



Chromatography Applications

Searchable by technique, industry,
and analyte

Volume 1: HPLC, UHPLC, LC-MS, SFC, SPE

Volume 2: GC, GC-MS, SPME, Air Monitoring

Volume 3: Chiral

Explore the Solutions Within

Method development can be a time-consuming part of the chromatographic process. Finding the best column, sample prep technique, mobile phase or carrier gas, and detection method is a challenging process. Just having a starting point can go a long way in reducing method development time.

Sigma-Aldrich has developed thousands of applications showing commonly analyzed compounds across many fields of research and testing.

This tool is interactive, searchable, and organized by research market focus within analytical technique, analyte, compound class, and key word. Each application includes links to the website which features additional information and convenient ordering.

This tool demonstrates how Sigma-Aldrich's analytical brands—Supelco, Fluka, Cerilliant, and RTC—are uniquely able to provide customers with a wide spectrum of chromatographic components across the analytical workflow:

- Sample collection and sample prep devices
- UHPLC, HPLC, LC-MS columns
- GC columns
- Chiral columns
- Mobile phase solvents
- Buffers and additives
- Derivatization reagents
- Analytical standards

Sigma-Aldrich continually adds new applications to its portfolio. If you have a suggestion for an application not found in this notebook, contact techservice@sial.com.

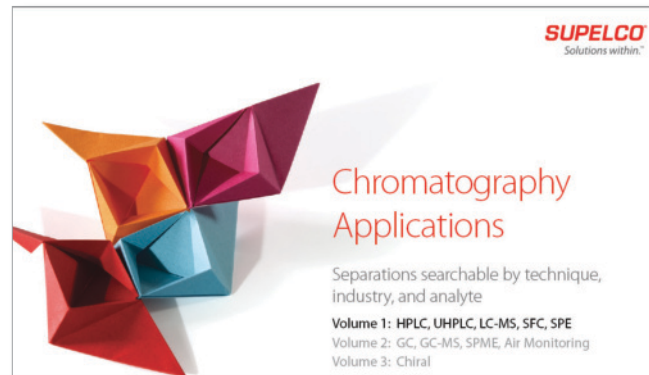
Expanded Publication

Learn How to Navigate the New Format

This expanded edition of the Chromatography Applications Notebook consists of three separate, but linked, volumes. Note that the application pages are numbered consecutively, **Volume 1** through **Volume 3**, beginning with 1.

Inside each volume is a **Master Table of Contents** and a comprehensive **Analyte Index**. These pages can be used to navigate from one volume to another.

When searching in the index, the page number(s) will help indicate the correct volume to visit. Volume page number keys are found in the index footer.



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Functionality Tips

The screenshot shows a web application interface for 'Chiral Agriculture'. The main content area displays a 'GC Analysis of cis-Chlordane Enantiomers on Astec® CHIRALDEX® G-BP' with a chromatogram and chemical structure. The interface includes a left sidebar with 'Publication Contents', a search panel, and a bottom navigation bar. Numbered callouts (1-19) point to specific UI elements: 1 (Content navigation), 2 (Publication title), 3 (Page number), 4 (Search field), 5 (Search results), 6 (Analytical technique), 7 (Market focus), 8 (Link to website product details), 9 (Publication issue date), 10 (Zoom bar), 11 (Bottom menu), 12 (Display publication contents), 13 (Display page thumbnails), 14 (Select text), 15 (Print options), 16 (Download PDF options), 17 (Full screen mode), 18 (Page navigation arrows), and 19 (Bottom menu navigation).

Legend

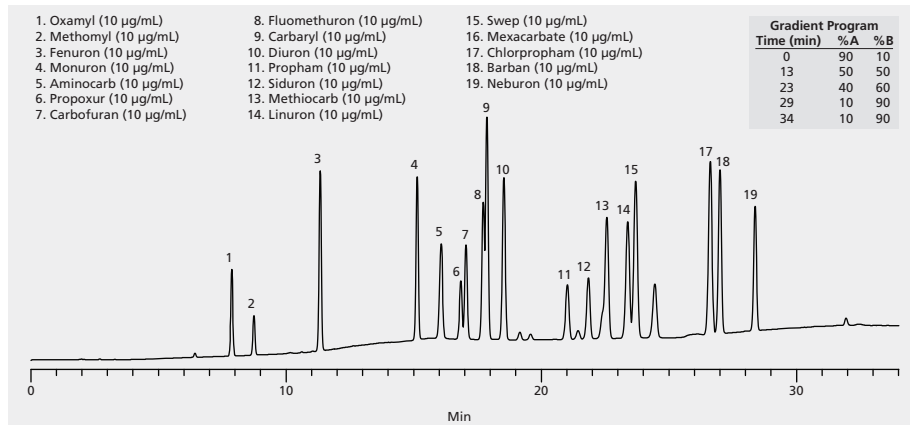
1. Content navigation
2. Publication title
3. Current page no. (accurate for chromatograms only)
4. Search field
5. Search results panel with search word(s) highlighted (will replace table of contents window)
6. Analytical technique
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HPLC, UHPLC or LC-MS

Agriculture

EPA Method 632: HPLC Analysis of Pesticides on Ascentis® C18

column Ascentis C18, 25 cm x 4.6 mm I.D., 5 µm particles (581325-U)
 mobile phase (A) water; (B) acetonitrile
 flow rate 1.0 mL/min
 column temp. 30 °C
 detector UV, 210 nm
 injection 10 µL
 sample as indicated in 16% acetonitrile in water
 Application No. **G003194**



HPLC Analysis of Acidic Herbicides in Water on a Polymeric C18 Column after SPE using Supelclean™ ENVI™-Carb

using Zymark AutoTrace Extraction WorkStation 1.20

sample preparation SPE (Solid Phase Extraction)
sample/matrix Fresh 1 L water samples, dechlorinated with sodium thiosulfate when necessary, at ambient temperature and pH.

SPE tube/cartridge Supelclean ENVI-Carb, 250 mg/6 mL (57092)
condition 10 mL DI water at 20 mL/min
sample addition 0.9 L water sample at 20 mL/min
drying 10 min using clean nitrogen
washing 10 mL DI water at 20 mL/min
elution 10 mL 0.1% phosphoric acid in

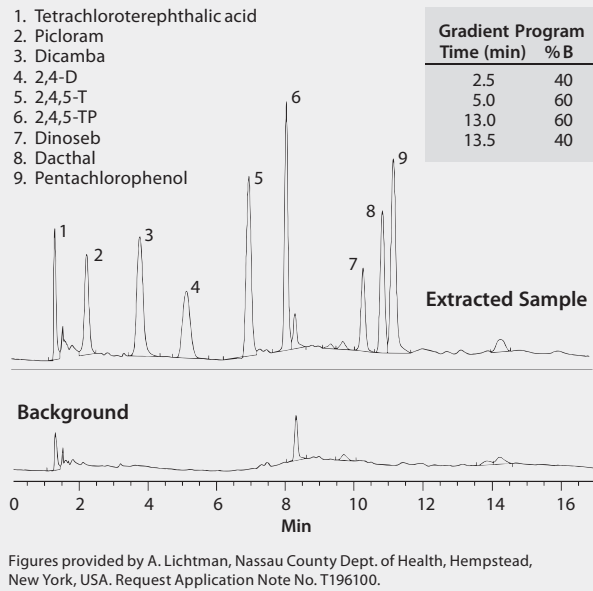
methylene chloride:acetonitrile (80:20) at 5 mL/min
column polymeric-coated silica-based PAH specialty column, 20 cm × 3 mm I.D., 5 μm (Supelco equivalent, SUPELCO SIL LC-PAH, available upon request)

mobile phase gradient, (A): 0.05% phosphoric acid in DI water; (B): acetonitrile
flow rate 0.5 mL/min
column temp. 50 °C

detector photodiode array- peak width: 0.053 min,
sampling interval: 0.320 sec, monitor 210 nm & 225 nm

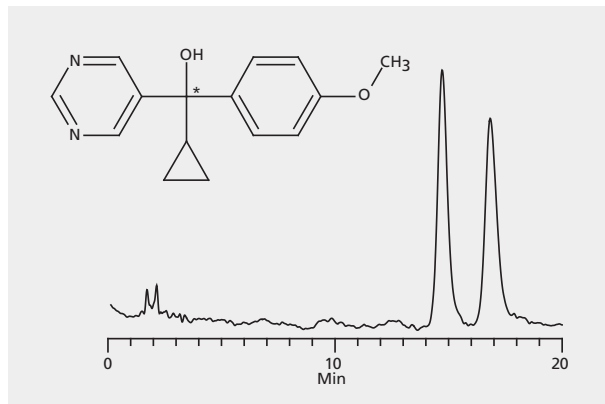
injection 10 μL of extract (4-5 ppb each analyte in water)

Application No. 796-0150



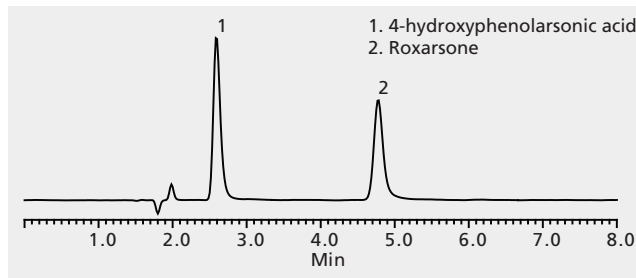
HPLC Analysis of Ancymidol Enantiomers on Astec® CYCLOBOND® I 2000 HP-RSP

column CYCLOBOND I 2000 HP-RSP, 25 cm x 4.6 mm I.D.,
5 µm particles (24024AST)
mobile phase ... (A) 5 mM ammonium acetate, pH 6.0; (B) acetonitrile; (80:20, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 215 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004684**



HPLC Analysis of Animal Feed Additives on Ascentis® Phenyl

column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase (A) 10 mM ammonium formate
(pH 3.0 with formic acid); (B) methanol; (78:22, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 225 nm
injection 5 µL
sample as indicated in mobile phase A
Application No. **G003712**

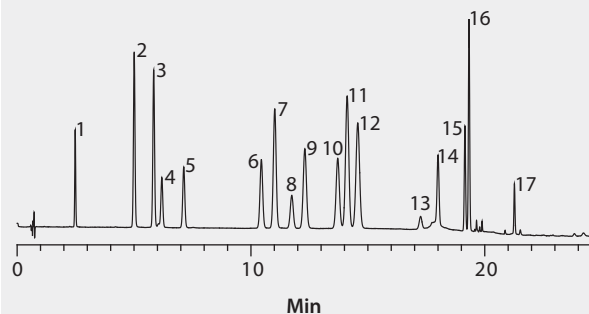


HPLC Analysis of Atrazine Herbicides on Ascentis® Express C18

This application demonstrates the suitability of Ascentis Express C18 for the efficient separation of 17 triazine pesticides.

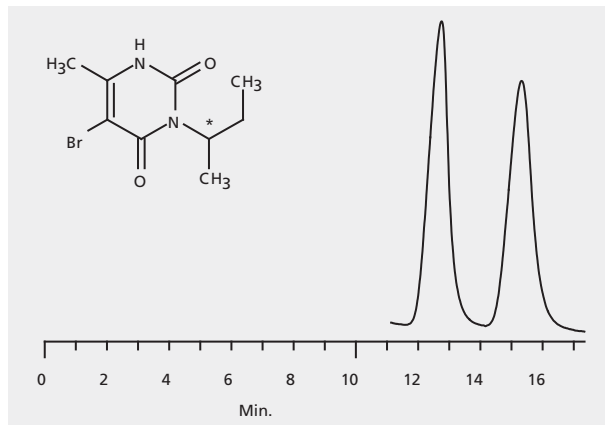
column . . . Ascentis Express C18, 10 cm x 3.0 mm I.D., 2.7 µm particles (53814-U)
 mobile phase . . . (A) 20 mM ammonium acetate, pH 6.4 unadjusted; (B) acetonitrile
 gradient . . . 20 to 28% B in 11 min; 28 to 65% B in 5 min; held at 65% B for 4 min
 flow rate 0.6 mL/min
 column temp. 46 °C
 detector UV, 240 nm
 injection 5 µL
 sample 10-25 µg/mL in 10:90, water: acetonitrile
 Application No. **G005654**

- | | |
|-----------------------|-------------------|
| 1. Desethylatrazine | 10. Diuron |
| 2. Metoxuron | 11. Isoproturon |
| 3. Hexazinone | 12. Metobromuron |
| 4. Simazine | 13. Metazachlor |
| 5. Cyanazine | 14. Sebuthylazine |
| 6. Methabenzthiazuron | 15. Terbutylazine |
| 7. Chlorotoluron | 16. Linuron |
| 8. Atrazine | 17. Metolachlor |
| 9. Monolinuron | |



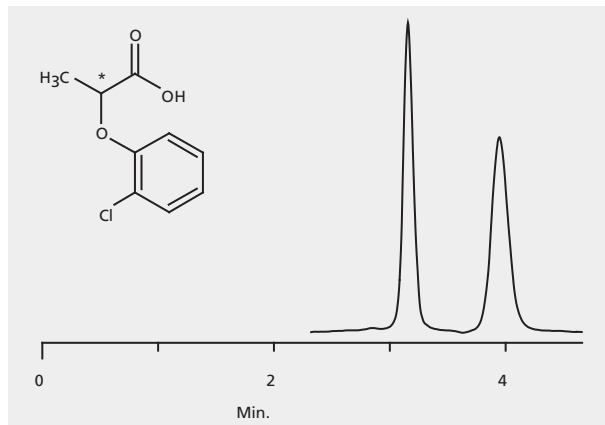
HPLC Analysis of Bromacil Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase (A) water; (B) ethanol; (70:30, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004595](#)



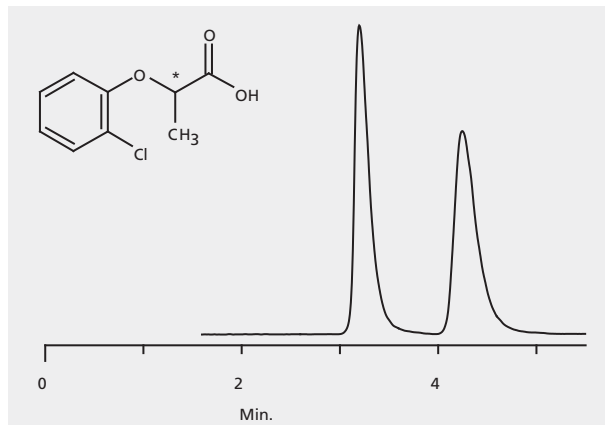
HPLC Analysis of 2(2-Chlorophenoxy) Propionic Acid Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase 0.1 wt% ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 235 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004579**



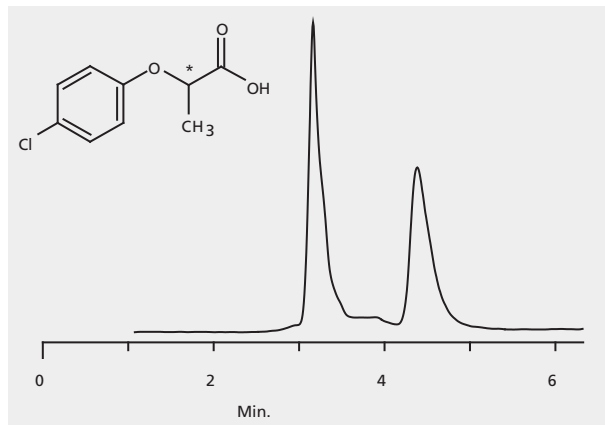
HPLC Analysis of 2(2-Chlorophenoxy) Propionic Acid Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase 0.1 wt% ammonium acetate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 2 mg/mL in methanol
Application No. [G004606](#)



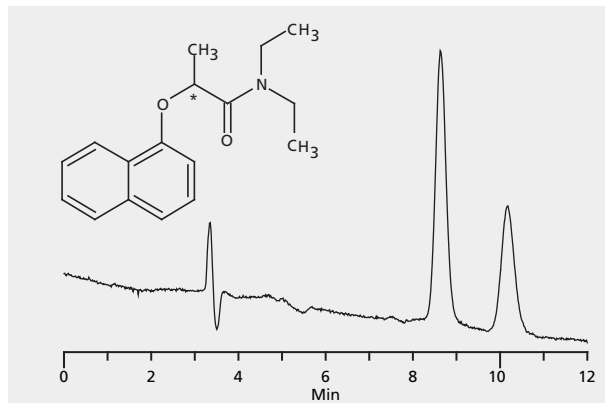
HPLC Analysis of 2(4-Chlorophenoxy) Propionic Acid Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase 0.1 wt% mM ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. [G004607](#)



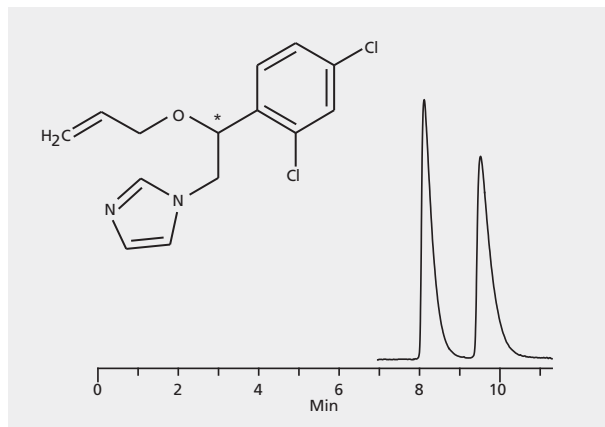
HPLC Analysis of Devrinol (Napropamide) Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 0.1% triethylamine, pH 5.0; (B) THF; (80:20, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004622](#)



HPLC Analysis of Enilconazol (Imazalil) Enantiomers on Astec® CYCLOBOND® I 2000

column CYCLOBOND I 2000, 25 cm x 4.6 mm I.D., 5 µm particles (20024AST)
mobile phase . . . (A) 0.1% triethylamine acetate, pH 4.1; (B) acetonitrile; (90:10, A:B)
flow rate 0.7 mL/min
column temp. 23 °C
detector UV, 230 nm
injection 1 µL
sample 5 mg/mL in methanol
Application No. [G004690](#)

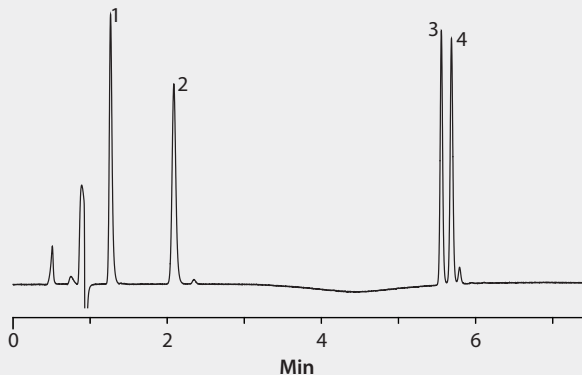


HPLC Analysis of Fusarium Mycotoxins on Ascentis® Express Phenyl-Hexyl

The trichothecene vomitoxins of *Fusarium* are significant plant pathogens of grain and forage crops that can lead to anorexic effects with livestock. This application demonstrates resolution of deoxynivalenol and three of its analogs.

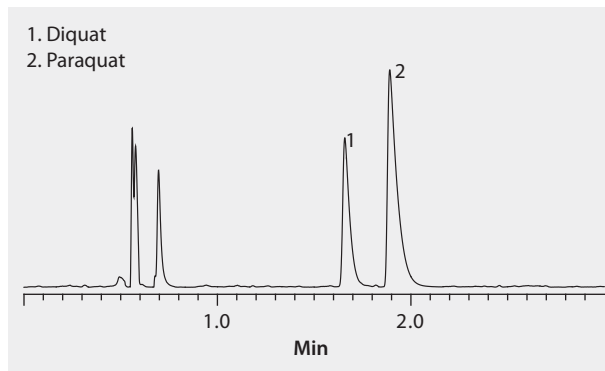
column Ascentis Express Phenyl-Hexyl, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53336-U)
mobile phase (A) water, acetonitrile, 90:10; (B) acetonitrile
gradient 0% B held for 0.5 min; to 15% B in 1 min; held at 15% B for 6 min
flow rate 0.3 mL/min
pressure 192 bar (2780 psi)
column temp. 30 °C
detector UV, 218 nm
injection 10 µL
sample 5 mg/L ea. in 95:5, water:acetonitrile
Application No. **G005539**

1. Nivalenol
2. Deoxynivalenol
3. 15-Acetyldeoxynivalenol
4. 3-Acetyldeoxynivalenol



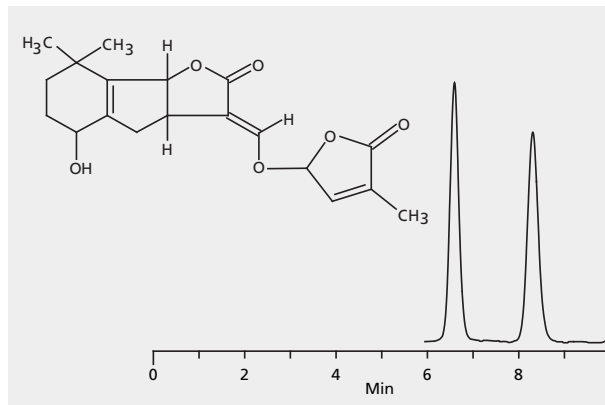
HPLC Analysis of Paraquat and Diquat on Ascentis® Express HILIC (UV Detection)

column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)
mobile phase (A) 200 mM ammonium TFA; (B) acetonitrile; (20:80, A:B)
flow rate 0.4 mL/min
column temp. 60 °C
detector UV, 257 nm (paraquat) and 308 nm (diquat)
injection 1 µL
sample 50 mg/L in mobile phase
Application No. [G005718](#)



HPLC Analysis of Strigol Enantiomers on Astec® CYCLOBOND® I 2000 RSP

column . . . CYCLOBOND I 2000 RSP, 25 cm x 4.6 mm I.D., 5 µm particles (20324AST)
mobile phase (A) 0.1% triethylamine, pH 4.1; (B) acetonitrile; (75:25, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 240 nm
injection 5 µL
sample 5 mg/mL in methanol
Application No. [G004707](#)



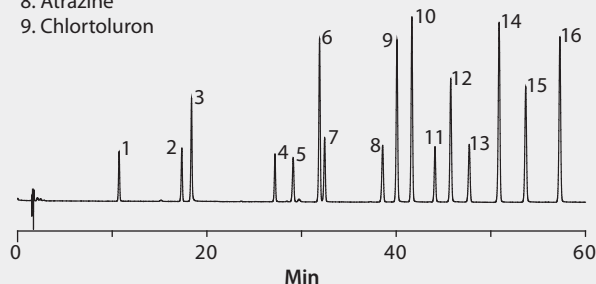
HPLC Analysis of 16 Triazine and Phenyl Urea Compounds on Ascentis® Express RP-Amide

This application demonstrates the suitability of Ascentis Express RP-Amide for the efficient separation of 16 triazine and phenyl urea compounds. Lower column temperature can improve resolution of the critical pair.

column . . . Ascentis Express RP-Amide, 15 cm x 3 mm I.D., 2.7 µm particles (53919-U)
 mobile phase (A) water; (B) acetonitrile
 gradient 5 to 53% B in 70 min
 flow rate 0.4 mL/min
 column temp. 35 °C
 detector UV, 240 nm
 injection 5 µL
 sample 20 mg/L (except terbuthylazin desethyl
 and terbuthylazine 60 mg/L) in 60:40, water: acetonitrile

Application No. **G005651**

- | | |
|---------------------------|--------------------|
| 1. Atrazine desisopropyl | 10. Isoproturon |
| 2. Atrazine desethyl | 11. Terbumeton |
| 3. Carbendazime | 12. Diuron |
| 4. Terbumeton desethyl | 13. Propazine |
| 5. Simazine | 14. Terbuthylazine |
| 6. Terbuthylazin desethyl | 15. Linuron |
| 7. Cyanazine | 16. Terbutryne |
| 8. Atrazine | |
| 9. Chlortoluron | |



HPLC Analysis of 16 Triazine and Phenyl Urea Compounds on Ascentis® Express RP-Amide, Modified Gradient

This application demonstrates the suitability of Ascentis Express RP-Amide for the efficient separation of 16 triazine and phenyl urea compounds.

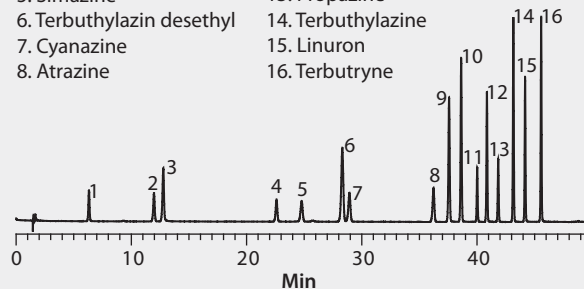
Lower column temperature can improve resolution of the critical pair.

column . . . Ascentis Express RP-Amide, 15 cm x 3 mm I.D., 2.7 µm particles (53919-U)
 mobile phase (A) water; (B) acetonitrile
 gradient . . . 10 to 25% B in 30 min; 25 to 60% B in 15 min; held at 60% B for 5 min
 flow rate 0.4 mL/min
 column temp. 35 °C
 detector UV, 240 nm
 injection 5 µL
 sample 20 mg/L each (except terbuthylazin desethyl and terbuthylazine 60 mg/L) in 60:40, water: acetonitrile

Application No. **G005652**

1. Atrazine desisopropyl
2. Atrazine desethyl
3. Carbendazime
4. Terbumeton desethyl
5. Simazine
6. Terbuthylazin desethyl
7. Cyanazine
8. Atrazine

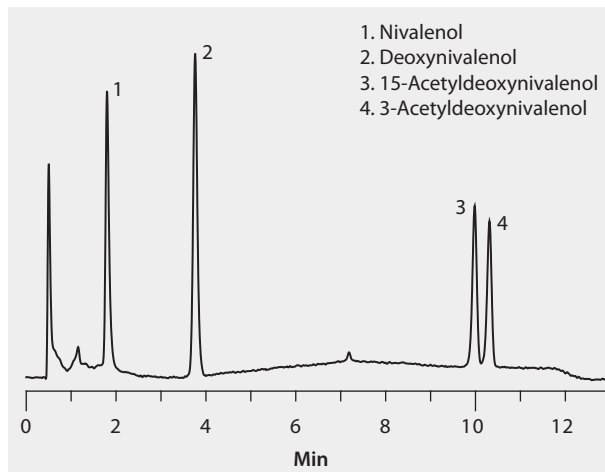
9. Chlortoluron
10. Isoproturon
11. Terbumeton
12. Diuron
13. Propazine
14. Terbuthylazine
15. Linuron
16. Terbutryne



HPLC Analysis of B-Trichothecenes on Ascentis® Express C18

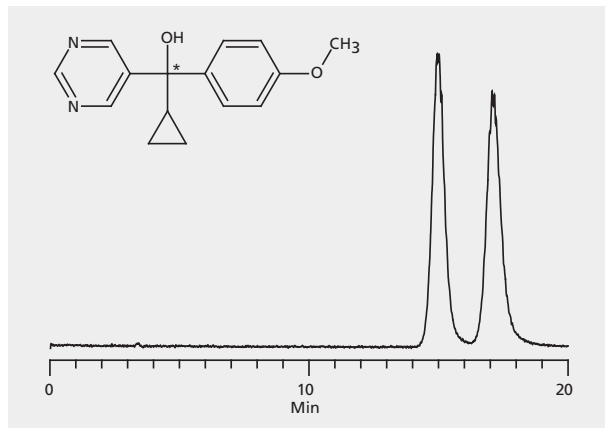
Mycotoxins are toxic secondary metabolites produced by fungi. Those chemicals exist in food as a result of fungal infection of crops. Mycotoxins have strong resistance to decomposition and digestion, so they remain in the food chain in meat and dairy products. They also resist to temperature, such as cooking and freezing. Their effects on human and animal health include death, cancer, weakened immune systems and as allergens or irritants.

column Ascentis Express C18, 10 cm x 3 mm I.D., 2.7 µm particles (53814-U)
 mobile phase (A) water:acetonitrile:methanol (92:4:4); (B) acetonitrile
 gradient 0% B held for 5 minutes, to 8% B in 3 minutes, 8% B held for 2 minutes
 flow rate 0.8 mL/min
 pressure 4061 psi (280 bar)
 column temp. 35 °C
 detector UV, 220 nm
 injection 40 µL
 sample 2 ppm each in water:methanol:acetonitrile (92:4:4)
 Application No. [G005561](#)



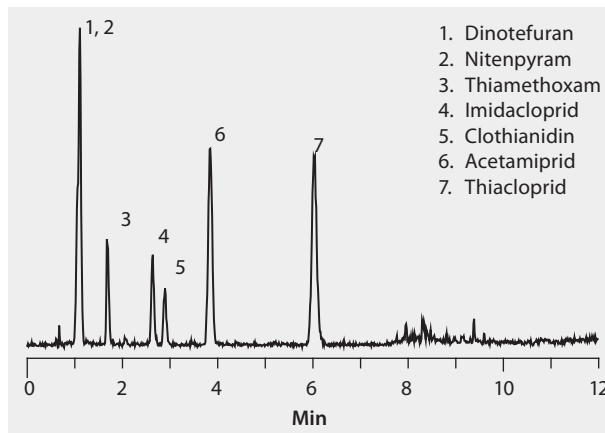
LC-MS Analysis of Ancymidol Enantiomers on Astec® CYCLOBOND® I 2000 HP-RSP

column CYCLOBOND I 2000 HP-RSP, 25 cm x 4.6 mm I.D.,
5 µm particles (24024AST)
mobile phase ... (A) 5 mM ammonium acetate, pH 6.0; (B) acetonitrile; (80:20, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector MS (m/z = 257)
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004683**



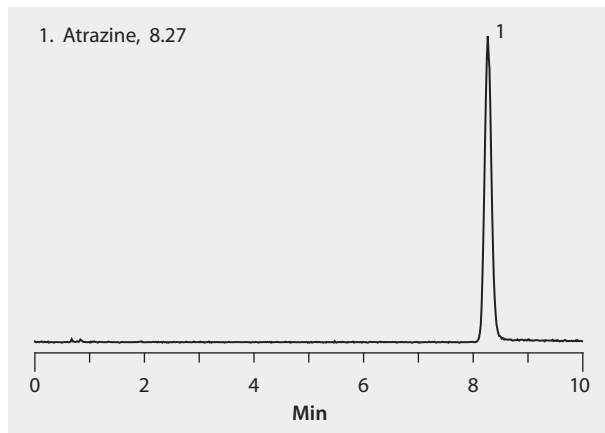
LC-MS/MS Analysis of Neonicotinoid Pesticides in Dandelion Blossoms on Ascentis® Express C18 after Dispersive SPE (QuEChERS) using Supel™ QuE

sample preparation Dispersive (QuEChERS)
 sample/matrix . . . 3 g pulverized dandelion blossoms, homogenized in 10 mL water
 extraction tube Supel QuE Acetate extraction tube (55234-U)
 extraction process . . . add 25 mL of acetonitrile; add contents of Supel QuE acetate
 extraction tube; shake immediately for 1 minute; centrifuge at 3400 rpm for 5 minutes
 clean-up tube Supel QuE PSA/C18 tube (55288-U)
 clean-up process Transfer 1 mL of the acetonitrile layer into a
 Supel QuE PSA/C18 cleanup tube; shake for 1 minute;
 centrifuge at 3500 rpm for 3 minutes; (draw off 700 μ L of supernatant,
 evaporate to dryness at 50 $^{\circ}$ C under nitrogen;
 reconstitute in 200 μ L of 50:50 0.1% formic acid:0.1% formic acid in methanol)
 column . . . Ascentis Express C18, 10 cm x 3.0 mm I.D., 2.7 μ m particles (53814-U)
 mobile phase . . . (A) 0.1% formic acid in water; (B) 0.1% formic acid in methanol
 gradient . . . 30% B from 0 to 5 min; to 100% B in 0.2 min; held at 100% B for 5.3
 min; to 30% B in 0.5 min; held at 30% B for 5 min
 flow rate 500 μ L/min
 pressure 3800 psi (262 bar)
 column temp. 25 $^{\circ}$ C
 detector MS, ESI(+), MRM, m/z 203.2/129.2, 271.2/225.0, 292.1/211.0,
 256.0/175.2, 250.0/132.0, 223.2/126.0, 253.0/125.8
 injection 3 μ L
 Application No. **G006046**



UHPLC Analysis of Atrazine on Titan™ C18

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase . . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 °C
detector MS, XIC m/z 216.10
injection 2 µL
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. **G006089**



Air Monitoring and Industrial Hygiene

EPA Method TO-11/IP-6A and ASTM® D5197: HPLC Analysis of Aldehydes and Ketones on SUPELCOSIL™ LC-18 after Collection/Desorption using LpDNPH

sample/matrix 5 µg each carbonyl-DNPH on LpDNPH cartridge.
Cartridge eluted with 5.0 mL acetonitrile

adsorbent tube LpDNPH Cartridge (21024-U)

column SUPELCOSIL LC-18, 25 cm × 4.6 mm I.D., 5 µm particles (58298)

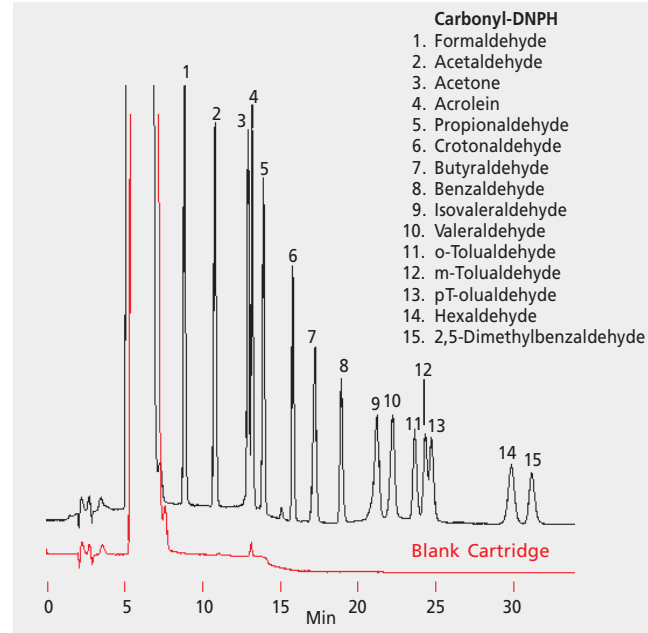
mobile phase (A): acetonitrile:tetrahydrofuran:water, 30:10:60;
(B): acetonitrile:water, 60:40 gradient 0% B for 1 min,
linear gradient to 100% B over 10 min

flow rate 1.5 mL/min

detector VIS, 360 nm

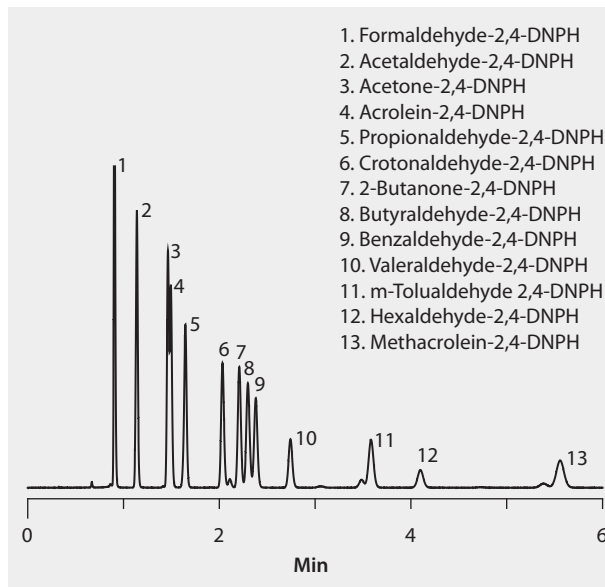
injection 25 µL of extract

Application No. **795-0298**



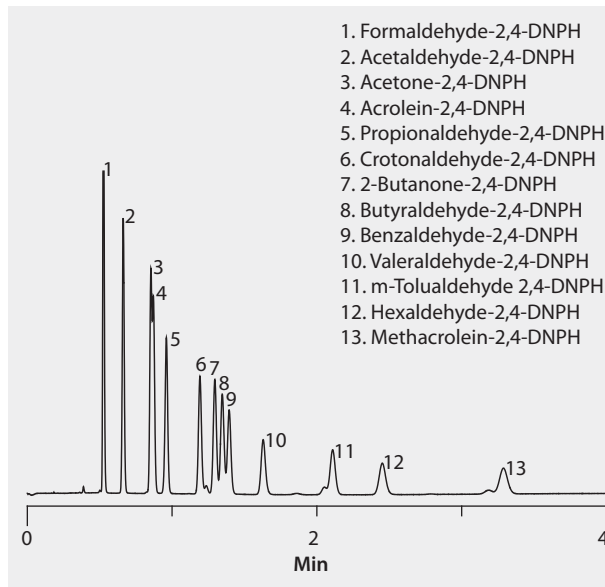
HPLC Analysis of 13 Aldehyde/Ketone DNPH Derivatives on Ascentis® Express C18

column . . . Ascentis Express C18, 10 cm x 4.6 mm I.D., 2.7 µm particles (53827-U)
 mobile phase (A) water; (B) acetonitrile; (40:60 v/v, A:B)
 flow rate 2 mL/min
 pressure 4685 psi (323 bar)
 detector UV, 360 nm
 injection 10 µL
 sample carb Method 1004 DNPH Mix 2 (47651-U) dilute 3:2 with water
 Application No. [G005635](#)



HPLC Analysis of 13 Aldehyde/Ketone DNPH Derivatives on Ascentis® Express C18 (High Flow Rate)

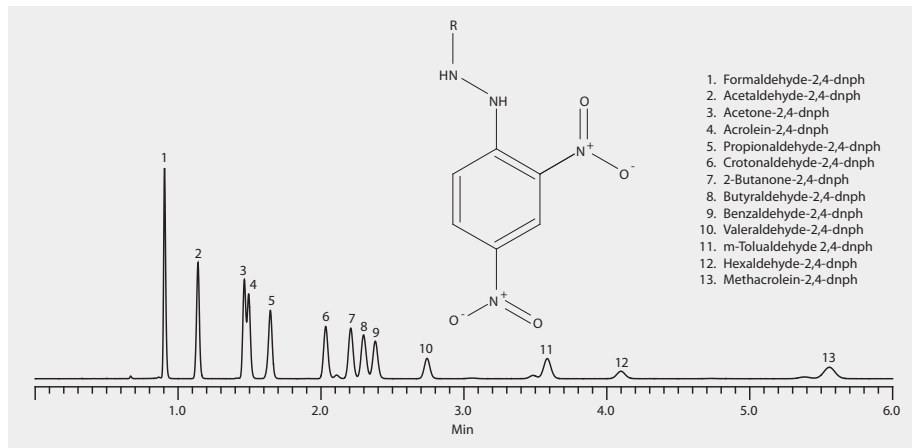
column . . . Ascentis Express C18, 10 cm x 4.6 mm I.D., 2.7 µm particles (53827-U)
 mobile phase (A) water; (B) acetonitrile; (40:60, v/v, A:B)
 flow rate 3.5 mL/min
 pressure 8296 psi (572 bar)
 detector UV, 360 nm
 injection 10 µL
 sample Carb Method 1004 DNPH Mix 2 (47651-U) dilute 3:2 with water
 Application No. **G005636**



HPLC Analysis of Aldehydes and Ketones as DNPH Derivatives on Ascentis® Express C18

This application demonstrates the suitability of Ascentis Express C18 for the separation of aldehyde/ketone-DNPH derivatives.

column . . . Ascentis Express C18, 10 cm x 4.6 mm I.D., 2.7 µm particles (53827-U)
 mobile phase (A) water; (B) acetonitrile; (40:60, A:B)
 flow rate 2 mL/min
 pressure 4685 psi (323 bar)
 column temp. 30 °C
 detector UV, 360 nm
 injection 5 µL
 sample Sample in water
 Application No. [G005382](#)

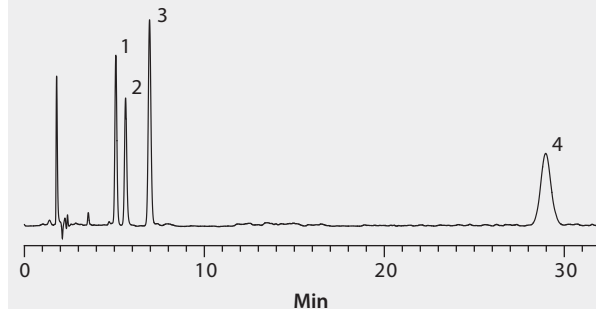


HPLC Analysis of Isocyanate Derivatives on Ascentis® ES-Cyano

This application demonstrates the suitability of Ascentis Cyano for the efficient separation of isocyanate derivatives.

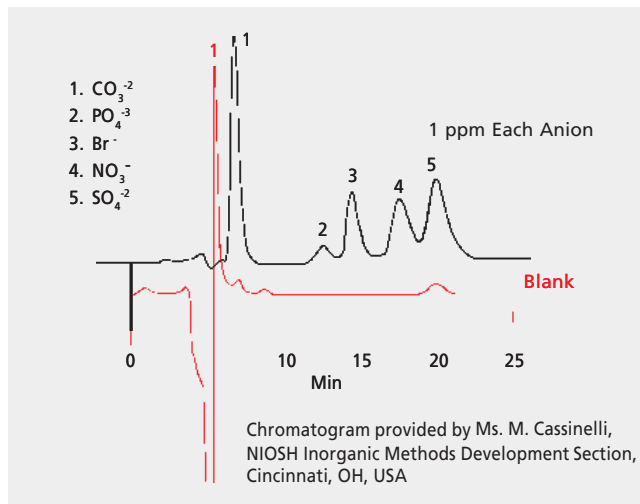
column Ascentis Cyano, 15 cm x 4.6 mm I.D., 5 µm particles (577306-U)
 mobile phase (A) 0.1% ammonium acetate in water;
 (B) 0.1% ammonium acetate in acetonitrile; (70:30, A:B)
 flow rate 1.0 mL/min
 column temp. 35 °C
 detector UV, 254 nm
 injection 5 µL
 sample 20 µg/mL in 80:12:8, water: acetonitrile: dimethylsulfoxide
 Application No. **G005707**

1. *N,N'*-(2-Methyl-1,3-phenylene)bis(4-(2-pyridinyl)-1-piperazinecarboxamide)
2. *N,N'*-1,6-Hexanediylbis(4-(2-pyridinyl)-1-piperazinecarboxamide)
3. *N,N'*-(4-Methyl-1,3-phenylene)bis(4-(2-pyridinyl)-1-piperazinecarboxamide)
4. *N,N'*-(Methylenediphenylene)bis(4-(2-pyridinyl)-1-piperazinecarboxamide)



NIOSH Method 7903: IC Analysis of Inorganic Acids after Collection/Desorption using ORBO™-53

sample/matrix	1 ppm of each component
adsorbent tube	ORBO-53 (20265)
column	Dionex S2 Fast Run Anion, 25 cm × 3 mm I.D.
mobile phase	3 mM NaHCO ₃ /2.4 mM Na ₂ CO ₃
flow rate	3 mL/min
detector	conductivity (10μSiemens/ cm)
Application No.	713-0873



OSHA Method 42/47 and ASTM® D5836: HPLC Analysis of Isocyanates on SUPELCOSIL™ LC-8 after Collection/Desorption using ORBO™-80

sample/matrix . . . calibration standard: isocyanate derivatives, 5 µg/mL in acetonitrile
 blank: 1-(2-pyridyl)piperazine (1-2PP) coated glass fiber filter
 desorbed in acetonitrile/DMSO, 9:1

adsorbent tube ORBO-80 (20811)

column SUPELCOSIL LC-8, 25 cm × 4.6 mm I.D., 5 µm particles (58297)

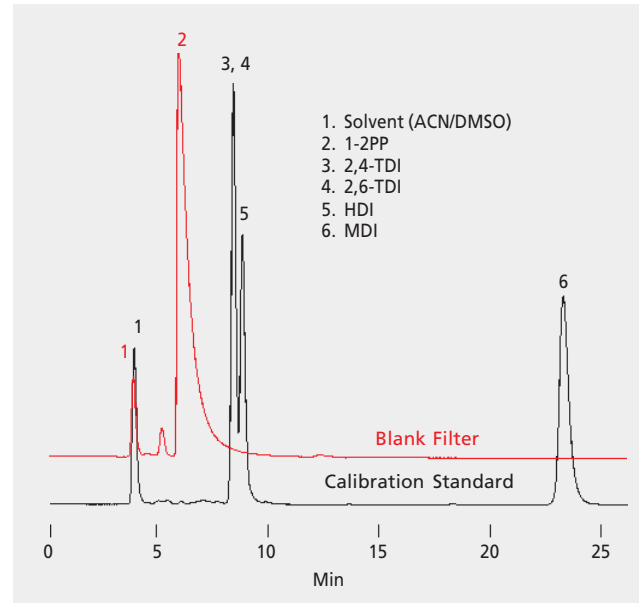
mobile phase 0.05 M ammonium acetate in water:acetonitrile,
 70:30 (pH 6-6.2 with acetic acid)

flow rate linear gradient, 0.7 mL/min to 2 mL/min in 15 min

detector UV, 254 nm

injection 10 µL

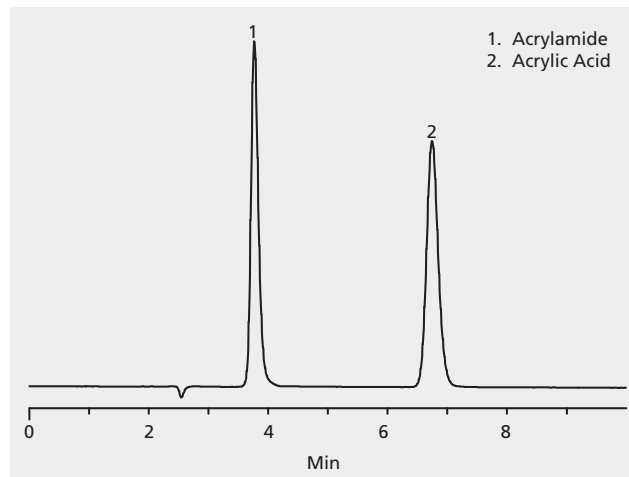
Application No. [796-0376](#)



Chemicals and Industrial Polymers

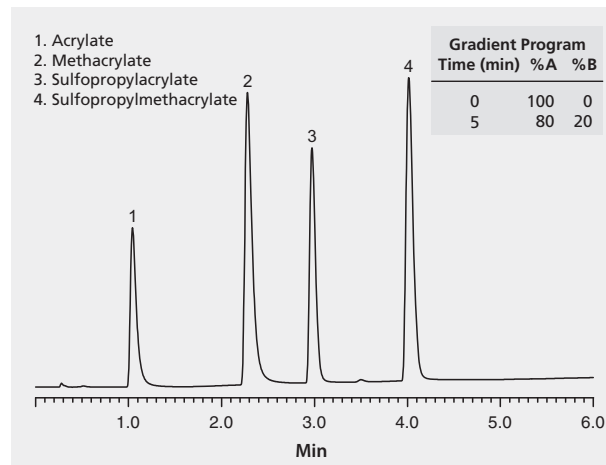
HPLC Analysis of Acrylamide and Acrylic Acid on
Discovery® HS F5

column Discovery HS F5, 15 cm × 4.6 mm I.D., 5 µm particles (567516-U)
mobile phase 0.05% formic acid
flow rate 1.0 mL/min
column temp. ambient
detector UV, 206 nm
injection 1 µL
sample 1.0 mg/mL each in mobile phase
Application No. [G002569](#)



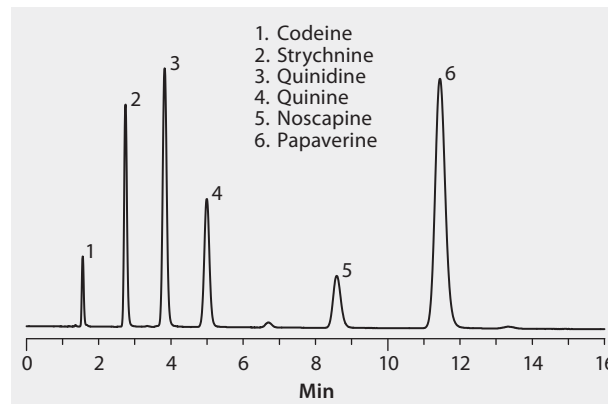
HPLC Analysis of Acrylic Acid Derivatives on Discovery[®] Zr-Carbon

column Discovery Zr-Carbon, 7.5 cm × 2.1 mm I.D., 3 μm particles (65726-U)
 mobile phase (A) 30 mM phosphoric acid, pH 1.9; (B) acetonitrile
 flow rate 0.42 mL/min
 column temp. 50 °C
 detector UV, 210 nm (200 nm will enhance sensitivity ~2x)
 injection 1 μL
 sample acrylate @ 0.05 g/L, methacrylate @ 0.05 g/L,
 sulfopropylacrylate @ 0.02 g/L, sulfopropylmethacrylate @ 0.02 g/L
 in 30 mM H₃PO₄, pH 1.9
 Application No. **G002143**



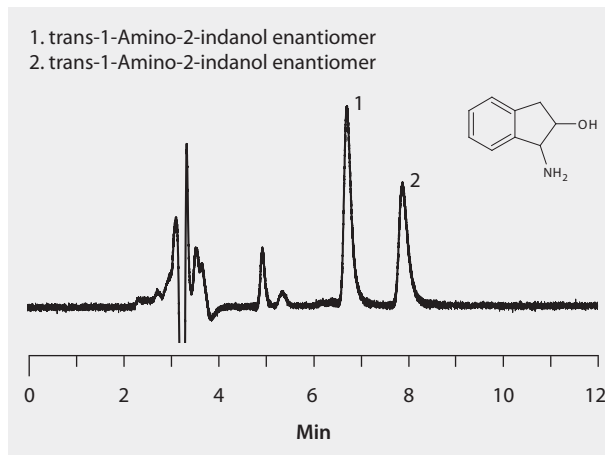
HPLC Analysis of Amides on Discovery® RP-Amide C16

column Discovery RP-Amide C16, 15 cm × 4.6 mm, 5 µm particles (505013)
mobile phase (A) methanol; (B) 25mM monopotassium phosphate,
pH 3.0; (20:80, A:B)
flow rate 2 mL/min
column temp. 30 °C
detector UV, 254 nm
injection 10 µL
Application No. **G000691**



HPLC Analysis of trans-1-Amino-2-Indanol Enantiomers on LARIHC™ CF6-P

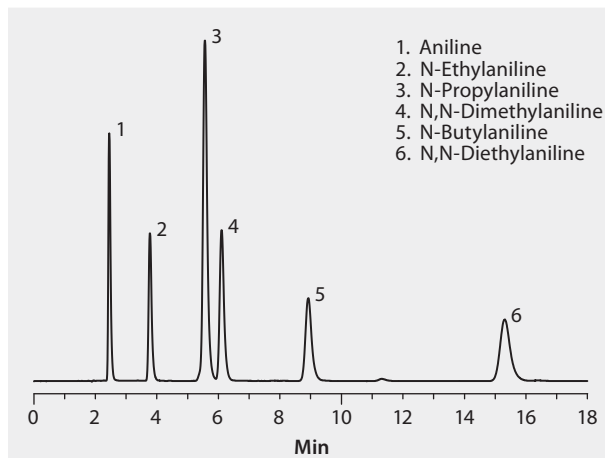
column . . . LARIHC CF6-P, 25 cm x 4.6 mm I.D., 5 µm particles (AZYP Part No.L1001, available from Supelco/Sigma-Aldrich as a custom item.)
 mobile phase . . . (A) methanol; (B) acetonitrile; (C) acetic acid; (D) triethylamine, (70:30:0.3:0.2, A:B:C:D)
 flow rate 1 mL/min
 column temp. 20 °C
 detector UV, 254 nm
 injection 5 µL
 sample Trans-1-Amino-2-indanol, 0.3 mg/mL in ethanol
 Application No. G005256



Ref: 1. Ping Sun, Chunlei Wang, Zachary S. Breitbach, Ying Zhang, and Daniel W. Armstrong, Development of New HPLC Chiral Stationary Phases Based on Native and Derivatized Cyclofructans *Anal. Chem.* **81**, 10215 (2009)
 2. Ping Sun and Daniel W. Armstrong, Effective enantiomeric separations of racemic primary amines by the isopropyl carbamate-cyclofructan6 chiral stationary phase *J. Chromatogr. A.* **1217**, 4904 (2010)

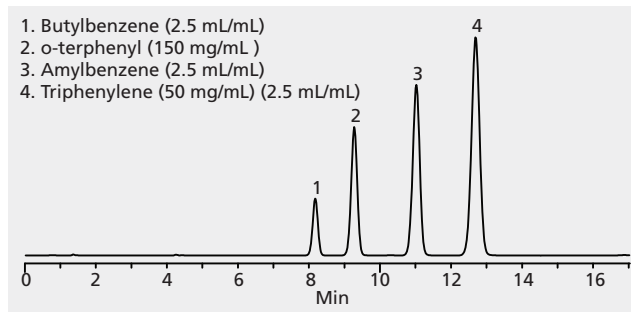
HPLC Analysis of Aniline Homologs on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 μm particles (504955)
mobile phase (A) methanol; (B) water (60:40, A:B)
flow rate 1 mL/min
column temp. 30 °C
detector UV, 254 nm
Application No. **G000295**



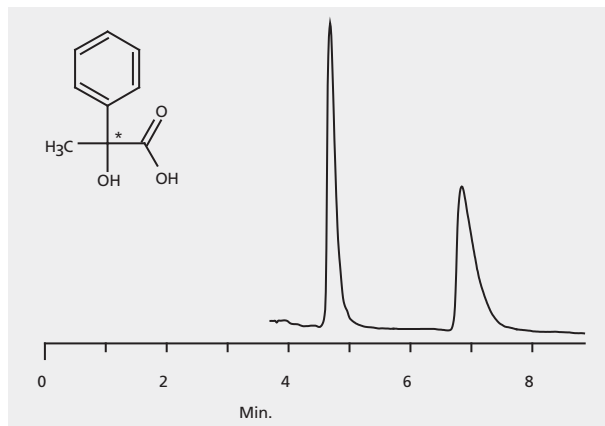
HPLC Analysis of Aromatics on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) water; (B) acetonitrile; (30:70, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 2 µL
sample as indicated in acetonitrile
Application No. [G002607](#)



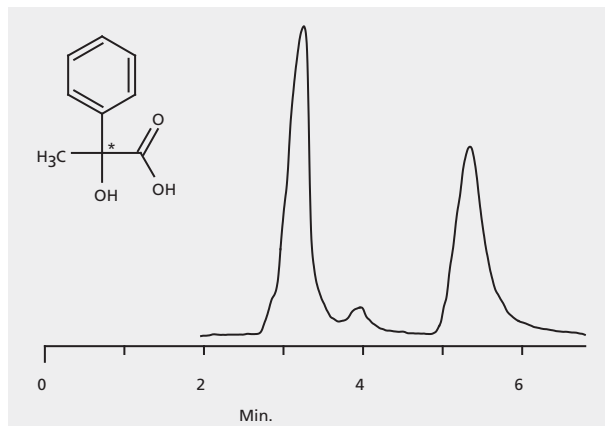
HPLC Analysis of Atrolactic Acid Enantiomers on Astec® CHIROBIOTIC® R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
mobile phase 0.1 wt% ammonium acetate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 5 mg/mL in methanol
Application No. [G004594](#)



HPLC Analysis of Atrolactic Acid Enantiomers on Astec® CHIROBIOTIC® TAG

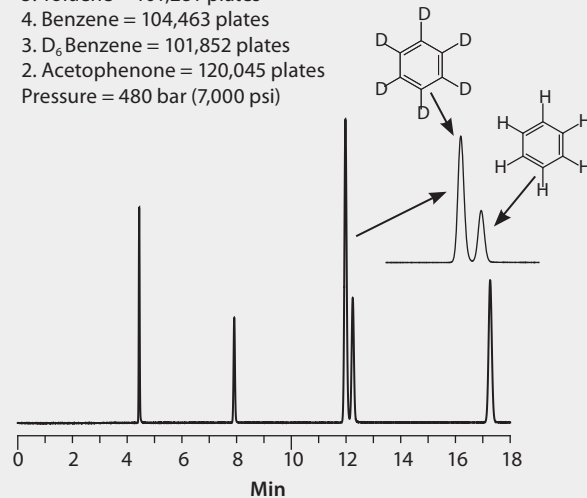
column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase 0.1 wt% ammonium acetate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. [G004604](#)



HPLC Analysis of Benzene and Deuterated Benzene on Ascentis® Express C18

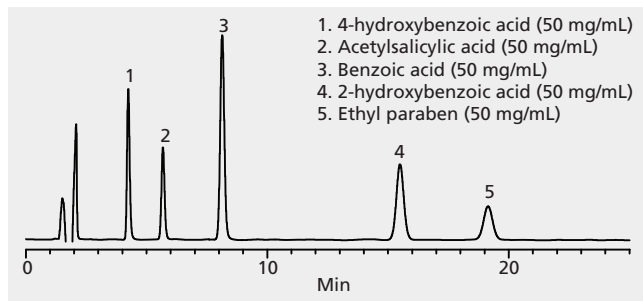
column Ascentis Express C18, 15 cm × 4.6 mm I.D., 2.7 μm particles
mobile phase (A) acetonitrile; (B) water (55:45, A:B)
flow rate 1.0 mL/min
column temp. 50 °C
detector UV, 254 nm
injection 10 μL
Application No. **G004046**

5. Toluene = 101,281 plates
 4. Benzene = 104,463 plates
 3. D₆ Benzene = 101,852 plates
 2. Acetophenone = 120,045 plates
- Pressure = 480 bar (7,000 psi)



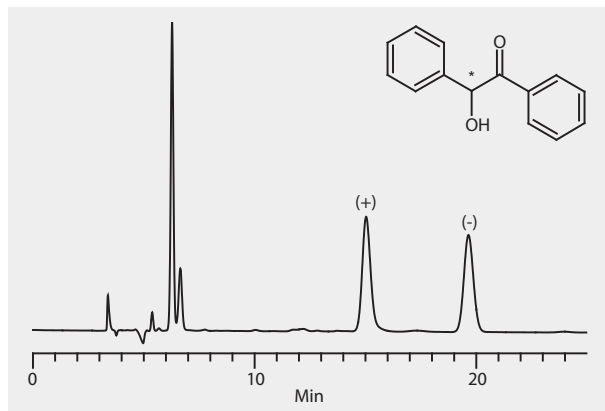
HPLC Analysis of Benzoic Acid Derivatives on Ascentis® RP-Amide

column . . . Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase . . . (A) 0.1% TFA in water; (B) 0.1% TFA in acetonitrile; (70:30, A:B)
flow rate 1.0 mL/min
column temp. 30 °C
detector UV, 220 nm
injection 10 µL
sample as indicated in 0.1% TFA in water
Application No. [G002627](#)



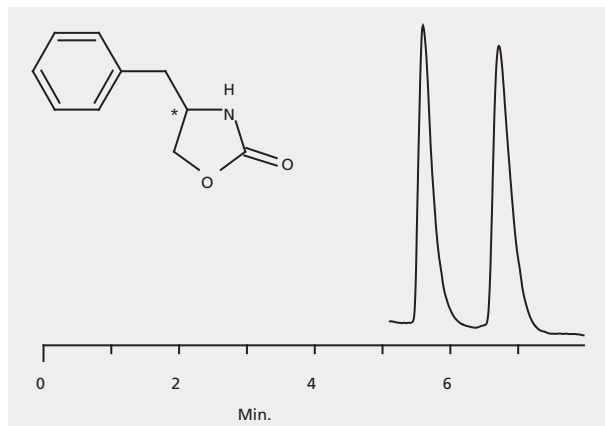
HPLC Analysis of Benzoin Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) heptane; (B) IPA; (C) TFA; (90:10:0.1, A:B:C)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G004986](#)



HPLC Analysis of 4-Benzyl-2-oxazolidinone Enantiomers on Astec® CHIROBIOTIC® TAG

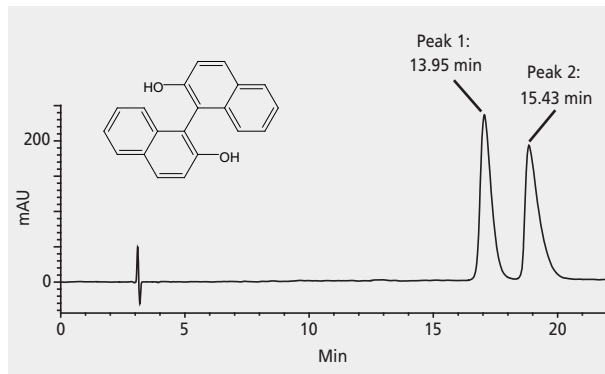
column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase methanol
flow rate 1 mL/min
column temp. 23 °C
detector UV, 230 nm
injection 2 µL
sample 2 mg/mL in methanol
Application No. [G004605](#)



HPLC Analysis of Binaphthol Enantiomers on Astec® CYCLOBOND® I 2000 DNP

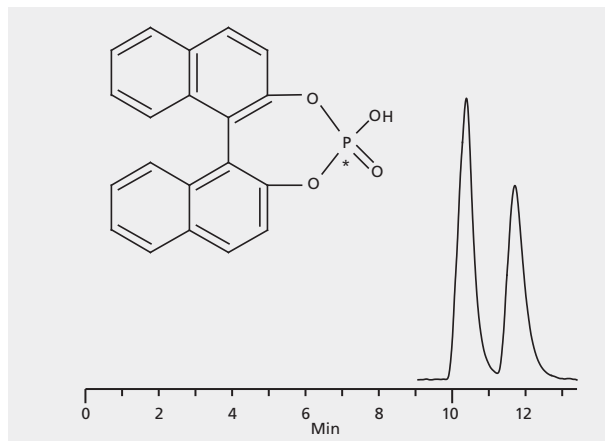
column . . . CYCLOBOND I 2000 DNP, 25 cm × 4.6 mm I.D., 5 μm particles (25024AST)
mobile phase . . . (A) 0.1% triethyl ammonium acetate, pH 4.1; (B) acetonitrile; (75:25, A:B)

flow rate 1.0 mL/min
column temp. 23 °C
detector UV, 230 nm
injection 5 μL
Application No. **G004028**



HPLC Analysis of 1,1'-Binaphthyl-2,2'-diyl Hydrogenphosphate Enantiomers on Astec® (R,R) P-CAP™

column Astec (R,R) P-CAP, 25 cm x 4.6 mm I.D., 5 µm particles (31024AST)
mobile phase 20 mM ammonium acetate in: (A) acetonitrile;
(B) methanol; (70:30, A:B)
flow rate 0.9 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. **G004718**



HPLC Analysis of 2,2'-Bis[(S)-(4-methylphenyl)sulfinyl]-1,1'-binaphthalene Diastereomers on Ascentis® Express C18

This application demonstrates the suitability of the Ascentis Express C18 for the separation of the diastereomers by HPLC in reversed phase mode.

column . . . Ascentis Express C18, 10 cm x 4.6 mm I.D., 2.7 μ m particles (53827-U)

mobile phase (A) water; (B) methanol; (25:75, A:B)

flow rate 0.8 mL/min

pressure 2450 psi (169 bar)

column temp. 35 $^{\circ}$ C

detector UV, 240 nm

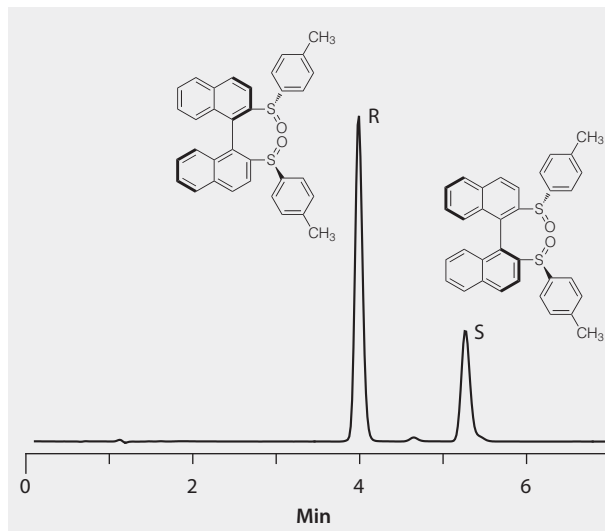
injection 5 μ L

sample (1R)-2,2'-Bis[(S)-(4-methylphenyl)sulfonyl]-1,1'-binaphthalene,

25 μ g/mL in methanol; (1S)-2,2'-Bis[(S)-(4-methylphenyl)sulfonyl]-

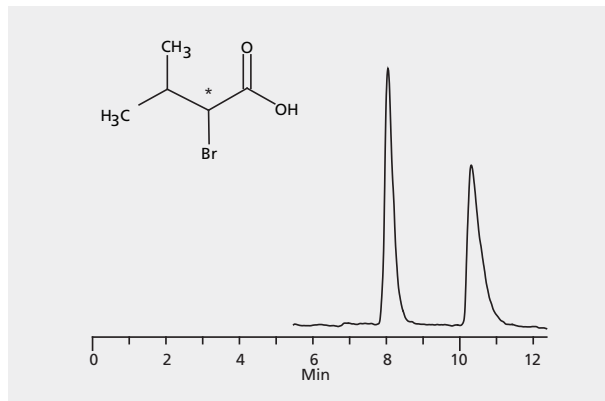
1,1'-binaphthalene, 50 μ g/mL in methanol

Application No. **G005612**



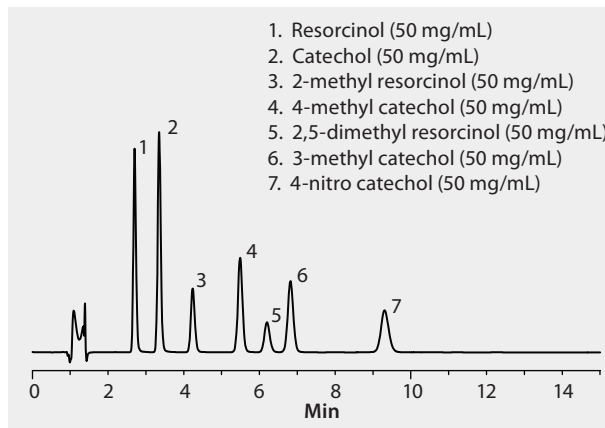
HPLC Analysis of 2-Bromo-3-Methylbutyric Acid Enantiomers on Astec® CHIROBIOTIC® R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
mobile phase (A) 20 mM ammonium acetate; (B) methanol; (15:85, A:B)
(alternate mobile phase of 0.1% ammonium acetate
in methanol gives 3.5 and 4.3 min retention)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. **G004667**



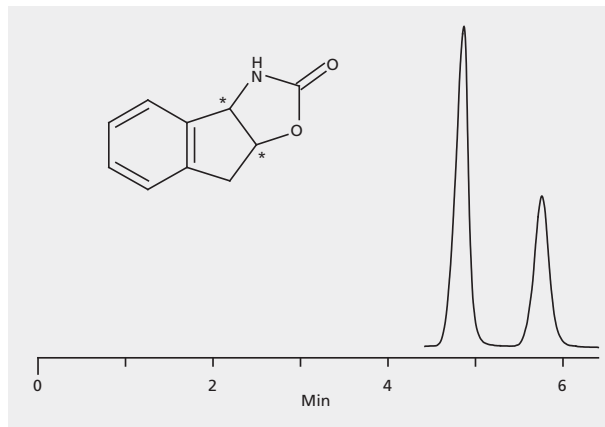
HPLC Analysis of Catechols and Resorcinols on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 20 mM phosphoric acid
(pH 2.0 unadjusted); (B) acetonitrile; (75:25, A:B)
flow rate 1.5 mL/min
column temp. 30 °C
detector UV, 270 nm
injection 25 µL
sample as indicated in 20 mM phosphoric acid (pH 2.0)
Application No. **G002597**



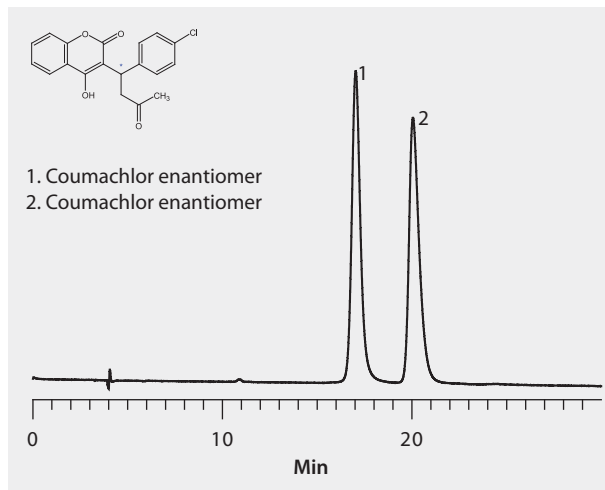
HPLC Analysis of Cis-(+/-)-3,3a,8,8a-Tetrahydro-2H-indeno[1,2-d]oxazol-2-one Enantiomers on Astec® (R,R) P-CAP™-DP

column . . . Astec (R,R) P-CAP-DP, 25 cm x 4.6 mm I.D., 5 µm particles (35024AST)
mobile phase (A) acetonitrile; (B) methanol; (98:2, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004729](#)



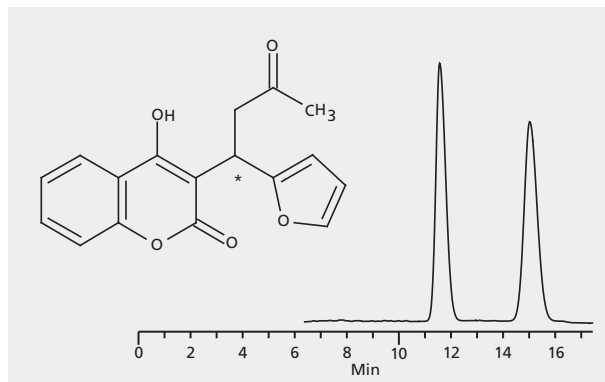
HPLC Analysis of Coumachlor Enantiomers on Astec® CYCLOBOND® I 2000 DM

column . . . CYCLOBOND I 2000 DM, 25 cm x 4.6 mm I.D., 5 µm particles (20924AST)
mobile phase . . . (A) acetonitrile; (B) 20 mM ammonium acetate, pH 2.9; (20:80, A:B)
flow rate 0.8 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 3 µL
sample coumachlor, 1 mg/mL in acetonitrile:water (50:50)
Application No. **G005160**



HPLC Analysis of Coumafuryl Enantiomers on Astec® CHIROBIOTIC® V

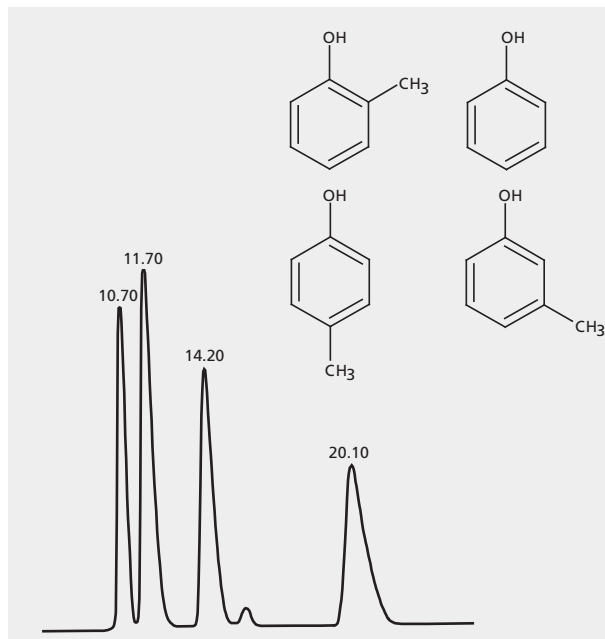
column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 20 mM ammonium nitrate, pH 5.5; (B) THF; (90:10, A:B)
flow rate 1.2 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 1 µL
sample 2 mg/mL in methanol
Application No. **G004639**



HPLC Analysis of Cresols and Phenol on Astec® CYCLOBOND® I 2000

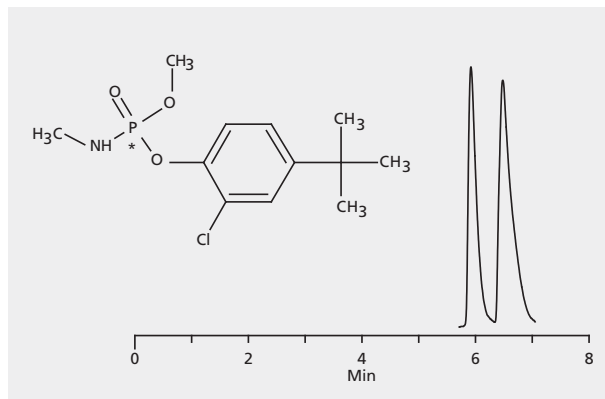
column CYCLOBOND I 2000, 25 cm x 4.6 mm I.D., 5 µm particles (20024AST)
mobile phase (A) water; (B) methanol; (90:10, A:B)
flow rate 1 mL/min
column temp. 22 °C
detector UV, 254 nm
injection 1 µL
sample 0.5 mg/mL in methanol
peak 1: o-cresol (10.70 min)
peak 2: phenol (11.70 min)
peak 3: m-cresol (14.20 min)
peak 4: p-cresol (20.10 min)

Application No. **G004731**



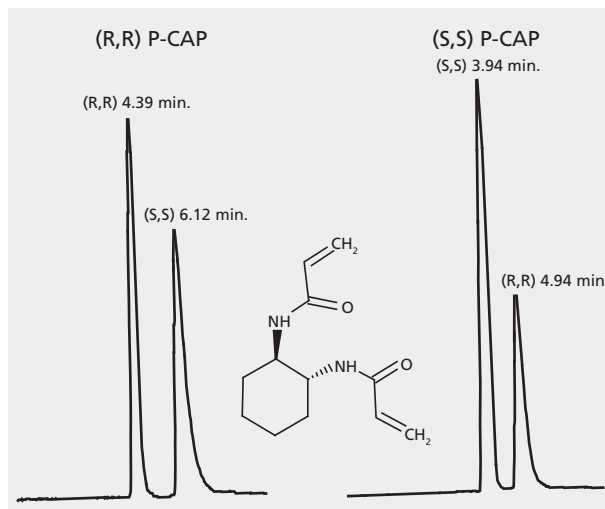
HPLC Analysis of Crufomate (Ruelene) Enantiomers on Astec® CYCLOBOND® I 2000

column CYCLOBOND I 2000, 25 cm x 4.6 mm I.D., 5 µm particles (20024AST)
mobile phase . . . (A) acetonitrile; (B) acetic acid; (C) triethylamine; (100:0.2:0.1, A:B:C)
flow rate 1 mL/min
column temp. ambient
detector UV, 254 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004703](#)



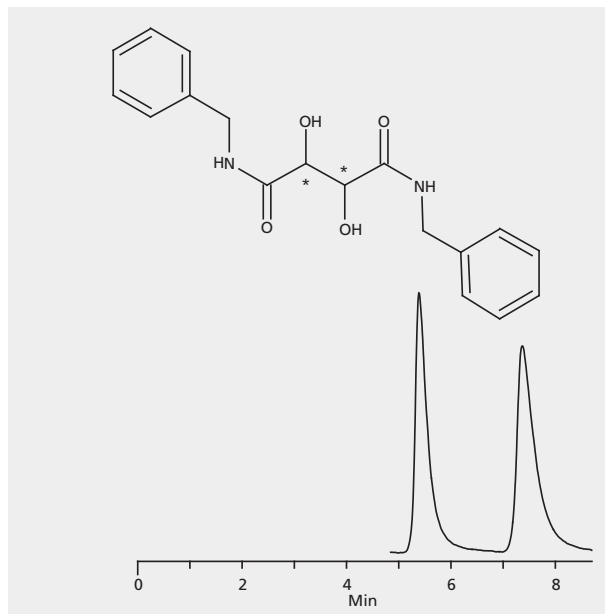
HPLC Analysis of DACH-ACR Enantiomers on Astec® P-CAP™

column Astec (R,R) P-CAP or (S,S) P-CAP, 25 cm x 4.6 mm I.D.,
 5 µm particles (31024AST, 33024AST)
 mobile phase (A) acetonitrile; (B) methanol; (97:3, A:B)
 flow rate 1 mL/min
 column temp. 25 °C
 detector UV, 254 nm
 injection 10 µL
 sample (R,R)- and (S,S)-DACH-ACR
 (N-(2-acryloylamino-(1R,2R)-cyclohexyl)-acrylamide)
 Application No. **G004401**



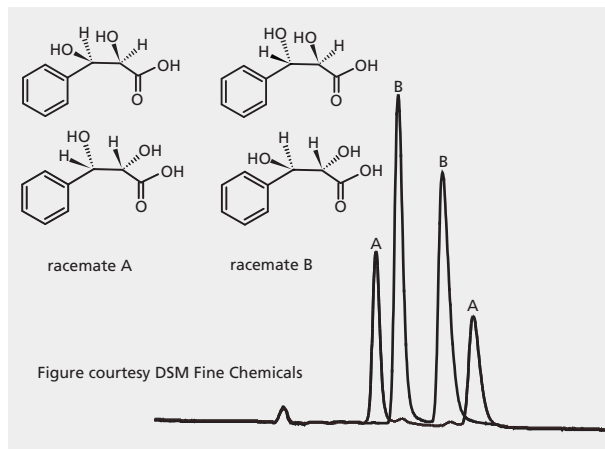
HPLC Analysis of (+/-)-N,N-Dibenzyltartaric Diamide Enantiomers on Astec® (R,R) P-CAP™-DP

column . . . Astec (R,R) P-CAP-DP, 25 cm x 4.6 mm I.D., 5 µm particles (35024AST)
mobile phase (A) acetonitrile; (B) methanol; (95:5, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004727](#)



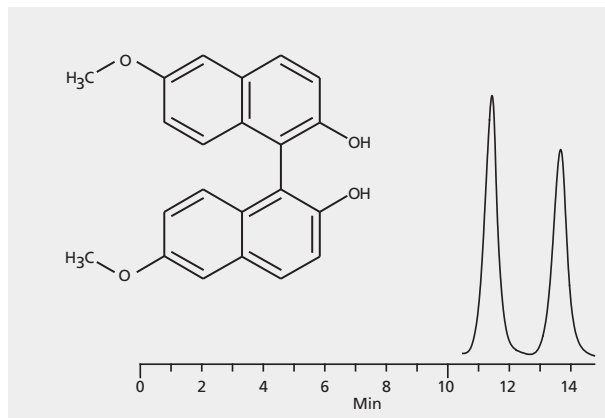
HPLC Analysis of 2,3-Dihydroxy-3-Phenylpropionic Acid Enantiomers on CHIROBIOTIC R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 μ m particles (13024AST)
 mobile phase (A) 0.1% ammonia, pH 4.1 with formic acid;
 (B) methanol; (50:50, A:B)
 flow rate 1 mL/min
 column temp. ambient
 detector UV, 258 nm
 injection 10 μ L
 sample 2,3-dihydroxy-3-phenyl-propionic acid isomers:
 (A) racemate A (4.85 and 6.95 min)
 (B) racemate B (5.33 and 6.29 min)
 Application No. **G004409**



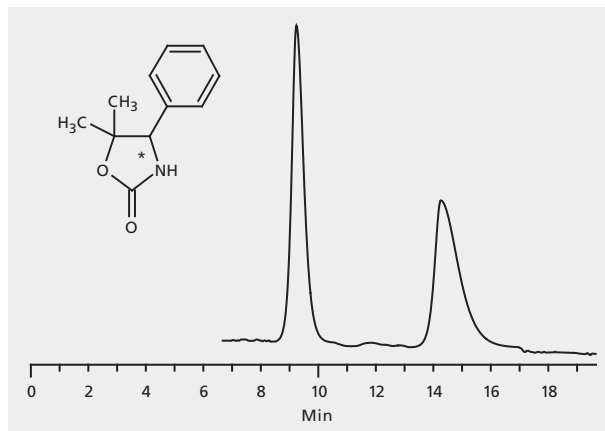
HPLC Analysis of Di-6,6'-Methoxy-bi(2-Naphthol) Enantiomers on Astec® (R,R) P-CAP™

column Astec (R,R) P-CAP, 25 cm x 4.6 mm I.D., 5 µm particles (31024AST)
mobile phase (A) ethanol; (B): heptane; (50:50, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 5 mg/mL in methanol
Application No. **G004724**



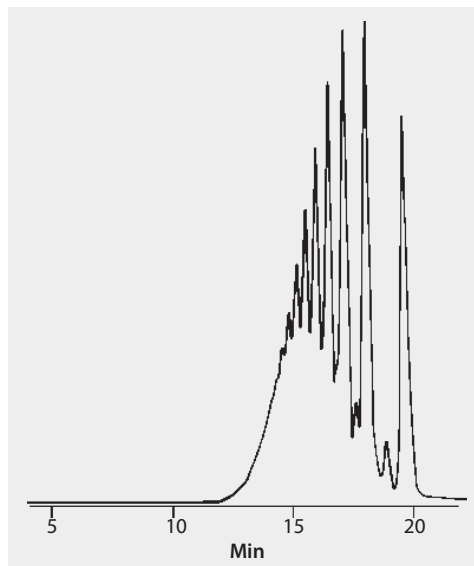
HPLC Analysis of 5,5-Dimethyl-4-phenyl-2-oxazolidinone Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 0.5% triethylamine acetate, pH 4.1; (B) methanol; (80:20, A:B)
flow rate 1 mL/min
column temp. ambient
detector UV, 254 nm
injection 5 µL
sample 5 mg/mL in methanol
Application No. [G004547](#)



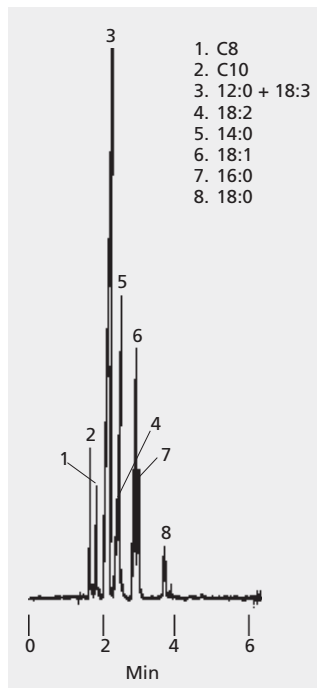
HPLC Analysis of Epoxy resin, Epikote® 1001 on TSKgel® G3000HXL

column TSKgel G3000HXL, 30 cm × 7.8 mm I.D., 6 μm particles (816136)
mobile phase tetrahydrofuran
flow rate 1 mL/min
detector UV, 254 nm
Application No. [713-0783](#)



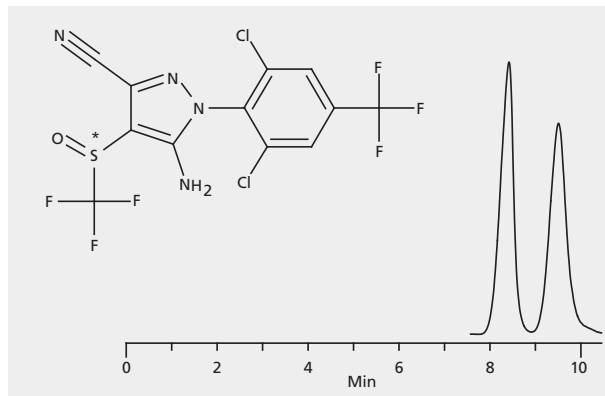
HPLC Analysis of Fatty Acid Methyl Esters (FAMES) on SUPELCOSIL™ LC-18

column SUPELCOSIL LC-18, 25 cm × 4.6 mm I.D., 5 μm particles (58298)
mobile phase (A) acetonitrile; (B) acetone; (59.0:41.0, v/v, A:B)
flow rate 1 mL/min
detector RI
injection . . . 10 μL of 9% C8 to C18 saturated and unsaturated FAMES in mobile phase
Application No. [797-0501](#)



HPLC Analysis of Fipronil Enantiomers on Astec® (R,R) P-CAP™

column Astec (R,R) P-CAP, 25 cm x 4.6 mm I.D., 5 µm particles (31024AST)
mobile phase (A) heptane; (B) ethanol; (80:20, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 235 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004720](#)



HPLC Analysis of p-Fluorophenyl Methyl Sulfoxide Enantiomers on Astec® CHIROBIOTIC® TAG

Details: A. Berthod *et al*, J. Chromatogr A, 955 (2002) 53-69.

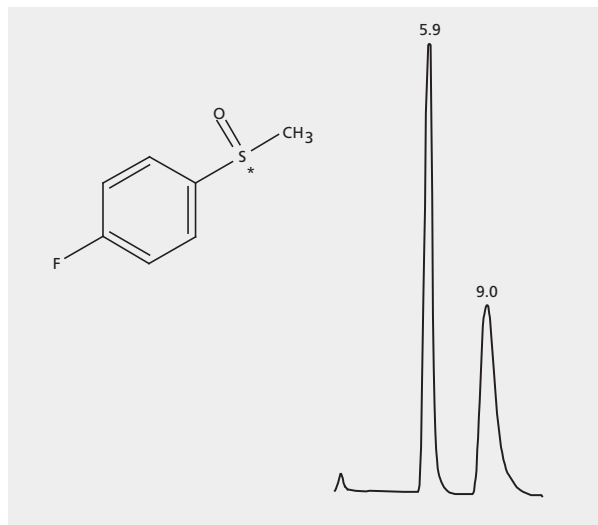
column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)

mobile phase (A) hexane; (B) ethanol; (50:50, A:B)

flow rate 2 mL/min

detector UV, polarimetry to confirm elution order

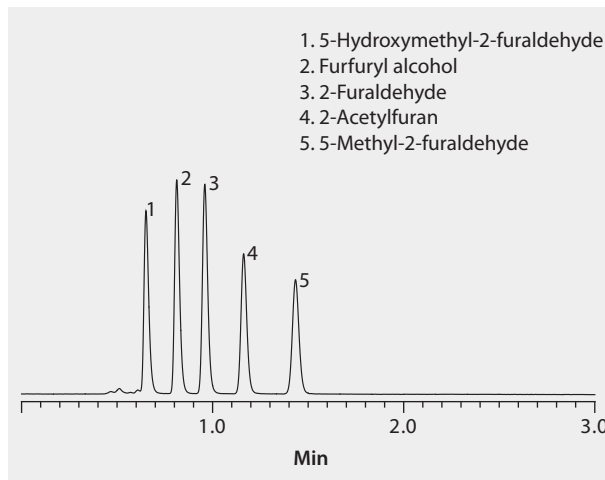
Application No. [G004735](#)



HPLC Analysis of Furans on Ascentis® Express C18

This application demonstrates the suitability of Ascentis Express C18 for the efficient separation of furans as listed in ASTM method 05837-99.

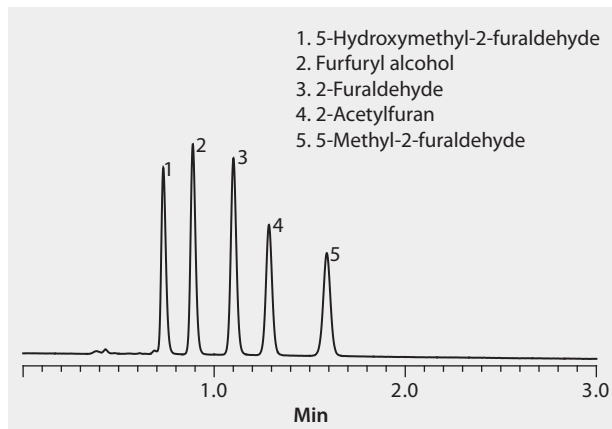
column . . . Ascentis Express C18, 5 cm x 3.0 mm I.D., 2.7 µm particles (53811-U)
mobile phase (A) water; (B) acetonitrile; (80:20, A:B)
flow rate 0.4 mL/min
column temp. 35 °C
detector UV, 230 nm
injection 1 µL
sample 20 µg/mL in 80:20, water: acetonitrile
Application No. **G005700**



HPLC Analysis of Furans on Ascentis® Express Phenyl-Hexyl

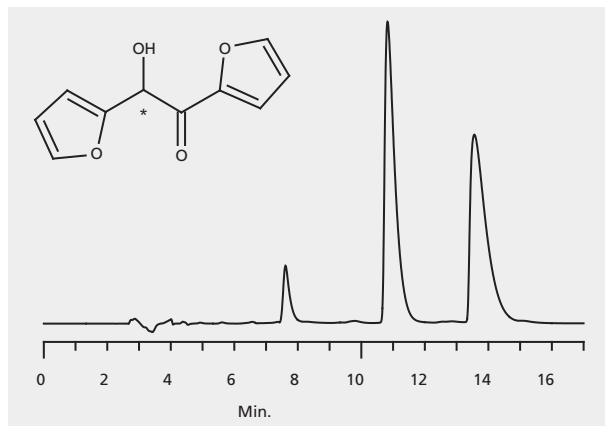
This application demonstrates the suitability of Ascentis Express Hexyl-Phenyl for the efficient separation of furans as listed in ASTM method D5837-99.

column Ascentis Express Phenyl-Hexyl, 5 cm x 3.0 mm I.D.,
2.7 µm particles (53342-U)
mobile phase (A) water; (B) acetonitrile; (80:20, A:B)
flow rate 0.4 mL/min
column temp. 35 °C
detector UV, 230 nm
injection 1 µL
sample 20 µg/mL in 80:20, water: acetonitrile
Application No. **G005704**



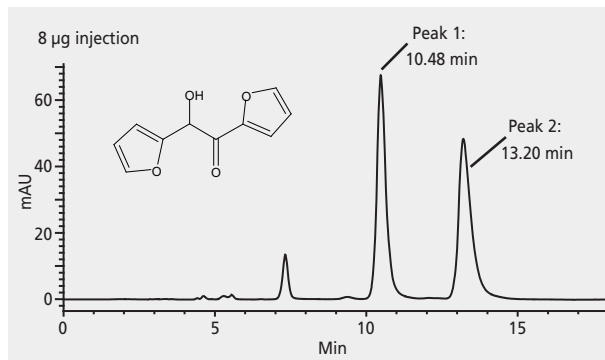
HPLC Analysis of Furoin Enantiomers on Astec® P-CAP™-DP

column (R,R) P-CAP-DP, 25 cm x 4.6 mm I.D., 5 µm particles (35024AST)
mobile phase (A) hexane; (B) ethanol; (80:20, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 235 nm
injection 10 µL
sample 2 mg/mL in mobile phase
Application No. [G004587](#)



HPLC Analysis of Furoin on Astec® (R,R) P-CAP™-DP

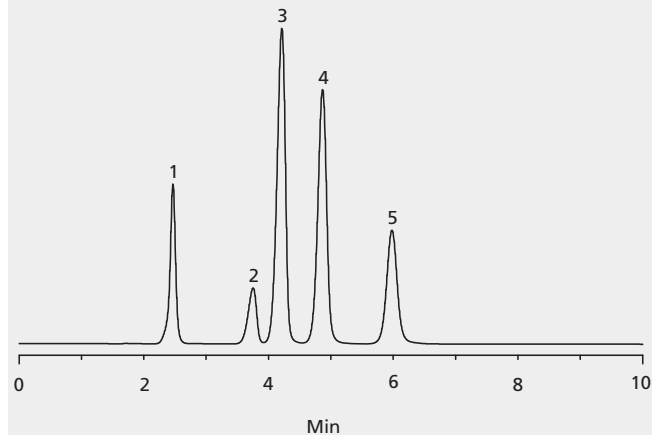
column (R,R) P-CAP-DP, 25 cm × 4.6 mm I.D., 5 µm particles (25024AST)
mobile phase (A) hexane; (B) ethanol; (80:20, A:B)
flow rate 1.0 mL/min
column temp. 23 °C
detector UV, 235 nm
injection 0.2 mL
sample 4 µg/mL
Application No. **G004031**



HPLC Analysis of Heterocyclic Amines (HCAs) on Discovery® HS F5

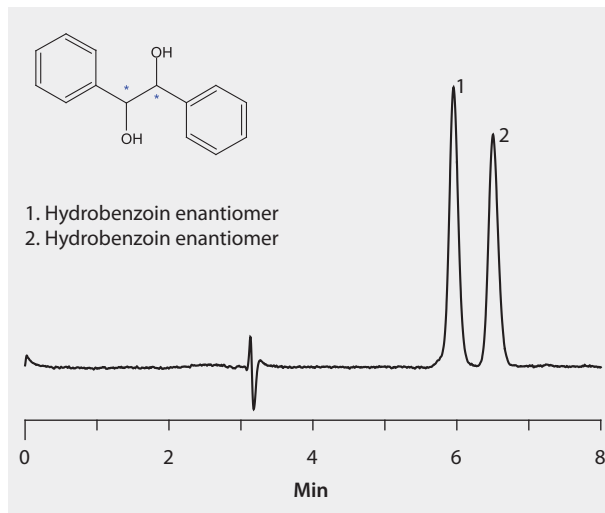
column Discovery HS F5, 15 cm × 4.6 mm I.D., 5 µm particles (567516-U)
mobile phase (A) water (10 mM ammonium acetate, pH 4.0 with acetic acid); (B) methanol (v/v); (15:85, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 5 µg/mL
sample 50 µg/mL each in mobile phase
Application No. **G002333**

1. 2-Amino-9H-pyrido[2,3-b]indole (AC)
2. 2-Amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (PHIP)
3. 2-Amino-3-methyl-3H-imidazo[4,5-f]quinoline (IQ)
4. 2-Amino-3,4-dimethyl-3H-imidazo [4,5-f]quinoline (MeIQ)
5. 2-Amino-3,8-dimethylimidazo[4,5-f]quinoxaline (MeIQx)



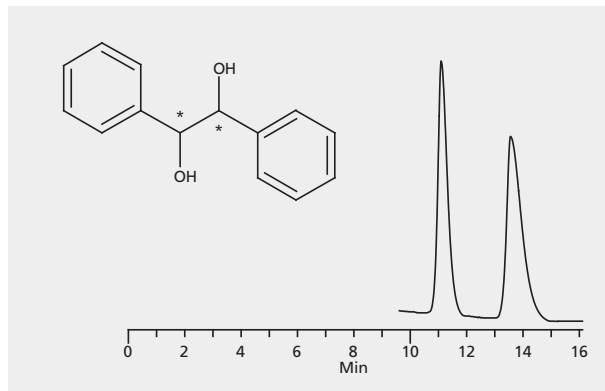
HPLC Analysis of Hydrobenzoin Enantiomers on Astec® CYCLOBOND® I 2000 RSP

column . . . CYCLOBOND I 2000 RSP, 25 cm x 4.6 mm I.D., 5 µm particles (20324AST)
mobile phase . . . (A) acetonitrile; (B) 10 mM ammonium acetate, pH 4.0; (25:75, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 5 µL
sample hydrobenzoin, 1 mg/mL in acetonitrile:water (50:50)
Application No. [G005163](#)



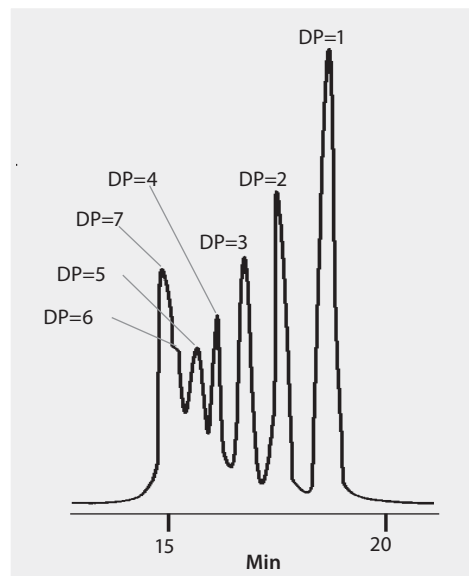
HPLC Analysis of Hydrobenzoin Enantiomers on Astec® CYCLOBOND® I 2000

column CYCLOBOND I 2000, 25 cm x 4.6 mm I.D., 5 µm particles (20024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) acetonitrile; (80:20, A:B)
flow rate 0.9 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
sample 5 mg/mL in methanol
Application No. [G004692](#)



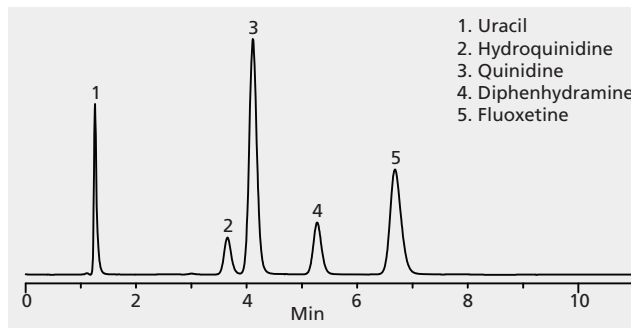
HPLC Analysis of Hydrolyzed β -Cyclodextrin on TSKgel® G-Oligo-PW

column TSKgel G-Oligo-PW, 30 cm \times 7.8 mm I.D., 6 μ m particles (808031)
mobile phase distilled water
flow rate 1 mL/min
column temp. 60 °C
detector RI
Application No. [713-0917](#)



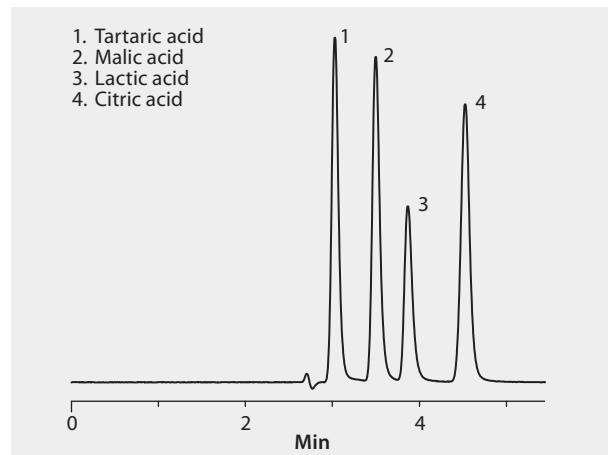
HPLC Analysis of Hydrophobic Bases on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase . . . (A) 25 mM ammonium phosphate, pH 7; (B) methanol; (35:65, A:B)
flow rate 1.2 mL/min
column temp. 35 °C
detector UV, 230 nm
injection 10 µL
sample NOS158
Application No. **G002612**



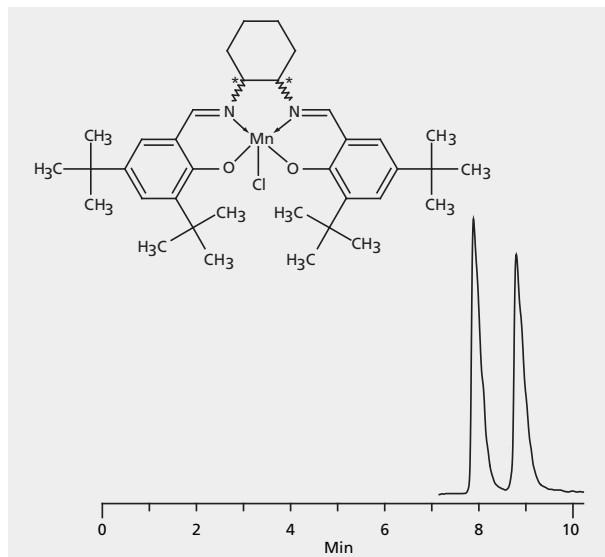
HPLC Analysis of α -Hydroxy Aliphatic Acids on Discovery® RP-Amide C16

column . . . Discovery RP-AmideC16, 15 cm \times 4.6 mm I.D., 5 μ m particles (505013)
mobile phase 25 mM potassium phosphate, pH 3.0
flow rate 1 mL/min
column temp. 30 °C
detector UV, 220 nm
injection 10 μ L
Application No. **G000624**



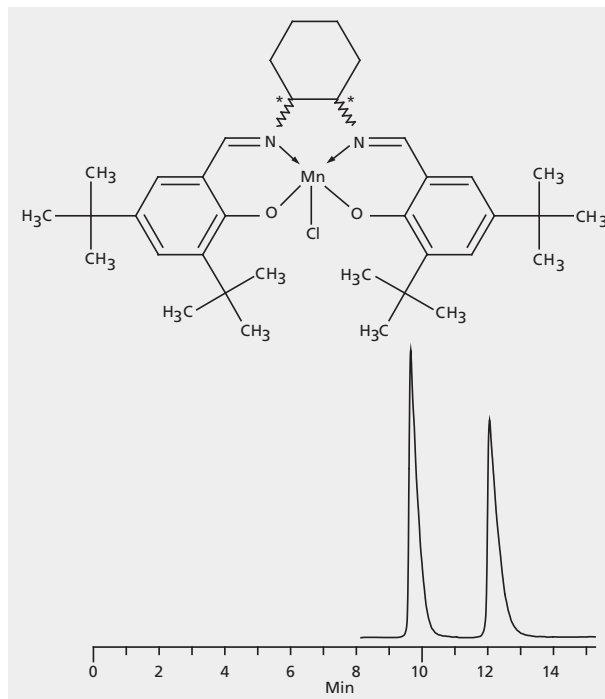
HPLC Analysis of Jacobsen Catalyst Enantiomers on Astec® CYCLOBOND® I 2000 HP-RSP (Ammonium Hydroxide Mobile Phase)

column CYCLOBOND I 2000 HP-RSP, 25 cm x 4.6 mm I.D.,
5 µm particles (24024AST)
mobile phase (A) acetonitrile; (B) methanol; (C) acetic acid;
(D) ammonium hydroxide; (85:15:0.4:0.1, A:B:C:D)
flow rate 0.9 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. [G004714](#)



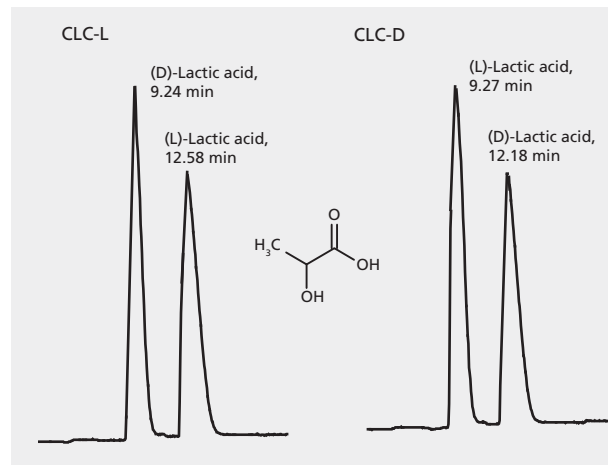
HPLC Analysis of Jacobsen Catalyst Enantiomers on Astec® CYCLOBOND® I 2000 HP-RSP (TEA mobile phase)

column CYCLOBOND I 2000 HP-RSP, 25 cm x 4.6 mm I.D.,
5 µm particles (24024AST)
mobile phase (A) acetonitrile; (B) methanol; (C) acetic acid;
(D) triethylamine; (95:5:0.2:0.1, A:B:C:D)
flow rate 1.5 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 5 mg/mL in methanol
Application No. **G004715**



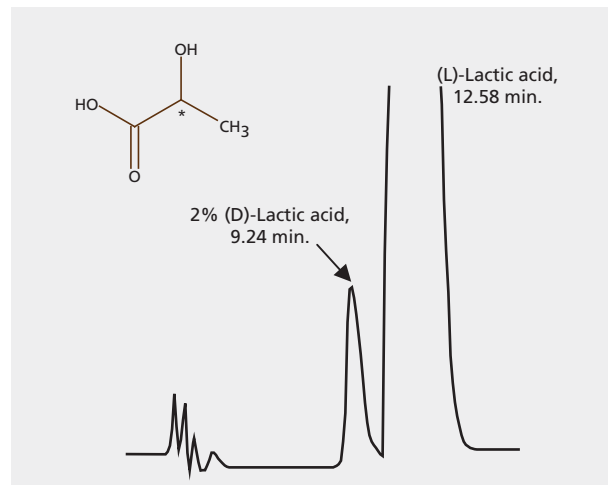
HPLC Analysis of Lactic Acid Enantiomers on Astec® CLC-L and CLC-D

column Astec CLC-L and CLC-D, 15 cm x 4.6 mm I.D.,
5 µm particles (53023AST, 53123AST)
mobile phase 5 mM copper sulfate
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
Application No. [G004399](#)



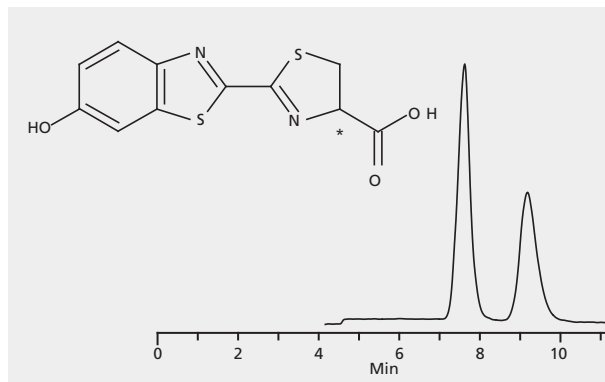
HPLC Analysis of Lactic Acid Enantiomers on Astec® CLC-L, Trace Level Detection

column Astec CLC-L, 15 cm x 4.6 mm I.D., 5 µm particles (53123AST)
mobile phase 5 mM copper sulfate
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
sample 5 mg/mL in water
Application No. [G004663](#)



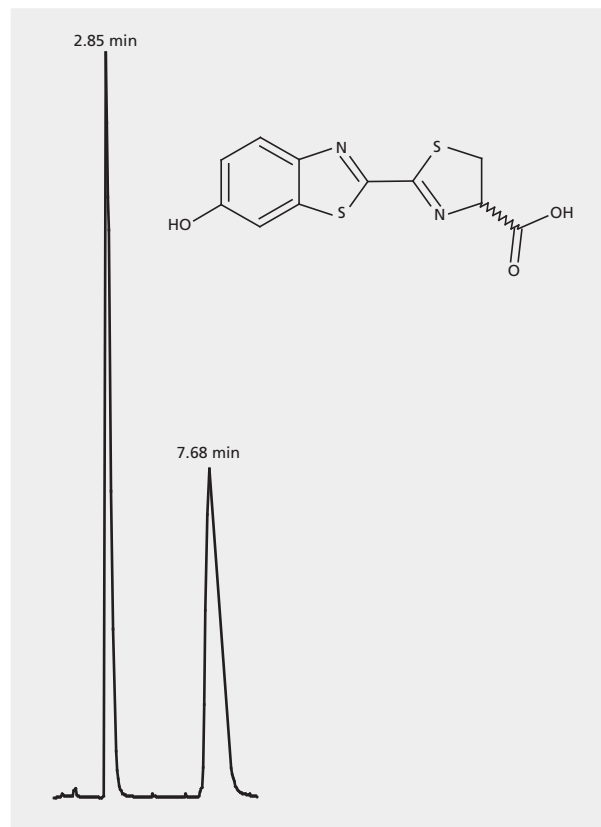
HPLC Analysis of Luciferin Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 20 mM ammonium nitrate, pH 5.5; (B) THF; (90:10, A:B)
flow rate 1 mL/min
column temp. ambient
detector UV, 254 nm
injection 6 µL
sample 0.5 mg/mL in methanol
Application No. **G004641**



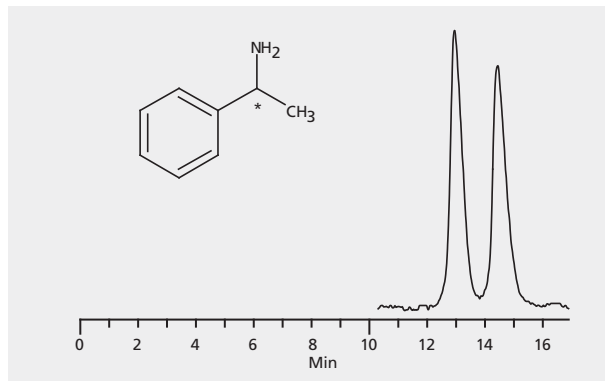
HPLC Analysis of Luciferin Enantiomers on CHIRALPAK® AGP

column CHIRALPAK AGP, 10 cm x 4 mm I.D., 5 µm particles (58150AST)
mobile phase 10 mM sodium phosphate, pH 6.0
flow rate 0.9 mL/min
column temp. 25 °C
detector UV, 225 nm
sample Luciferin
Application No. **G004398**



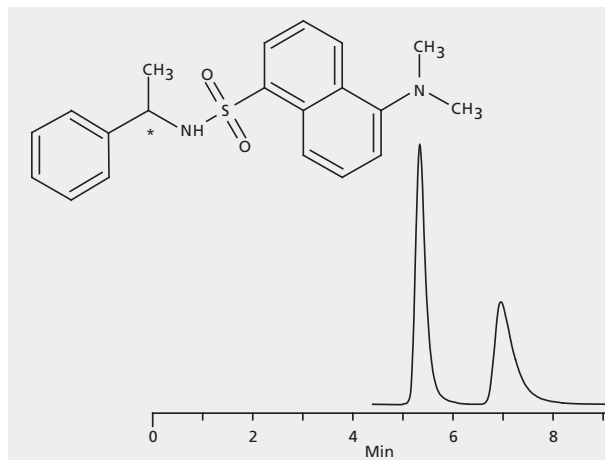
HPLC Analysis of α -Methylbenzylamine Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 μ m particles (11024AST)
mobile phase (A) hexane; (B) isopropanol; (90:10, A:B)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 1 μ L
sample 2 mg/mL in methanol
Application No. [G004642](#)



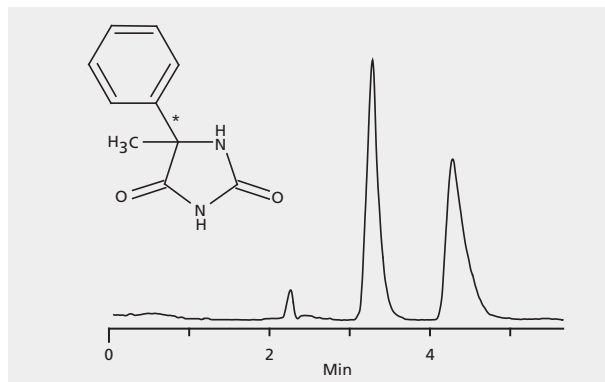
HPLC Analysis of α -Methylbenzylamine Enantiomers on Astec® CYCLOBOND® I 2000 DMP

column . . . CYCLOBOND I 2000 DMP, 25 cm x 4.6 mm I.D., 5 μ m particles (20724AST)
mobile phase . . . ethanol
flow rate . . . 1.2 mL/min
column temp. 22 °C
detector UV, 254 nm
injection 1 μ L
sample 3 mg/mL in methanol
Application No. **G004698**



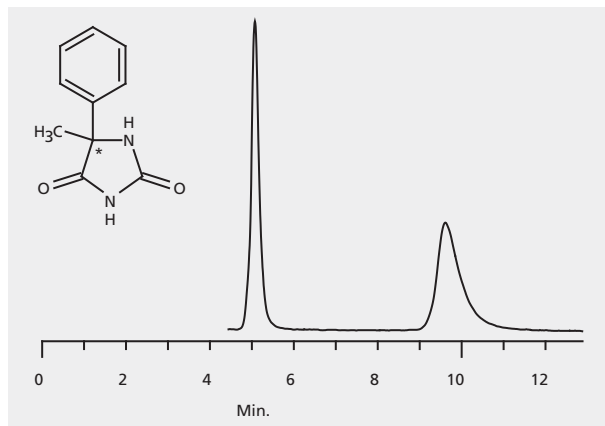
HPLC Analysis of 5-Methyl-5-Phenylhydantoin Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase ethanol
flow rate 1.5 mL/min
column temp. ambient
detector UV, 254 nm
injection 5 µL
sample 4 mg/mL in methanol
Application No. [G004643](#)



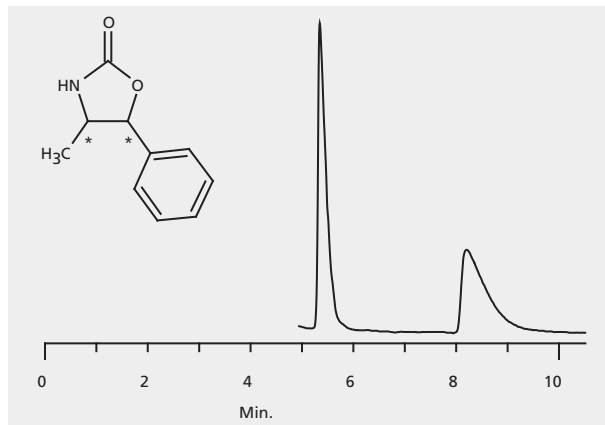
HPLC Analysis of 5-Methyl-5-Phenylhydantoin Enantiomers on Astec® CHIROBIOTIC® TAG (Fast Flow)

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase methanol
flow rate 0.8 mL/min
column temp. 23 °C
detector UV, 220 nm
injection 2 µL
sample 5 mg/mL in methanol
Application No. [G004613](#)



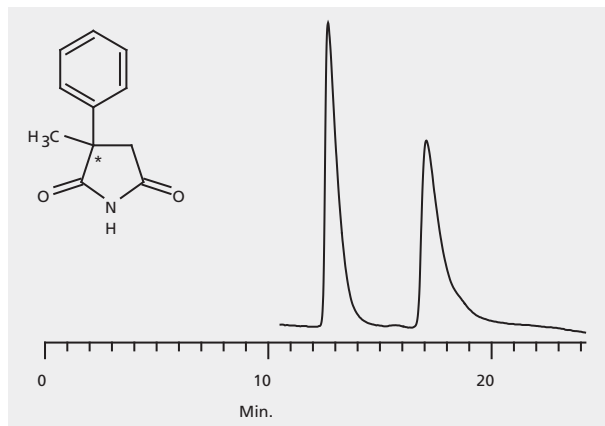
HPLC Analysis of 4-Methyl-5-Phenyl-2-Oxazolidone Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase methanol
flow rate 0.8 mL/min
column temp. 23 °C
detector UV, 230 nm
injection 2 µL
sample 2 mg/mL in methanol
Application No. **G004612**



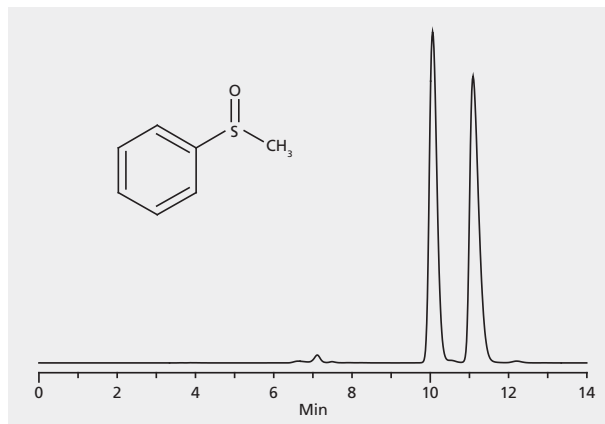
HPLC Analysis of α -Methyl- α -Phenylsuccinimide Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 μ m particles (14024AST)
mobile phase (A) hexane; (B) ethanol; (80:20, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 220 nm
injection 2 μ L
sample 5 mg/mL in methanol
Application No. **G004611**



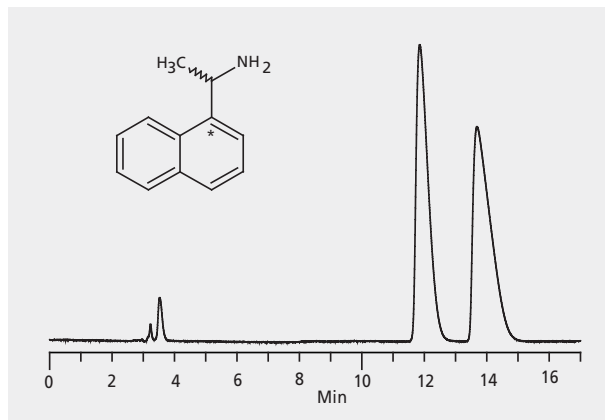
HPLC Analysis of Methyl Phenyl Sulfoxide Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase methanol
flow rate 0.48 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 10 µL
sample 1 mg/mL in mobile phase
Application No. [G004407](#)



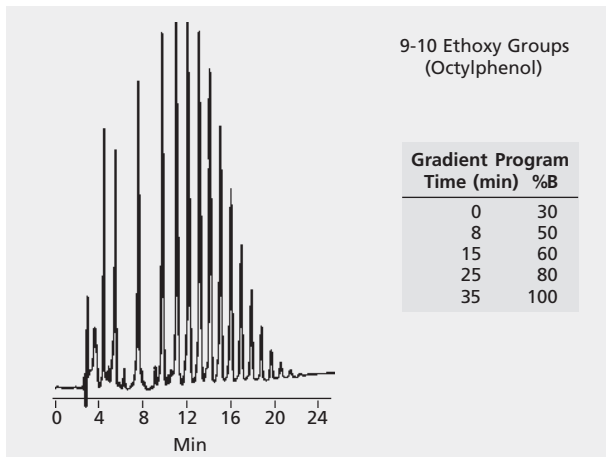
HPLC Analysis of 1-(1-Naphthyl)ethylamine Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase (A) methanol; (B) 20 mM ammonium acetate; (90:10, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. [G004458](#)



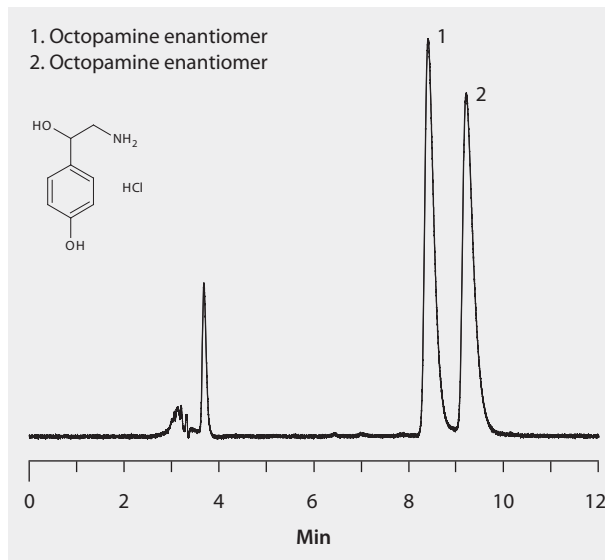
HPLC Analysis of Nonionic Surfactants, 9-10 Ethoxy Groups (Octylphenol) on SUPELCOSIL™ LC-Diol

column SUPELCOSIL LC-Diol, 25 cm × 4.6 mm I.D., 5 µm particles (58201)
mobile phase (A) hexane:methylene chloride (95:5);
 (B) hexane:methylene chloride:methanol (50:40:10)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 280 nm
injection 10 µL methylene chloride containing 20 µg surfactant
Application No. [713-0782](#)



HPLC Analysis of Octopamine Enantiomers on LARIHC™ CF6-P

column LARIHC CF6-P, 25 cm x 4.6 mm I.D.,
5 µm particles (AZYP Part No.L1001,
available from Supelco/Sigma-Aldrich as a custom item.)
mobile phase (A) methanol: (B) acetonitrile: (C) acetic acid:
(D) triethylamine, (70:30:0.3:0.2, A:B:C:D)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 5 µL
sample Octopamine, 0.3 mg/mL in ethanol
Application No. G005258

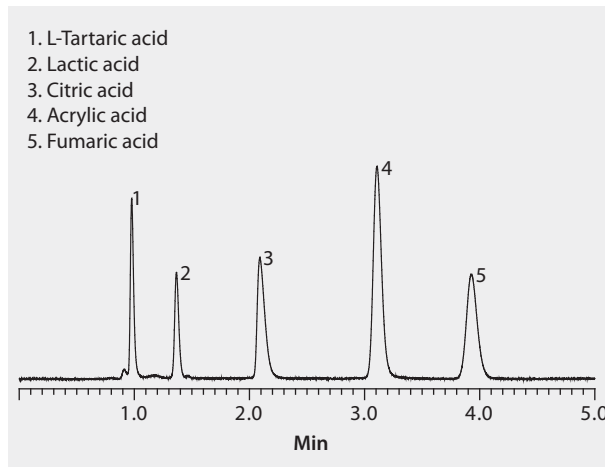


Ref: 1. Ping Sun, Chunlei Wang, Zachary S. Breitbach, Ying Zhang, and Daniel W. Armstrong, Development of New HPLC Chiral Stationary Phases Based on Native and Derivatized Cyclofructans *Anal. Chem.* **81**, 10215 (2009)
2. Ping Sun and Daniel W. Armstrong, Effective enantiomeric separations of racemic primary amines by the isopropyl carbamate-cyclofructan6 chiral stationary phase *J. Chromatogr. A.* **1217**, 4904 (2010)

HPLC Analysis of Organic Acids on Ascentis® Express RP-Amide

This application demonstrates the suitability of Ascentis Express RP-Amide for the analysis of organic acids under 100% aqueous conditions.

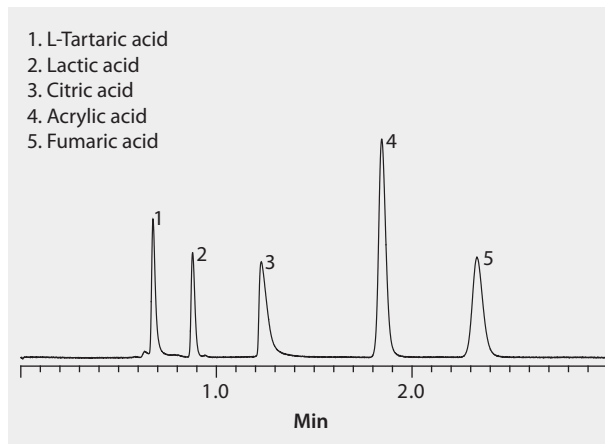
column Ascentis Express RP-Amide, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53913-U)
mobile phase (A) 0.1% (v/v) TFA in (B) water
flow rate 0.3 mL/min
column temp. 35 °C
detector UV, 210 nm
injection 1 µL
sample 0.2 - 4 g/L in mobile phase
Application No. [G005714](#)



HPLC Analysis of Organic Acids on Ascentis® RP-Amide

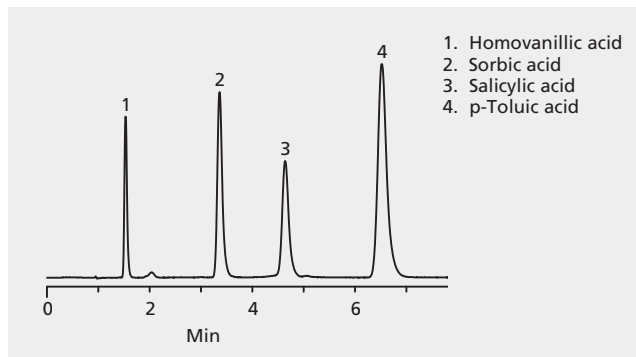
This application demonstrates the suitability of Ascentis RP-Amide for the analysis of organic acids under 100% aqueous conditions.

column Ascentis RP-Amide, 10 cm x 2.1 mm I.D., 3 µm particles (565301-U)
mobile phase (A) 0.1% (v/v) TFA in (B) water
flow rate 0.3 mL/min
column temp. 35 °C
detector UV, 210 nm
injection 1 µL
sample 0.2 - 4 g/L in mobile phase
Application No. **G005715**



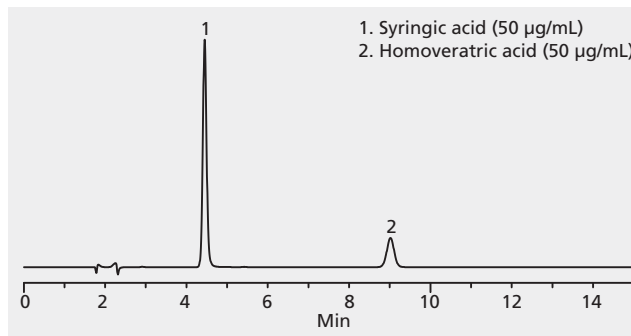
HPLC Analysis of Organic Acids on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase (A) methanol; (B) water, 0.1% TFA (40:60, A:B)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 10 µL
sample 1 mg/mL each analyte
Application No. [797-0657](#)



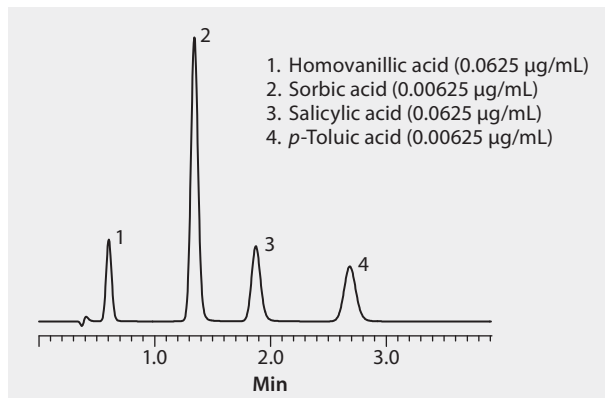
HPLC Analysis of Organic Acids on Ascentis® C8

column Ascentis C8, 15 cm x 4.6 mm I.D., 5 µm particles (581424-U)
mobile phase (A) 10 mM ammonium phosphate monobasic (pH 2.50 with phosphoric acid); (B) acetonitrile; (80:20, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample as indicated in mobile phase
Application No. **G003160**



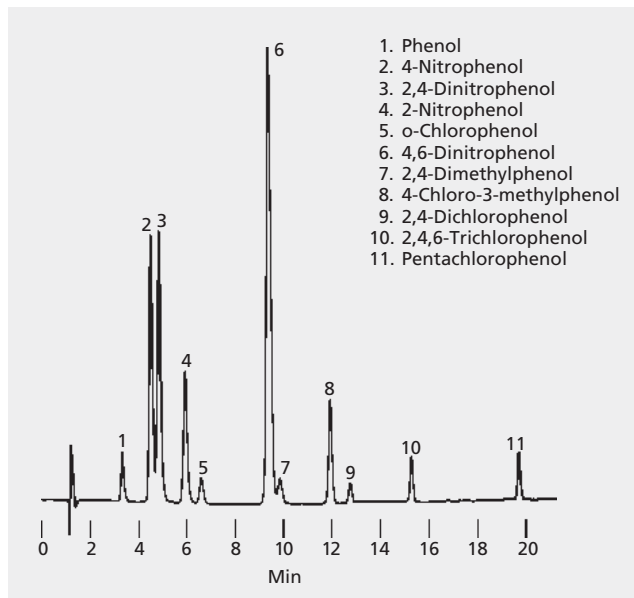
HPLC Analysis of Organic Acids on Discovery® C18

column Discovery C18, 5 cm × 4.6 mm I.D., 5 µm particles (504947)
mobile phase (A) 0.1% TFA in (B) water:methanol; (60:40, A:B)
flow rate 2.0 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 10 µL
Application No. **G001431**



HPLC Analysis of Phenols on SUPELCO[™] LC-8

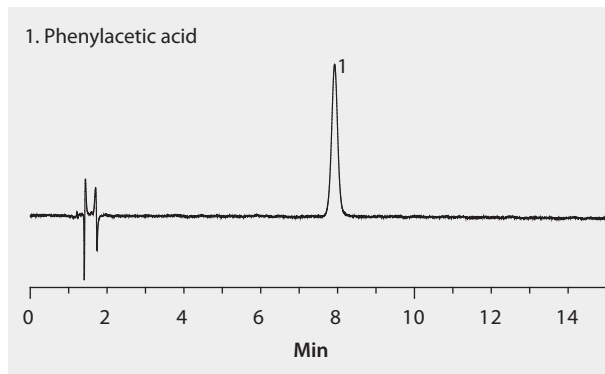
column SUPELCO[™] LC-8, 15 cm × 4.6 mm I.D., 5 μm particles (58220-U)
mobile phase (A) 1% acetic acid/methanol: (B) 1% acetic acid/water
gradient 35:65 to 100:0 (20 min), return to 35:65 (5 min)
flow rate 1.5 mL/min
column temp. 30 °C
detector UV, 280 nm
Application No. **713-1031**



HPLC Analysis of Phenylacetic Acid on Ascentis® C18

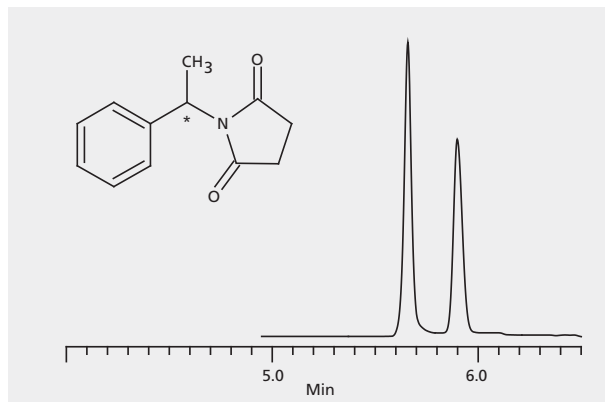
This application demonstrates the suitability of Ascentis C18 for the analysis of phenylacetic acid.

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 20 mM phosphoric acid; (B) acetonitrile; (75:25, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 215 nm
injection 5 µL
sample 50 µg/mL in water: acetonitrile: methanol (75: 20: 5)
Application No. **G005720**



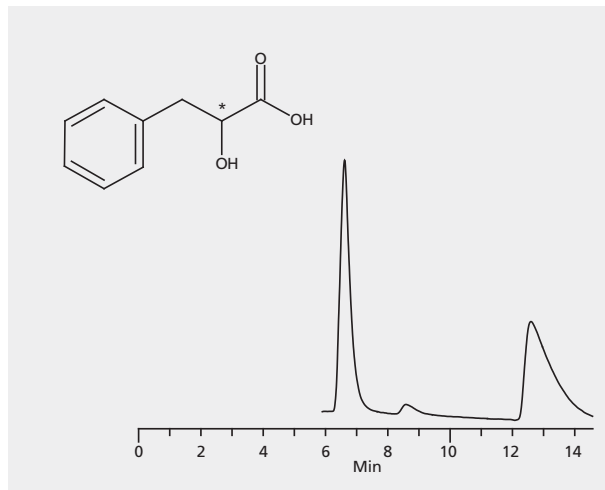
HPLC Analysis of N-(1-Phenylethyl)maleimide Enantiomers on Astec® CHIROBIOTIC® R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
mobile phase . . . (A) 0.1% triethylamine acetate, pH 4.1; (B) methanol; (70:30, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 254 nm
injection 3 µL
sample 5 mg/mL in methanol
Application No. **G004668**



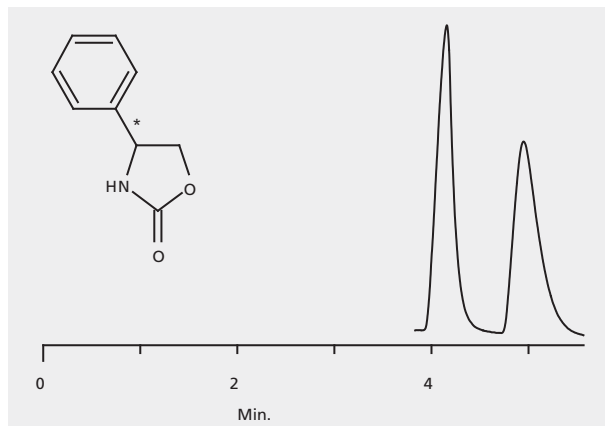
HPLC Analysis of 3-Phenyllactic Acid Enantiomers on Astec® CHIROBIOTIC® R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
mobile phase 0.1% ammonium acetate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 0.5 µL
sample 1 mg/mL in methanol
Application No. **G004680**



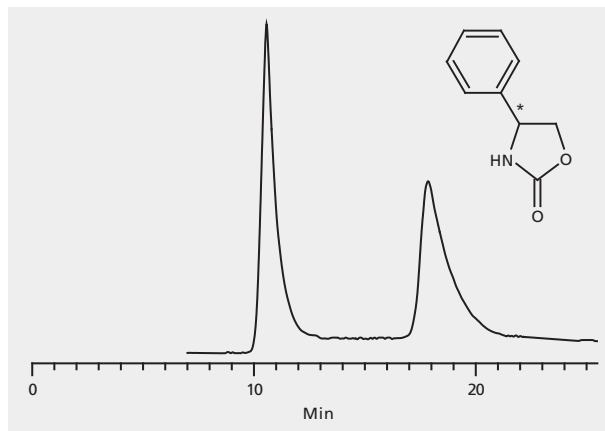
HPLC Analysis of 4-Phenyl-2-Oxazolidinone Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. **G004599**



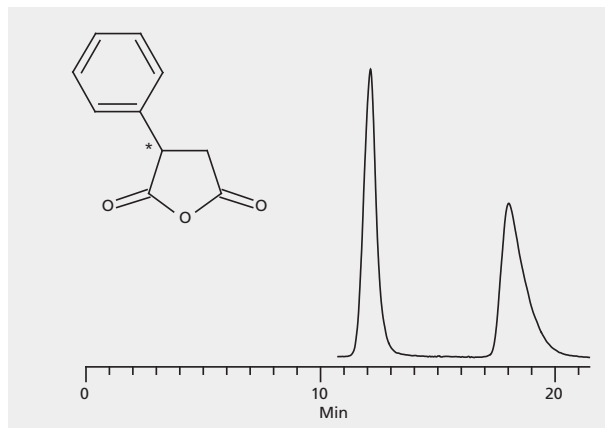
HPLC Analysis of 4-Phenyl-2-oxazolidinone Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 0.5% triethylamine acetate, pH 4.1; (B) methanol; (80:20, A:B)
flow rate 1 mL/min
column temp. ambient
detector UV, 254 nm
injection 5 µL
sample 5 mg/mL in methanol
Application No. [G004548](#)



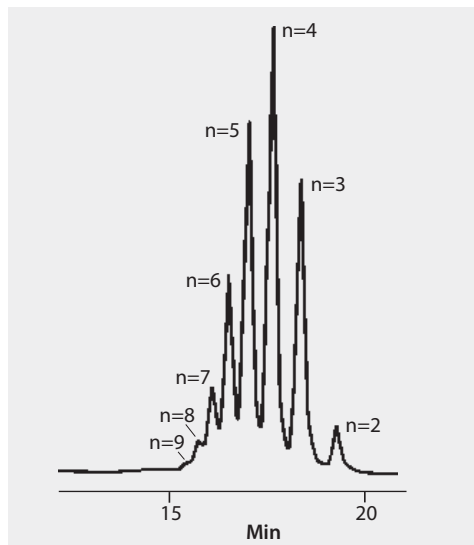
HPLC Analysis of Phenylsuccinic Anhydride Enantiomers on Astec® (R,R) P-CAP™-DP

column . . . Astec (R,R) P-CAP-DP, 25 cm x 4.6 mm I.D., 5 µm particles (35024AST)
mobile phase . . . (A) acetonitrile; (B) methanol; (C) trifluoroacetic acid; (99:1/0.1 (A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004728**



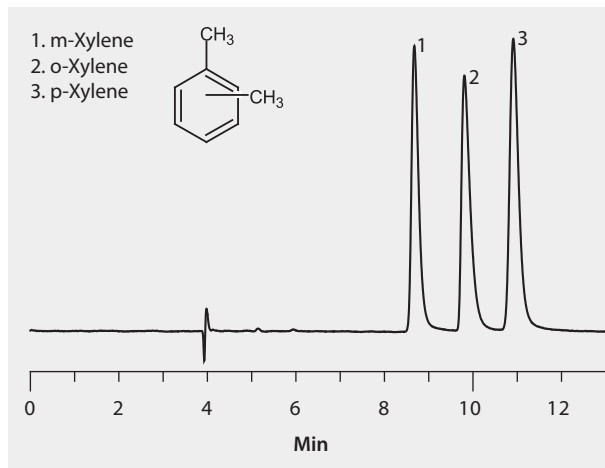
HPLC Analysis of Polyethylene Glycol 200 on TSKgel® G-OLIGO-PW

column . . . TSKgel G-OLIGO-PW, 30 cm × 7.8 mm I.D., 6 μm particles (808031)
mobile phase distilled water
flow rate 1 mL/min
detector RI
Application No. [713-0778](#)



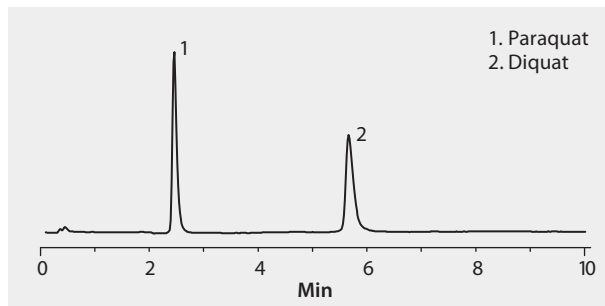
HPLC Analysis of Positional Isomers (Xylenes) on Astec® CYCLOBOND® I 2000

column CYCLOBOND I 2000, 25 cm x 4.6 mm I.D., 5 µm particles (20024AST)
mobile phase (A) acetonitrile; (B) water; (15:85, A:B)
flow rate 0.8 mL/min
column temp. 55 °C
detector UV, 230 nm
injection 3 µL
sample xylene isomers, each compound,
0.1 mg/mL in acetonitrile:water (50:50) ((elution order: m, o, p))
Application No. **G005166**



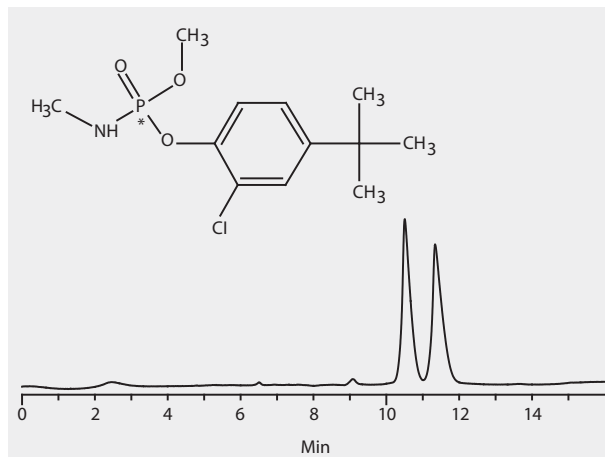
HPLC Analysis of Quaternary amines on Discovery® Zr-PS

column Discovery Zr-PS, 7.5 cm × 4.6 mm I.D., 3 µm particles (65741-U)
mobile phase . . . (A) 25 mM phosphoric acid, 25 mM ammonium fluoride (pH with
ammonium hydroxide); (B) acetonitrile, (50:50, A:B)
flow rate 3 mL/min
column temp. 65 °C
detector UV, 290 nm
injection 10 µL
sample Paraquat, diquat (50 µg/mL)
Application No. **G001853**



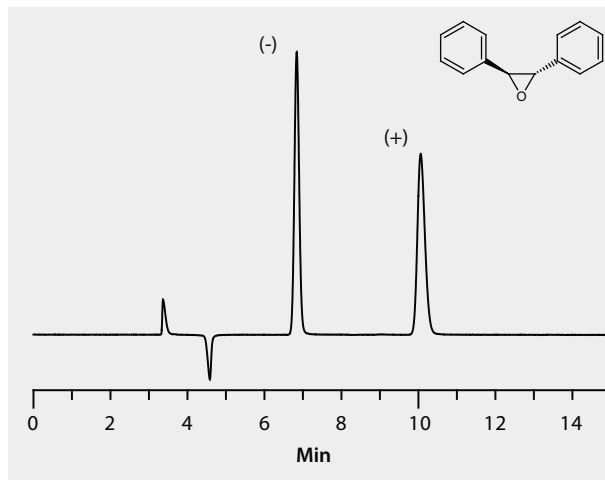
HPLC Analysis of Ruelene (Cruformate) Enantiomers on Astec® CYCLOBOND® I 2000

column CYCLOBOND I 2000, 25 cm x 4.6 mm I.D., 5 µm particles (20024AST)
mobile phase (A) acetonitrile; (B) acetic acid; (C) TEA; (100:0.3:0.2, A:B:C)
flow rate 0.6 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 5 µL
sample Ruelene (cruformate), 1 mg/mL in acetonitrile
Application No. [G005158](#)



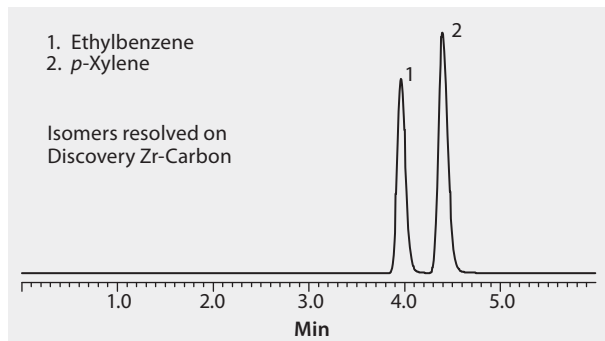
HPLC Analysis of trans-Stilbene Oxide Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) heptane; (B) IPA; (90:10, A:B)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G004995](#)



HPLC Analysis of Structural Isomers on Discovery® Zr-Carbon

column . . . Discovery Zr-Carbon, 15 cm × 4.6 mm I.D., 3 μm particles (65730-U)
mobile phase (A) water; (B) acetonitrile; (20:80, A:B)
flow rate 0.5 mL/min
column temp. 60 °C
detector UV, 254 nm
injection 10 μL
Application No. **G001874**

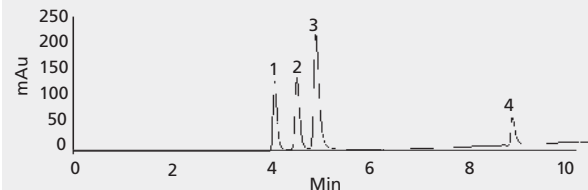


HPLC Analysis of Sulfonamide Positional Isomers on Discovery® Zr-Carbon C18

column . . . Discovery Zr-Carbon C18, 15 cm × 4.6 mm I.D., 3 µm particles (65706-U)
mobile phase (A) 10mM diethylamine, pH 10.8; (B) acetonitrile;
flow rate 1.5 mL/min
column temp. 80 °C
detector UV, 240 nm
injection 5 µL
Application No. **G001866**

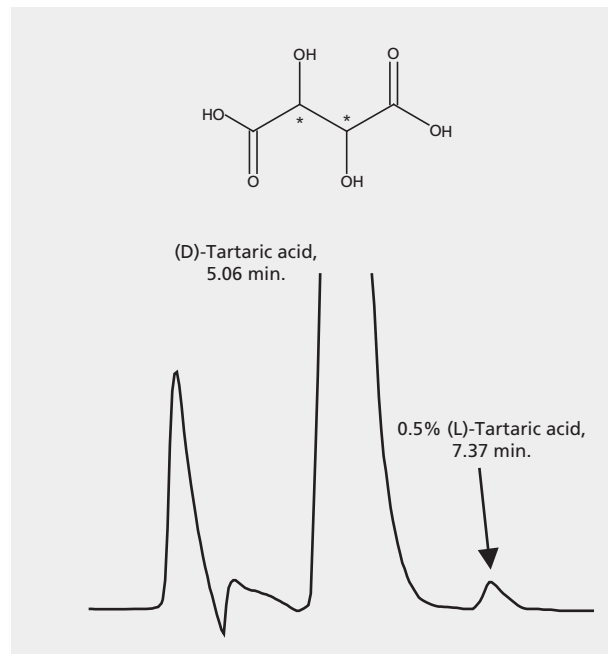
1. Isomer 1
2. Isomer 2
3. Parent drug
4. Isomer 3

Time (min)	Gradient	
	%A	%B
0.0	55	45
5.0	55	45
7.5	25	75
10.0	25	75



HPLC Analysis of Tartaric Acid Enantiomers on Astec® CLC-D, Trace Level Detection

column Astec CLC-D, 15 cm x 4.6 mm I.D., 5 µm particles (53023AST)
mobile phase 3 mM copper sulfate, pH 3.2
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
sample 5 mg/mL in water
Application No. [G004665](#)



HPLC Analysis of 3,5-tBu-MeOBIPHEP Enantiomers on Astec® CHIROBIOTIC® V in Normal Phase and Polar Ionic Modes

Demonstration of CHIROBIOTIC® column utility in both normal phase and polar ionic modes. The same CHIROBIOTIC® column can be used in all four modes, from aqueous to organic, without memory effects or loss of performance.

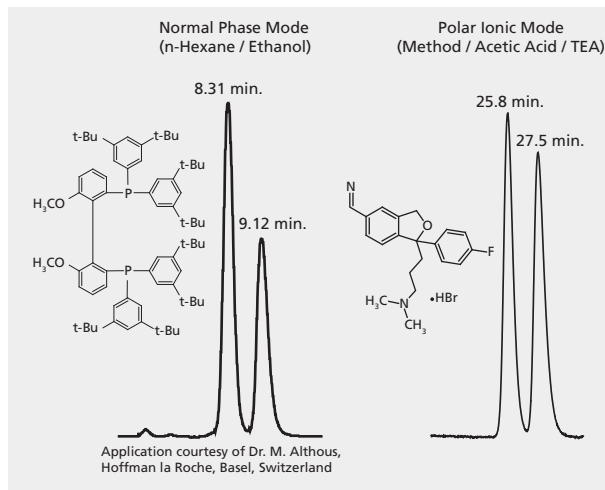
Column: CHIROBIOTIC® V, 25 cm x 4.6 mm, 5 µm particles (11024AST).

Left: **Normal phase mode.** 3,5-tBu-MeOBIPHEP enantiomers. n-Hexane:10% ethanol in n-hexane (75:25), 1.5 mL/min.

Right: **Polar ionic mode.** Citalopram enantiomers. Methanol:acetic acid:TEA (99.8:0.1:0.1), 0.5 mL/min.

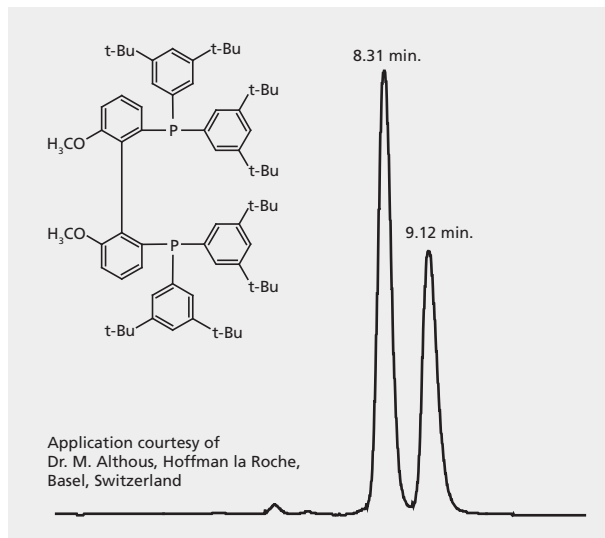
column CHIROBIOTIC® V, 25 cm x 4.6 mm, 5 µm particles (11024AST)

Application No. [G004430](#)



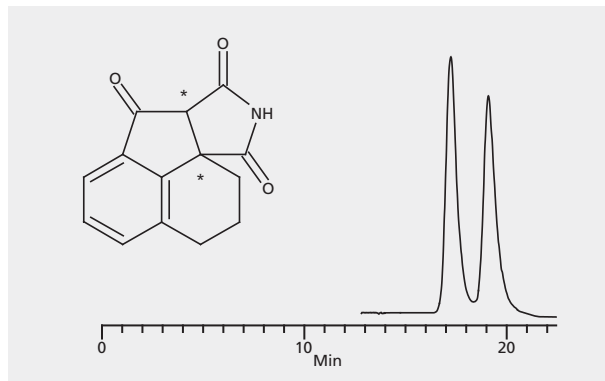
HPLC Analysis of 3,5-tBu-MeOBIPHEP Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
 mobile phase (A) n-hexane; (B) 10% ethanol in n-hexane; (75:25, A:B)
 flow rate 1 mL/min
 column temp. 18 °C
 detector UV, 230 nm
 sample 3,5-tBu-MeOBIPHEP ((6,6'-dimethoxybiphenyl-2,2'-diyl)bis[bis(3,5-di-*tert*-butylphenyl)phosphine]),
 1 mg/mL in ethanol with 5 drops of H₂O₂ added for oxidation
 Application No. **G004402**



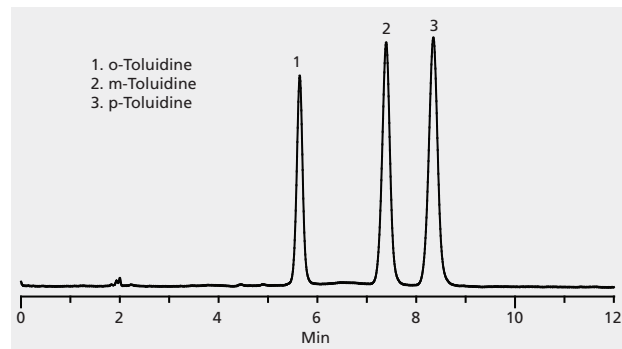
HPLC Analysis of 3a,4,5,6-Tetrahydrosuccinimido [3,4-b]acenaphthen-10-one Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) hexane; (B) ethanol; (75:25, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 1 µL
sample 4 mg/mL in methanol
Application No. **G004648**



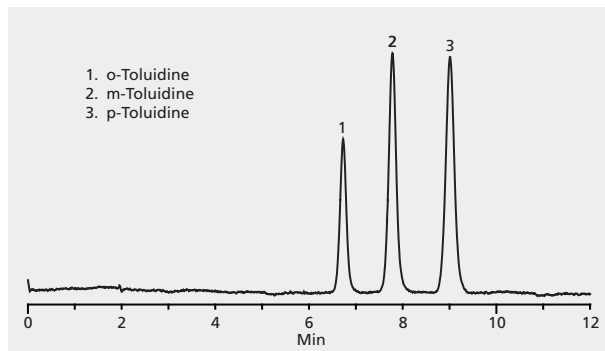
HPLC Analysis of Toluidine Isomers on Ascentis® Si (Hexane: 2-Propanol)

column Ascentis Si, 15 cm × 4.6 mm I.D., 5 µm particles (581512-U)
mobile phase (A) hexane; (B) 2-propanol; (96:4, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 245 nm
injection 10 µL
sample 50 µg/mL in mobile phase
Application No. **G003799**



HPLC Analysis of Toluidine Isomers on Ascentis® Si (Silica), (80:20 Hexane:Ethyl Acetate)

column Ascentis Si, 15 cm × 4.6 mm I.D., 5 µm particles (581512-U)
mobile phase (A) hexane; (B) ethyl acetate; (80:20, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 245 nm
injection 10 µL
sample 50 µg/mL in mobile phase
Application No. [G003697](#)



HPLC Analysis of 16 Triazine and Phenyl Urea Compounds on Ascentis® Express RP-Amide

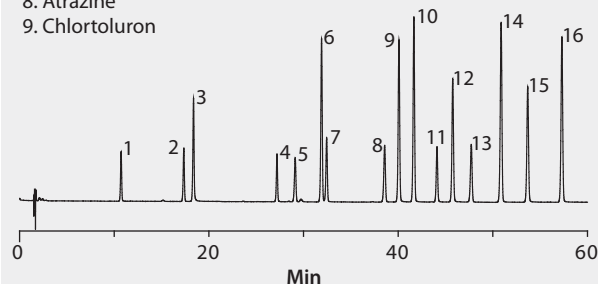
This application demonstrates the suitability of Ascentis Express RP-Amide for the efficient separation of 16 triazine and phenyl urea compounds. Lower column temperature can improve resolution of the critical pair.

column . . . Ascentis Express RP-Amide, 15 cm x 3 mm I.D., 2.7 µm particles (53919-U)
 mobile phase (A) water; (B) acetonitrile
 gradient 5 to 53% B in 70 min
 flow rate 0.4 mL/min
 column temp. 35 °C
 detector UV, 240 nm
 injection 5 µL
 sample . . . 20 mg/L (except terbuthylazin desethyl and terbuthylazine 60 mg/L) in
 60:40, water: acetonitrile

Application No. **G005651**

1. Atrazine desisopropyl
2. Atrazine desethyl
3. Carbendazime
4. Terbumeton desethyl
5. Simazine
6. Terbuthylazin desethyl
7. Cyanazine
8. Atrazine
9. Chlortoluron

10. Isoproturon
11. Terbumeton
12. Diuron
13. Propazine
14. Terbuthylazine
15. Linuron
16. Terbutryne



HPLC Analysis of 16 Triazine and Phenyl Urea Compounds on Ascentis® Express RP-Amide, Modified Gradient

This application demonstrates the suitability of Ascentis Express RP-Amide for the efficient separation of 16 triazine and phenyl urea compounds.

Lower column

temperature can improve resolution of the critical pair.

column . . . Ascentis Express RP-Amide, 15 cm x 3 mm I.D., 2.7 µm particles (53919-U)

mobile phase (A) water; (B) acetonitrile

gradient . . . 10 to 25% B in 30 min; 25 to 60% B in 15 min; held at 60% B for 5 min

flow rate 0.4 mL/min

column temp. 35 °C

detector UV, 240 nm

injection 5 µL

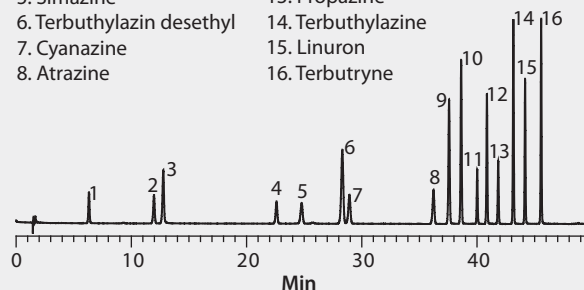
sample . . . 20 mg/L each (except terbuthylazin desethyl and terbuthylazine 60 mg/L)

in 60:40, water: acetonitrile

Application No. **G005652**

1. Atrazine desisopropyl
2. Atrazine desethyl
3. Carbendazime
4. Terbumeton desethyl
5. Simazine
6. Terbuthylazin desethyl
7. Cyanazine
8. Atrazine

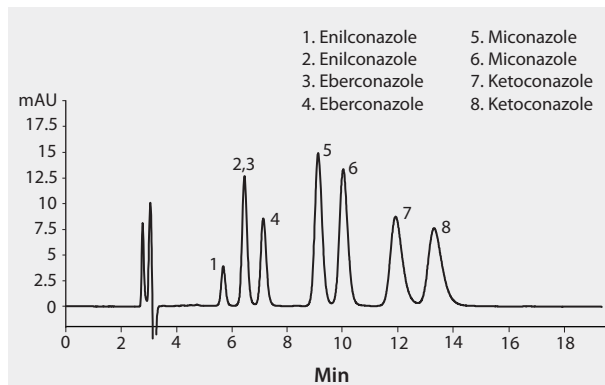
9. Chlortoluron
10. Isoproturon
11. Terbumeton
12. Diuron
13. Propazine
14. Terbuthylazine
15. Linuron
16. Terbutryne



HPLC Analysis of Triazole Antifungal Agent Enantiomers on Astec® CYCLOBOND® I 2000 HP-RSP

column Astec CYCLOBOND I 2000 HP-RSP, 25 cm x 4.6 mm I.D.,
5 µm particles (24024AST)
mobile phase (A) 0.1% formic acid; (B) acetonitrile; (70:30, A:B)
flow rate 1 mL/min
detector UV, 230 nm
injection 1 µL
sample 0.1 mg/mL in methanol
peaks 1&2: enilconazole
peaks 2&3: eberconazole
peaks 4&5: miconazole
peaks 6&7: ketoconazole

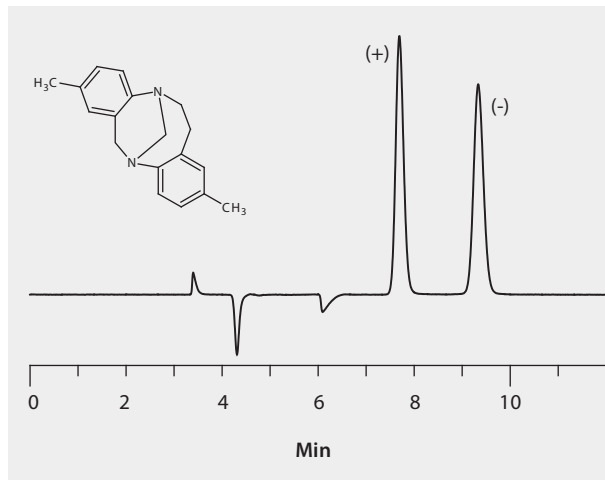
Application No. **G004737**



HPLC Analysis of Tröger's Base Enantiomers on Astec® Cellulose DMP

Tröger's base is an organic compound that exhibits chirality due to the presence of two bridgehead stereogenic nitrogen atoms in its structure.

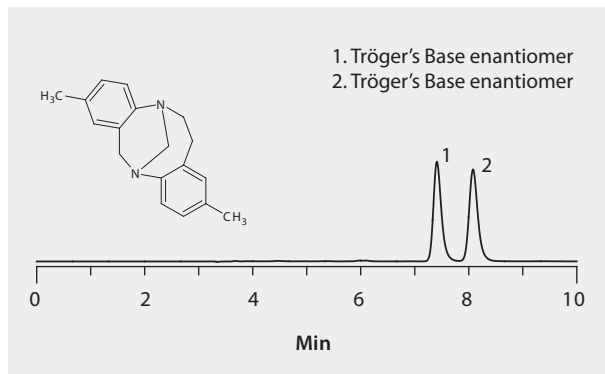
column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) heptane; (B) IPA; (C) DEA; (90:10:0.1, A:B:C)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G004996](#)



HPLC Analysis of Tröger's Base Enantiomers on Astec® Cellulose DMP (LC/MS Mobile Phase)

Tröger's base is an organic compound that exhibits chirality due to the presence of two bridgehead stereogenic nitrogen atoms in its structure.

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) methanol; (B) ammonium formate; (100:0.1, A:B)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
Application No. **G005002**



HPLC Analysis of Tröger's Base Enantiomers on Astec® Cellulose DMP (Polar Organic Mode)

Tröger's base is an organic compound that exhibits chirality due to the presence of two bridgehead stereogenic nitrogen atoms in its structure.

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)

mobile phase (A) methanol; (B) DEA; (100:0.1, A:B)

flow rate 0.5 mL/min

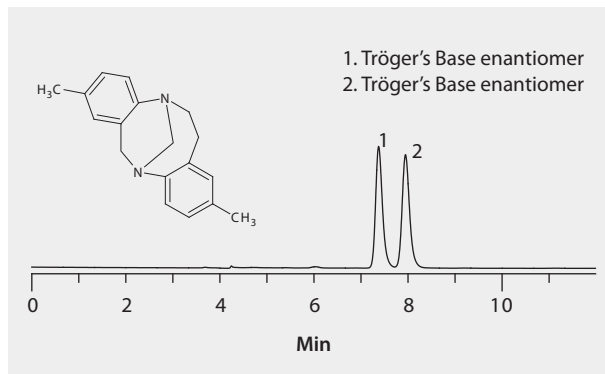
column temp. 25 °C

detector UV, 230 nm

injection 2 µL

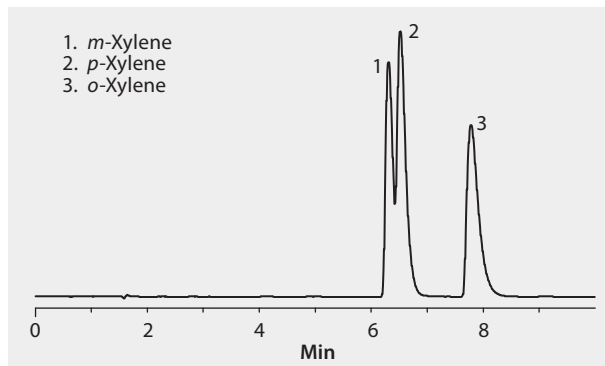
sample 2 mg/mL in mobile phase

Application No. **G005001**



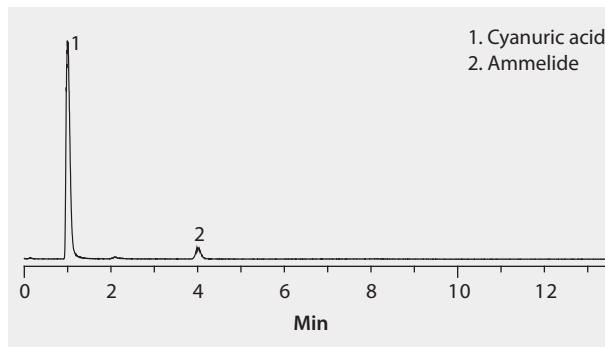
HPLC Analysis of Xylene Isomers on Discovery® Zr-Carbon

column . . . Discovery Zr-Carbon, 15 cm × 4.6 mm I.D., 3 µm particles (65730-U)
mobile phase (A) water: (B) acetonitrile; (50:50, A:B)
flow rate 1 mL/min
column temp. 30 °C
detector UV, 254 nm
injection 1 µL
sample o-xylene, m-xylene, p-xylene (290 µg/mL)
Application No. **G001880**



LC-MS Analysis of Cyanuric Acid on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 5 cm x 2.1 mm I.D., 2.7 µm particles (53934-U)
mobile phase 5 mM ammonium formate in 95:5 (v/v) acetonitrile:water
flow rate 0.2 mL/min
pressure 328 psi (22.6 bar)
column temp. 35 °C
detector MS, ESI(-), SIR mode
injection 2 µL
sample 1 µg/mL in mobile phase
Application No. **G005690**

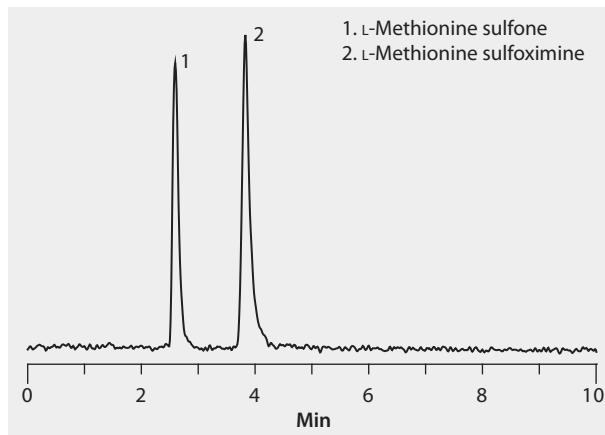


LC-MS Analysis of L-Methionine Sulfoximine and Sulfone on Ascentis® Express OH5

L-methionine sulfoximine and L-buthionine sulfoximine are used in are used to prevent additional enzyme activity in Chinese hamster ovary (CHO) cell lines with supplemental Glutamine Synthase (GS). It is of interest to be able to monitor both purity of such molecules in order to control addition to cell media as well as for the assay of parent molecules during use. The analytes are highly polar and thus should be amenable to HILIC-LC-MS analysis. This first installment investigates the ability of Ascentis Express HILIC and Ascentis Express OH5 stationary phases for the separation of the methionine analog and related compounds as well as methionine and buthionine separations.

column . . . Ascentis Express OH5, 10 cm x 3.0 mm I.D., 2.7 µm particles (53769-U)
mobile phase (A) acetonitrile; (B) water with 0.1% formic acid,
pH 3.5 with ammonium formate; (75:25, A:B)

flow rate 0.4 mL/min
pressure 1350 ppi (93 bar)
column temp. 25 °C
detector MS, ESI (+), TIC, m/z 150-300
injection 5 µL
Application No. **G005791**



LC-MS Extracted Ion Chromatogram of MSX, Sulfone, and Sulfoxide on Ascentis® Express OH5 (HILIC Mode)

This figure shows the extracted ion currents for methionine sulfoximine-related compounds on Ascentis Express OH5. The OH5 shows excellent peak shape compared to traditional HILIC on bare silica.

column Ascentis Express OH5, 10 cm x 3 mm I.D., 2.7 μ m particles (53769-U)
mobile phase (A) 0.1% formic acid, pH 3.5 with ammonium formate;
(B) acetonitrile; (25:75, A:B)

flow rate 0.4 mL/min

pressure 1350 psi (93 bar)

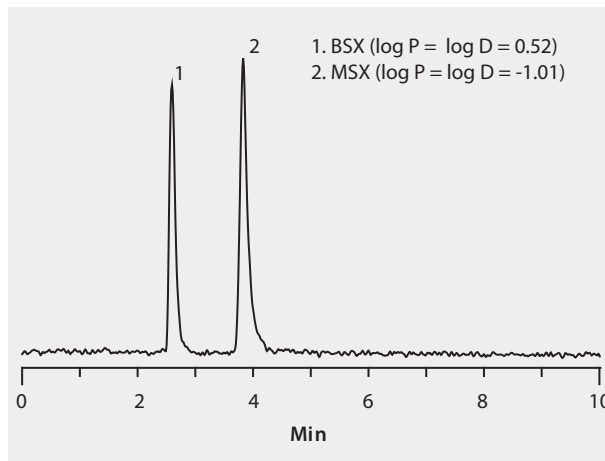
column temp. ambient

detector ESI (+), scan m/z 150-300

injection 5 μ L

sample 10 μ g/mL in 90% methanol

Application No. [G005803](#)



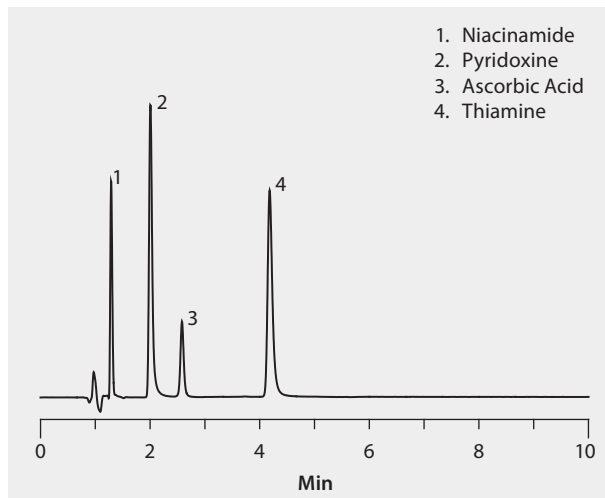
Clinical

HILIC Analysis of Polar Vitamins on Ascentis® Express 2.7 µm OH5

This application demonstrates good retention and selectivity for polar vitamins on Ascentis® Express OH5 in HILIC mode.

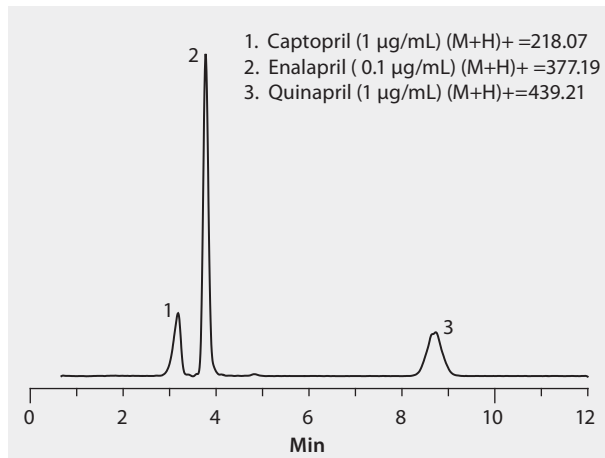
column . . . Ascentis Express OH5 10 cm x 3.0 mm I.D. x 2.7 µm particles (53769-U)
mobile phase 100 mM ammonium formate:Acetonitrile (15:85, v/v),
pH adjusted to 5.0 with formic acid

flow rate 0.5 mL/min
pressure 850 psi (58.6 bar)
column 35 °C
detector UV, 276 nm
injection 2.0 µL
sample 100 µg/mL in 50:50 methanol:acetonitrile
Application No. **G006253**



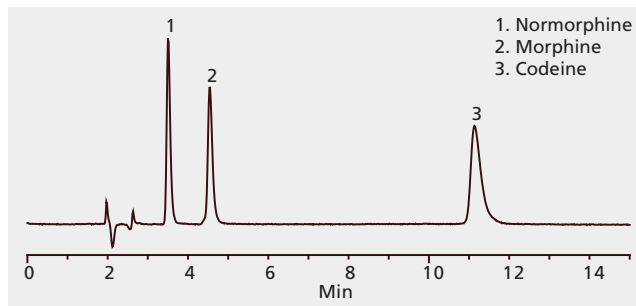
HPLC Analysis of ACE Inhibitors on Ascentis® Phenyl

column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase (A) 13 mM ammonium formate (pH 2.0 with concentrated formic acid): (B) methanol; (40:60, A:B)
flow rate 1 mL/min, split to the MS
column temp. 35 °C
detector MS, ESI (+) in selected ion recording (SIR) mode
injection 5 µL
sample as indicated in 40:60, 13 mM ammonium formate (pH 2.0 with concentrated formic acid):methanol
Application No. **G003702**



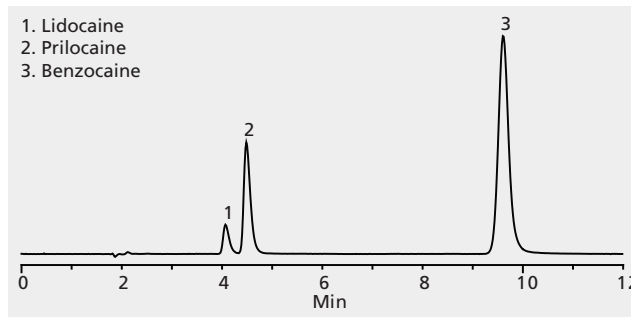
HPLC Analysis of Analgesics, Narcotics on Ascentis® Phenyl

column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase (A) 10 mM ammonium formate (pH 3.0 with formic acid); (B) acetonitrile; (90:10, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample 50 µg/mL in 90:10, water:methanol
Application No. **G003709**



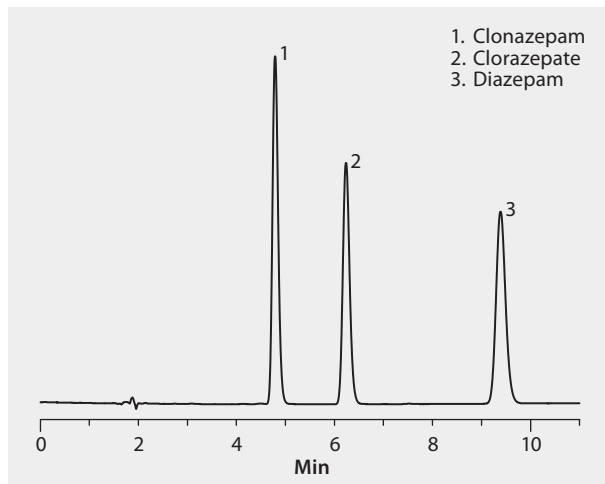
HPLC Analysis of Anesthetics, Local on Ascentis® Phenyl

column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase (A) 10 mM ammonium formate (pH 3.0 with formic acid);
(B) methanol; (55:45, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample 50 µg/mL in 85:15, water:methanol
Application No. **G003708**



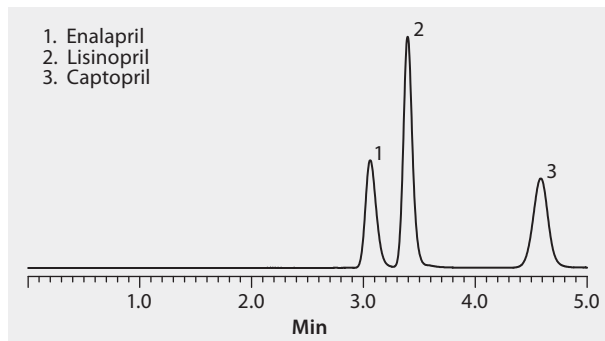
HPLC Analysis of Anticonvulsant Drugs on Discovery® RP-AmideC16

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase . . (A) acetonitrile; (B) 25 mM potassium phosphate, pH 7.0 (40:60, A:B)
flow rate 1 mL/min
column temp. 40 °C
detector UV, 254 nm
injection 10 µL
Application No. **G000188**



HPLC Analysis of Antihypertensive ACE Inhibitors on Discovery® RP-AmideC16

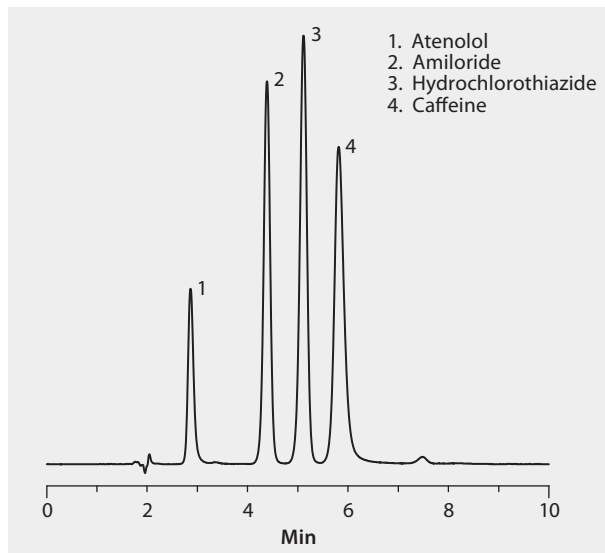
column . . . Discovery RP-AmideC16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase . . . (A) acetonitrile; (B) 25 mM potassium phosphate, pH 2.3 (33:67, A:B)
flow rate 0.6 mL/min
column temp. 35 °C
detector UV, 214 nm
injection 3 µL
Application No. **G000279**



HPLC Analysis of Antihypertensive and Diuretic Drugs on Discovery® RP-Amide C16

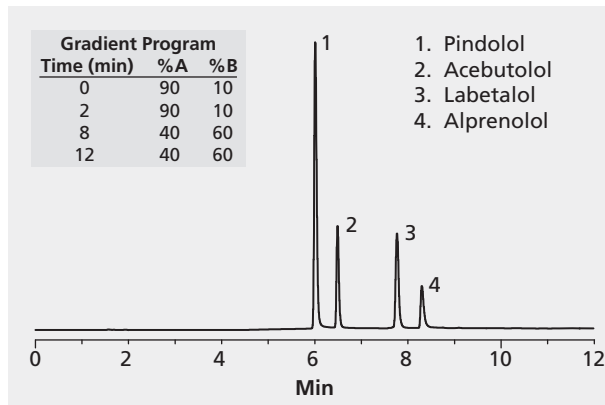
column . . . Discovery RP-AmideC16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase (A) methanol; (B) 25 mM potassium phosphate,
dibasic, pH 7.0 (22:78, A:B)

flow rate 1 mL/min
column temp. 30 °C
detector UV, 254 nm
injection 10 µL
Application No. **G000280**



HPLC Analysis of Antihypertensive Drugs on Ascentis® C18

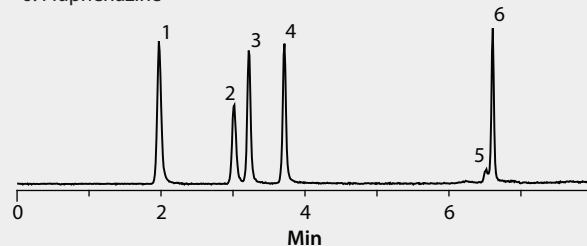
column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 7.0 with potassium hydroxide); (B):acetonitrile
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002383**



HPLC Analysis of Antipsychotic Drugs on Ascentis® Express RP-Amide

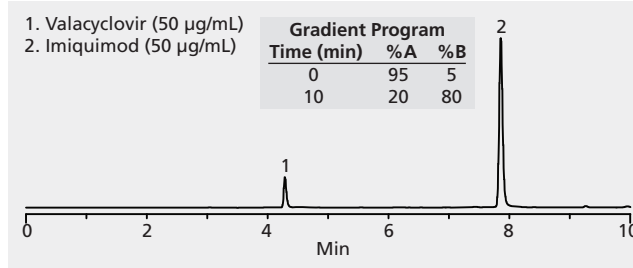
column Ascentis Express RP-Amide, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53913-U)
mobile phase (A) 5 mM ammonium formate (in water);
(B) 5 mM ammonium formate (in 95:5 methanol:water)
flow rate 3 mL/min
column temp. 35 °C
detector ESI(+), TIC 100 - 1000 m/z
injection 1 µL
sample 200 µg/L in water
Application No. **G005373**

1. Desmethyl venlafaxine
2. Hydroxybupropion
3. Hydroxyrisperidon
4. Bupropion
5. Zuclophethixol
6. Fluphenazine



HPLC Analysis of Antiviral Drugs on Ascentis® C8

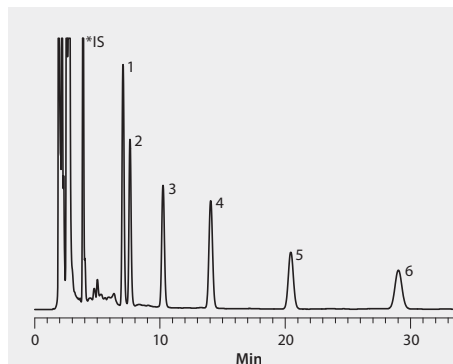
column Ascentis C8, 15 cm x 2.1 mm I.D., 3 µm particles (581402-U)
 mobile phase . . (A) 10 mM ammonium phosphate (pH 2.5 with phosphoric acid);
 (B) acetonitrile
 flow rate 0.2 mL/min
 column temp. 35 °C
 detector UV, 254 nm
 injection 2 µL
 sample as indicated in mobile phase
 Application No. [G003201](#)



HPLC Analysis of Barbiturates in Serum on Discovery® C18 after SPE using Discovery® DSC-18Lt

A Zymark® RapidTrace® SPE Workstation was used for this analysis.

sample preparation SPE (Solid Phase Extraction)
 sample/matrix . . . 0.5 mL porcine serum spiked with 0.5 µg/mL or 1.0 µg/mL each
 analyte then diluted with 0.5 mL water
 SPE tube/cartridge Discovery DSC-18Lt, 500 mg/3 mL (52613-U)
 condition 2 mL methanol; 2 mL DI water
 sample addition 1 mL at 0.75 mL/min
 washing 2 mL 5% methanol, then vacuum or air dry for 5-10 min
 elution 1-2 mL methanol
 eluate post-treatment dry eluate with nitrogen purge (40 °C; 15-20 min),
 reconstitute in 20 µL mobile phase
 column Discovery C18, 15 cm × 4.6 mm, 5 µm preceded by a
 2 cm C18 guard column and 0.5 µm frit filter (504955)
 mobile phase (A) methanol; (B) water (40:60, A:B)
 flow rate 1 mL/min
 column temp. 30 °C
 detector UV, 214 nm
 injection 30 µL, diluted porcine serum extract
 Application No. **G001056**



Barbiturates from serum using 500 mg/3 mL Discovery DSC-18Lt SPE tubes and Zymark's RapidTrace SPE Workstation.
 *IS = Barbitol (internal standard).

Sample Info: 0.5 mL porcine serum spike with 0.5 µg/mL or 1.0 µg/mL each analyte then diluted with 0.5 mL water.

Efficiency of Recovery

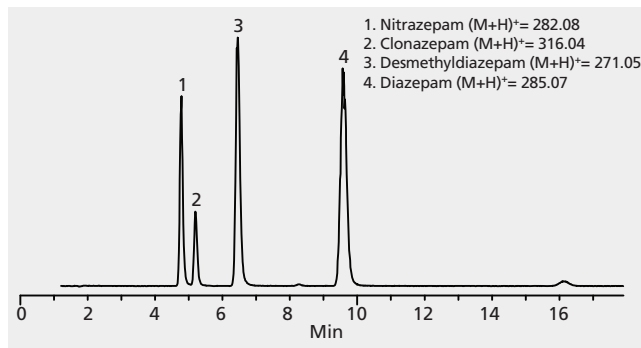
Compound	Concentration (µg/mL)	%Recovery	%RSD (n=6)
1. Phenobarbital	0.5	96.2	±1.6
	1.0	94.9	±1.7
2. Aprobarrbital	0.5	98.5	±2.1
	1.0	100.8	±0.8
3. Butabarrbital	0.5	97.2	±1.9
	1.0	98.7	±1.8
4. Mephobarbital	0.5	99.7	±2.4
	1.0	101.0	±2.0
5. Pentobarbital	0.5	96.4	±1.7
	1.0	96.4	±1.9
6. Secobarbital	0.5	98.2	±1.7
	1.0	97.7	±1.8

SPE Method For RapidTrace SPE Workstation Application

- Condition & equilibrate each tube/well with 2 mL MeOH & 2 mL DI Water
- Load sample
- Wash each tube/well with 2 mL 5% MeOH
- Vacuum or air dry for 5-10 min
*This removes any excess water from the sorbent.
 The presence of water in the final eluent may prolong eluent evaporation.*
- Elute with 1-2 mL MeOH
- Dry eluate with nitrogen purge (40 °C; 15-20 min)
- Reconstitute with 200 µL mobile phase
- Quantify against internal or external standards via HPLC analyses

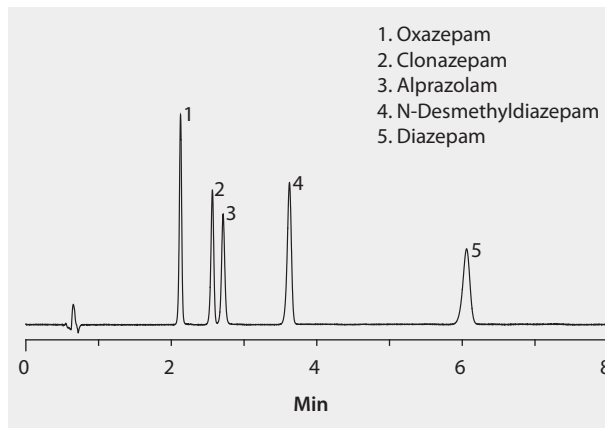
HPLC Analysis of Benzodiazepines on Ascentis® C8

column Ascentis C8, 15 cm x 2.1 mm I.D., 3 µm particles (581402-U)
 mobile phase (A) 10 mM ammonium acetate (pH 6.98 unadjusted);
 (B) acetonitrile; (55:45, A:B)
 flow rate 0.2 mL/min
 column temp. 35 °C
 detector MS, ESI (+), Selected Ion Recording Mode
 injection 5 µL
 sample 1 µg/mL each in 10 mM ammonium acetate (pH 6.98 unadjusted)
 Application No. **G003309**



HPLC Analysis of Benzodiazepines on Ascentis® Express C18, Acetonitrile Mobile Phase

column . . . Ascentis Express C18, 10 cm x 3 mm I.D., 2.7 µm particles (53814-U)
mobile phase (A) water; (B) acetonitrile; (66:34, A:B)
flow rate 0.6 mL/min
column temp. 35 °C
detector UV, 250 nm
injection 2 µL
sample 0.1 g/L each in 20% methanol
Application No. **G005673**



HPLC Analysis of Benzodiazepines on Ascentis® Express Phenyl-Hexyl, Methanol Mobile Phase

The Phenyl-Hexyl phase of the Ascentis Express product line displays the best selectivity of this sample; selectivity is markedly affected by choice of organic modifier. The application also demonstrates feasibility of fast LC with Ascentis Express by virtue of low backpressure and high efficiency.

column Ascentis Express Phenyl-Hexyl, 5 cm x 4.6 mm I.D.,
2.7 µm particles (53348-U)

mobile phase (A) water; (B) methanol; (35:65, A:B)

flow rate 1.4 mL/min

pressure 3600 psi (248 bar)

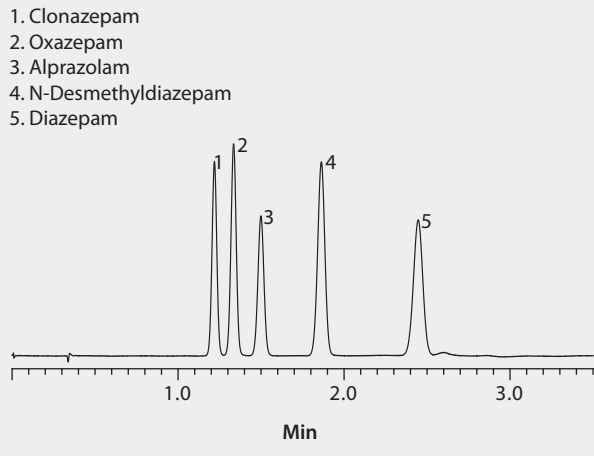
column temp. 35 °C

detector UV, 250 nm

injection 2 µL

sample 0.1 g/L in 20% methanol

Application No. **G005674**



HPLC Analysis of Benzodiazepines on Ascentis® Express Phenyl-Hexyl with Acetonitrile Mobile Phase

The Phenyl-Hexyl phase of the Ascentis Express product line displays the best selectivity of this sample; selectivity is markedly affected by choice of organic modifier. The application also demonstrates feasibility of fast LC with Ascentis Express by virtue of low backpressure and high efficiency.

column Ascentis Express Phenyl-Hexyl, 5 cm x 4.6 mm I.D.,
2.7 µm particles (53348-U)

mobile phase (A) water; (B) acetonitrile; (62:38, A:B)

flow rate 1.4 mL/min

pressure 2600 psi (179 bar)

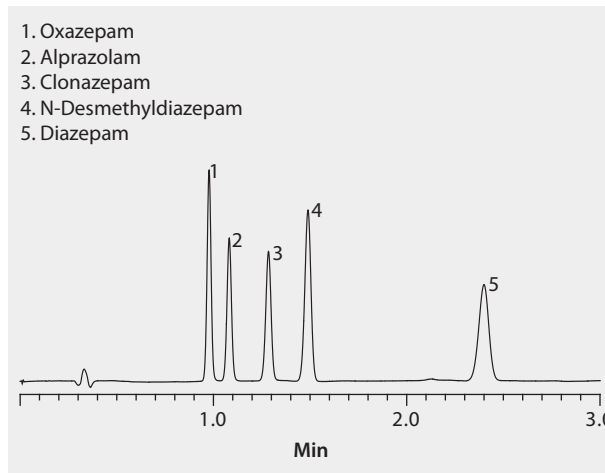
column temp. 35 °C

detector UV, 250 nm

injection 2 µL

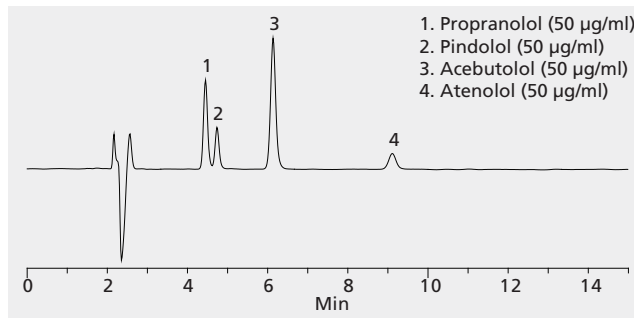
sample 0.1 g/mL of each in 20% methanol

Application No. [G005675](#)



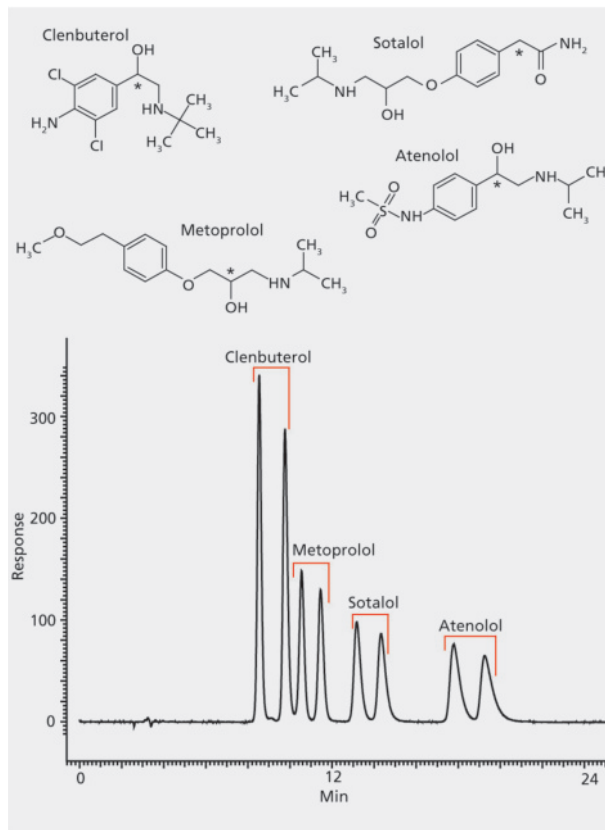
HPLC Analysis of Beta Blockers on Ascentis® Si (Silica)

column Ascentis Si, 15 cm x 4.6 mm I.D., 5 µm particles (581512-U)
 mobile phase (A) 0.1% ammonium acetate in water (pH unadjusted);
 (B) 0.1% ammonium acetate in acetonitrile; (15:85, A:B)
 flow rate 1 mL/min
 column temp. 35 °C
 detector UV, 225 nm
 injection 10 µL
 sample as indicated in 0.1% ammonium acetate in 10:90:water:acetonitrile
 Application No. **G003735**



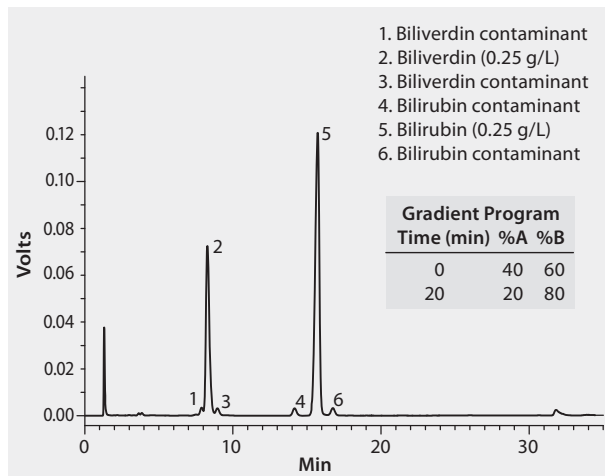
HPLC Analysis of Beta-Receptor Agonist Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm, 5 µm particles (12024AST)
 mobile phase 15 mM ammonium formate in methanol
 flow rate 1 mL/min
 column temp. 25 °C
 detector UV, 220 nm
 Application No. [G004337](#)



HPLC Analysis of Bilirubin and Biliverdin on Discovery® C18

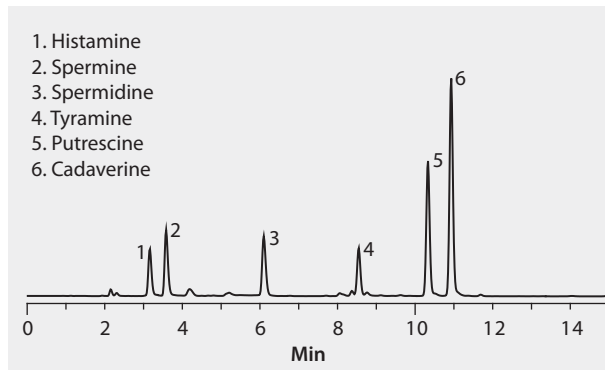
column Discovery C18, 10 cm × 2.1 mm I.D., 5 µm particles (569220-U)
 mobile phase (A) 10 mM ammonium acetate (pH unadjusted)
 (B) 90:10, methanol:(100 mM ammonium acetate)
 flow rate 0.2 mL/min
 column temp. ambient
 detector UV, 405 nm
 injection 1 µL
 sample as indicated (in 50% MeOH, 1% NH₄OH)
 Application No. **G002490**



HPLC Analysis of Biogenic Amines on Ascentis® RP-Amide

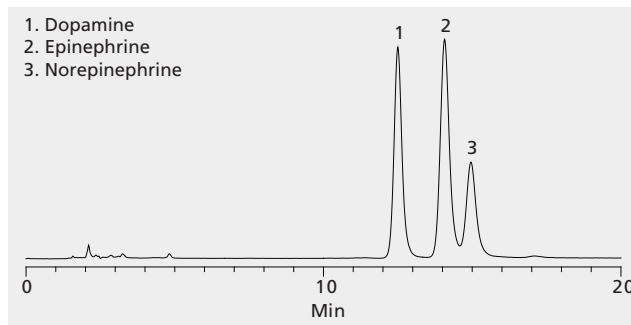
Following pre-column derivatization of primary amino groups using o-phthalaldehyde/thiol reagent, the Ascentis RP-Amide was used for the analysis of biogenic amines commonly found in wines. These include histamine, spermine, spermidine, tyramine, putrescine and cadaverine. Structures along with an optimized chromatogram are presented.

column Ascentis RP-Amide, 15 cm x 2.1 mm I.D., 5 µm particles (565305-U)
 mobile phase (A) 0.1% ammonium acetate in water (pH unadjusted);
 (B) acetonitrile
 gradient 25 to 75% B in 10 min; held at 75% B for 5 min
 flow rate 0.5 mL/min
 column temp. 35 °C
 detector UV, 340 nm
 injection 10 µL
 Application No. **G005680**



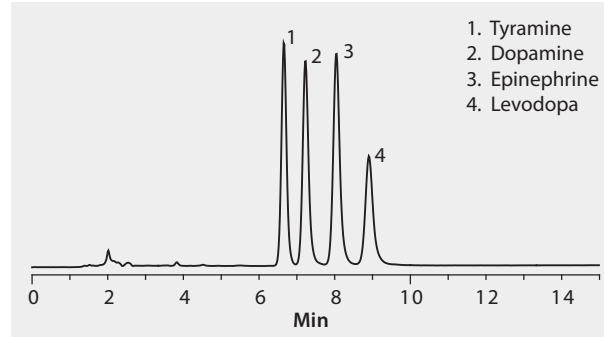
HPLC Analysis of Biogenic Amines on Ascentis® Si, HILIC Mode, (90 % Acetonitrile)

column Ascentis Si, 15 cm x 4.6 mm I.D., 5 µm particles (581512-U)
 mobile phase (A) 0.1% ammonium acetate in water (pH unadjusted);
 (B) 0.1% ammonium acetate in acetonitrile; (10:90, A:B)
 flow rate 1 mL/min
 column temp. 35 °C
 detector UV, 280 nm
 injection 10 µL
 sample 50 µg/mL each in 0.1% ammonium acetate in 10:90:water:acetonitrile
 Application No. **G003717**



HPLC Analysis of Biogenic Amines on Ascentis® Si, HILIC Mode (85 % Acetonitrile)

column Ascentis Si, 15 cm x 4.6 mm I.D., 5 µm particles (581512-U)
mobile phase (A) 0.1% ammonium acetate in water (pH unadjusted);
. (B) 0.1% ammonium acetate in acetonitrile; (15:85, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 280 nm
injection 10 µL
sample 50 µg/mL in 0.1% ammonium acetate in 10:90:water:acetonitrile
Application No. **G003716**



HPLC Analysis of β -Blockers and β -Agonists in Urine and Wastewater on a C18 Column after SPE using SupelMIP® SPE-Beta-Receptor

Sample Pre-treatment:

Horse urine was centrifuged at 3000 g for 10 min, diluted 1:1 (v/v) with DI water, adjusted to pH 7. Wastewater was filtered with 1 μ m filter paper and adjusted to pH 6-7. Samples were spiked with 10 beta-agonists and beta-blockers at the level of 1 ng/mL.

sample preparation SPE (Solid Phase Extraction)
sample/matrix horse urine or waste water spiked with
10 beta-agonists and beta-blockers at 1 ng/mL

SPE tube/cartridge SupelMIP SPE - Beta-Receptor, 25 mg/10 mL (LRC) (53223-U)
condition 1 mL acetonitrile; 1 mL DI water

sample addition 1 mL
washing 3 x 1 mL DI water; 1 mL acetonitrile; 1 mL 60% acetonitrile/40% DI
water; apply 2 min of full vacuum to dry the tube after each step

elution 2 x 1 mL 1% formic acid in acetonitrile
eluate post-treatment evaporate under nitrogen and reconstitute with
150 μ L 5% acetonitrile in 10 mM ammonium acetate,
pH 4.6 prior to LC-MS-MS analysis

column C18, 5 cm x 3 mm I.D., 3 μ m particles
mobile phase (A) 10 mM ammonium acetate,
pH 4.6 (adjusted with acetic acid); and (B) acetonitrile

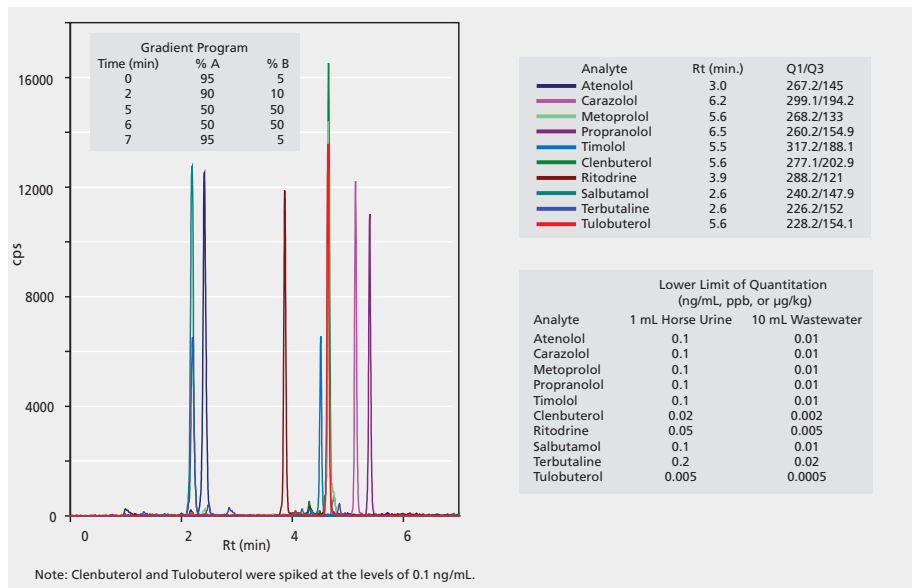
flow rate 0.5 mL/min

column temp. ambient

detector MS/MS, ESI(+)

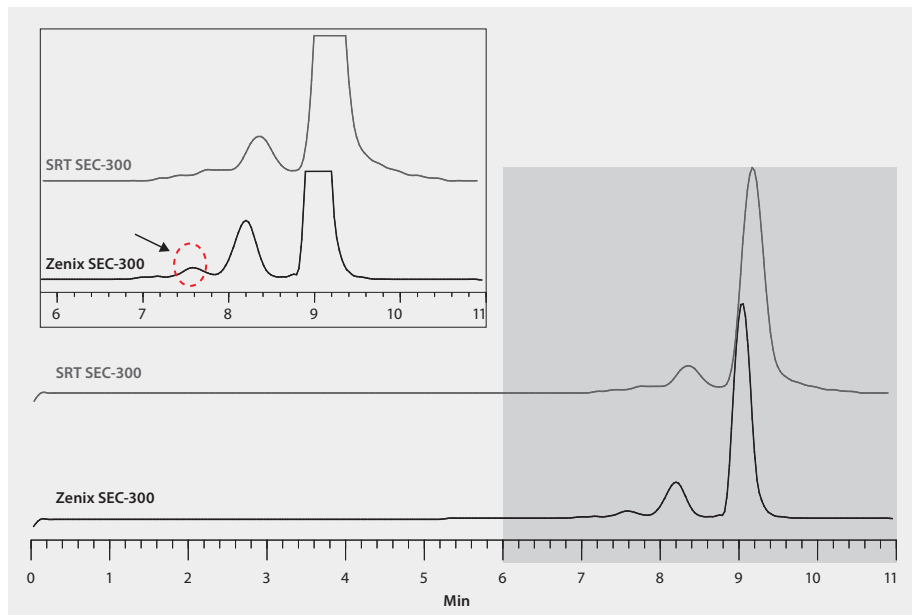
injection 20 μ L

Application No. [G004059](#)



HPLC Analysis of Bovine Serum Albumin (BSA) on Zenix® SEC-300 versus SRT® SEC-300, Effect of Particle Size on Resolution

column . . . SRT SEC-300, 30 cm x 7.8 mm I.D., 5 μ m, 300 Å particles (Z777051)
 column . . . Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 μ m, 300 Å particles (Z777033)
 mobile phase 150 mM sodium phosphate, pH 7
 flow rate 1 mL/min
 column temp. ambient
 detector UV, 214 nm
 injection 10 μ L
 sample 5 mg/mL, BSA
 Application No. **G006119**

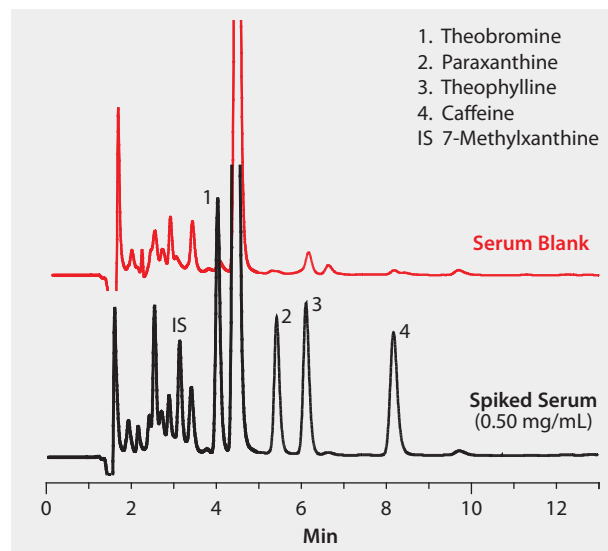


HPLC Analysis of Bronchodilators Theophylline and Other Caffeine Metabolites from Serum on Discovery® RP-AmideC16 after SPE using Discovery® DSC-18

sample preparation SPE (Solid Phase Extraction)
 SPE tube/cartridge Discovery® DSC-18, 500 mg/3 mL (52603-U)
 condition 2 mL methanol, then 2 mL water
 sample preparation 1 mL porcine serum spiked with 0.1 µg/mL, 0.50 µg/mL, or 1.0 µg/mL each analyte
 sample preparation 1 mL methanol; evaporate to dryness with nitrogen stream at room temperature; reconstitute in 200 µL mobile phase containing 0.2 µg/mL or 7-methylxanthine (IS)
 sample preparation 2 mL 5% methanol in water; dry tube 10 min with nitrogen stream
 column Discovery RP-AmideC16, 15 cm × 4.6 mm, 5 µm particles, preceded by a 2 cm RP-AmideC16 guard column and 0.5 µm frit filter (505013)
 mobile phase (A) Methanol; (B) 1% acetic acid (17:38, A:B)
 flow rate 1 mL/min
 column temp. 30 °C
 detector UV, 272 nm
 injection 20 µL reconstituted porcine serum extract
 Application No. **G000594**

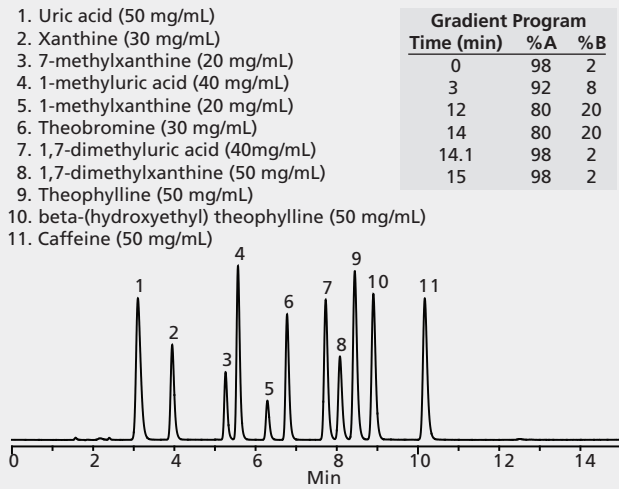
Efficiency of Recovery

Compound	Concentration (µg/mL)	% Recovery	% RSD (n=6)
1. Theobromine	0.1	97.4	±6.8
	0.5	96.4	±8.5
	1.0	96.1	±5.0
2. Paraxanthine	0.1	96.2	±8.4
	0.5	95.2	±8.7
	1.0	95.0	±8.7
3. Theophylline	0.1	97.8	±8.5
	0.5	97.8	±8.8
	1.0	98.5	±5.7
4. Caffeine	0.1	98.8	±3.9
	0.5	95.6	±6.7
	1.0	97.6	±5.8



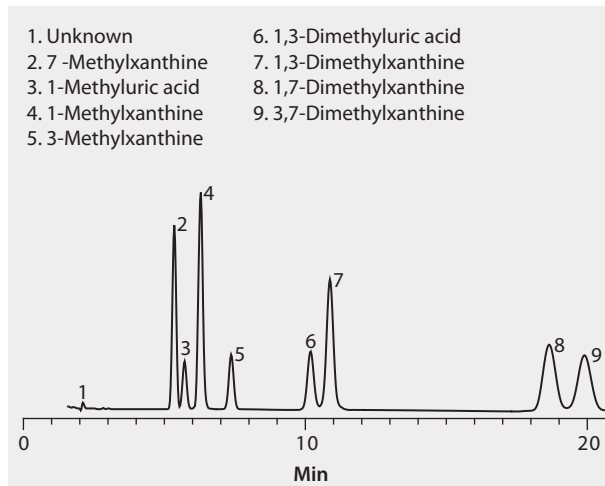
HPLC Analysis of Caffeine and Metabolites on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
 mobile phase . . . (A) 0.1% ammonium acetate in water (pH 4.5 with acetic acid);
 (B) acetonitrile
 flow rate 1.0 mL/min
 column temp. 30 °C
 detector UV, 275 nm
 injection 10 µL
 sample . . . as indicated in 0.1% ammonium acetate in water (pH 4.5 with acetic acid)
 Application No. **G003750**



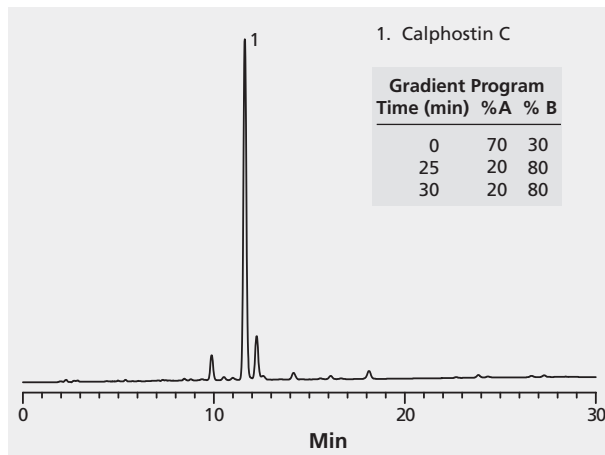
HPLC Analysis of Caffeine Metabolites and Analogs on Discovery® C18

column Discovery C18, 15 cm x 4.6 mm I.D., 5 µm particles (504955)
 mobile phase (A) 1% acetic acid in water; (B) methanol; (92:8, A:B)
 flow rate 1.0 mL/min
 column temp. 35 °C
 detector UV, 254 nm
 Application No. **G005684**



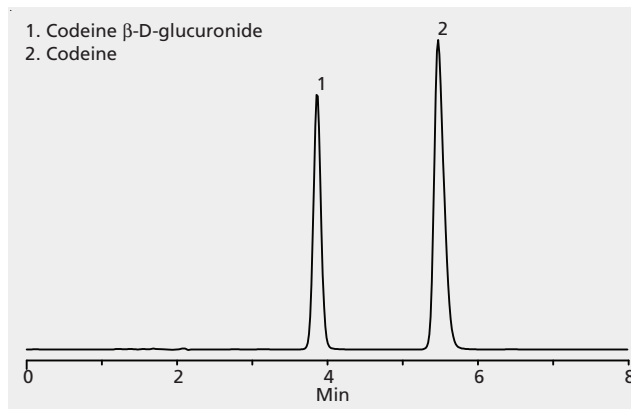
HPLC Analysis of Calphostin C on Discovery® HS C18

column Discovery HS C18, 25 cm × 2.1 mm I.D., 5 µm particles (568503-U)
mobile phase (A) (0.1% phosphorus acid in water):(0.1% phosphorus acid in acetonitrile); (B) 0.1% phosphorus acid in acetonitrile; (50:50, A:B)
flow rate 0.2 mL/min
column temp. 24 °C
detector UV, 254 nm
injection 3 µL
sample Calphostin C (0.25 g/L) in 40% MeOH, 0.025% TFA
Application No. **G002574**



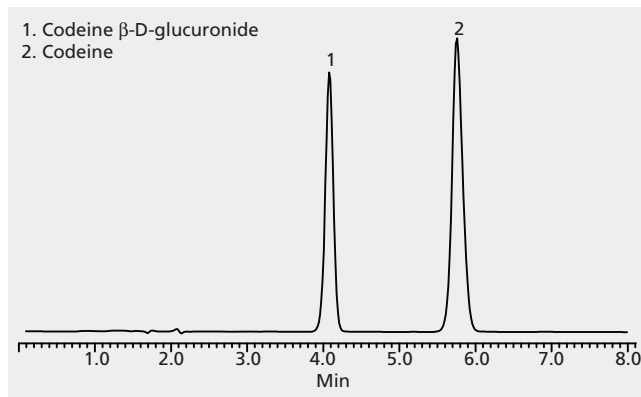
HPLC Analysis of Codeine and Metabolite on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile; (90:10, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002417**



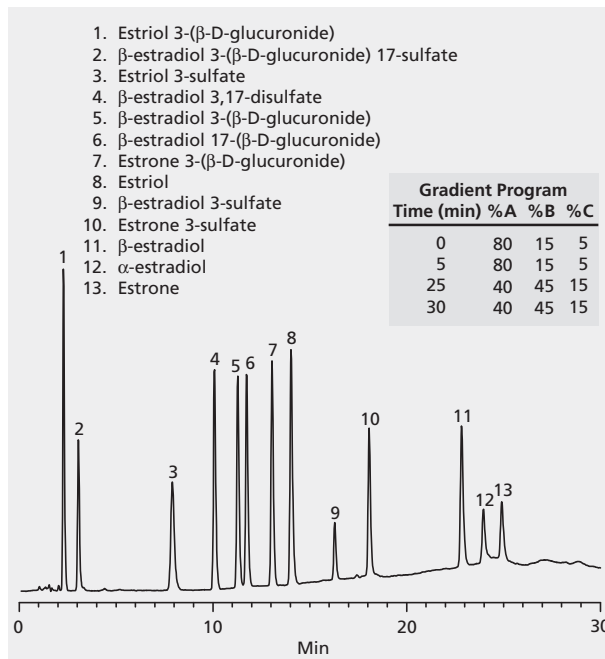
HPLC Analysis of Codeine and Metabolite on Ascentis® RP-Amide

column Ascentis RP-Amide 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile; (90:10, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002599**



HPLC Analysis of Conjugated Estrogens on Discovery® HS C18

column Discovery HS C18, 15 cm × 4.6 mm I.D., 5 µm particles (568522-U)
 mobile phase (A) 10 mM potassium phosphate (pH 7.01 unadjusted);
 (B) acetonitrile; (C) methanol
 flow rate 1 mL/min
 column temp. 30 °C
 detector UV, 220 nm
 injection 10 µL
 sample 10 µg/mL each in 60/40, water:acetonitrile
 Application No. **G002155**

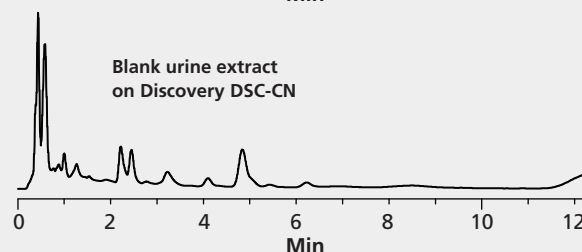
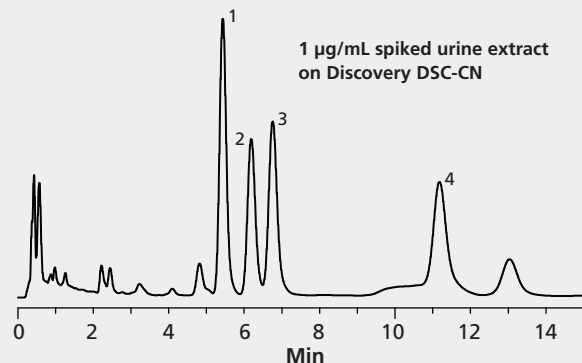


HPLC Analysis of Corticosteroids in Urine on Discovery® HS F5 after SPE using Discovery® DSC-CN

sample preparation SPE (Solid Phase Extraction)
 sample/matrix human urine spiked with corticosteroids at
 0.5 and 1.0 µg/mL and diluted in DI water (1:1, v/v)
 SPE well plate Discovery DSC-CN 96-well SPE, 100 mg/well (575636-U)
 condition 1 mL methanol; 1 mL DI water.
 sample addition 1 mL spiked urine
 washing 1 mL 20% methanol
 elution 1 mL methanol
 eluate post-treatment Evaporate eluate with nitrogen at 30 °C.
 Reconstitute in 200 µL mobile phase.
 column Discovery HS F5, 5 cm x 4.6 mm I.D., 3 µm particles (567504-U)
 mobile phase (A) methanol; (B) DI water; (40:60, A:B)
 flow rate 1.5 mL/min
 column temp. 35 °C
 detector UV, 240 nm
 injection 5 µL
 Application No. **G003763**

Efficiency of Recovery

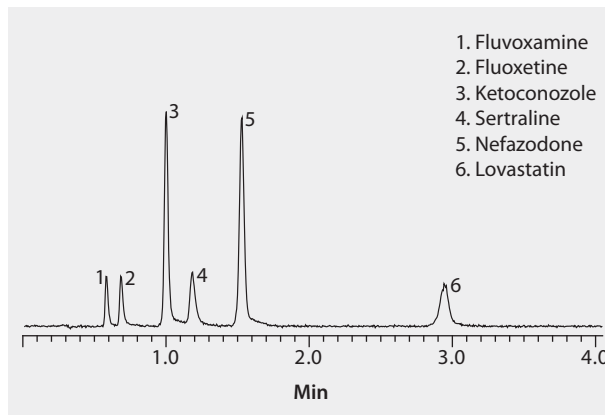
Compound	%Recovery ± RSD (n=3)	
	0.5 µg/mL spike level	1.0 µg/mL spike level
1. Hydrocortisone	123.3±1.4%	95.9±1.7%
2. Prednisilone	107.2±1.1%	91.9±1.1%
3. Prednisone	103.2±1.0%	88.4±1.8%



HPLC Analysis of CYP3A Inhibitors on Ascentis® Express RP-Amide

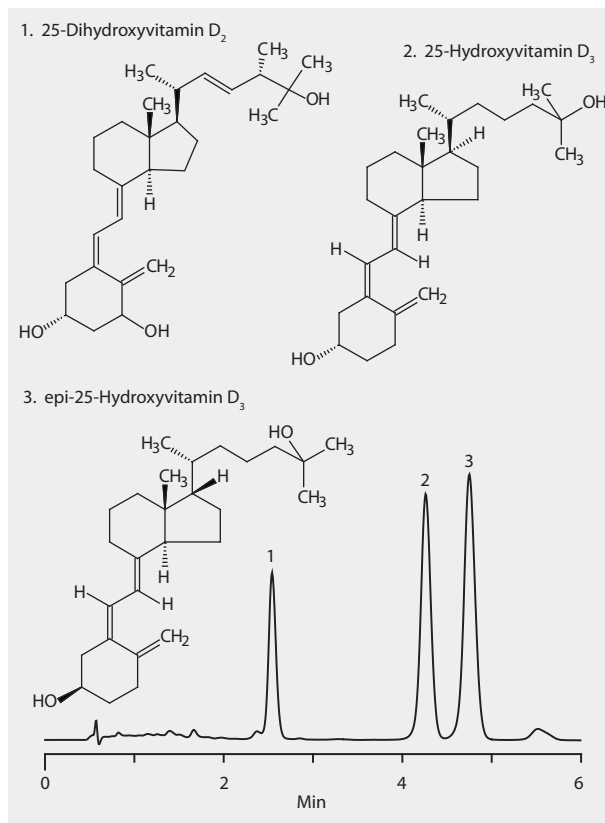
This application demonstrates the suitability of the Ascentis Express RP Amide for the analysis of CYP3A Inhibitors.

column Ascentis Express RP-Amide, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53913-U)
mobile phase . . . (A) 20 mM ammonium formate in 50:50 (v/v) water:acetonitrile
flow rate 0.6 mL/min
column temp. 35 °C
detector ESI(+), m/z 100-600
injection 1 µL
Application No. **G005750**



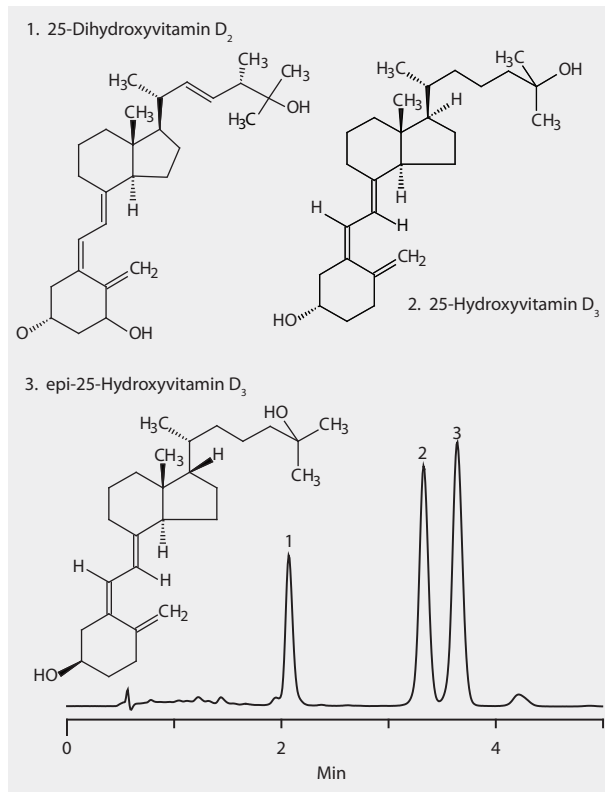
HPLC Analysis of 25-Dihydroxyvitamin D₂, 25-Hydroxyvitamin D₃ and 3-epi-25- Hydroxyvitamin D₃ on Ascentis® Express F5, 20 °C

column . . . Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 μm particles (53569-U)
 mobile phase (A) 5 mM ammonium formate; (B) methanol:water (75:25)
 flow rate 0.4 mL/min
 pressure 3553 psi (245 bar)
 column temp. 20 °C
 detector (UV, 265 nm, ESI(+), m/z 100 - 1000)
 injection 1 μL
 sample 500 mg/L in 25:75, water:methanol
 Application No. **G005375**



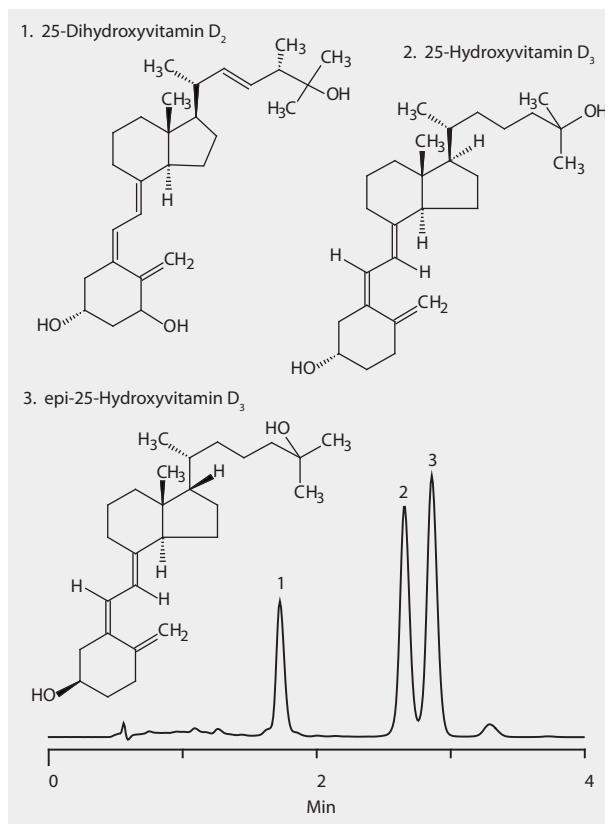
HPLC Analysis of 25-Dihydroxyvitamin D₂, 25-Hydroxyvitamin D₃ and 3-epi-25- Hydroxyvitamin D₃ on Ascentis® Express F5, 30 °C

column . . . Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 μm particles (53569-U)
 mobile phase . . . (A) 5 mM ammonium formate in methanol; (B) water (25:75, A:B)
 flow rate 0.4 mL/min
 pressure 4293 psi (296 bar)
 column temp. 30 °C
 detector UV, 265 nm
 ESI(+), m/z 100 - 1000
 injection 1 μL
 sample 500 μg/mL in methanol
 Application No. **G005376**



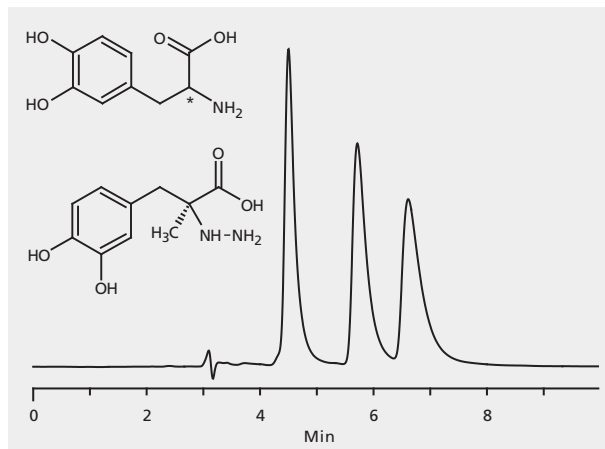
HPLC Analysis of 25-Dihydroxyvitamin D₂, 25-Hydroxyvitamin D₃ and 3-epi-25- Hydroxyvitamin D₃ on Ascentis® Express F5, 40 °C

column . . . Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 μm particles (53569-U)
 mobile phase . . . (A) 5 mM ammonium formate in methanol; (B) water (25:75, A:B)
 flow rate 0.4 mL/min
 pressure 5221 psi (360 bar)
 column temp. 40 °C
 detector UV, 265 nm
 ESI(+), m/z 100 - 1000
 injection 1 μL
 sample 300 mg/L in 25:75, water:methanol
 Application No. **G005377**



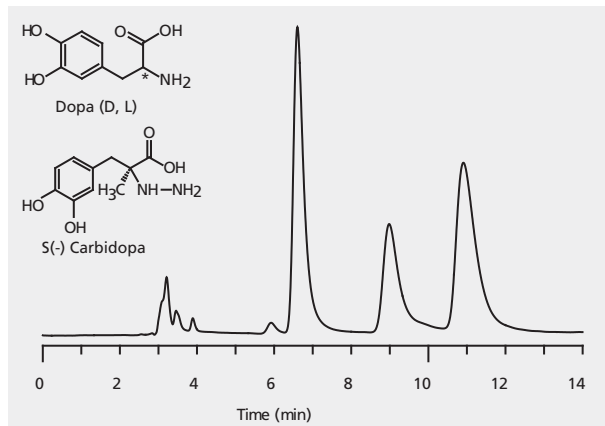
HPLC Analysis of Dopa and Carbidopa Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4; (B) methanol; (30:70, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004529](#)



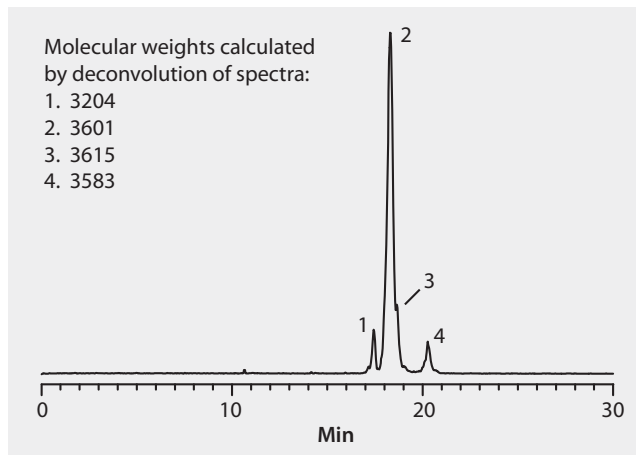
HPLC Analysis of Dopa and Carbidopa Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4; (B) methanol; (10:90, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004481**



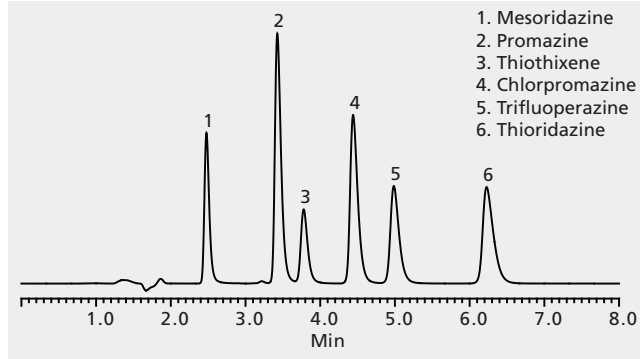
HPLC Analysis of Dopamine and Related Compounds on Discovery® HS F5

column Discovery HS F5, 15 cm × 4.6 mm I.D., 5 µm particles (567516-U)
mobile phase (A) 10 mM ammonium formate
(pH 3.0 with concentrated formic acid), (B) acetonitrile
flow rate 1 mL/min, split to the MS
column temp. 35 °C
detector MS in SIR (Selected Ion Recording) mode using (+) or (-) ESI mode
injection 25 µL
sample 50 µg/mL in 10 mM ammonium formate (pH 3.0 with formic acid)
Application No. [G002482](#)



HPLC Analysis of Dopamine Receptor Antagonists on Ascentis® Phenyl

column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
 mobile phase (A) 50 mM ammonium formate (pH 3.0 with formic acid);
 (B) acetonitrile; (45:55, A:B)
 flow rate 1.0 mL/min
 column temp. 35 °C
 detector UV, 254 nm
 injection 10 µL
 sample 50 µg/mL in 50:50, water:methanol
 Application No. **G003707**

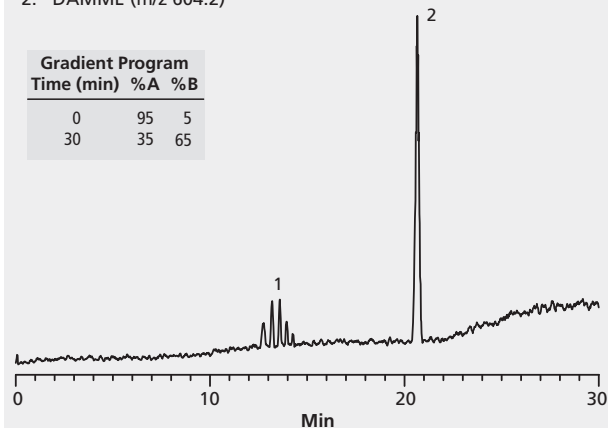


HPLC Analysis of Enkephalin Derivative (DAMME) on Discovery® HS F5

column Discovery HS F5, 10 cm × 2.1 mm I.D., 5 µm particles (568501-U)
 mobile phase (A) 25 mM HCO₂H in water; (B) 25 mM HCO₃H in acetonitrile
 flow rate 0.2 mL/min
 column temp. 22 °C
 detector ESI (+), full scan
 injection 2 µL
 sample 10 mg/L in 0.1% HCO₂H
 Application No. [G002572](#)

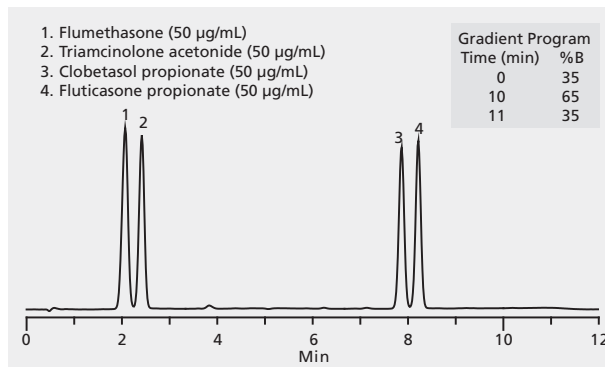
1. PEG contaminants (m/z 520.1, 564.1, 608.2, 652.2, 696.2)
2. DAMME (m/z 604.2)

Gradient Program		
Time (min)	%A	%B
0	95	5
30	35	65



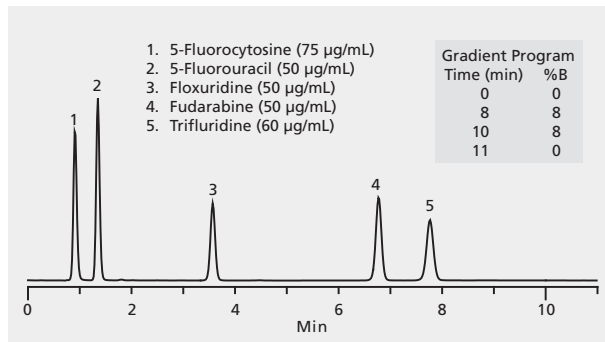
HPLC Analysis of Fluorinated Corticosteroids on Ascentis® C18

column Ascentis C18, 5 cm × 4.6 mm I.D., 5 µm particles (581323-U)
 mobile phase (A) water; (B) acetonitrile;
 flow rate 1.0 mL/min
 column temp. 30 °C
 detector UV, 240 nm
 injection 5 µL
 sample as indicated in acetonitrile
 Application No. **G003939**



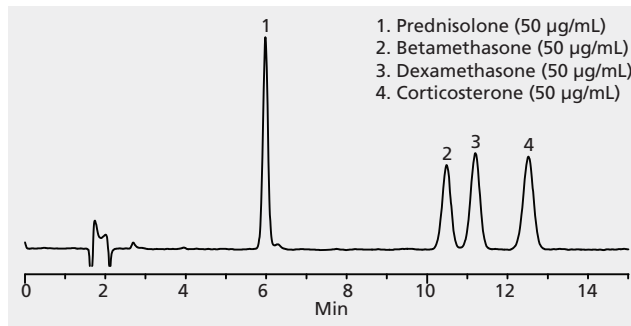
HPLC Analysis of Fluorinated Pyrimidine Nucleosides on Ascentis® RP-Amide

column Ascentis RP-Amide, 5 cm × 4.6 mm I.D., 5 µm particles (565323-U)
 mobile phase (A) water with 0.1% ammonium formate
 (pH 3.04 with formic acid), (B) acetonitrile
 flow rate 1.0 mL/min
 column temp. 30 °C
 detector UV, 260 nm
 injection 5 µL
 sample as indicated in mobile phase A
 Application No. **G003940**



HPLC Analysis of Glucocorticoids on Ascentis® C8

column Ascentis C8, 15 cm x 4.6 mm I.D., 5 µm particles (581424-U)
mobile phase (A) water; (B) acetonitrile; (68:32, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample as indicated in mobile phase
Application No. **G003148**



HPLC Analysis of Hippuric and Methylhippuric Acids in Urine on SUPELCOSIL™ LC-18

Urinary excretion of hippuric acid and m-or p-methylhippuric acid in the urine is a test of exposure to toluene and m-or p-xylene vapors.

column SUPELCOSIL LC-18, 7.5 cm × 4.6 mm I.D., 3 μm particles (58984)

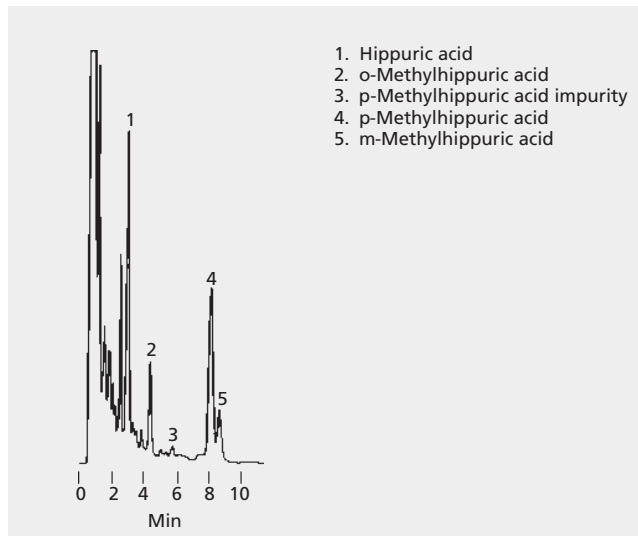
mobile phase (A) tetrahydrofuran:10 mM potassium phosphate, pH 3.0 (B) with phosphoric acid (3:97, A:B)

flow rate 1.5 mL/min

detector UV, 260 nm

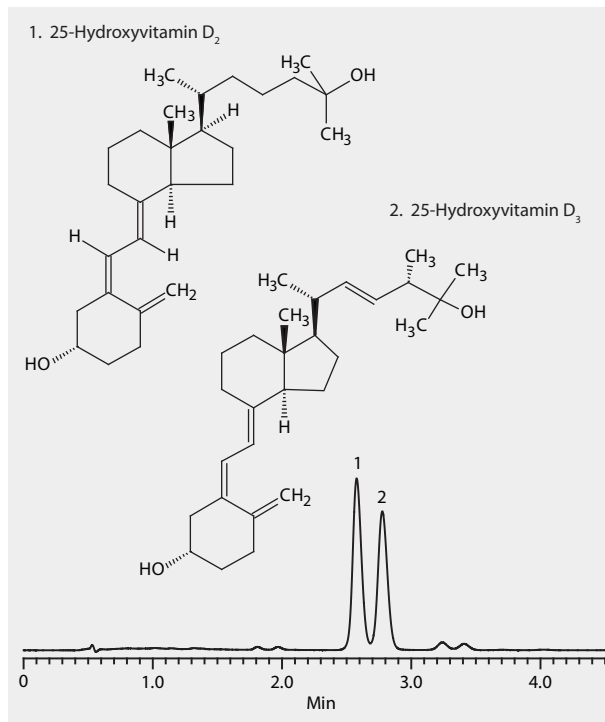
injection . . . 10 μL spiked urine (300 μg/mL HA, o-MHA; 150 μg/mL m-MHA, p-MHA)

Application No. [713-0961A](#)



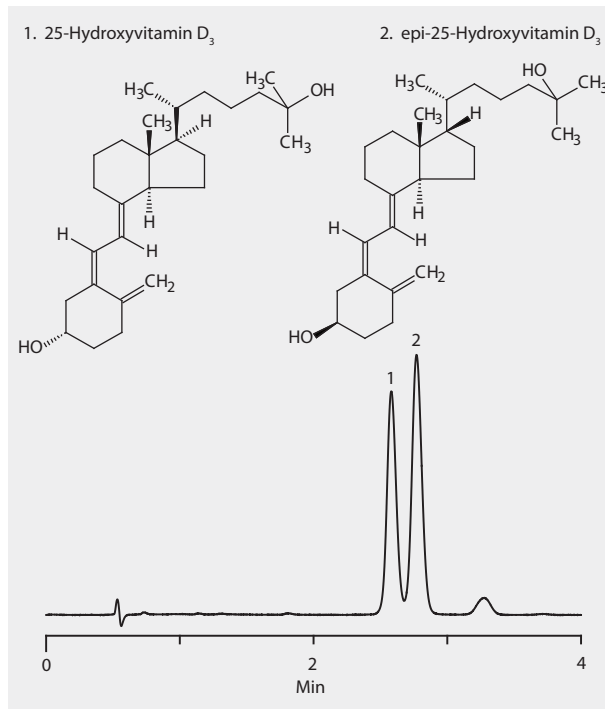
HPLC Analysis of 25-Hydroxyvitamin D3 and 25-Hydroxyvitamin D2 on Ascentis® Express F5

mobile phase (A) 7 mM ammonium formate; (B) methanol; (25:75, A:B)
 flow rate 0.4 mL/min
 column temp. 40 °C
 detector UV, 250 nm
 ESI(+), TIC m/z 100 - 1000
 injection 1 µL
 sample 300 mg/L in 25:75, water:methanol
 column Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 µm particles (53569-U)
 Application No. **G005374**



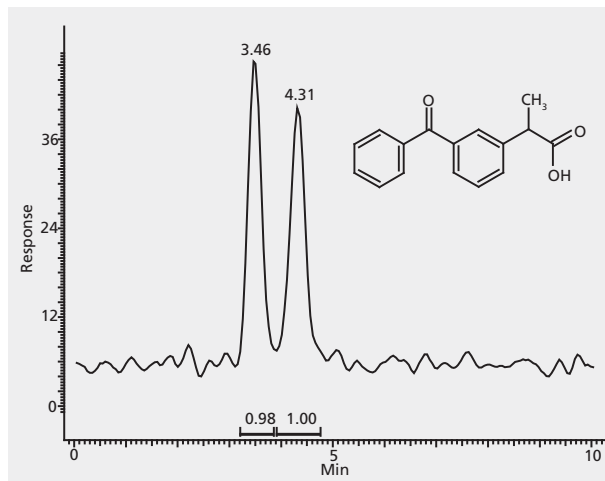
HPLC Analysis of 25-Hydroxyvitamin D₃ and epi-25-Hydroxyvitamin D₃ on Ascentis® Express F5

column . . . Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 µm particles (53569-U)
 mobile phase (A) 7 mM ammonium formate; (B) methanol; (25:75, A:B)
 flow rate 0.4 mL/min
 column temp. 40 °C
 detector UV, 265 nm
 ESI(+), m/z 100 - 1000
 injection 1 µL
 sample 300 mg/L in 25:75, water:methanol
 Application No. **G005378**



HPLC Analysis of Ketoprofen Enantiomers on Astec® CHIROBIOTIC® R (MS Detection)

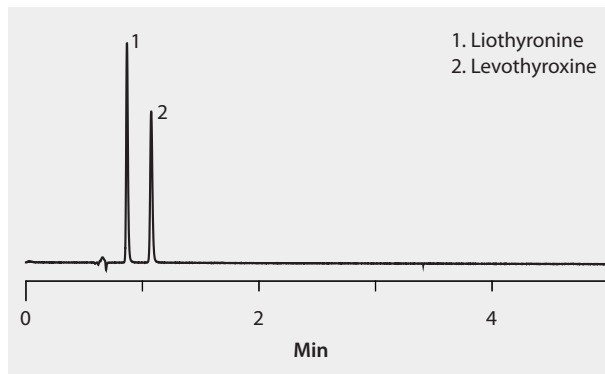
column CHIROBIOTIC R, 15 cm x 2.1 mm, 5 µm particles (13019AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 5.6 (B) methanol; (70:30, A:B)
flow rate 0.2 mL/min
column temp. 35 °C
detector ESI(-)
Application No. **G004331**



HPLC Analysis of Levothyroxine and Liothyronine on Ascentis® Express ES-Cyano

This application demonstrates the suitability of Ascentis Express ES-Cyano for the analysis of Levothyroxine according to USP Monograph 3301 with Liothyronine as a reference standard.

column Ascentis Express ES-Cyano, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53491-U)
mobile phase (A) water with 0.05% phosphoric acid;
(B) acetonitrile with 0.05% phosphoric acid; (60:40, A:B)
flow rate 1.5 mL/min
pressure 3270 psi (225 bar)
column temp. 30 °C
detector UV, 225 nm
injection 5 µL
sample 20 µg/mL in mobile phase
Application No. [G005601](#)



HPLC Analysis of Metabolites of 7,12-Dimethylbenz[a]anthracene on SUPELCOTM LC-18

column SUPELCOTM LC-18, 25 cm × 4.6 mm I.D., 5 μm particles (58298)
 mobile phase . . (A) methanol:(B) water, (50:50, A:B), 10 min to 100:0 at 2.5% /min
 flow rate 0.8 mL/min
 detector fluorescence
 sample rat liver, 9000 × g supernatant fraction from Aroclor-treated animals
 Application No. 713-1043

- | | |
|---|---|
| 1. 2-OH-DMBA(t-diol) | 11. 7-OHM-12-MBA-4-ol |
| 2. 7-OHM-12-MBA-(t-10,11-diol) | 12. 7-M-12-OHMBA-(3-ol) |
| 3. 7-M-12-OHMBA-(t-8,9-diol) | 13. 7-M-12-OHMBA-2-ol |
| 4. 7-OHM-12-MBA-(t-8,9-diol) | 14. 7-OHM-12-MBA |
| 5. 7-OHM-(t-3,4-diol) | 15. 7-M-12-OHMBA |
| 6. Mixed diols, incl. DMBA-
(t-8,9-diol & t-10, 11-diol) | 16. DMBA-2-ol |
| 7. Position of 7,12-bis-OHMBA | 17. DMBA-3-ol |
| 8. 7-OHM-12-MBA-2-ol | 18. DMBA-4-ol |
| 9. 7-OHM-12-MBA-(3-ol) | 19. DMBA |
| 10. 7-M-12-OHMNA-4-ol | (parentheses = tentative identifications) |

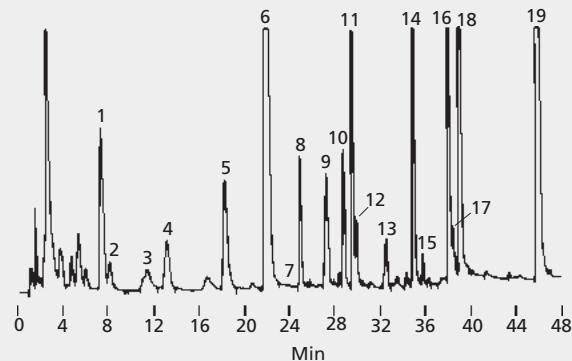
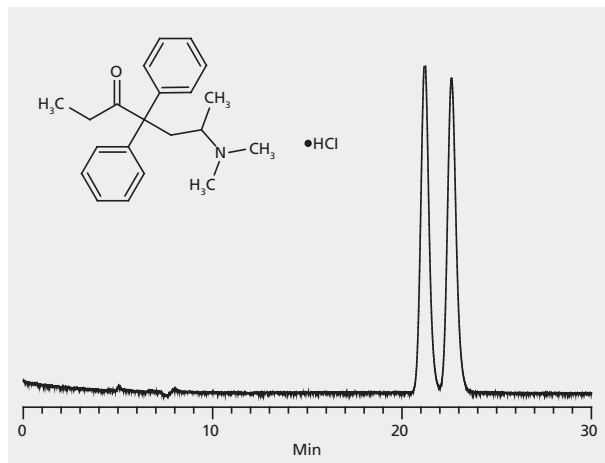


Figure provided by Drs. J. Milner and J. Grunau, University of Illinois, Urbana, Illinois, USA.

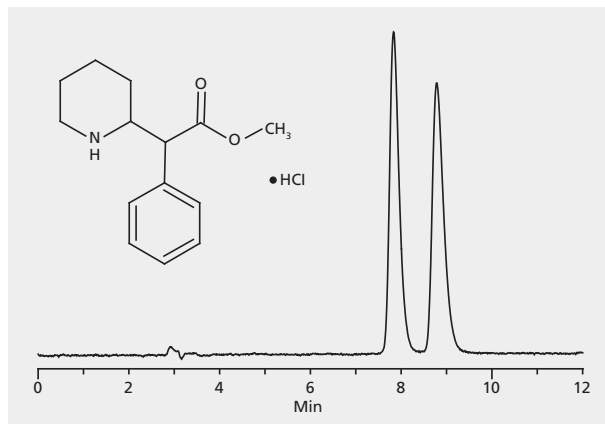
HPLC Analysis of Methadone Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase (A) methanol; (B) 20 mM ammonium formate; (95:5, A:B)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 205 nm
injection 2 µL
sample methadone, 1 mg/mL in mobile phase
Application No. [G004403](#)



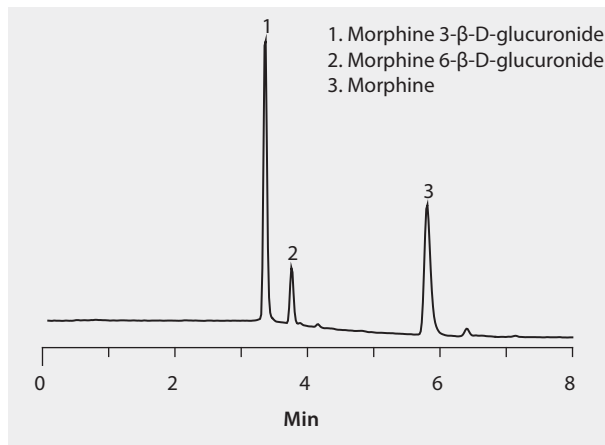
HPLC Analysis of Methylphenidate (Ritalin) Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase 15 mM ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample methylphenidate, 1 mg/mL in mobile phase
Application No. [G004405](#)



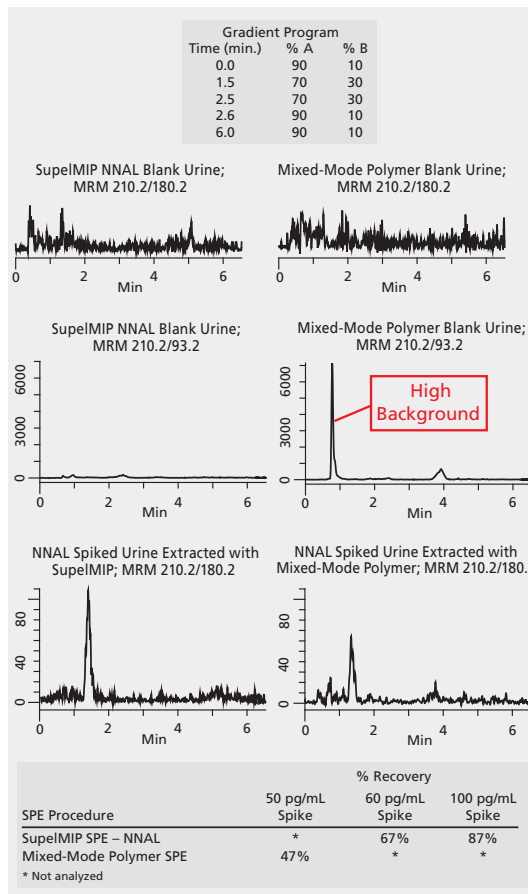
HPLC Analysis of Morphine and Glucuronide Metabolites on Discovery® HS F5

column Discovery HS F5, 5 cm x 4.6 mm I.D., 5 µm particles (567513-U)
mobile phase . . . (A) 10 mM ammonium acetate, pH 6.8 (unadjusted); (B) acetonitrile
gradient 0% B for 1 min, to 30% B in 4 min, held 3 min
flow rate 1 mL/min
column temp. 40 °C
detector UV, 280 nm
injection 10 µL
sample 50 µg/mL in final mobile phase
Application No. [G006123](#)



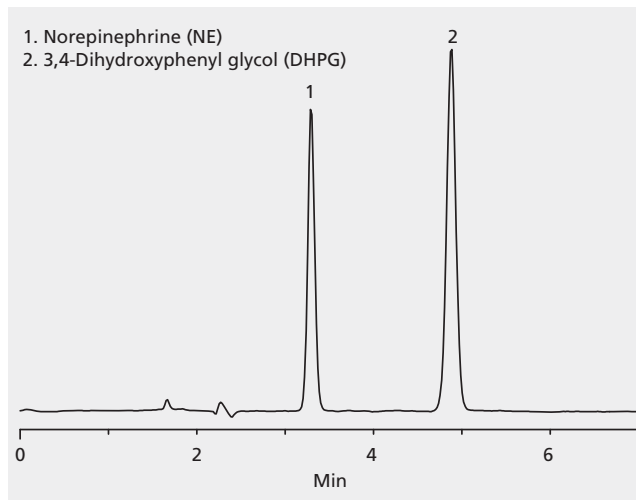
HPLC Analysis of NNAL in Urine on Ascentis® Express C18 after SPE using SupelMIP® SPE-NNAL

sample preparation SPE (Solid Phase Extraction)
 sample/matrix human urine spiked with 60 or 100 pg/mL NNAL
 SPE tube/cartridge SupelMIP SPE - NNAL, 25 mg/10 mL (LRC) (53206-U)
 condition 1 mL dichloromethane; 1 mL methanol; 1 mL DI water
 sample addition 2 mL (60 pg/mL sample), 5 mL (100 pg/mL sample)
 washing 2 x 1 mL DI water, 10 min vacuum; mL toluene; 1 mL toluene:
 dichloromethane (9:1, v/v); 1 mL toluene:dichloromethane (4:1, v/v), 2 min. vacuum
 elution 2 x 1 mL 10% methanol in dichloromethane,
 apply gentle vacuum between each fraction
 eluate post-treatment evaporate under nitrogen and reconstitute
 in 0.15 - 0.25 mL mobile phase
 column Ascentis Express C18, 5 cm x 2.1 mm I.D., 2.7 µm particles (581307-U)
 mobile phase (A) 10 mM ammonium acetate;
 (B) 10 mM ammonium acetate in acetonitrile
 flow rate 0.3 mL/min
 column temp. 35 °C
 detector MS/MS, MRM Transitions, ESI(+) (210.2/180 and 210.2/93.2 m/z)
 injection 20 µL
 Application No. [G004434](#)



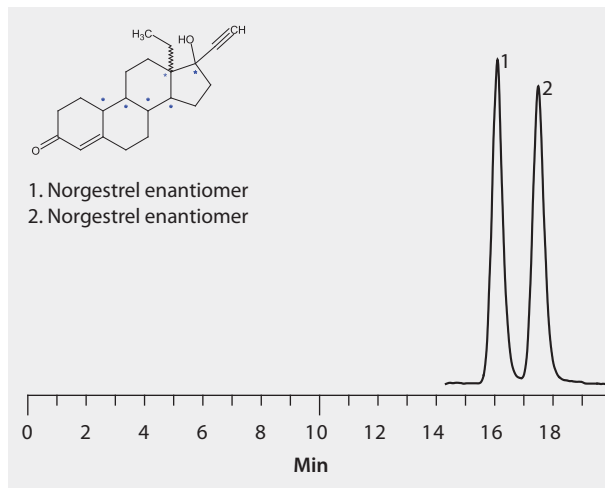
HPLC Analysis of Norepinephrine and 3,4-Dihydroxyphenylglycol on Discovery® HS F5

column Discovery HS F5, 15 cm × 4.6 mm I.D., 5 µm particles (567561-U)
mobile phase 50 mM ammonium formate, pH to 3.0 with formic acid
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 266 nm
injection 10 µL
sample 50 µg/mL each (NE and DHPG) in 5% methanol in mobile phase
Application No. [G002096](#)



HPLC Analysis of Norgestrel Enantiomers on Astec® CYCLOBOND® II

column CYCLOBOND II, 25 cm x 4.6 mm I.D., 5 µm particles (41020AST)
mobile phase (A) water; (B) acetonitrile; (70:30, A:B)
flow rate 0.8 mL/min
column temp. 22 °C
detector UV, 254 nm
injection 1 µL
sample norgestrel, 1 mg/mL in methanol
Application No. **G005165**



HPLC Analysis of Oenothien B on Ascentis® Express RP-Amide, UV and MS Detection

Optimization of a published method showing much better retention, peak shape and resolution on Supelco Ascentis Express RP-Amide 2.7 μm compared to a C18 phase. Isomers and small amounts of homologues are resolved and detectable with higher sensitivity.

column Ascentis Express RP-Amide, 10 cm x 4.6 mm I.D.,
2.7 μm particles (53929-U)

mobile phase (A) 0.2% formic acid; (B) methanol

gradient 5% B for 2 min; to 90% B over 18 min; held at 90% B for 10 min

flow rate 0.6 mL/min

column temp. 35 $^{\circ}\text{C}$

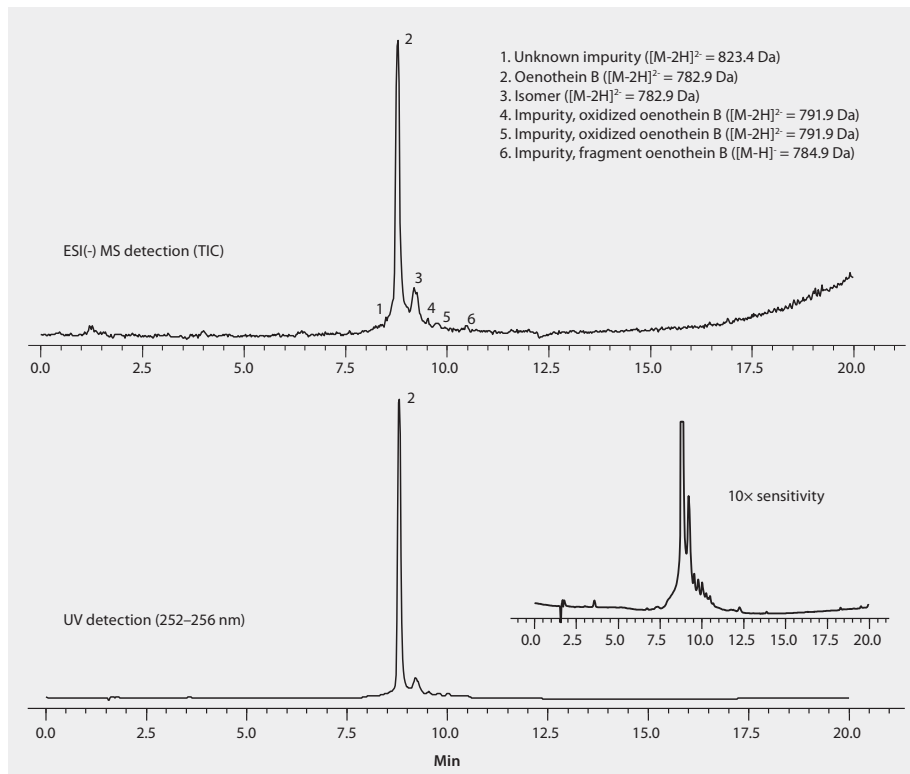
detector UV, 254 nm

detector MS (ion trap), m/z 100-1500

injection 2 μL

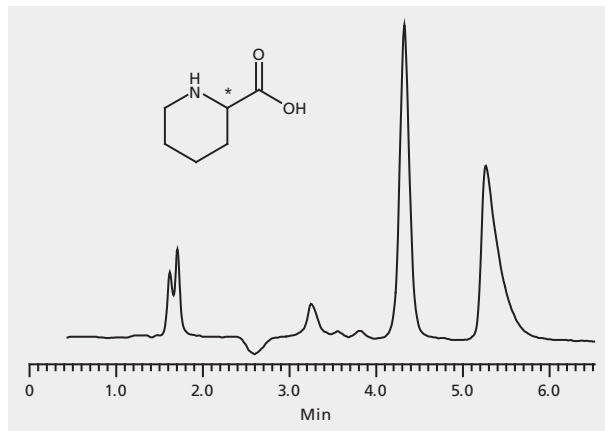
sample 1 mg/mL in methanol

Application No. **G006164**



HPLC Analysis of Pipecolic Acid Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) acetonitrile; (50:50, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 1 µL
sample 5 mg/mL in methanol
Application No. [G004554](#)



HPLC Analysis of Piroxicam and 2-Aminopyridine in Urine on Discovery® HS F5 after SPE using Discovery® DSC-MCAX

Sample Pre-Treatment:

Piroxicam and 2-aminopyridine (piroxicam's polar metabolite) was spiked into human urine at the levels of 4 and 10 µg/mL, respectively. The urine sample was diluted 1:1 with 10 mM potassium phosphate, pH 3.

sample preparation SPE (Solid Phase Extraction)
sample/matrix human urine spiked with piroxicam (4 µg/mL) and 2-aminopyridine (10 µg/mL)

SPE tube/cartridge Discovery DSC-MCAX, 100 mg/3 mL (52783-U)

condition 1 mL methanol; 1 mL 10 mM potassium phosphate, pH 3

sample addition 1 mL

washing 1 mL 10 mM potassium phosphate, pH 3; 1 mL methanol

elution 1 mL 5% ammonium hydroxide in methanol

eluate post-treatment evaporate to dryness with nitrogen at room temperature, reconstitute in 1 mL mobile phase

column Discovery HS F5, 15 cm x 4.6 mm I.D., 5 µm particles (567516-U)

mobile phase (A) 10 mM potassium phosphate, pH 6; (B) acetonitrile (85:15, A:B)

flow rate 2 mL/min

column temp. 25 °C

detector UV, 220 nm

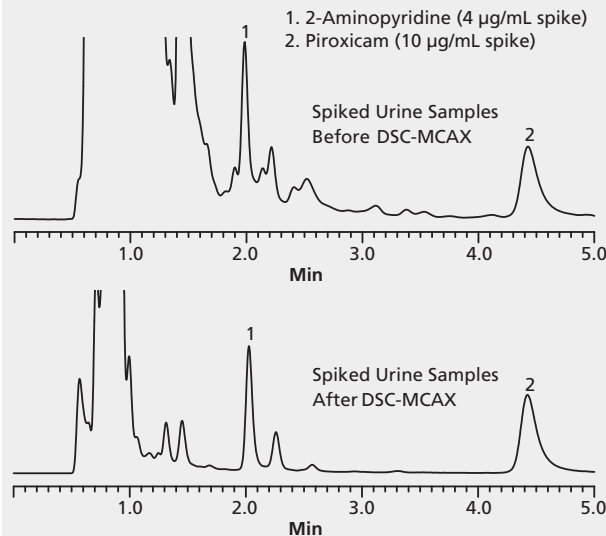
injection 10 µL

Application No. **G003762**

Efficiency of Recovery

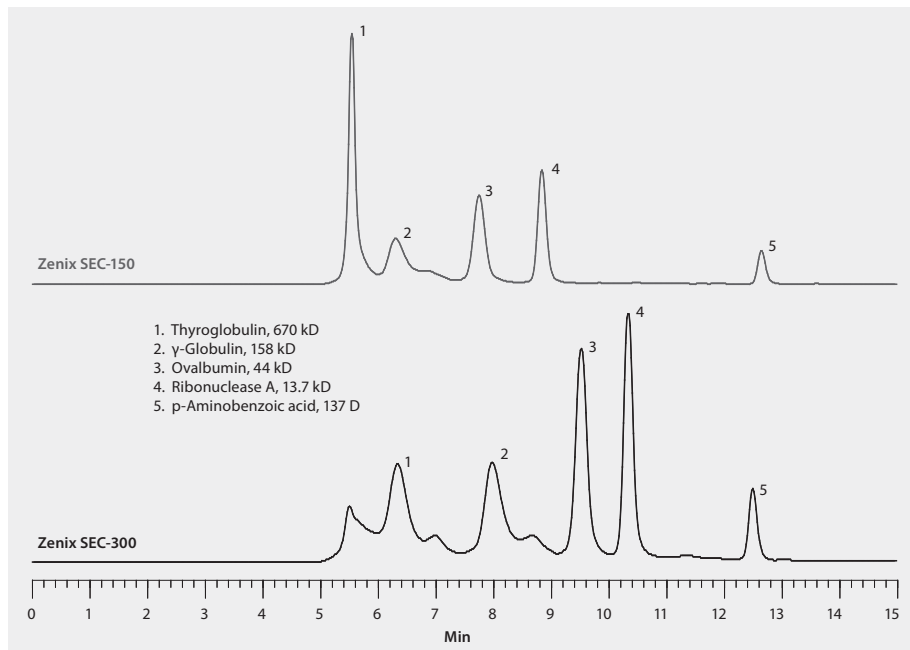
%Recovery ± RSD (n=4)

	2-Aminopyridine	Piroxicam
Discovery DSC-MCAX	102 ± 3.5%	101 ± 1.2%
Leading Competitor	A30 ± 52.5%	98 ± 3.2%
Leading Competitor	B36 ± 24.2%	83 ± 4.3%



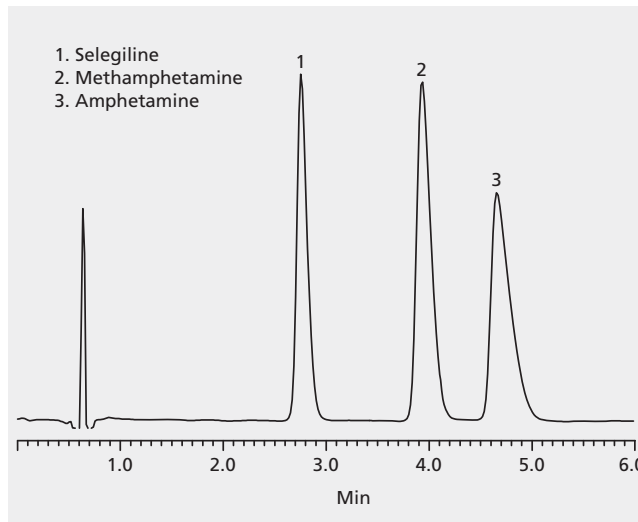
HPLC Analysis of a Protein Mixture on Zenix® SEC-150 versus Zenix® SEC-300, Effect of Pore Size on Resolution

column . . . Zenix SEC-150, 30 cm x 7.8 mm I.D., 3 µm, 150 Å particles (Z777018)
 column . . . Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm, 300 Å particles (Z777033)
 mobile phase 150 mM sodium phosphate, pH 7
 flow rate 1 mL/min
 column temp. ambient
 detector UV, 214 nm
 injection 10 µL
 sample protein mixture
 Application No. **G006118**



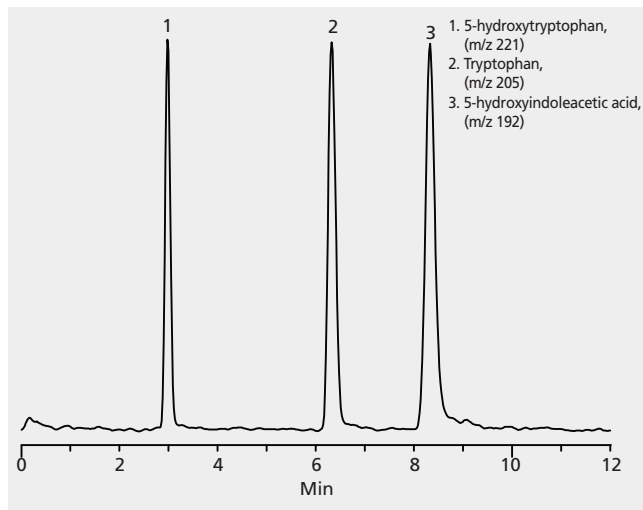
HPLC Analysis of Selegiline and Amphetamine Metabolites on Discovery® HS F5

column Discovery HS F5, 5 cm × 4.6 mm I.D., 5 μm particles (567513-U)
mobile phase (A) water (10 mM ammonium acetate, pH 4.0 with acetic acid:
(B) acetonitrile (v/v), (25:75, A:B)
flow rate 1.0 mL/min
column temp. 40 °C
detector UV, 210 nm
injection 10 μL
sample 50 μg/mL each in mobile phase
Application No. **G002136**



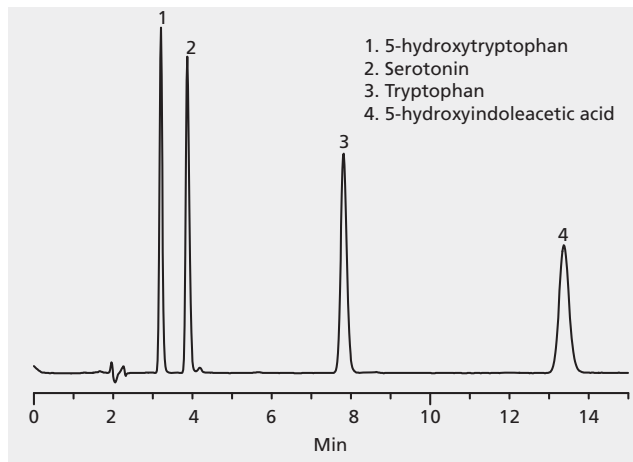
HPLC Analysis of Serotonin Metabolites on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase . . (A) 10 mM formic acid/acetate (pH 3.0): (B) methanol; (80:20, A:B)
flow rate 0.7 mL/min
column temp. 35 °C
detector ESI (+); overlay of extracted ion chromatograms
of individual (M+H)⁺ species
injection 10 µL
sample 25 mg/L in 90:10, 10 mM formic acid/acetate (pH 3.0):methanol
Application No. **G002449**



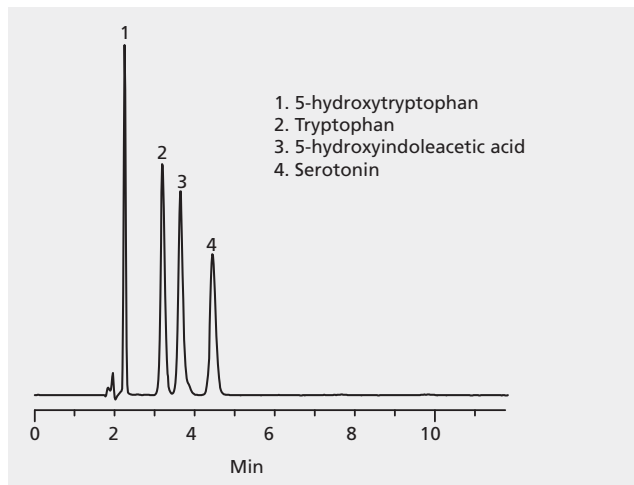
HPLC Analysis of Serotonin Synthetic Intermediates and Metabolites on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase . . . (A) water (10 mM ammonium formate, pH 3.0 with formic acid);
(B) acetonitrile; (95:5, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample 50 µg/mL each
Application No. **G002533**



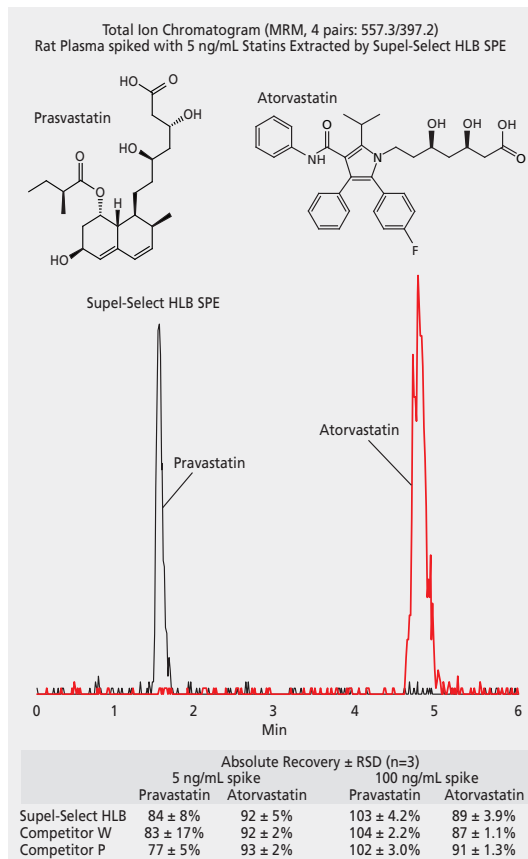
HPLC Analysis of Serotonin Synthetic Intermediates and Metabolites on Discovery® HS F5

column Discovery HS F5, 15 cm × 4.6 mm A.D., 5 µm particles (567516-U)
mobile phase (A) water (10 mM ammonium sulfate, pH 3.0 with formic acid);
(B)acetonitrile; (80:20, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample 50 µg/mL each
Application No. **G002561**



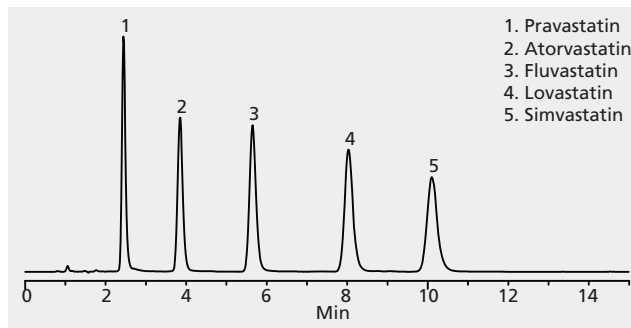
HPLC Analysis of Statins in Rat Plasma on Ascentis® Express C18 after SPE using Supel™-Select HLB

sample preparation SPE (Solid Phase Extraction)
 sample/matrix rat plasma spiked with pravastatin and atorvastatin at 5 and 100 ng/mL
 SPE tube/cartridge Supel-Select HLB SPE, 30 mg/1 mL (54181-U)
 condition 0.5 mL methanol:acetonitrile (1:1, v/v); 0.5 mL DI water
 sample addition 0.5 mL
 washing 0.5 mL 5% methanol
 elution 0.5 mL methanol:acetonitrile (1:1, v/v)
 eluate post-treatment evaporate to dryness with nitrogen at 37 °C,
 reconstitute in 0.5 mL DI water
 column Ascentis Express C18, 5 cm x 2.1 mm, 2.7 µm particles (53822-U)
 mobile phase 0.1% acetic acid diluted in 60% methanol
 flow rate 0.2 mL/min
 column temp. 35 °C
 detector ABI 3200 QT; ESI(+), MRM (423.3/321.3, 423.3/101.0,
 557.3/397.2 and 557.3/453.4)
 injection 5 µL
 Application No. **G004432**



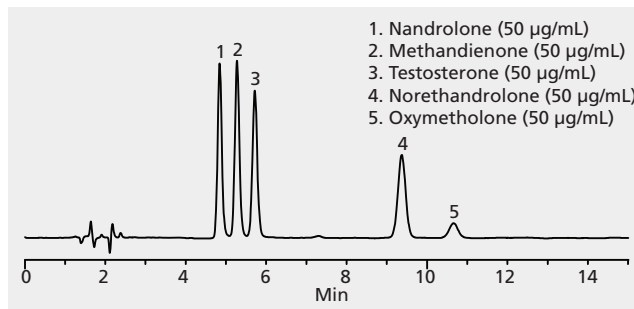
HPLC Analysis of Statins on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase . . . (A) water with 0.1% formic acid (34673): (B) methanol; (25:75, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 240 nm
injection 10 µL
sample 50 µg/mL in mobile phase
Application No. **G003270**



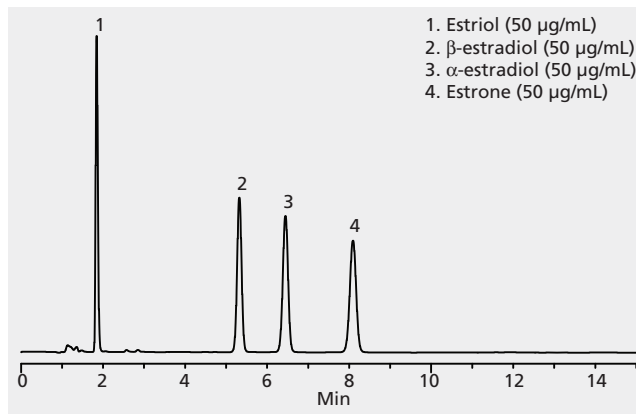
HPLC Analysis of Steroids, Anabolic, on Ascentis® C8

column Ascentis C8, 15 cm x 4.6 mm I.D., 5 µm particles (581424-U)
mobile phase (A) water; (B) acetonitrile; (50:50, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample as indicated in mobile phase
Application No. **G003238**



HPLC Analysis of Steroids on Ascentis® C18 (Mobile phase: 55:45)

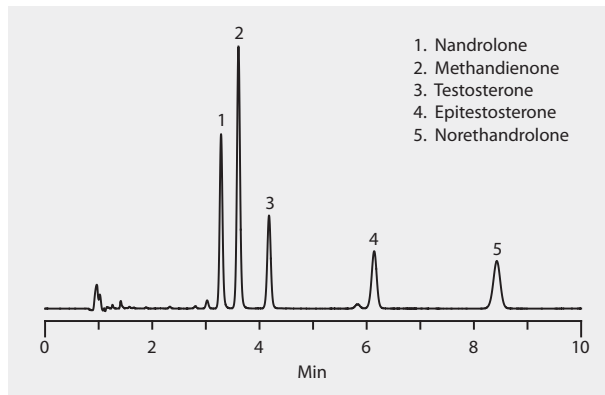
column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) water; (B) acetonitrile; (55,45:A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample as indicated in 55:45, water:acetonitrile
Application No. [G002330](#)



HPLC Analysis of Steroids on Ascentis® Express C18 (10 cm x 2.1 mm I.D., 2.7 µm)

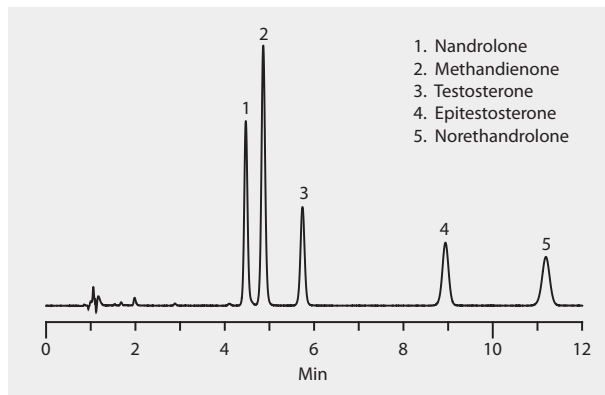
This application demonstrates the suitability of Ascentis Express C18 for the efficient separation of 5 steroids.

column . . . Ascentis Express C18, 10 cm x 2.1 mm I.D., 2.7 µm particles (53823-U)
mobile phase (A) water; (B) acetonitrile; (60:40, A:B)
flow rate 0.2 mL/min
pressure 2944 psi (203 bar)
column temp. 35 °C
detector UV, 254 nm
injection 2 µL
sample 50 mg/L in 75:25, water:methanol
Application No. **G005401**



HPLC Analysis of Steroids on Ascentis® Express C18 with Methanolic Mobile Phase

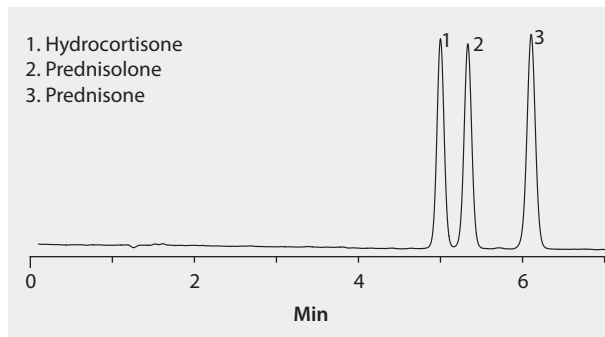
column . . . Ascentis Express C18, 10 cm x 2.1 mm I.D., 2.7 µm particles (53823-U)
mobile phase (A) water; (B) methanol; (60:40, A:B)
flow rate 0.2 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 2 µL
sample 50 mg/L in 75:25, water:methanol
Application No. **G005404**



HPLC Analysis of Steroids on Ascentis® Express F5

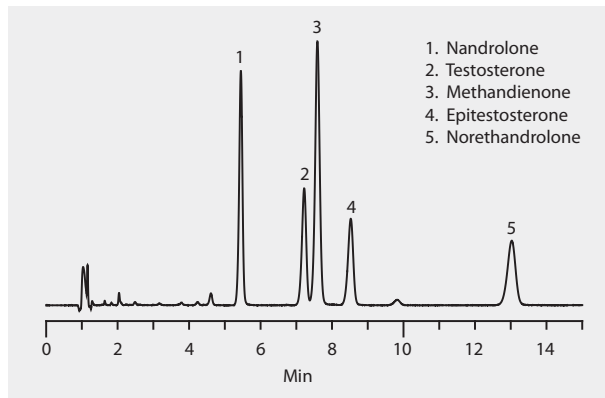
Sample concentrations at 10 µg/mL in 90:10 water:methanol. Acetonitrile does not provide adequate selectivity on this phase. Mass spec was used for peak identification.

column Ascentis Express F5, 15 cm x 4.6 mm I.D., 2.7 µm particles (53591-U)
mobile phase (A) water; (B) methanol; (50:50, A:B)
flow rate 0.8 mL/min
pressure 2393 psi (165 bar)
column temp. 35 °C
detector UV, 240 nm
injection 5 µL
sample 10 µg/mL of each in 90: 10, water: methanol
Application No. **G005743**



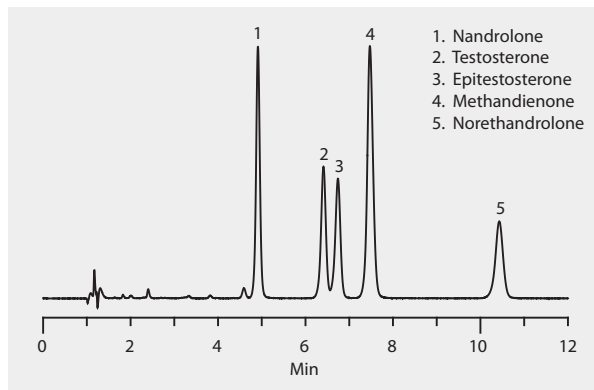
HPLC Analysis of Steroids on Ascentis® Express F5, Acetonitrile Mobile Phase

column . . . Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 µm particles (53569-U)
mobile phase (A) water; (B) acetonitrile; (70:30, A:B)
flow rate 0.2 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 2 µL
sample 50 mg/L in 75:25, water:methanol
Application No. [G005409](#)



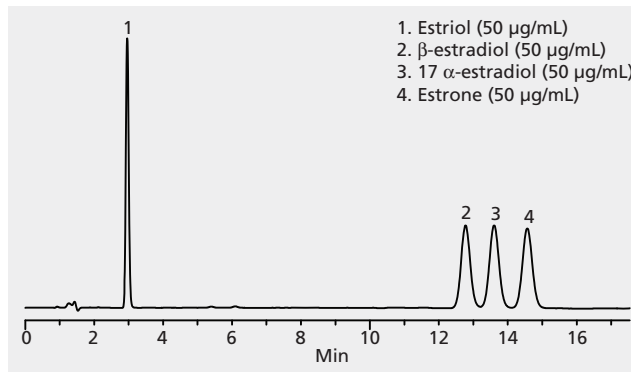
HPLC Analysis of Steroids on Ascentis® Express F5 with Methanolic Mobile Phase

column . . . Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 µm particles (53569-U)
mobile phase (A) water (B) methanol; (40:60, A:B)
flow rate 0.2 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 0.2 mL/min
sample 50 mg/L in 75:25, water:methanol
Application No. **G005410**



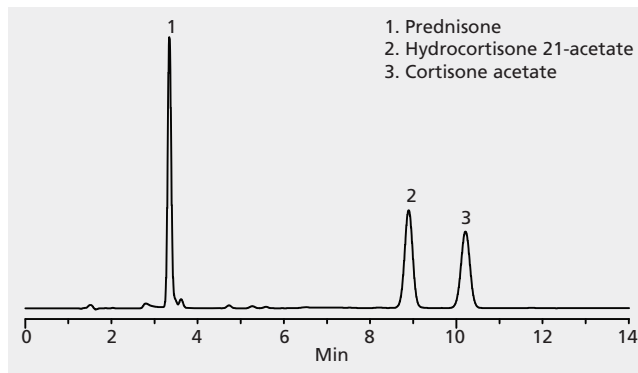
HPLC Analysis of Steroids on Ascentis® RP-Amide (Mobile phase: 55:45)

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) water; (B) acetonitrile; (55:45, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample as indicated in 55:45, water:acetonitrile
Application No. **G002672**



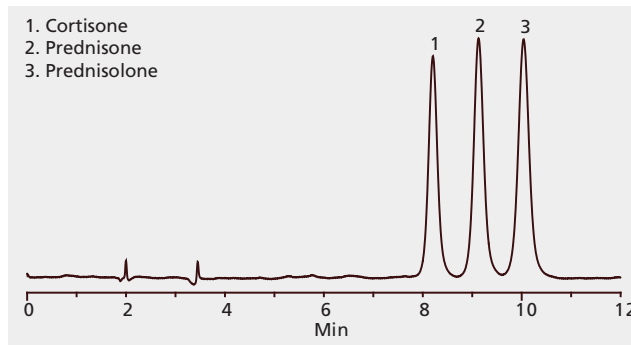
HPLC Analysis of Steroids on Ascentis® RP-Amide (Mobile phase: 60:40)

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) water; (B) acetonitrile; (60:40, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. [G002674](#)



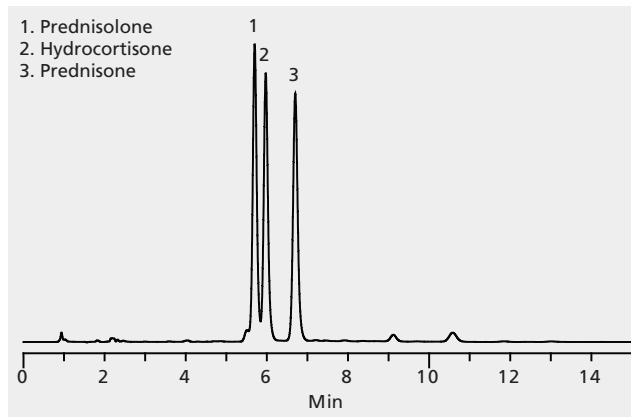
HPLC Analysis of Steroids on Ascentis® Si

column Ascentis Si, 15 cm x 4.6 mm I.D., 5 µm particles (581512-U)
mobile phase (A) hexane; (B) ethanol; (88:12, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 245 nm
injection 10 µL
sample 50 µg/mL in 85:15, hexane:2-propanol
Application No. **G003728**



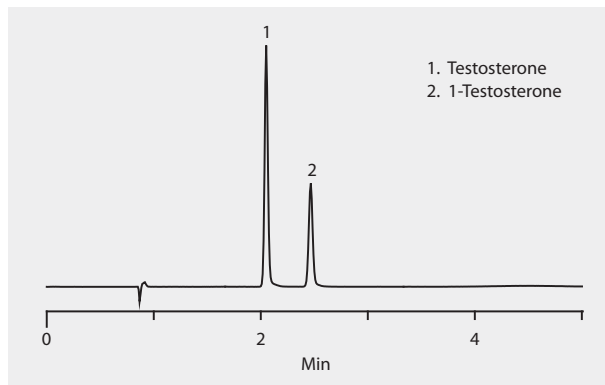
HPLC Analysis of Steroids on Ascentis® Phenyl

column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 3 µm particles (581610-U)
mobile phase (A) water: (B) acetonitrile; (75:25, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 240 nm
injection 10 µL
sample 50 µg/mL in 85:15, water:methanol
Application No. **G003698**



HPLC Analysis of Testosterone and 1-Testosterone on Ascentis® Express C18

column . . . Ascentis Express C18, 10 cm x 4.6 mm I.D., 2.7 µm particles (53827-U)
mobile phase (A) water; (B) methanol; (20:80, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 240 nm
injection 5 µL
sample 50 µg/mL in 10:90 water:methanol
Application No. **G005413**



HPLC Analysis of Thyroglobulin, gamma-Globulins, Ovalbumin, Myoglobin, and Poly-DL-Alanine on Zenix® SEC-150, 30 cm x 7.8 mm I.D., 3 µm particles

This application demonstrates the suitability of Discovery BIO GFC 150 for the separation of proteins. Separation is by inclusion into the pore volume with larger molecules being excluded and therefore eluting earlier.

column Zenix® SEC-150, 30 cm x 7.8 mm I.D., 3 µm particles (Z777018)
mobile phase 150 mM potassium phosphate monobasic,
pH 7.0 (adjusted with potassium hydroxide)

flow rate 0.7 mL/min

pressure 890 psi (61.4 bar)

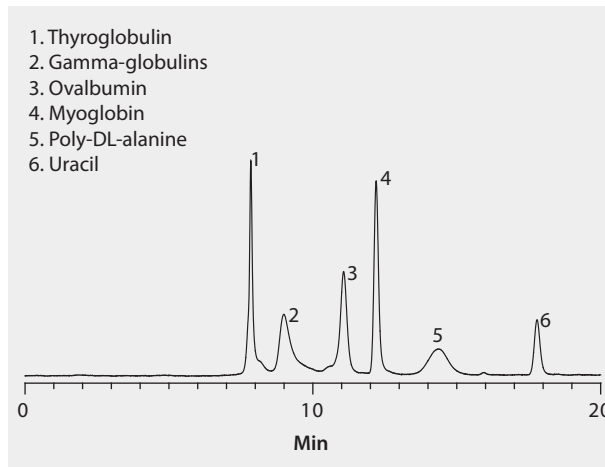
column temp. 25 °C

detector UV, 214 nm

injection 1 µL

sample 1 g/L each (except uracil, 0.1 g/L) in mobile phase A

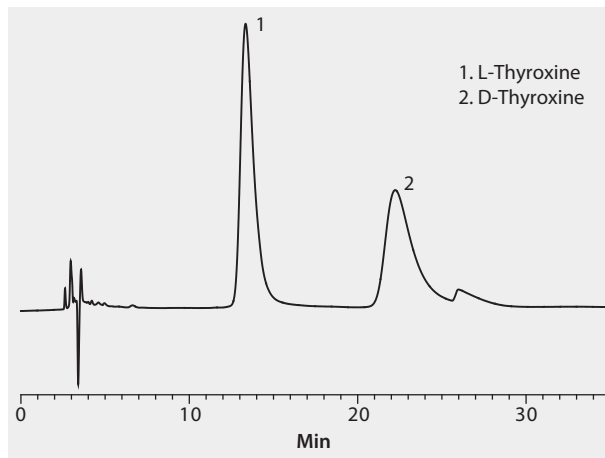
Application No. [G005727](#)



HPLC Analysis of Thyroxine Enantiomers on Astec® CHIROBIOTIC® TAG

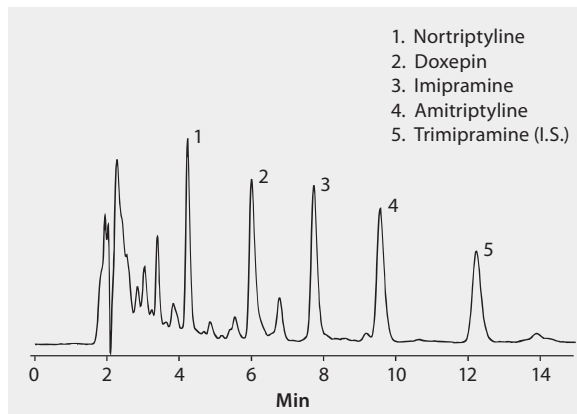
Baseline resolution of the chiral enantiomers of DL-Thyroxine is achieved by polar ionic mode on the Astec CHIROBIOTIC TAG with the use of an LC/MS-compatible mobile phase.

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase 1% ammonium formate in methanol
flow rate 1 mL/min
pressure 826 psi (57 bar)
column temp. 25 °C
detector UV, 220 nm
injection 10 µL
sample each enantiomer 0.1 mg/L in methanol
Application No. **G005515**



HPLC Analysis of Tricyclic Antidepressants in Serum on Discovery® C18 after SPE using Discovery® DSC-18

sample preparation SPE (Solid Phase Extraction)
 SPE tube/cartridge Discovery DSC-18, 100 mg/1 mL (52602-U)
 column Discovery C18, 15 cm × 4.6 mm, 5 μm preceded by a
 2 cm C18 guard column and 0.5 μm frit filter (504955)
 mobile phase . . . (A) acetonitrile: (B) methanol: (C) 25 mM potassium phosphate,
 monobasic (pH 7 with triethylamine) (45:25:30, A:B:C)
 flow rate 1 mL/min
 column temp. ambient
 detector UV, 254 nm
 injection 50 μL, diluted porcine serum extract
 Application No. G000595



Efficiency of Recovery

Compound	Concentration (μg/mL)	% Recovery	% RSD (n=6)
1. Nortriptyline	0.10	103.6	±4.5
	0.50	97.5	±4.5
2. Doxepin	0.10	102.2	±3.0
	0.50	100.8	±1.8
3. Imipramine	0.10	92.0	±1.5
	0.50	97.5	±1.7
4. Amitriptyline	0.10	93.6	±1.2
	0.50	95.7	±1.4

SPE Procedure, Using Zymark RapidTrace SPE Workstation

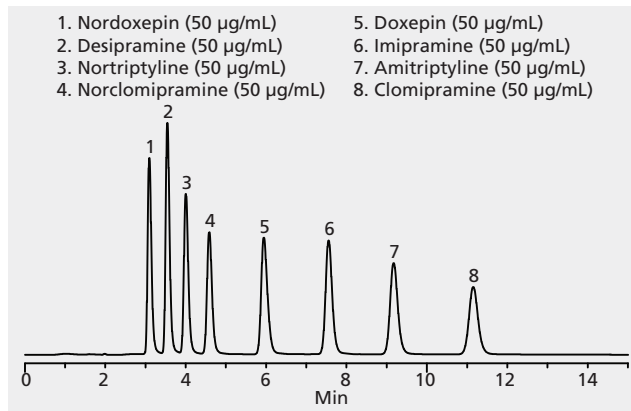
Step	Solvent/Solution	Volume (mL)	Flow Rate (mL/min)	Comments
1. Condition	MeOH	2.0	5.0	conditions sorbent
2. Condition	H ₂ O	2.0	5.0	conditions sorbent
3. Load	spiked porcine serum	2.0 ^A	0.75	applies serum sample
4. Rinse	20% MeOH in H ₂ O	2.0	5.0	washes sorbent
5. Purge-Cannula	H ₂ O	4.0	30.0	cleans sample cannula
6. Rinse	vent	0.1	2.0	positions SPE tube over waste port
7. Dry	N ₂	Time = 10 min		dries sorbent
8. Purge-Cannula	MeOH	4.0	30.0	cleans sample cannula
9. Collect	MeOH	1.0	1.0	elutes analytes into collection vessel
10. Collect	vent	6.0	3.0	pushes residual eluent into vessel ^B
11. Purge-Cannula	H ₂ O	4.0	30.0	cleans sample cannula

^A1 mL porcine serum spiked with 0.1 μg/mL each analyte basified with 3 μL 10 N KOH, then diluted with 1 mL water

^B350 μL water added per mL methanolic eluent before analysis

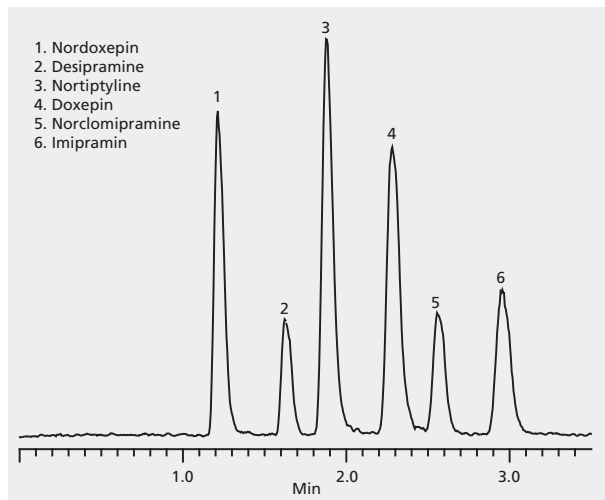
HPLC Analysis of Tricyclic Antidepressants on Ascentis® C8

column Ascentis C8, 15 cm x 2.1 mm I.D., 3 µm particles (581402-U)
mobile phase (A) 25 mM ammonium phosphate dibasic
(pH 7.0 with phosphoric acid): (B) methanol; (25:75, A:B)
flow rate 0.2 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample as indicated in 60:40 water:methanol
Application No. **G003156**



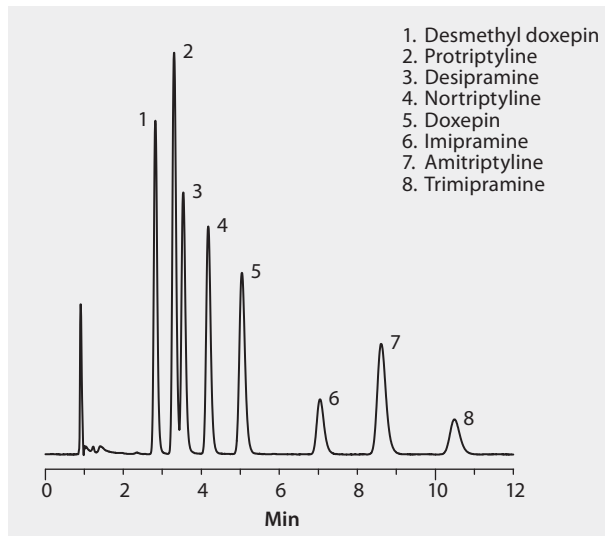
HPLC Analysis of Tricyclic Antidepressants on Ascentis® Express C18

column . . . Ascentis Express C18, 10 cm × 2.1 mm I.D., 2.7 μm particles (53823-U)
mobile phase (A) 100 mM ammonium acetate
(pH 7.0; titrated with ammonium hydroxide),
(B) water, (C) methanol
flow rate 0.3 mL/min
column temp. 55 °C
detector Thermo LCQ Advantage; ESI(+), m/z 250-320
injection 1 μL
instrument Jasco X-LC
Application No. [G004062](#)



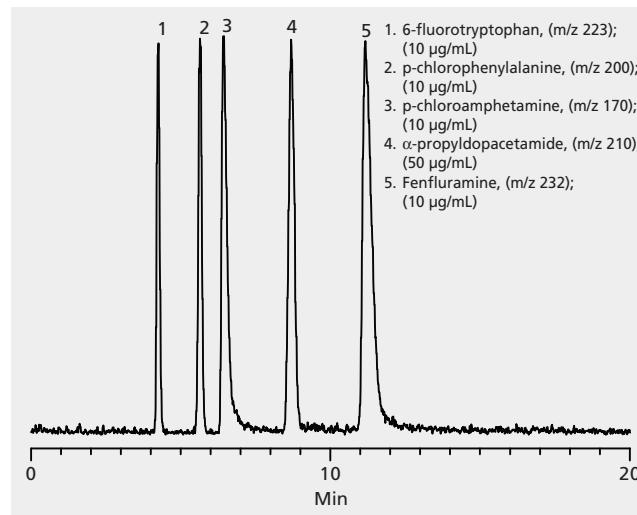
HPLC Analysis of Tricyclic Antidepressants on Discovery® RP-AmideC16

column . . . Discovery RP-AmideC16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase . . . (A) water/acetonitrile (40:60 v/v); (B) 10 mM potassium phosphate
flow rate 2 mL/min
detector UV, 230 nm
injection 10 µL
Application No. **G000163**



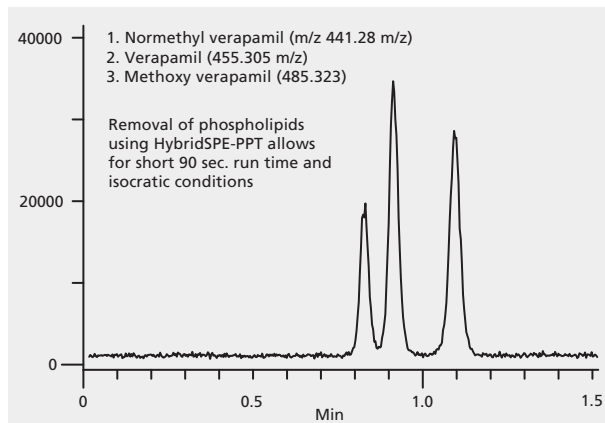
HPLC Analysis of Tryptophan Hydroxylase Inhibitors on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 40 mM formic acid, (pH ~2.5): (B) methanol; (65:35, A:B)
flow rate 0.7 mL/min
column temp. 35 °C
detector full scan MS; overlay of extracted ion chromatograms
of individual (M+H)⁺ species
injection 10 µL
sample as indicated in 90:10, 10 mM formic acid:methanol
Application No. **G002453**



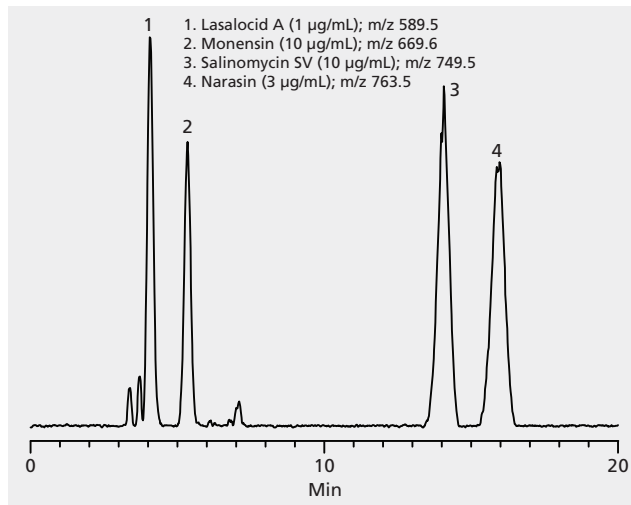
HPLC Analysis of Verapamil and Metabolites in Rat Plasma on Ascentis® Express C18 after Phospholipid Removal using HybridSPE®-Phospholipid

SPE well plate . . . HybridSPE-Precipitation 96-well Plate, 50 mg/well (575656-U)
 sample preparation SPE (Solid Phase Extraction)
 column . . . Ascentis Express C18, 5 cm x 2.1 mm I.D., 2.7 µm particles (53822-U)
 sample/matrix . . . Rat plasma spiked with verapamil and metabolites at 10 ng/mL
 mobile phase (A) water; (B) acetonitrile, pH 2.55 adjust with formic acid (30:70, A:B)
 flow rate 0.6 mL/min
 column temp. 35 °C
 detector TOF/MS
 injection 1 µL
 sample addition 100 µL spiked rat plasma followed by 300 µL 1% formic acid in acetonitrile
 elution apply vacuum
 Application No. **G004366**



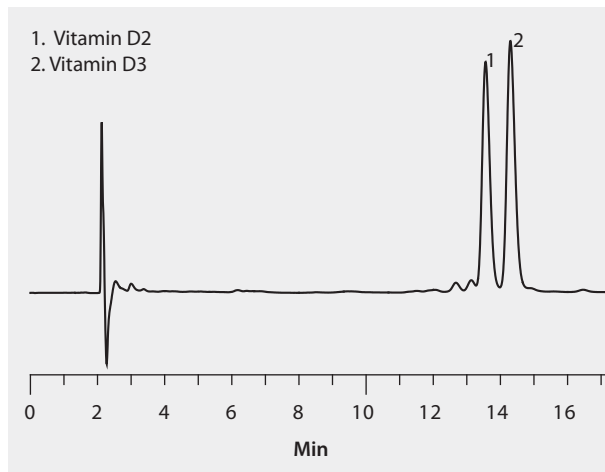
HPLC Analysis of Veterinary Antibiotics on Ascentis® C18

column Ascentis C18, 5 cm x 2.1 mm I.D., 3 µm particles (581300-U)
mobile phase . . (A) 50 mM ammonium acetate (pH 6.0): (B) methanol; (20:80, A:B)
flow rate 0.2 mL/min
column temp. 22 °C
detector ESI(-), full scan
injection 2 µL
sample as indicated in 50:50, water:methanol
Application No. [G002459](#)



HPLC Analysis of Vitamin D2 and D3 on Ascentis® Express C18

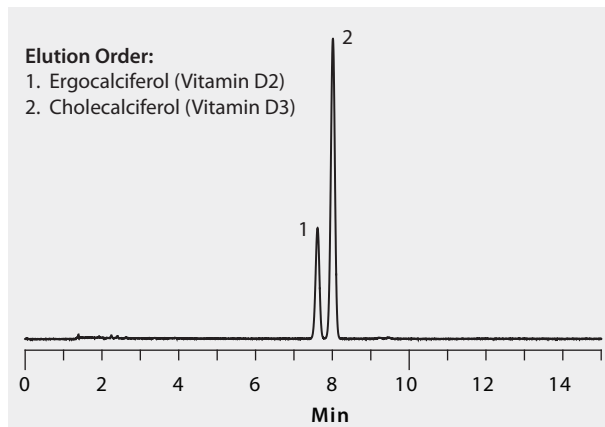
column . . . Ascentis Express C18, 15 cm x 2.1 mm I.D., 2.7 µm particles (53825-U)
mobile phase acetonitrile
flow rate 0.15 mL/min
column temp. 35 °C
detector UV, 290 nm
injection 10 µL
sample 10 mg/L each (vitamins D2 and D3) in methanol
Application No. **G005615**



HPLC Analysis of Vitamin D2 and D3 on Ascentis® Express C18 5 µm

This application demonstrates the suitability of the Ascentis Express C18, 5 µm, for the routine analysis of the fat-soluble vitamins D2 and D3. Structures along with the optimized chromatogram obtained on the Ascentis Express C18, 5 µm are presented.

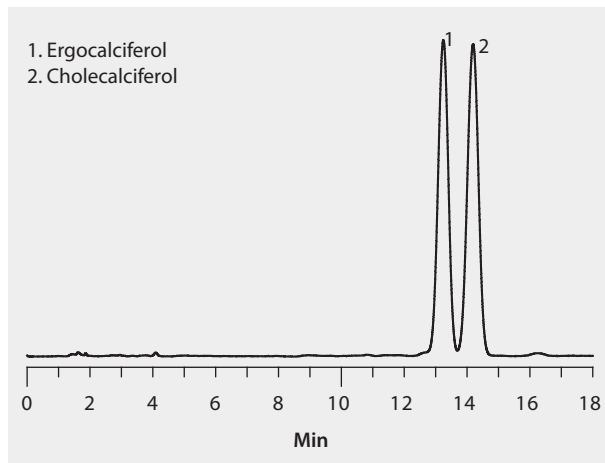
column . . . Ascentis® Express C18, 25 cm x 4.6 mm I.D., 5 µm particles (50538-U)
mobile phase (A) acetonitrile; (B) methanol; (95:5, A:B)
flow rate 1.5 mL/min
pressure 1726 psi (119 bar)
column temp. 35 °C
detector UV, 265 nm
injection 10 µL
sample 50 µg/mL in 90:10, acetonitrile:methanol
Application No. [G005891](#)



HPLC Analysis of Vitamin D2 and Vitamin D3 on Ascentis® C18

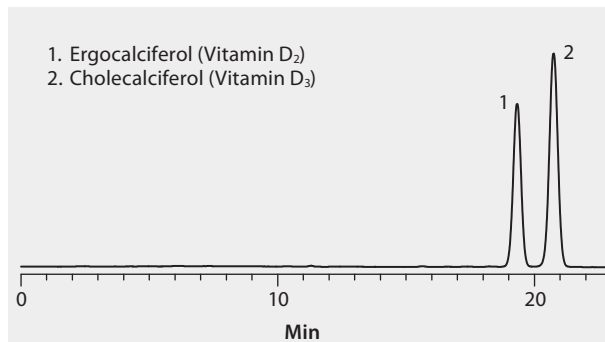
This application demonstrates the suitability of the Ascentis C18 for the analysis of the fat-soluble vitamins D2 and D3. Structures along with the optimized chromatogram obtained on the Ascentis C18 are presented.

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase acetonitrile
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 290 nm
sample 50 µg/mL each in acetonitrile
Application No. **G005614**



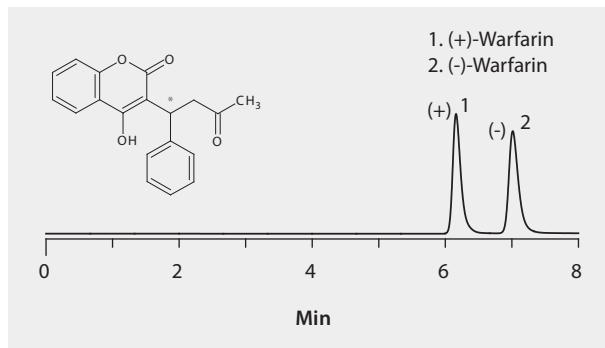
HPLC Analysis of Vitamins, Fat Soluble (D2 and D3), on Discovery® HS C18

column Discovery HS C18, 15 cm × 4.6 mm I.D., 3 µm particles (569252-U)
mobile phase 100% acetonitrile
flow rate 0.8 mL/min
column temp. 30 °C
detector UV, 290 nm
injection 10 µL
sample 50 µg/mL each analyte
Application No. **G001419**



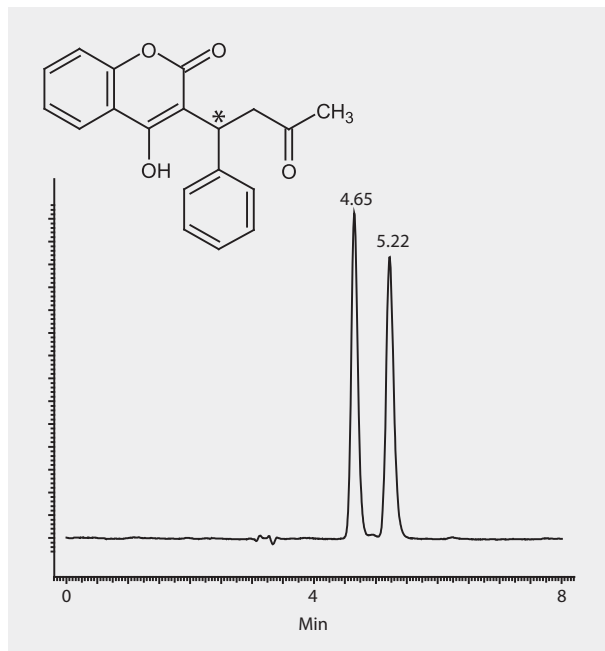
HPLC Analysis of Warfarin™ Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) methanol; (B) acetic acid; (C) TEA; (100:0.2:0.1, A:B:C)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 278 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G005007](#)



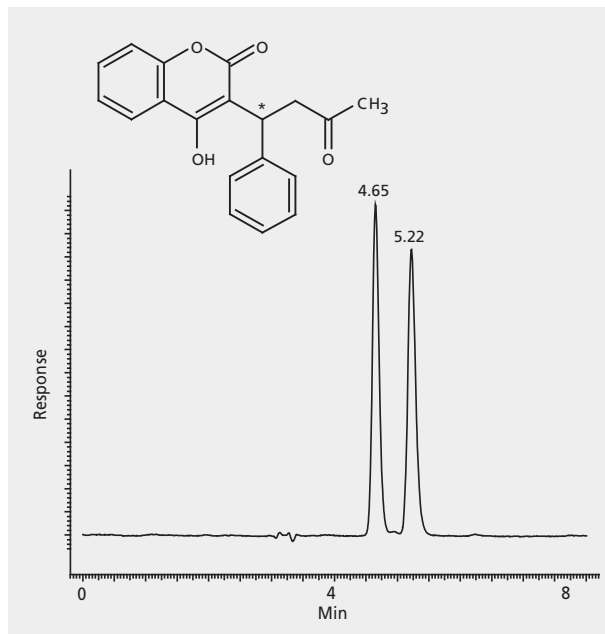
HPLC Analysis of Warfarin™ Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase . . . (A) 5 mM ammonium acetate, pH 4.1; (B) acetonitrile; (70:30, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. **G004349**



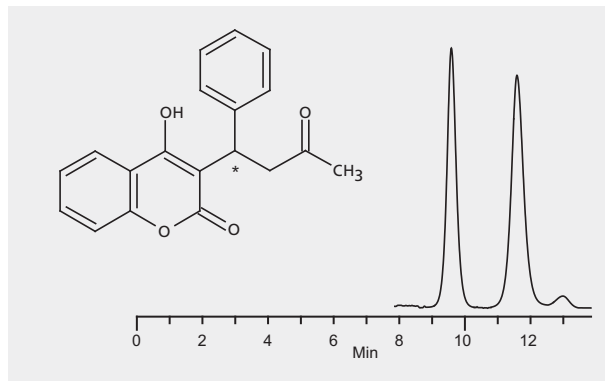
HPLC Analysis of Warfarin™ Enantiomers on Astec® CHIROBIOTIC® V (Method 1)

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase . . . (A) acetonitrile; (B) 5 mM ammonium acetate, pH 4.1; (30:70, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 5 µL
sample 1 mg/mL in mobile phase
Application No. [G004472](#)



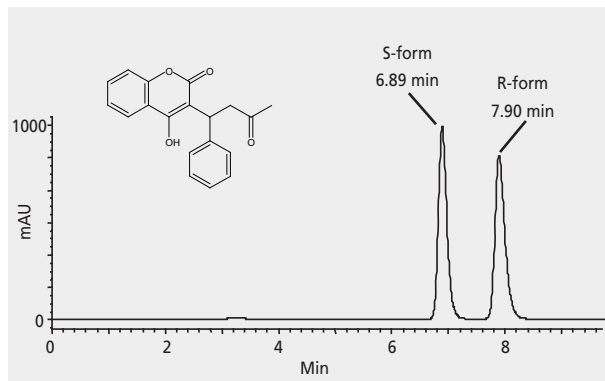
HPLC Analysis of Warfarin™ Enantiomers on Astec® CHIROBIOTIC® V (Method 2)

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 0.1% triethylamine acetate, pH 5.0; (B) THF; (80:20, A:B)
flow rate 1 mL/min
column temp. ambient
detector UV, 254 nm
injection 1 µL
sample 4 mg/mL in methanol
Application No. [G004649](#)



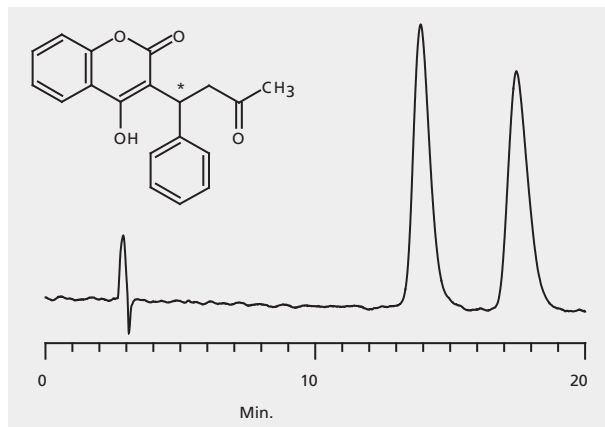
HPLC Analysis of Warfarin™ Enantiomers on Astec® CYCLOBOND® I 2000 (UV at 254 nm)

column CYCLOBOND I 2000, 25 cm × 4.6 mm I.D., 5 μm particles (20024AST)
 mobile phase (A) acetonitrile; (B) acetic acid;
 (C) triethylamine; (100:0.3:0.25, A:B:C)
 flow rate 1 mL/min
 column temp. 23 °C
 detector UV, 254 nm
 injection 5 μL
 Application No. **G004027**



HPLC Analysis of Warfarin™ Enantiomers on Astec® CHIROBIOTIC® V2

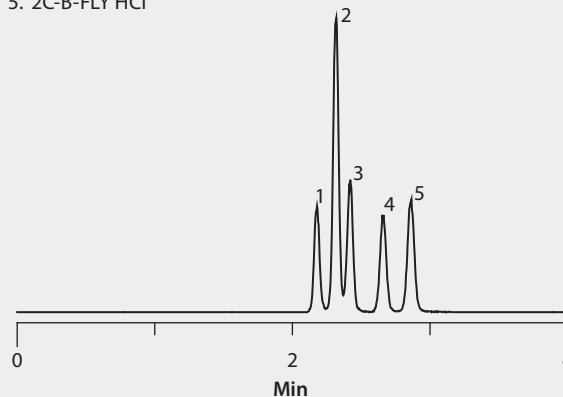
column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase . . . (A) 10 mM ammonium acetate, pH 4.1; (B) acetonitrile; (70:30, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 280 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. [G004475](#)



LC-MS Analysis of 2C Amines Drugs of Abuse on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)
mobile phase 5 mM ammonium formate in acetonitrile:water (90:10, v/v)
flow rate 0.4 mL/min
column temp. 35 °C
detector TOF/MS
detector 2.0 µL
sample 300 ng/mL in acetonitrile
Application No. [G006166](#)

1. *R*-(-)-Bromo-DragonFLY HCl
2. (±)-2,5-Dimethoxy-4-Iodoamphetamine HCl (DOI HCl)
3. (±)-2,5-Dimethoxy-4-Bromoamphetamine HCl (DOB HCl)
4. 4-Bromo-2,5-dimethoxyphenethylamine HCl (2C-B)
5. 2C-B-FLY HCl

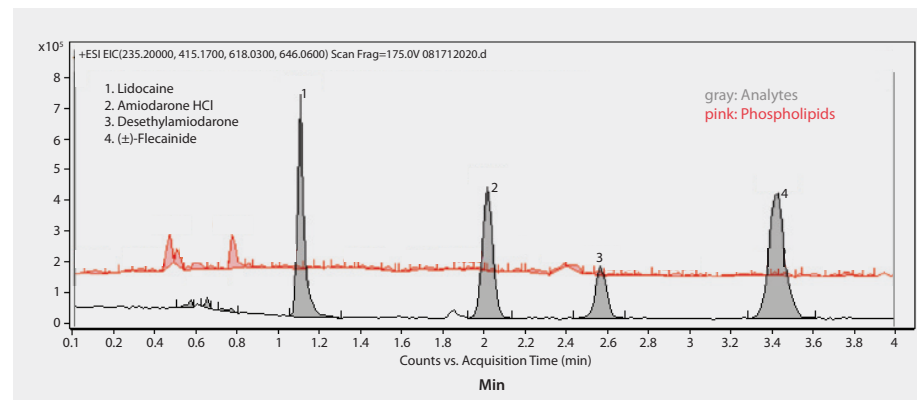


LC-MS Analysis of Antiarrhythmic Drugs and Metabolites in Plasma on Ascentis® Express HILIC following Sample Prep using HybridSPE®-Phospholipid

For efficient therapeutic drug monitoring, it is important for clinicians to have access to fast and robust analytical methods for accurate assessment of drug efficacy. Industrial trends toward highly specific LC/MS applications over traditional ELISA type immunoassay have resulted in the need for high-speed chromatographic assays along with simplified sample preparation methods. Often the limitation of a bioanalytical technique is based upon the effectiveness of the sample preparation technique. Plasma and serum samples are often susceptible to assay irregularities due to matrix-induced interferences. In this study the impact of matrix interference is investigated with respect to precision and accuracy of antiarrhythmic cardiac drugs from plasma samples. A robust bioanalytical method was developed using a combination of fast HILIC chromatography on Ascentis Express along with a selective sample preparation using HybridSPE-Phospholipid. Solvents were LC-MS Ultra CHROMASOLV® and Certified Reference Material grade standards were from Cerilliant.

Endogenous phospholipids can dramatically impact the precision and accuracy of a bioanalytical method. During development, the sample matrix impact on analyte detection should be priority in method validation. Failure to do so can result in inaccuracies in reported levels, thus impacting the assessment of patient health. Eliminating matrix effects in LC/MS is imperative to producing reliable and accurate bioanalytical methods. The targeted phospholipid selectivity of the HybridSPE-Phospholipid technique enables simplified sample processing with no detected phospholipid matrix interference, while exhibiting excellent recovery from plasma and serum samples. This application demonstrates how combining selectivity in both sample preparation and chromatographic separation allows for a simplified and efficient bioanalytical method resulting in a high precision and accurate assay.

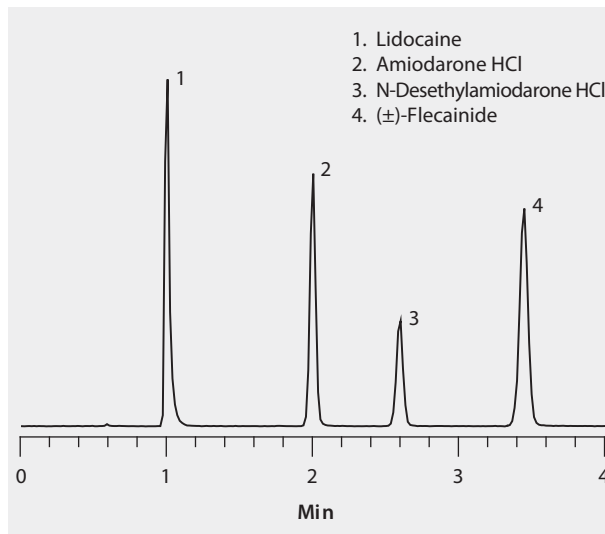
sample preparation	SPE (Solid Phase Extraction)
sample/matrix	rabbit plasma, unfiltered K2-EDTA, spiked with each compound at 100 ng/mL (3:1, plasma:1% formic acid in acetonitrile)
SPE tube/cartridge	HybridSPE-Phospholipid, 96-well plate (575656-U)
sample addition	To each well add 100 µL plasma, followed by a 300 µL of 1% formic acid in acetonitrile, agitate on orbital shaker for 4 minutes. Collect filtrate and analyze directly.
column	Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)
mobile phase	(A) 5 mM ammonium formate; (B) 5 mM ammonium formate in acetonitrile, 5:95 (A:B), adjusted to pH 7.0 with formic acid
flow rate	0.4 mL/min
pressure	1305 psi (90 bar)
column temp.	35 °C
detector	ESI+, 100-1000 m/z
injection	0.5 µL
Application No.	G005854



LC-MS Analysis of Antiarrhythmic Drugs and Metabolites on Ascentis® Express HILIC

The basic nature of these antiarrhythmic agents makes them ideal candidates for HILIC (hydrophilic interaction) chromatographic separation. The benefit of HILIC over traditional reversed-phase chromatography is two-fold for both sample introduction and analyte detection. First, the high acetonitrile concentration of HILIC mobile phases allows for direct analysis of precipitated plasma samples without the need for additional sample solvent exchange. Second, the high acetonitrile content provides increased analyte response in positive ESI MS detection. Of the various HILIC-mode columns tested, method development for this assay determined the Ascentis Express HILIC, 2.7 μm particles, provided the best chromatographic resolution of the antiarrhythmic drugs while maintaining high peak efficiency for enhanced detection levels.

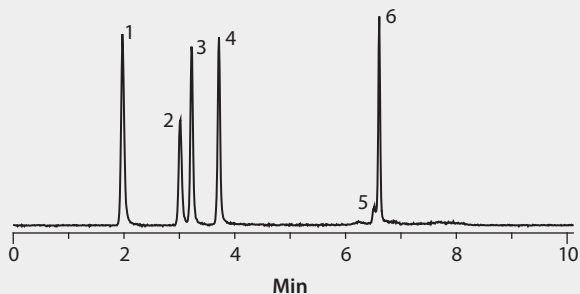
column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 μm particles (53939-U)
 mobile phase . . . (A) 5 mM ammonium formate; (B) 5 mM ammonium formate in acetonitrile, 5:95 (A:B), adjusted to pH 7.0 with formic acid
 flow rate 0.4 mL/min
 pressure 1305 psi (90 bar)
 column temp. 35 $^{\circ}\text{C}$
 detector ESI+, 100-1000 m/z
 injection 0.5 μL
 sample . . . each compound, 300 ng/mL in 75:25 (1% formic acid acetonitrile:water)
 Application No. **G005855**



LC-MS Analysis of Antipsychotic Drugs on Ascentis® Express RP Amide

column Ascentis Express RP Amide, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53913-U)
mobile phase (A) 5 mM ammonium formate water;
(B) 5mM ammonium formate in 95:5 (v/v) methanol:water
gradient held at 35% B for 0.5 min; 35 to 85% B in 5.5 min;
held at 85% B for 1 min
flow rate 0.3 mL/min
pressure 4641 psi (320 bar)
column temp. 35 °C
detector ESI(+), m/z 100-1000
injection 1 µL
sample 200 ng/mL in water
Application No. **G005668**

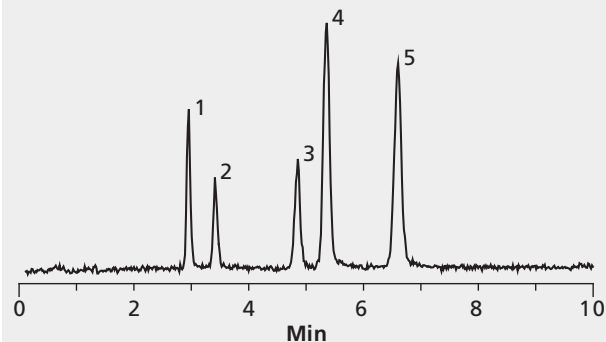
1. Desmethyl venlafaxine
2. Hydroxybupropion
3. Hydroxyrisperidon
4. Bupropion
5. Zuclopenthixol
6. Fluphenazine



LC-MS Analysis of Benzodiazepines on Ascentis® Phenyl (Analyte Mix 1)

column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase (A) 0.1% ammonium acetate in water (pH unadjusted),
(B): 0.1% ammonium acetate in acetonitrile, (50:50, A:B)
flow rate 1 mL/min., split to the MS
column temp. 35 °C
detector MS, ESI (+) in selected ion recording (SIR) mode
injection 5 µL
sample as indicated in 0.1% ammonium acetate in 90:10:water:acetonitrile
Application No. **G003705**

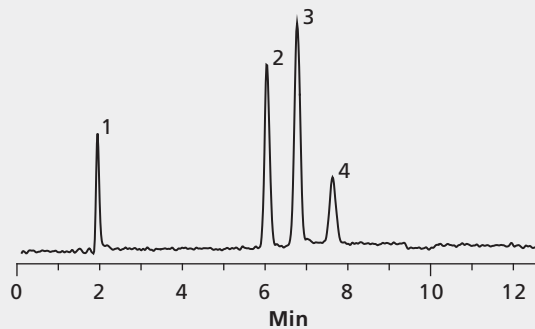
1. Demoxepam (1 µg/mL) (M+H)⁺ = 287.05
2. Oxazepam (1 µg/mL) (M+H)⁺ = 287.05
3. Temazepam (1 µg/mL) (M+H)⁺ = 301.06
4. Clobazam (1 µg/mL) (M+H)⁺ = 301.06
5. Diazepam (1 µg/mL) (M+H)⁺ = 285.07



LC-MS Analysis of Benzodiazepines on Ascentis® Phenyl (Analyte Mix 2)

column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase (A) 0.1% ammonium acetate in water (pH unadjusted);
(B) 0.1% ammonium acetate in acetonitrile; (60:40, A:B)
flow rate 1 mL/min., split to the MS
column temp. 35 °C
detector MS, ESI (+) in selected ion recording (SIR) mode
injection 5 µL
sample as indicated in 0.1% ammonium acetate in 90:10:water:acetonitrile
Application No. **G003706**

1. Fenoldopam (10 µg/mL) (M+H)+ = 306.08
2. Lorazepam (10 µg/mL) (M+H)+ = 321.01
3. Nitrazepam (10 µg/mL) (M+H)+ = 282.08
4. Clonazepam (10 µg/mL) (M+H)+ = 316.04

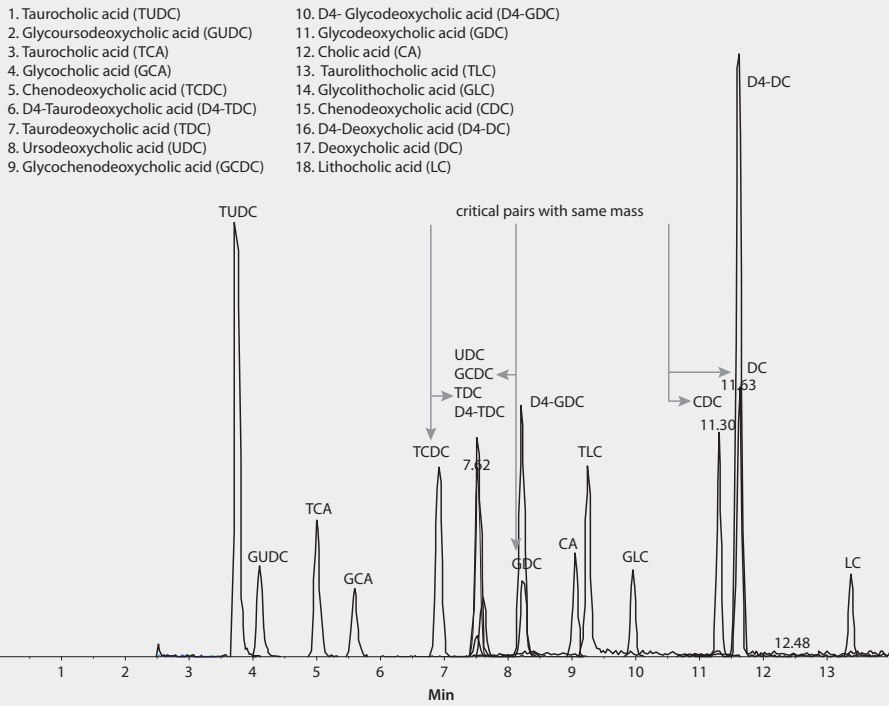


LC-MS Analysis of Bile Acids and Their Conjugates on Ascentis® Express C18

A fast robust LC-MS/MS method was developed on a C18 Ascentis Express Fused-CoreR Particle Column allowing the 15 bile acid species to be measured individually rather than the alternative measurement of a total concentration by colourimetric kinetic enzyme assays.

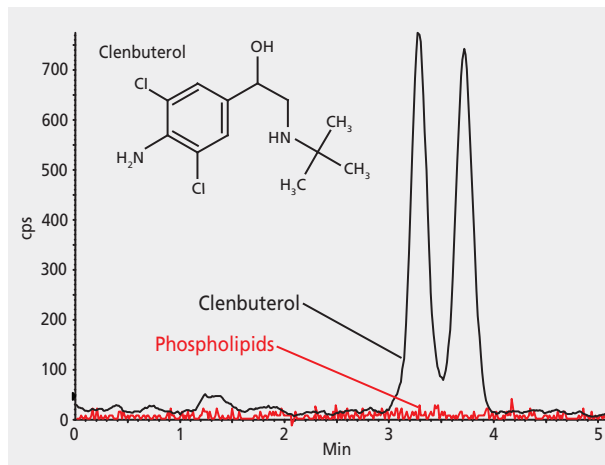
sample/matrix Plasma proteins were removed with addition of 900 µL of acetonitrile, containing deuterated internal standards, to 250 µL of human EDTA plasma. The mixture was vortexed, (centrifuged and the supernatant evaporated before being reconstituted in a 50:50 solution of methanol and water. 10 µL (corresponding to 8.57 µL of plasma) was injected into the HPLC.)

column Ascentis Express C18, 15 cm x 4.6 mm I.D., 2.7 µm particles (53829-U)
 gradient 70 to 95% B in 10 minutes held 4 minutes
 flow rate 0.6 mL/min
 column temp. 40 °C
 detector ESI(-), MRM Mode
 Application No. **G005599**



LC-MS Analysis of Clenbuterol Enantiomers in Plasma on Astec® CHIROBIOTIC® T after SPE using HybridSPE®-Phospholipid

column CHIROBIOTIC T, 10 cm x 2.1 mm I.D., 5 µm particles (12018AST)
mobile phase 10 mM ammonium formate in methanol
flow rate 0.3 mL/min
column temp. 30 °C
detector ESI(+)
sample clenbuterol, 10 ng/mL in rat plasma (phospholipids removed by extraction with HybridSPE-Phospholipid)
Application No. **G004245**

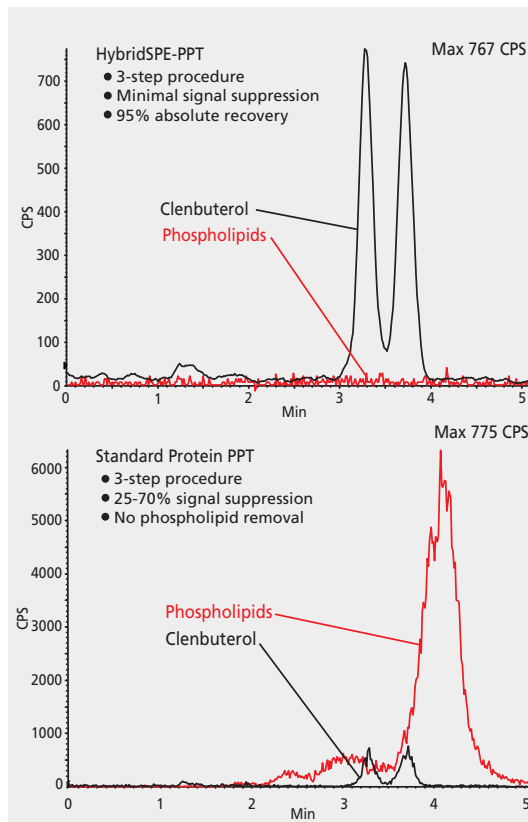


LC-MS Analysis of Clenbuterol In Plasma on Astec® CHIROBIOTIC® T with Phospholipid Removal Using HybridSPE® Phospholipid

The HybridSPE method provides significant improvement in LC-MS baseline. sample preparation SPE (Solid Phase Extraction) sample/matrix rat plasma spiked with clenbuterol enantiomers at 10 ng/mL SPE well plate HybridSPE-Precipitation 96-well Plate, 50 mg/well (575656-U) sample addition 100 μ L spiked rat plasma followed by 300 μ L 1% formic acid in acetonitrile. Mix by vortexing the HybridSPE-PPT plate briefly.

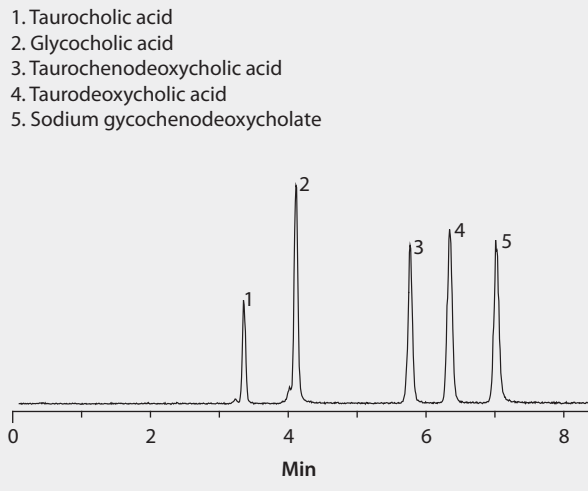
elution apply vacuum column CHIROBIOTIC T, 10 cm x 2.1 mm I.D., 5 μ m particles (12018AST) mobile phase 10 mM ammonium formate in methanol flow rate 0.3 mL/min column temp. 30 $^{\circ}$ C detector ABI 3200 QT; ESI(+), MRM: 184/104 m/z (phospholipids); 277.2/203.1 m/z (clenbuterol)

injection 10 μ L Application No. **G004431**



LC-MS Analysis of Conjugated Bile Acids on Ascentis® Express C18

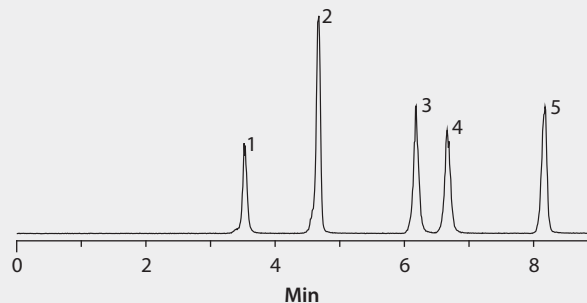
column . . . Ascentis Express C18, 5 cm x 4.6 mm I.D., 2.7 µm particles (53826-U)
mobile phase . . . (A) 10 mM ammonium acetate, pH 4 with acetic acid; (B) acetonitrile
gradient 25 to 40% B in 10 min
flow rate 1.0 mL/min (postcolumn split to MS)
column temp. 35 °C
detector MS, ESI(-), SIR
injection 5 µL
sample 10 mg/L each in mobile phase A
Application No. [G005688](#)



LC-MS Analysis of Conjugated Bile Acids on Ascentis® Express RP-Amide

column . . . Ascentis Express RP-Amide, 5 cm x 4.6 mm I.D., 2.7 µm particles (53922-U)
mobile phase . . . (A) 10 mM ammonium acetate, pH 3 with acetic acid; (B) acetonitrile
gradient 25 to 40% B in 10 min
flow rate 1.0 mL/min (postcolumn split to the MS)
column temp. 35 °C
detector MS, ESI(-), SIR
injection 5 µL
sample 10 mg/L in mobile phase A
Application No. **G005689**

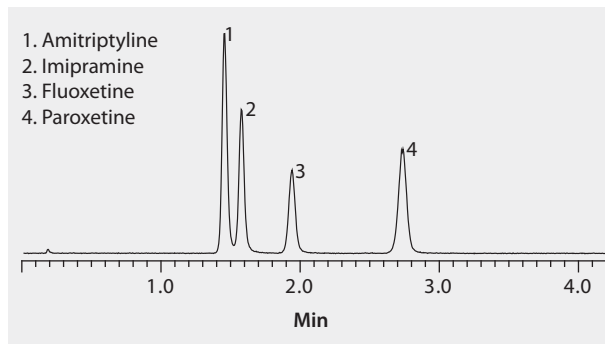
1. Taurocholic acid
2. Glycocholic acid
3. Taurochenodeoxycholic acid
4. Taurodeoxycholic acid
5. Sodium glycochenodeoxycholate



LC-MS Analysis of CYP2D6 Inhibitors on Ascentis® Express HILIC

This application demonstrates the suitability of the Ascentis Express HILIC for the analysis of CYP2D6 Inhibitors.

column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)
mobile phase 5 mM ammonium formate in 2:98 (v/v) water:acetonitrile
flow rate 1.2 mL/min
column temp. 50 °C
detector ESI(+), m/z 100-400
injection 0.5 µL
Application No. **G005691**



LC-MS Analysis of DL- α -Hydroxyglutaric acid on Astec® CHIROBIOTIC® R

Chiral 2-hydroxyglutarates (2-OHG) are important molecular signatures of both healthy and diseased biological cells, their specific biochemical pathways and inborn errors of metabolism. The chiral differentiation and quantification of D-2-OHG and L-2-OHG is key for characterizing neuro-metabolic disorders like the 2-hydroxyglutaric acidurias that cause neurological impairment early in life. In this application, an Astec® CHIROBIOTIC® R column run under polar ionic mobile phase conditions achieved a rapid separation of the D and L enantiomers of 2-OHG under conditions amenable for sensitive LC-MS/MS detection.

column . . . Astec CHIROBIOTIC® R, 10 cm x 4.6 mm I.D., 5 μ m particles (13022AST)
mobile phase 5:95, (water:methanol) with 0.3% acetic acid
and 0.1% ammonium hydroxide

flow rate 1 mL/min
pressure 1700 psi (117 bar)

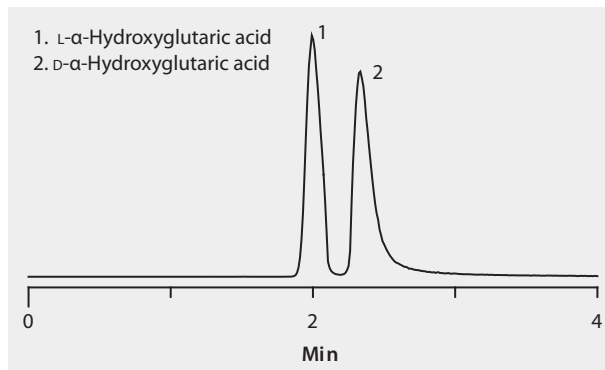
column temp. 25 °C

detector MS, ESI(-) TOF, SIM, m/z 147.03, split 100:1

injection 10 μ L

sample DL- α -Hydroxyglutaric acid, 1 mg/mL in 50:50, water:methanol

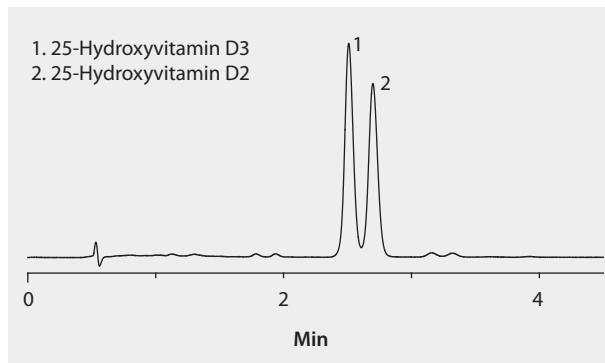
Application No. **G005887**



LC-MS Analysis of 25-Hydroxyvitamin D2 and 25-Hydroxyvitamin D3 on Ascentis® Express F5

The 25-OH forms of the secosteroids vitamin D2 and D3 are indicators of the vitamin D status of an individual. However, because they have different biological activity and clinical interest, they should be distinguishable. The F5 phase was able to resolve the two compounds under highly LC-MS/MS compatible conditions.

column . . . Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 µm particles (53569-U)
mobile phase . . . (A) 5 mM ammonium formate in (B) 75:25 (v/v) methanol:water
flow rate 0.4 mL/min
detector UV, 265 nm (MS, ESI(+), m/z 100-1000)
column temp. 40 °C
injection 1 µL
sample 20 µg/mL in methanol
Application No. [G005858](#)



LC-MS Analysis of Illicit Bath Salts in Urine on Ascentis® Express HILIC after Solid Phase Extraction (SPE) on Supel™-Select SCX

The designer drugs known as "bath salts" are synthetic stimulants and illegal in most states as of 2011. This application demonstrates the analysis of bath salts extracted from human urine samples using polymeric solid phase extraction (SPE) sample preparation followed by hydrophilic interaction liquid chromatography (HILIC) analysis with TOF-MS detection. HILIC conditions on the Ascentis Express HILIC (Si) phase are used for fast, high-resolution separation of nine synthetic bath salts. Recoveries greater than 65% were observed for all analytes except MDPV (43.7%). The Figure illustrates the detection of bath salts in the spiked urine sample after SPE sample cleanup. Notice there are no interfering peaks in the chromatogram, demonstrating the effectiveness of the SPE sample cleanup.

sample/matrix . . . Urine samples were spiked to a level of 100 ng/mL with each target analyte. (To ensure full ionization of the analytes, spiked samples were treated with formic acid to a final concentration of 0.1% formic acid.)

SPE tube/cartridge Supel-Select SCX, 30 mg/1 mL (54240-U)
condition 1 mL 1% formic acid acetonitrile then 1 mL water

sample addition 1 mL spiked water blank or urine

washing 1 mL water, 1 mL 1% formic acid acetonitrile, 1 mL water

elution 2 mL 10% ammonium hydroxide in acetonitrile

eluate post-treatment . . . thoroughly mix via vortex agitation, evaporate 1 mL aliquot to dryness, reconstitute in 100 µL water:methanol

column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)

mobile phase (A) 5 mM ammonium formate acetonitrile;
(B) 5 mM ammonium formate water; (98:2, A:B); premixed

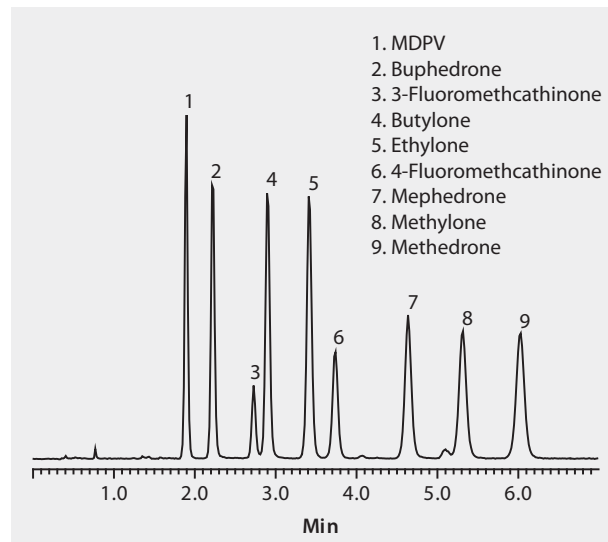
flow rate 0.6 mL/min

pressure 1842 psi (127 bar)

column temp. 35 °C

detector MS, ESI(+), TIC, m/z 100-1000

injection 1 µL
sample 200 µg/L ea. in acetonitrile
Application No. G005796



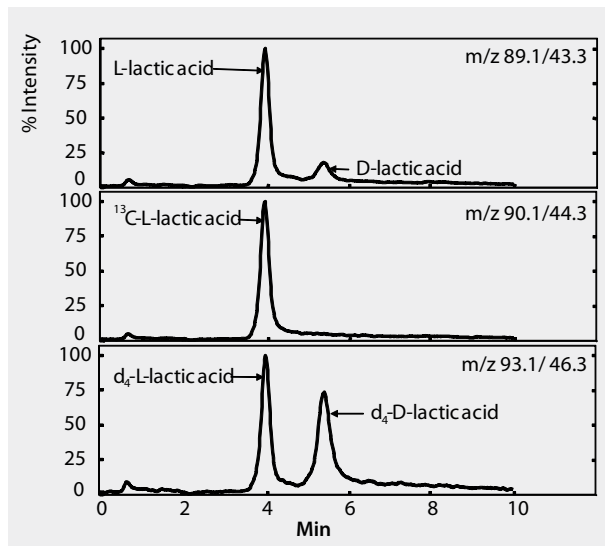
LC-MS Analysis of Lactic Acid Enantiomers in Urine on Astec® CHIROBIOTIC® R

Chromatogram supplied courtesy of H. Henry and associates at the Clinical Chemistry Laboratory, Centre Hospitalier Universitaire Vaudois, University of Lausanne, CH-1011, Switzerland. View the related full-length contributed article in Reporter 30.1.

Reference: Biomed. Chromatogr. 2011 "Sensitive determination of D-lactic acid and L-lactic acid in urine by high-performance liquid chromatography–tandem mass spectrometry" H. Henry, N. Marmy Conus, P. Steenhout, A. Béguin and O. Boulat, Published online in Wiley Online Library, wileyonlinelibrary.com/journal/bmc.

column . . . Astec CHIROBIOTIC R, 15 cm x 2.1 mm I.D., 5 µm particles (13019AST)
 mobile phase (A) 33.3 mM ammonium acetate; (B) acetonitrile; (15:85, A:B)
 flow rate 0.7 mL/min
 column temp. 4 °C
 detector (-)ESI
 injection 20 µL
 sample Urine extracts in 5% (v/v) acetic acid,
 10% (v/v) H₂O and 85% (v/v) acetonitrile

Application No. [G005482](#)



LC-MS Analysis of Omeprazole and Metabolites in Plasma on Ascentis® Express RP Amide after Sample Prep using HybridSPE®-Phospholipid

This application demonstrates the suitability of HybridSPE and the Ascentis Express RP Amide for the analysis of omeprazole metabolites.

Sample was vortexed and centrifuged for 2 minutes at 15000 rpm.

Supernatant was then passed through HybridSPE 96 well plate. Eluent was collected, evaporated and reconstituted in mobile phase.

sample preparation SPE (Solid Phase Extraction)

sample/matrix rat plasma spiked with omeprazole, phenacetin and metabolites at 2 µg/mL

SPE well plate HybridSPE-Phospholipid, 96-well plate, 15 mg/0.8 mL (575656-U)

sample addition 100 µL plasma to each well, followed by 300 µL of 1% formic acid in acetonitrile

elution apply vacuum

eluate post-treatment eluate was collected, evaporated, and reconstituted in mobile phase.

column Ascentis Express RP-Amide, 5 cm x 2.1 mm I.D., 2.7 µm particles (53911-U)

mobile phase (A) water, 10 mM ammonium formate, pH 3.4; (B) methanol, 10 mM ammonium formate, pH 3.4; (65:35, A:B)

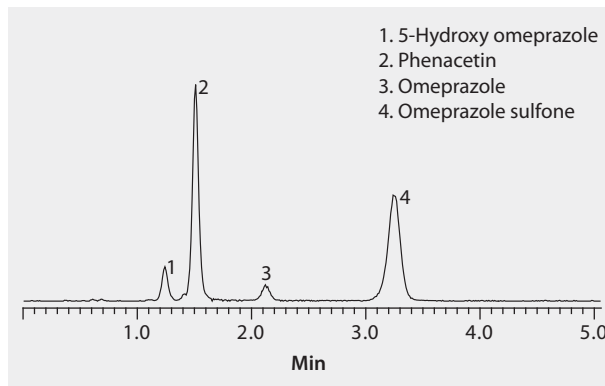
flow rate 0.3 mL/min

column temp. 35 °C

detector ESI(+), m/z = 50-400

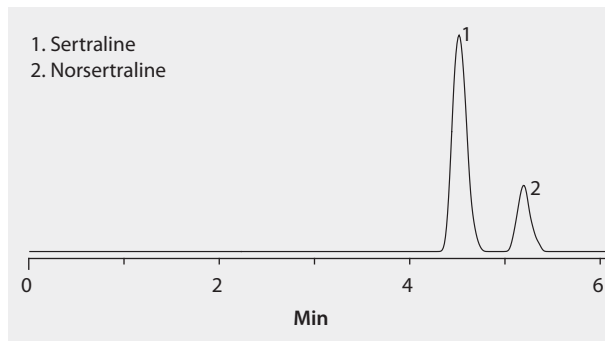
injection 1 µL

Application No. [G005711](#)



LC-MS Analysis of Sertraline and Norsertaline on Ascentis® Express RP-Amide

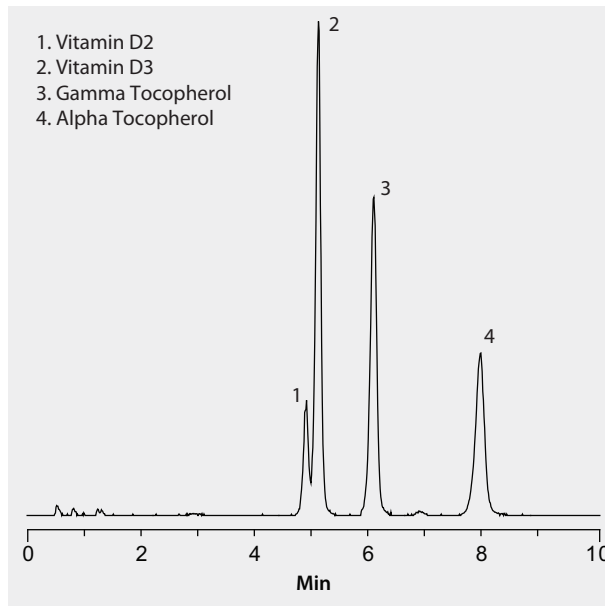
column Ascentis Express RP Amide, 10 cm x 3.0 mm I.D.,
2.7 µm particles (53918-U)
mobile phase (A) 10 mM ammonium formate, water, pH 3.6;
(B) 10 mM ammonium formate, acetonitrile, pH 3.6; (65:35, A:B)
flow rate 0.6 mL/min
column temp. 55 °C
detector ESI(+), 100-1000 m/z
injection 2 µL
sample 200 ng/mL in 25:75, water: acetonitrile
Application No. [G005736](#)



LC-MS Analysis of Vitamin D2, D3, Gamma- and Alpha-Tocopherol on Ascentis® Express C18

Analysis was conducted using standard solution, detection on LC/MS system.

column . . . Ascentis Express C18, 10 cm x 2.1 mm I.D., 2.7 µm particles (53823-U)
mobile phase (A) water; (B) acetonitrile; (5:95, A:B)
flow rate 0.4 mL/min
column temp. 40 °C
detector MS, ESI+
injection 2 µL
sample 1 µg/mL in acetonitrile
Application No. **G005806**



LC-MS/MS Analysis of Epinephrine, Metanephrine and Metabolites on Ascentis® Express OH5

HILIC mode on Ascentis Express OH5 provided rapid separation of neurotransmitters in highly MS-compatible mobile phases.

column . . . Ascentis Express OH5, 10 cm x 2.1 mm I.D., 2.7 µm particles (53757-U)
mobile phase (A) 5 mM ammonium formate; (B) 5 mM ammonium formate in acetonitrile; (15:85, A:B)

flow rate 0.3 mL/min

pressure 1189 psi (82 bar)

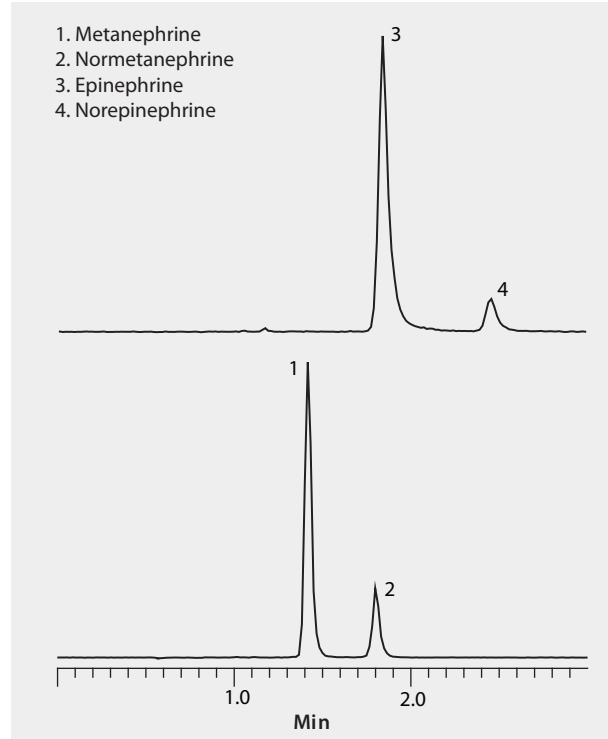
column temp. 35 °C

detector MS ESI(+), 100-1000 m/z

injection 1 µL

sample 300 ng/mL each in acetonitrile

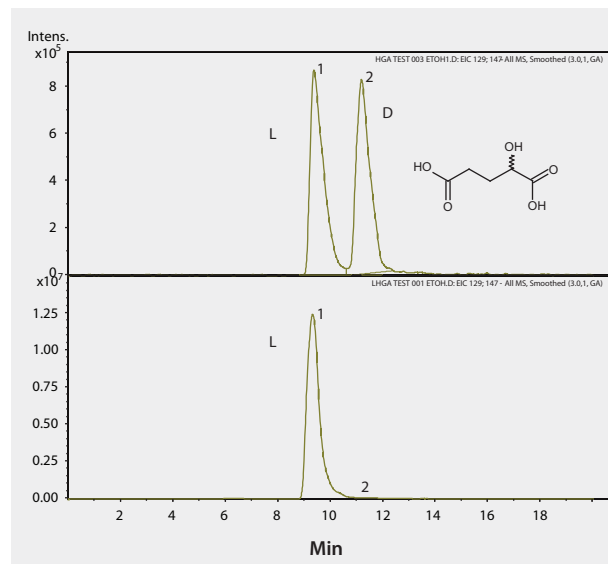
Application No. [G005879](#)



LC-MS/MS Analysis of 2-Hydroxyglutaric Acid Enantiomers on Astec® CHIROBIOTIC® R

Chiral 2-hydroxyglutarates (2-OHG) are important molecular signatures of both healthy and diseased biological cells, their specific biochemical pathways and inborn errors of metabolism. The chiral differentiation and quantification of D-2-OHG (R(-)-2-OHG) and L-2-OHG (S(+)-2-OHG) is key for characterizing neurometabolic disorders like the 2-hydroxyglutaric acidurias that cause neurological impairment early in life. The ability to distinguish and quantify the enantiomers of 2-OHG is therefore important to be able to track its disposition throughout the metabolic pathway of normal vs. mutated cells. We show here a rapid and sensitive method to separate and measure D-2-OHG and L-2-OHG using LC-MS/MS detection. An Astec® CHIROBIOTIC R (ristocetin chiral selector) column was run under polar ionic mobile phase conditions. Using tandem MS eliminated two fundamental analytical challenges with these compounds: the lack of a UV-absorbing chromophore in the 2-OHG molecule, and the abundance of competing low molecular weight acids in urine. The upper panel in the chromatogram shows the separation of D-2-OHG and L-2-OHG obtained during method development. The lower panel shows the pure L-2-hydroxyglutaric acid. Besides providing the necessary enantioselectivity, Astec® CHIROBIOTIC columns have the advantage of operating in aqueous and polar organic mobile phases that are amenable to polar drugs and metabolites. Their ionic interactions promote analyte ionization which enhances sensitivity in ESI detection. In addition to the CHIROBIOTIC columns, Sigma-Aldrich also provides the high purity mobile phase agents, racemic and pure chiral 2-OHG enantiomers and other compounds in the isocitrate dehydrogenase (IDH) pathway.

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
 mobile phase ... (A) ethanol:methanol (3:1, v:v); (B) 0.1% v/v TEA in water, adjusted to pH 4.5 with acetic acid; 75:25 (A:B)
 flow rate 0.4 mL/min
 column temp. 20 °C
 detector MS, ESI(-), 100-1000 m/z
 injection 5 µL
 sample each enantiomer, 100 µg/mL in water
 Application No. G005848



LC-MS/MS Analysis of Interacting Cardiac Drugs Digoxin, Quinidine, Amiodarone and Verapamil on Titan™ C18

Sample pretreatment: Sample spiked into rat plasma

Detector:

MRM transitions:

Peak MRM

1. Quinidine 325.2/81.1, 307.1

2. Verapamil 455.3/165.1

3. Digoxin 798.5/651.5

4. Amiodarone 646.1/58.1, 100.1

sample/matrix Sample spiked into rat plasma

SPE well plate HybridSPE®-Plus 96-Well Plate (575659-U)

condition . . . 100 uL of spiked rat plasma was added to the HybridSPE plate well, followed by 300 uL of protein precipitation solvent, acetonitrile with 1% formic acid. (The plate, sealed, secured on a vibrator, agitated by vibration at 1000 rpm for 2 min. The plate was transferred to a vacuum manifold. Vacuum was applied at 10 in Hg for 4 min.)

column Titan C18, 5 cm x 2.1 mm I.D., 1.9 µm particles (577122-U)

mobile phase (A) Water; (B) Methanol, both with 0.1% formic acid/10 mM ammonium formate

gradient 0-1 min, 45%B; 1.5-4 min 90%B, 4.5-8 min 45%B

flow rate 0.2 mL/min

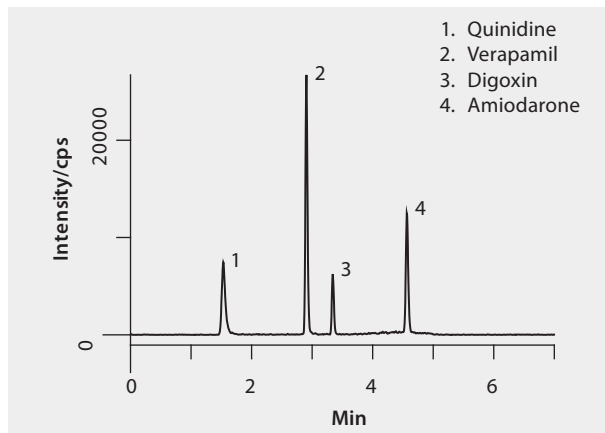
pressure 2900 psi

column temp. 35 °C

detector MS, ESI(+), MRM mode

injection 1.0 µL

Application No. **G006304**



LC-MS/MS Analysis of Steroid Hormones in Plasma on Ascentis® Express C18 after Sample Prep using HybridSPE®-Phospholipid

Immunoassay approaches for steroid determination are typically hindered due to the lack of specificity of antibodies for the measurement of the particular steroids. With the wide acceptance of LC-MS/MS in the clinical setting, there is a growing trend toward converting traditional IA techniques toward more specific and robust LC-MS/MS approaches. Though LC-MS/MS improves assay specificity and allows of multiplexed analyte assays to be conducted simultaneously, it is not without limitations specifically toward interferences from endogenous sample matrix. Often LC-MS/MS assays can be hindered due to ionization effects due to endogenous matrix from biological samples; this can result in random and arbitrary discrimination in analyte response. The use of HybridSPE-Phospholipid prior to LC-MS/MS analysis removes the endogenous phospholipids and precipitated proteins in one step, enabling high analyte recovery, negligible matrix background and long column lifetime.

SPE tube/cartridge HybridSPE®-Phospholipid, 96-well plate,
50 mg/well (575656-U)

sample addition To each well add 100 µL of plasma followed by 300 µL of precipitation solvent (1% formic acid or 0.5% citric acid in acetonitrile).
(Agitate via vortex for 4 minute, place on vacuum manifold and apply 10" Hg vacuum for 4 minutes. Collect filtrate and analyze directly.)

column Ascentis® Express C18, 10 cm x 2.1 mm I.D., 2.7 µm particles (53823-U)

mobile phase (A) 5 mM ammonium formate pH 4.0 with formic acid; (B) methanol

gradient 60% B for 3 min, 60% B to 95% B in 5 min, held at 95% B for 2 min

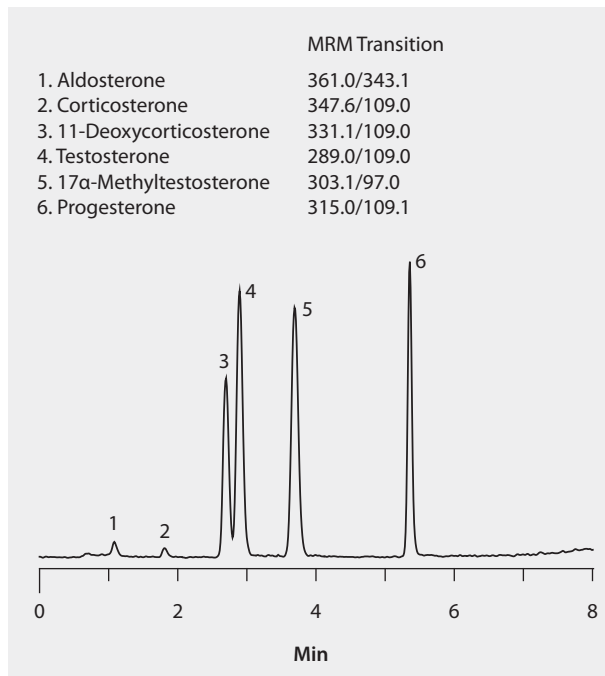
flow rate 0.3 mL/min

column temp. 50 °C

detector ESI+, MRM

injection 2 µL

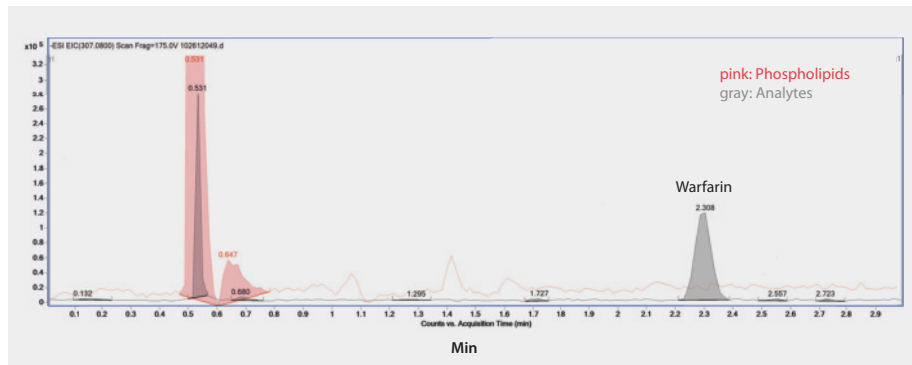
Application No. **G005895**



LC-MS/MS Analysis of Warfarin™ in Plasma on Ascentis® Express C18 after SPE using HybridSPE®-Phospholipid

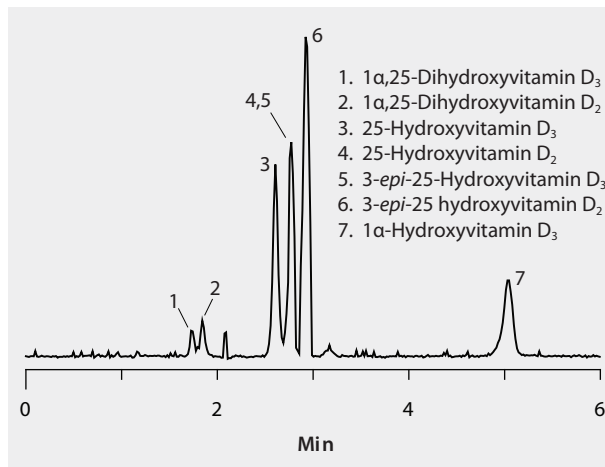
Warfarin is a widely prescribed oral anticoagulant for treatment and prevention of thrombosis and thromboembolism. The pharmacological effect of warfarin is derived from its ability to inhibit the enzyme vitamin K epoxide reductase, thereby reducing circulating levels of vitamin K which is required in the clotting process. In spite of its popularity, there are some downsides to warfarin, including a relatively narrow therapeutic index, interactions with other clinically important drugs, side effects, genetic variation in warfarin metabolism, frequent migration of blood levels outside the therapeutic range, bleeding events, and variability in time to reach therapeutic levels. These, and the fact that warfarin is the second leading cause of drug-related emergency room visits make it a commonly analyzed compound in the clinical lab. The clinical implications and importance of therapeutic drug monitoring of warfarin necessitate reliable and sensitive analytical methods, like UHPLC-MS/MS, to detect and quantify warfarin and its enantiomers in serum.

sample/matrix rabbit plasma, unfiltered K2-EDTA, spiked with warfarin at 100 ng/mL (3:1, plasma:1% formic acid in acetonitrile)
 SPE tube/cartridge HybridSPE®-Phospholipid, 96-well plate (575656-U)
 sample addition to each well add 100 µL plasma, followed by a 300 µL of 1% formic acid in acetonitrile, agitate on orbital shaker for 4 minutes
 elution . . . to each well add 100 µL plasma, followed by a 300 µL of 1% formic acid in acetonitrile, agitate on orbital shaker for 4 minutes
 column . . . Ascentis® Express C18, 10 cm x 2.1 mm I.D., 2.7 µm particles (53823-U)
 mobile phase (A) 5mM ammonium formate, pH 4.2 with formic acid; (B) 5mM ammonium formate in 95:5 acetonitrile:water, 50:50 (A:B)
 flow rate 0.3 mL/min
 column temp. 35 °C
 detector ESI+, 100-1000 m/z
 injection 2 µL
 Application No. **G005850**



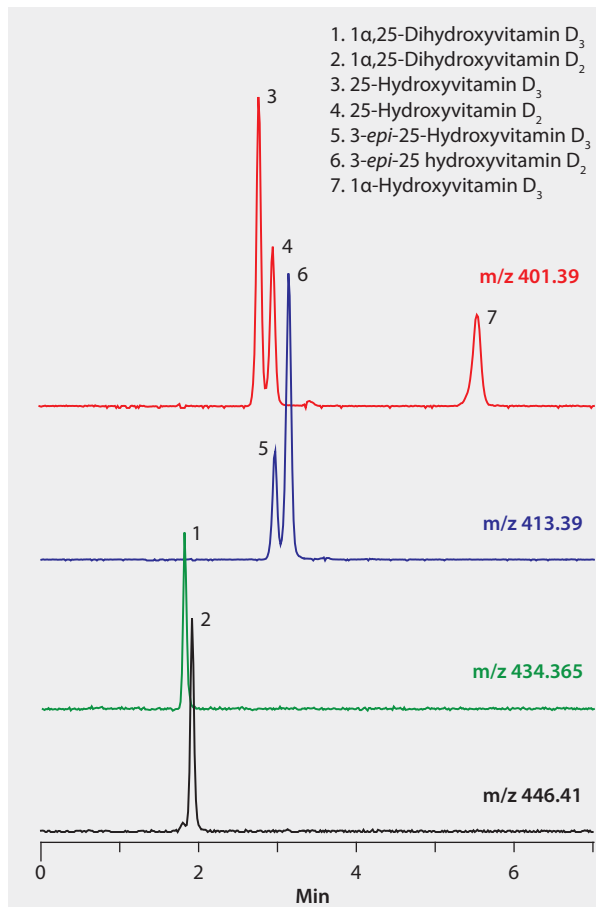
LC-MS/MS Analysis of Vitamin D Metabolites on Ascentis® Express F5

column . . . Ascentis Express F5, 15 cm x 2.1 mm I.D., 2.7 µm particles (53571-U)
mobile phase . . . (A) 5 mM ammonium formate water; (B) methanol; (25:75, A:B)
flow rate 0.4 mL/min
pressure 5178 psi (357 bar)
column temp. 40 °C
detector ESI(+), 100-1000 m/z
injection 2 µL, each compound 300 ng/mL in 40:60 (water:methanol)
Application No. [G005878](#)



LC-MS/MS Analysis of Vitamin D Metabolites on Ascentis® Express F5 (Monitored Ions)

column . . . Ascentis Express F5, 15 cm x 2.1 mm I.D., 2.7 μ m particles (53571-U)
 mobile phase . . . (A) 5 mM ammonium formate water; (B) methanol; (25:75, A:B)
 flow rate 0.4 mL/min
 pressure 5178 psi (357 bar)
 column temp. 40 °C
 detector ESI(+), 100-1000 m/z
 injection 2 μ L, each compound 300 ng/mL in 40:60 (water:methanol)
 Application No. **G005876**



LC-MS/MS Analysis of Warfarin™ Enantiomers in Plasma on Astec® CHIROBIOTIC® V after SPE using HybridSPE®-Phospholipid

Warfarin is a widely prescribed oral anticoagulant for treatment and prevention of thrombosis and thromboembolism. The pharmacological effect of warfarin is derived from its ability to inhibit the enzyme vitamin K epoxide reductase, thereby reducing circulating levels of vitamin K which is required in the clotting process. In spite of its popularity, there are some downsides to warfarin, including a relatively narrow therapeutic index, interactions with other clinically important drugs, side effects, genetic variation in warfarin metabolism, frequent migration of blood levels outside the therapeutic range, bleeding events, and variability in time to reach therapeutic levels. These, and the fact that warfarin is the second leading cause of drug-related emergency room visits make it a commonly analyzed compound in the clinical lab. Warfarin is a chiral compound comprising an equal mixture of (R) and (S) enantiomers. (S)-Warfarin is considerably more potent and pharmacologically active than (R)-warfarin. Astec CHIROBIOTIC V columns resolve warfarin enantiomers under LC-MS conditions and hold up well to biological samples. The clinical implications and importance of therapeutic drug monitoring of warfarin necessitate reliable and sensitive analytical methods, like UHPLC-MS/MS, to detect and quantify warfarin and its enantiomers in serum.

sample/matrix rabbit plasma, unfiltered K2-EDTA, spiked with warfarin at 100 ng/mL (3:1, plasma:1% formic acid in acetonitrile)

SPE tube/cartridge HybridSPE-Phospholipid, 96-well plate (575656-U)

sample addition . . . to each well add 100 µL plasma, followed by a 300 µL of 1% formic acid in acetonitrile, agitate on orbital shaker for 4 minutes

elution to each well add 100 µL plasma, followed by a 300 µL of 1% formic acid in acetonitrile, agitate on orbital shaker for 4 minutes

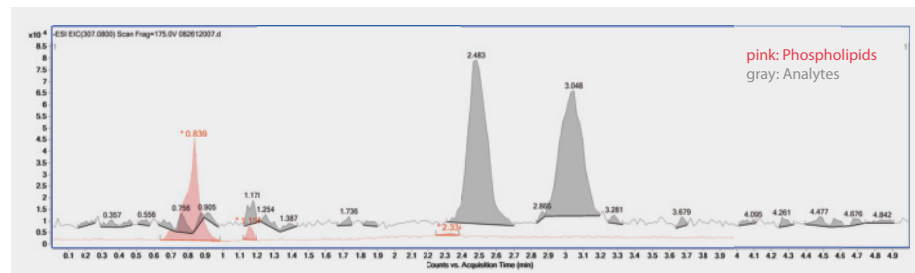
column Astec CHIROBIOTIC® V, 10 cm x 4.6 mm I.D., 5 µm particles (11022AST)

mobile phase . . . (A) 0.1% formic acid (pH unadjusted); (B) acetonitrile, 75:25 (A:B)

flow rate 1 mL/min

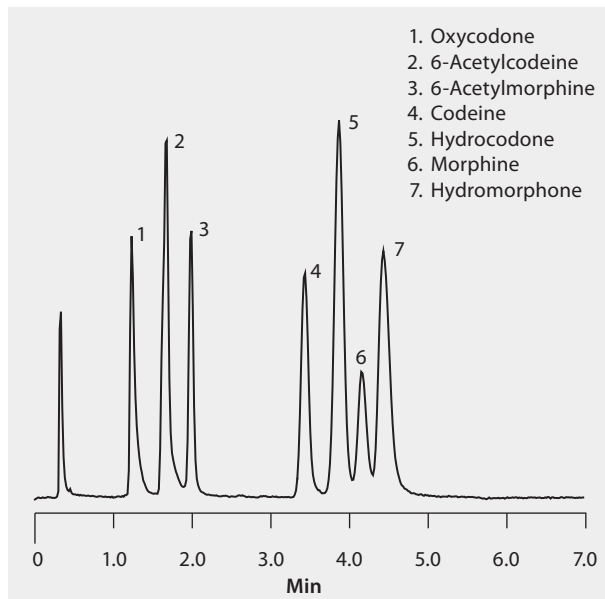
column temp. 35 °C

detector ESI+, 100-1000 m/z
 injection 2 µL
 Application No. G005849



LC-MS (TOF) Analysis of Opioids and Opiate-Dependence Management Drugs on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 5 cm x 2.1 mm I.D., 2.7 µm particles (53934-U)
mobile phase 2 mM ammonium formate in 90:10 (v:v) acetonitrile:water
flow rate 0.3 mL/min
column temp. 55 °C
detector TOF/MS
injection 2 µL
sample 400 ng/mL in acetonitrile
Application No. **G006153**



LC-MS (TOF) Analysis of Warfarin™ Enantiomers in Plasma on Astec® CHIROBIOTIC® V after SPE Using HybridSPE®-Phospholipid

This application demonstrates the benefit of using Sigma-Aldrich Analytical (Supelco, Fluka, and Cerilliant) consumables for rapid, accurate, sensitive and reliable MS detection in a clinical or bioanalytical setting.

Warfarin was originally developed as a rodenticide, but soon found medical application as an anticoagulant to prevent the formation of blood clots, especially after heart attacks. At the time of this writing, it is the most widely prescribed oral anticoagulant and is sold under Coumadin and various other brand names. Warfarin is a chiral molecule. The R- and S- forms are cleared by the body via different pathways and have different pharmacokinetic and pharmacodynamic effects. S-warfarin is more potent than the R-warfarin in producing the anticoagulant response.

The Astec® CHIROBIOTIC V column provided rapid resolution of the enantiomers under conditions that are compatible with mass spectrometric (MS) detection. Considering the rise of MS in the clinical laboratory, this is an important consideration. The CHIROBIOTIC family of chiral columns are based on the macrocyclic glycopeptide molecule and affect enantioresolution under mobile conditions that are compatible with reversed-phase and MS conditions. Their durability allows them to stand up to repeated injections of biological extracts.

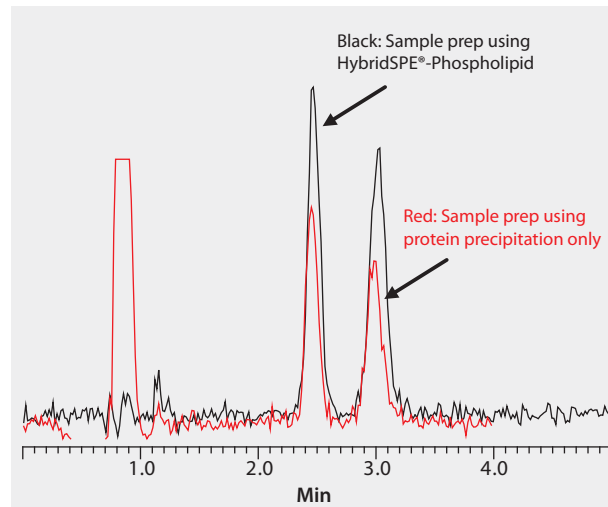
By using HybridSPE-Phospholipid for the sample prep, ion-suppressing phospholipids were removed for improved sensitivity and longer column lifetime. LC-MS Ultra CHROMASOLV solvents were used to supply low background interference and particulate contaminants. Cerilliant reference material grade standards provided reliable quantitation.

system: Agilent 1290, 6210 TOF

sample/matrix Rat plasma stabilized with K2EDTA was acquired from Lampire Biological Laboratories, (Pipersville PA). (Plasma was spiked directly from stock standard to a level of 100 ng/mL in 3:1 (plasma:1% formic acid acetonitrile).)

SPE tube/cartridge . . . Pk1 50 mg/96-Well HybridSPE-Phospholipid Plate (575656-U)

condition . . . Apply 100 µL of plasma to plate, followed by 300 µL of 1% formic acid acetonitrile. Agitate via vortex for 4 min.
 elution Place on vacuum manifold and apply 10" Hg vacuum for 4 minutes. Collect filtrate and analyze directly.
 column CHIROBIOTIC V, 10 cm x 4.6 mm I.D., 5 µm particles (11022AST)
 mobile phase (A) 0.1% formic acid water; (B) acetonitrile, (75:25, A:B)
 flow rate 1 mL/min
 column temp. 35 °C
 detector ESI+, 100-1000 m/z
 injection 2 µL
 Application No. **G005827**



LC-TOF Analysis of Antiarrhythmic Drugs and Metabolites in Plasma on Ascentis® Express HILIC after Sample Prep using HybridSPE®-Phospholipid

The basic characteristics of antiarrhythmic cardiac drugs and associated metabolites make them targets for HILIC chromatographic separation. Because HILIC mobile phases consist of a high composition of acetonitrile, this can also facilitate the direct analysis of precipitated plasma samples without the need for additional sample solvent exchange. In most cases, the high organic mobile phase also facilitates increased analyte response in ESI (+) MS detection. This application used HybridSPE-Phospholipid sample prep to remove phospholipids and precipitated proteins prior to LC-MS analysis on Ascentis Express HILIC. The resulting method was robust and sensitive.

sample/matrix . . . Rat plasma stabilized with K2EDTA was acquired from Lampire Biological Laboratories, (Pipersville PA). Plasma was spiked directly from stock standard to a level of 400 ng/mL

SPE tube/cartridge . . HybridSPE-Phospholipid 96-Well Plate, 50 mg/2 mL (575656-U)

sample addition . . . Apply 100 µL of plasma to plate, followed by 300 µL of 1% formic acid acetonitrile. Agitate via vortex for 4 min
elution Place on vacuum manifold and apply 10" Hg vacuum for 4 minutes.
Collect filtrate and analyze directly.

column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)

mobile phase . . . (A) 5 mM ammonium formate; (B) 5 mM ammonium formate in acetonitrile; (5:95, A:B, pH 7.0 with formic acid) (LC-MS CHROMASOLV Ultra grade)

flow rate 0.4 mL/min

pressure 1305 psi (90 bar)

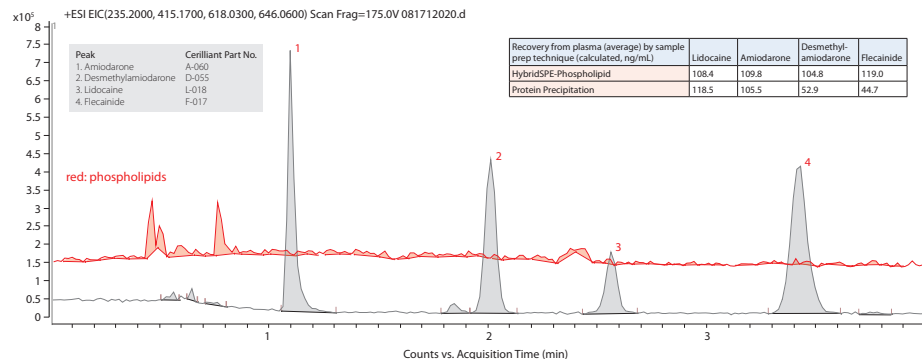
column temp. 35 °C

detector ESI(+), full scan, m/z 100-1000

injection 0.5 µL

sample plasma extract, analyte concentration of final sample work up is equivalent to 100 ng/mL

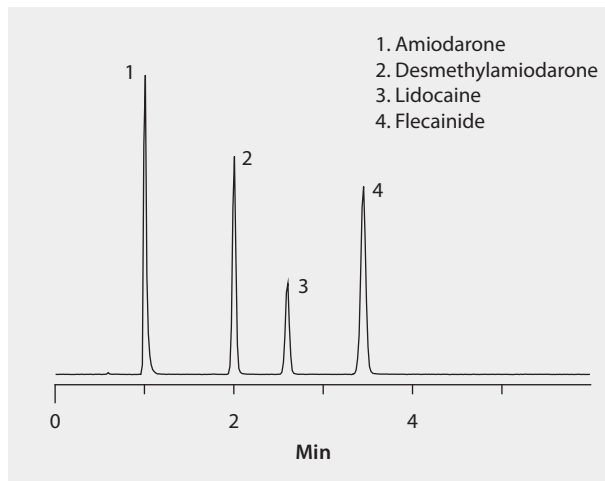
Application No. **G005818**



LC-TOF Analysis of Antiarrhythmic Drugs and Metabolites on Ascentis® Express HILIC

The basic characteristics of these compounds make them targets for HILIC chromatographic separation. Because HILIC mobile phases consist of a high composition of acetonitrile, this can also facilitate the direct analysis of precipitated plasma samples without the need for additional sample solvent exchange. In most cases, the high organic mobile phase also facilitates increased analyte response in ESI+ MS detections.

column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 μ m particles (53939-U)
mobile phase . . . (A) 5 mM ammonium formate; (B) 5 mM ammonium formate in acetonitrile; (5:95, A:B, pH 7.0 with formic acid) (LC-MS CHROMASOLV Ultra grade)
flow rate 0.4 mL/min
column temp. 35 $^{\circ}$ C
detector ESI(+), full scan, m/z 200-800
injection 0.5 μ L
sample each compound, 300 ng/mL in 1% formic acid acetonitrile:water, 75:25
Application No. **G005817**

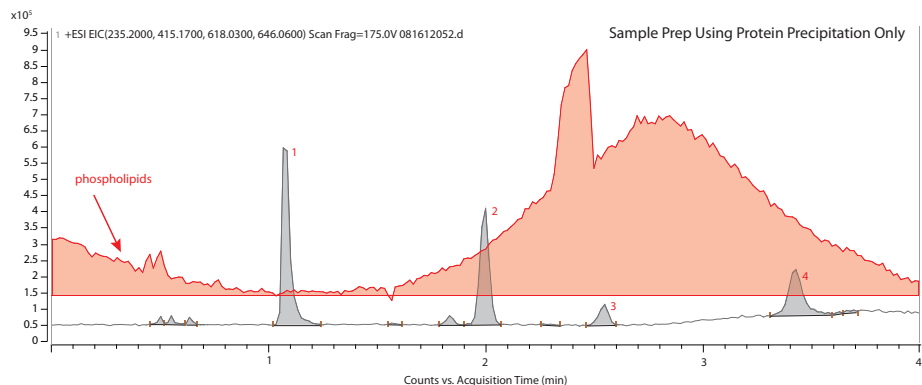
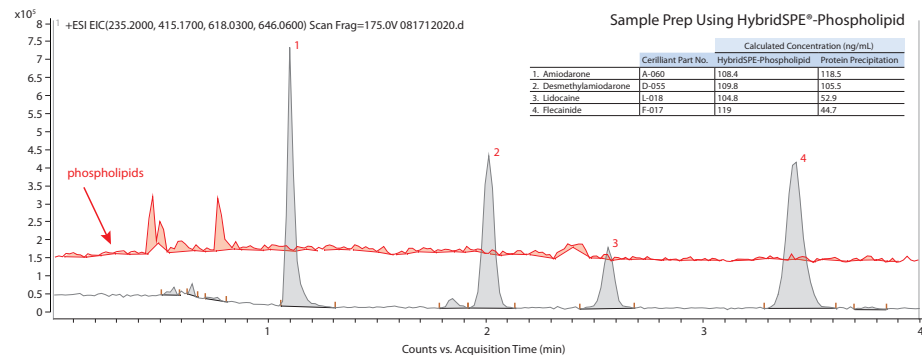


LC-TOF Analysis of Antiarrhythmic Drugs and Metabolites on Ascentis® Express HILIC: Improvement in Analyte Response after Sample Prep using HybridSPE®-Phospholipid

The basic characteristics of antiarrhythmic cardiac drugs and associated metabolites make them targets for HILIC chromatographic separation. Because HILIC mobile phases consist of a high composition of acetonitrile, this can also facilitate the direct analysis of precipitated plasma samples without the need for additional sample solvent exchange. In most cases, the high organic mobile phase also facilitates increased analyte response in ESI (+) MS detection. This application used HybridSPE-Phospholipid sample prep to remove phospholipids and precipitated proteins prior to LC-MS analysis on Ascentis Express HILIC. These chromatograms compare the response with HybridSPE-Phospholipid vs. standard protein precipitation sample prep methods.

sample Rat plasma stabilized with K2EDTA was acquired from Lampire Biological Laboratories, (Pipersville PA). Plasma was spiked directly from stock standard to a level of 400 ng/mL
 SPE tube/cartridge . . . HybridSPE-Phospholipid 96-Well Plate, 50 mg/2 mL (575656-U)
 sample addition . . . Apply 100 µL of plasma to plate, followed by 300 µL of 1% formic acid acetonitrile. Agitate via vortex for 4 min.
 elution Place on vacuum manifold and apply 10" Hg vacuum for 4 minutes. Collect filtrate and analyze directly.
 column Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)
 mobile phase (A) 5 mM ammonium formate; (B) 5 mM ammonium formate in acetonitrile; (5:95, A:B, pH 7.0 with formic acid) (LC-MS CHROMASOLV Ultra grade)
 flow rate 0.4 mL/min
 pressure 1305 psi (90 bar)
 column temp. 35 °C
 detector ESI(+), full scan, m/z 100-1000
 injection 0.5 µL

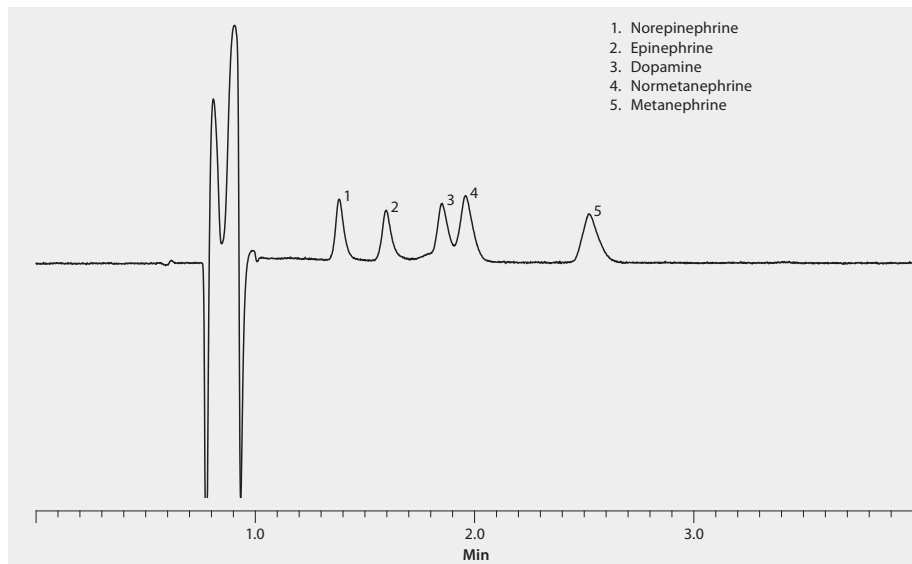
sample plasma extract, analyte concentration of final sample work up is equivalent to 100 ng/mL
 Application No. G005819



UHPLC Analysis of Catecholamines on Ascentis® Express F5

column . . . Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 µm particles (53823-U)
mobile phase . . . (A) water; (B) 100 mM ammonium acetate (pH 4.1 with acetic acid);
(C) acetonitrile; (88:2:10, A:B:C)

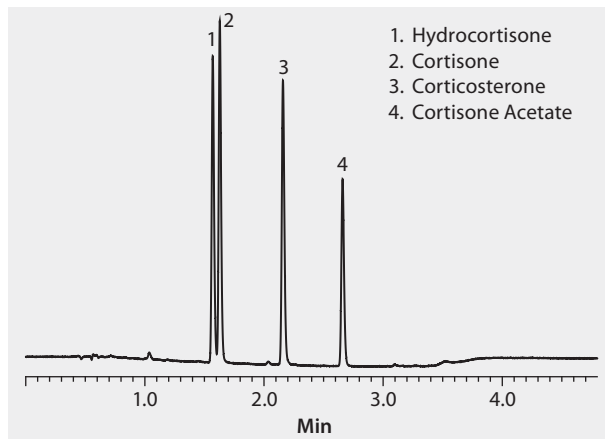
flow rate 0.3 mL/min
pressure 1880 psi (130 bar)
column temp. 60 °C
detector UV, 250 nm
injection Catecholamines 25 µg/mL in 90:10, water:methanol
Application No. **G006281**



UHPLC Analysis of Corticosteroids on Titan™ C18

Analysis of Corticosteroids on a Titan C18 UPLC column with MS detection in ESI (+) Mode

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase (A) water; (B) acetonitrile; (70:30, A:B)
gradient 30% to 60% B in 3 minutes, hold for 0.2 min
flow rate 0.4 mL/min
pressure 7423 psi (512 bar)
column temp. 35 °C
detector UV, 240 nm
injection 1 µL
sample 1000 ng/ml in mobile phase
detector ESI (+) MS TIC SIR
Application No. **G006147**

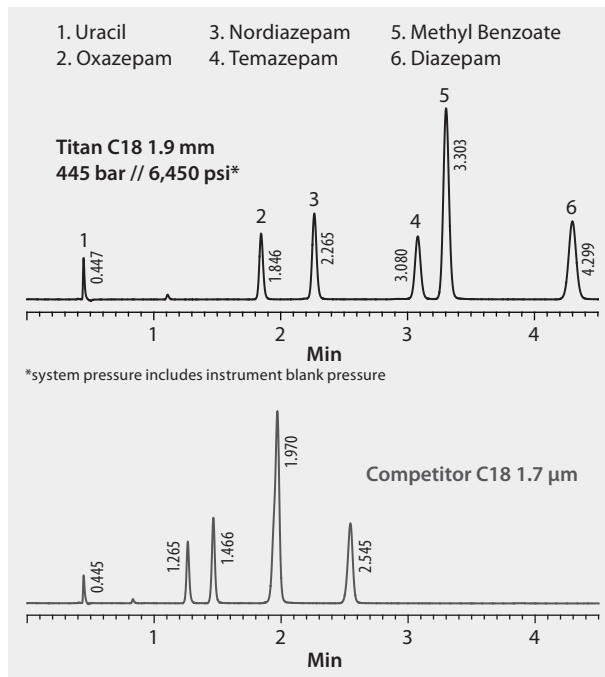


UHPLC Analysis of Diazepam and Metabolites on Titan™ C18, Competitive Comparison

This application shows a comparison between Titan™ C18 and a competitive column for diazepam and its metabolites using a MS compatible mobile phase.

Used 75 µm I.D. x 250 mm L tubing in system.

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
 mobile phase (A) 0.1% formic acid; (B) acetonitrile; (60:40, A:B)
 pressure 6450 psi (445 bar)
 column temp. 35 °C
 detector UV, 254 nm
 Application No. **G006001**



UHPLC Analysis of Riboflavin and Impurities on Titan™ C18 with MS Detection

Riboflavin (vitamin B2) is a water-soluble vitamin. It is synthesized by all plants and many microorganisms, but it is not produced by higher animals. It is a precursor of coenzymes that are required for the enzymatic oxidation of carbohydrates, so it is essential to basic metabolism. Riboflavin is used as an additive to food and feed and is also used in fortification of baby food and cereal. The current USP method for impurity analysis is non-quantitative, and uses an ion pair reagent in the mobile phase. An alternative to USP and EP methods using LC-MS/MS to identify and quantify the riboflavin and impurities is presented. This new proposed method is also compatible with UV-Vis detection.

A riboflavin certified reference material (CRM) was used in this study. MRM transitions for the determination of ions for the parent and four impurities were made. Three transitions were used for each ion. Structures for each of these major impurities were confirmed by MS. In addition to improving the specificity of the method with MS/MS detection, two additional goals were to decrease analysis time and eliminate the need for ion pairing reagents that are not compatible with MS.

Other MS Conditions

Capillary (kV) 2.29

Cone (V) 54.95

Extractor (V) 5.13

Source Temperature (°C) 151

Desolvation Temperature (°C) 349

Cone Gas Flow (L/Hr) 2

Desolvation Gas Flow (L/Hr) 646

Collision Gas Flow (mL/Min) ON

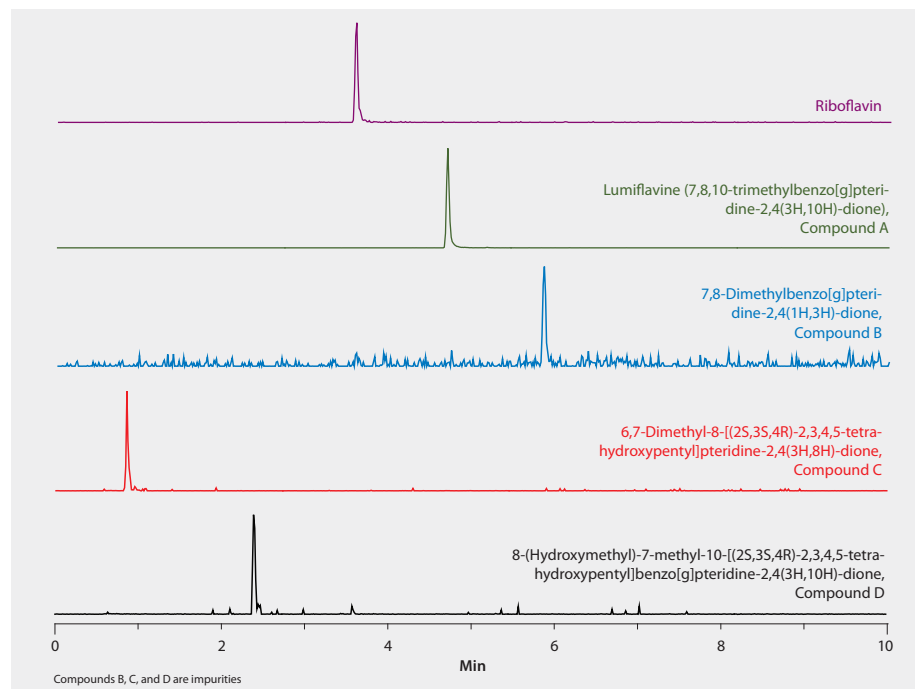
column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)

mobile phase (A) 0.1% formic acid in water;
(B) 0.1% formic acid in acetonitrile (95:5)

gradient 5% to 25% in 6 min, return to 5% b in 0.1 min,
and re-equilibrate for 4 min

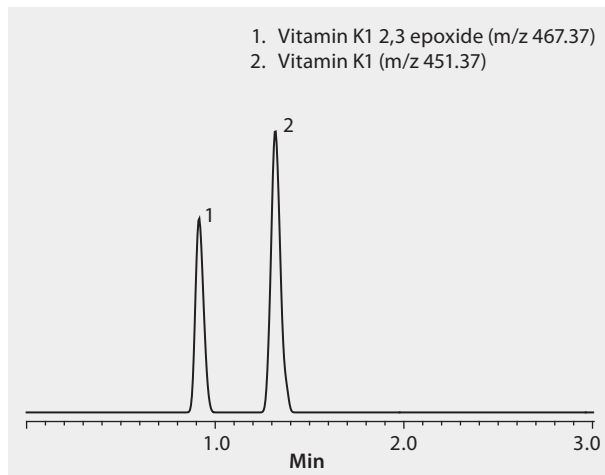
flow rate 500 µL/min

pressure 5000 psi (345 bar)
column temp. 35 °C
detector ESI (+), MRM and TIC
detector Diode Array at 276 nm
injection 2.0 µL
Application No. G006138



UHPLC-MS Analysis of Vitamin K1 and Related Compound on Ascentis® Express 2.7 µm C18

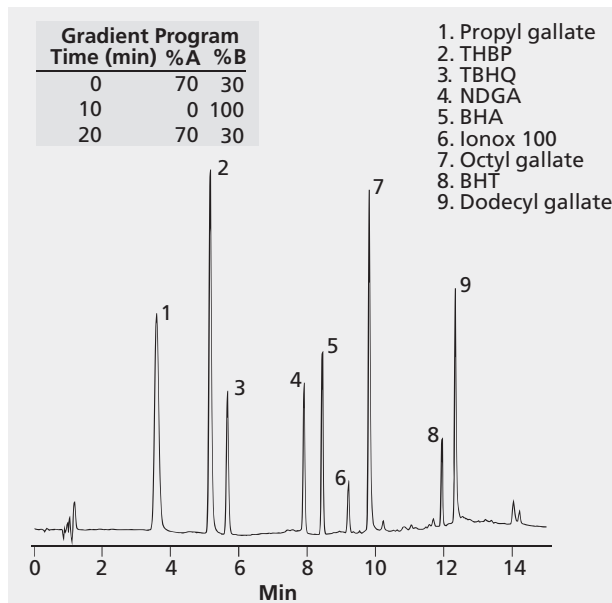
column . . . Ascentis Express C18 5 cm x 2.1 mm I.D., 2.7 µm particles (53822-U)
mobile phase (A) methanol; (B) 2-propanol; (90:10, A:B)
flow rate 0.4 mL/min
pressure 1870 psi (129 bar)
column temp. 35 °C
detector MS-APCI+, full scan 425-525 m/z
injection 2.0 µL
sample 50 ng/mL 90:10, methanol:2-propanol
Application No. [G006309](#)



Cosmetics, Personal Care, and Cleaning Products

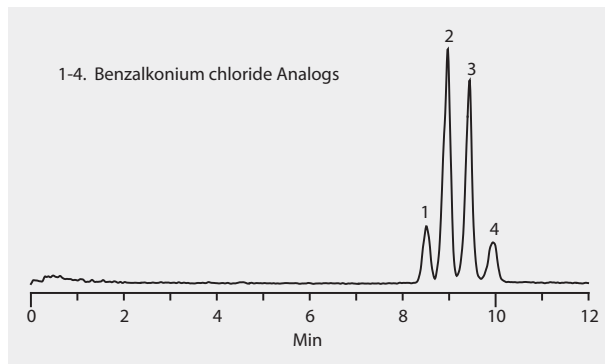
HPLC Analysis of Antioxidants on SUPELCOSIL™ LC-18

column SUPELCOSIL LC-18, 15 cm × 4.6 mm I.D., 5 µm particles (58230-U)
 mobile phase . . . (A) 5% acetic acid in deionized water; (B) acetonitrile:methanol (1:1)
 70% A/30% B to 100% B, linear gradient over 10 min, hold 10min
 flow rate 2 mL/min
 detector UV, 280 nm
 injection 10µL, 20 µg/mL each antioxidant
 Application No. [795-0438](#)



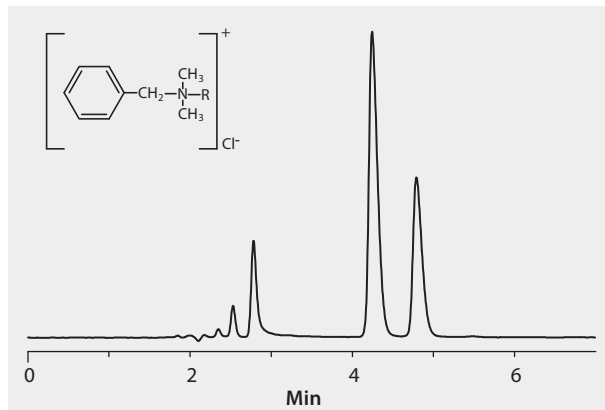
HPLC Analysis of Benzalkonium Chloride in Commercial Disinfecting Wipes on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 15 cm x 4.6 mm I.D., 2.7 μ m particles (53981-U)
mobile phase (A) 20 mM ammonium acetate; (B) acetonitrile; (10:90, A:B)
flow rate 1 mL/min
column temp. 35 $^{\circ}$ C
detector ESI(+), TIC 150 - 500 m/z
injection 2 μ L
sample Single wipe sheet, extracted with 10 mL methanol
Application No. **G005414**



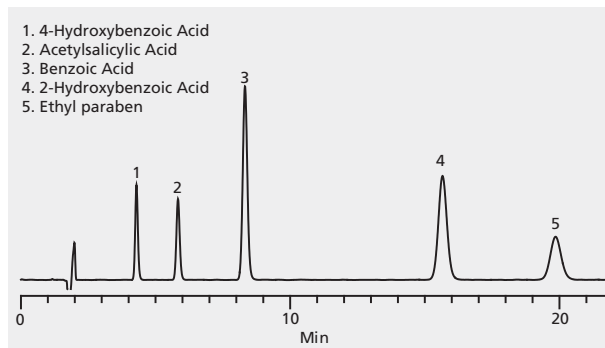
HPLC Analysis of Benzalkonium Chlorides on Discovery® Cyano

column Discovery Cyano, 15 cm × 4.6 mm I.D., 5 μm particles (59356-U)
mobile phase (A) acetonitrile; (B) acetate buffer, pH 4.5, (60:40, A:B)
flow rate 1 mL/min
column temp. ambient
detector UV, 254 nm
sample undefined C8 to C18 Benzalkonium Chlorides
Application No. [G000726](#)



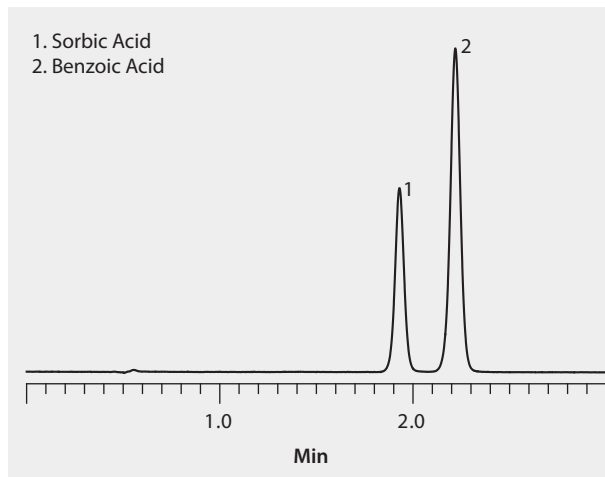
HPLC Analysis of Benzoic Acid and Related Compounds on Ascentis® RP-Amide

column . . . Ascentis RP-Amide, 15 cm × 4.6 mm I.D., 5 μm particles (565324-U)
mobile phase (A) water with 0.1% TFA; (B) acetonitrile; (70:30, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 μL
Application No. **G004094**



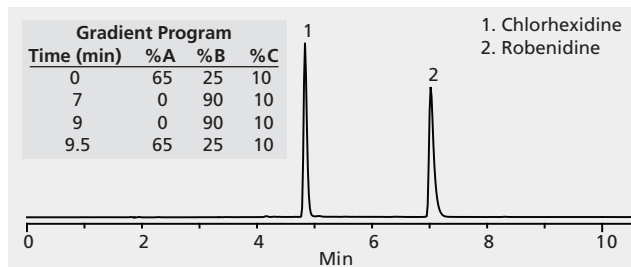
HPLC Analysis of Benzoic Acid and Sorbic Acid on Ascentis® Express RP-Amide ("Green" Mobile Phase Conditions)

column . . . Ascentis Express RP-Amide, 5 cm x 3 mm I.D., 2.7 µm particles (53916-U)
mobile phase (A) 10 mM ammonium phosphate monobasic,
pH 2.5 with phosphoric acid; (B) ethanol; (75:25, A:B)
flow rate 0.4 mL/min
pressure 138 bar (2000 psi) column, 248 bar (3600 psi) total
column temp. 55 °C
detector UV, 215 nm
injection 1 µL
sample 50 µg/mL in mobile phase
Application No. **G005588**



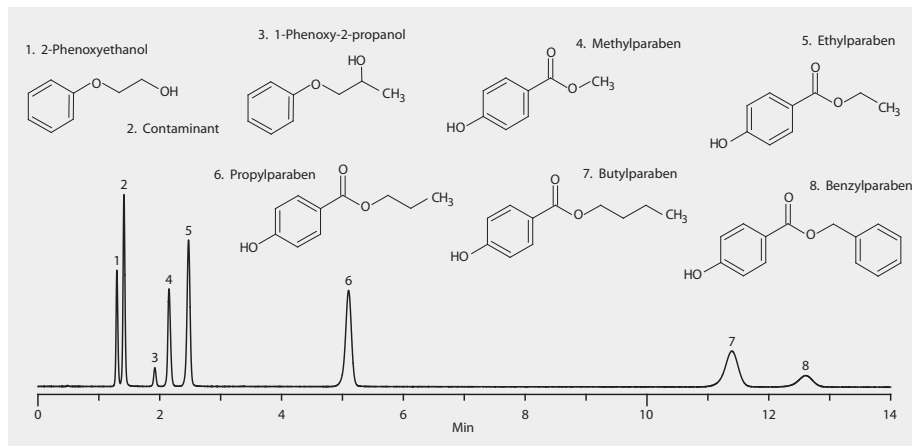
HPLC Analysis of Chlorhexidine and Robenidine on Ascentis® Phenyl

column Ascentis Phenyl 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
 mobile phase (A) water; (B) acetonitrile; (C) 500 mM ammonium formate, pH 3.0, with formic acid
 flow rate 1.0 mL/min
 column temp. 35 °C
 detector UV, 273 nm
 injection 10 µL
 sample 100 µg/mL each in 70:30, 25 mM ammonium formate pH 3.0:acetonitrile
 Application No. **G003711**



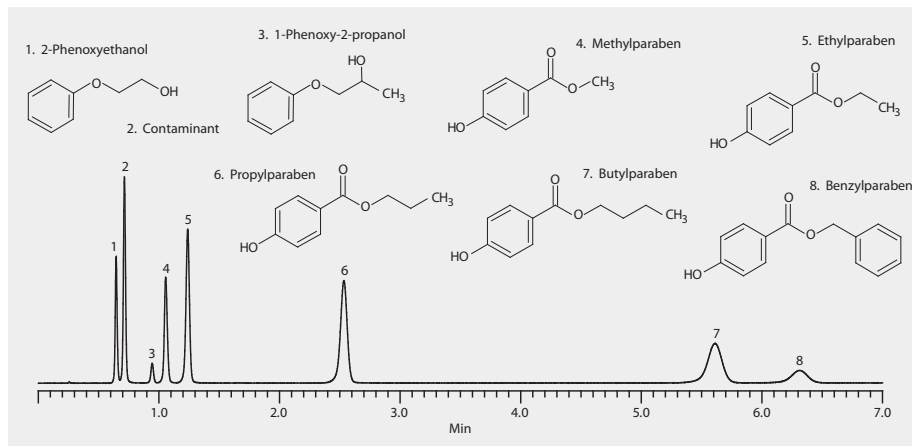
HPLC Analysis of Cosmetic Preservatives on Ascentis® Express C18 (0.6 mL/min)

column . . . Ascentis Express C18, 7.5 cm x 3 mm I.D., 2.7 µm particles (53812-U)
 mobile phase (A) water; (B) methanol; (55:45, A:B)
 flow rate 0.6 mL/min
 column temp. 35 °C
 detector UV, 250 nm
 injection 1 µL
 sample methyl-, benzylparaben, 50 mg/L; ethylparaben, 30 mg/L;
 propyl-, butylparaben, 100 mg/L; 2-phenoxyethanol, 1.5 g/L;
 1-phenoxy-2-propanol, 3 g/L; all in 40% methanol
 Application No. **G005386**



HPLC Analysis of Cosmetic Preservatives on Ascentis® Express C18 (1.2 mL/min)

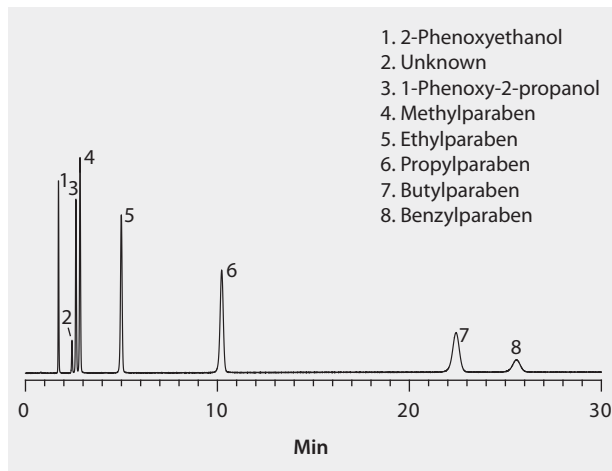
column . . . Ascentis Express C18, 7.5 cm x 3 mm I.D., 2.7 µm particles (53812-U)
 mobile phase (A) water; (B) methanol; (55:45, A:B)
 flow rate 1.2 mL/min
 column temp. 35 °C
 detector UV, 250 nm
 injection 1 µL
 sample methyl-, benzylparaben, 50 mg/L; ethylparaben, 30 mg/L;
 propyl-, butylparaben, 100 mg/L; 2-phenoxyethanol, 1.5 g/L;
 1-phenoxy-2-propanol, 3 g/L; all in 40% methanol
 Application No. **G005385**



HPLC Analysis of Cosmetic Preservatives on Ascentis® Express RP-Amide

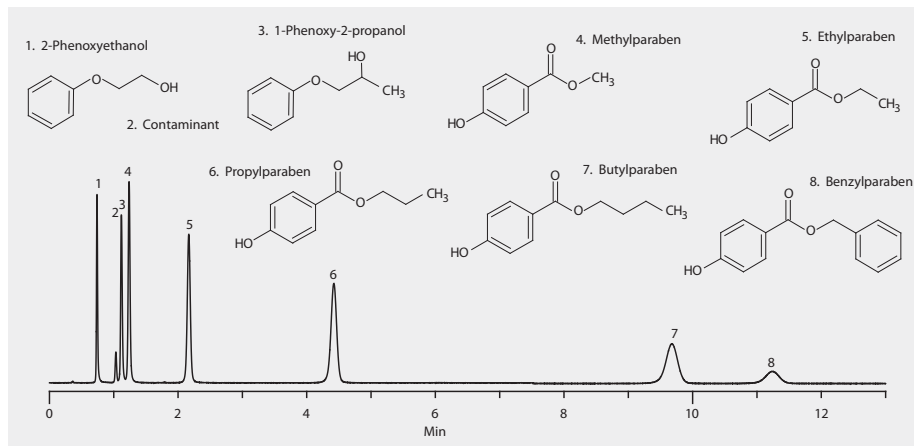
With the publication Borremans, M. et.al. 2004, Chromatographia 59: 47-53 as a reference, this method is 10% faster, but with superior resolution of critical pairs; in this case, the minimum USP resolution is 2.4.

column . . . Ascentis Express RP-Amide, 10 cm x 3 mm I.D., 2.7 µm particles (53918-U)
 mobile phase (A) water; (B) methanol; (60:40, A:B)
 flow rate 0.6 mL/min
 pressure 2900 psi (200 bar)
 column temp. 50 °C
 detector UV, 250 nm
 injection 1 µL
 sample methyl-, benzylparaben (50 mg/L), ethylparaben (30 mg/L),
 propyl-, butylparaben (100 mg/L), 2-phenoxyethanol (1.5 g/L),
 1-phenoxy-2-propanol (3 g/L), all in 40% methanol
 Application No. **G005738**



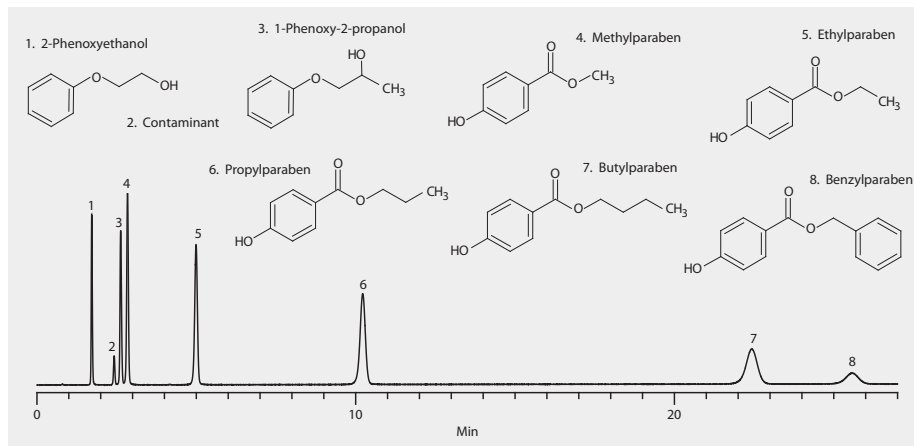
HPLC Analysis of Cosmetic Preservatives on Ascentis® Express RP-Amide at Elevated Flow and Temperature (1.2 mL/min)

column . . . Ascentis Express RP-Amide, 10 cm x 3 mm I.D., 2.7 µm particles (53918-U)
 mobile phase (A) water; (B) methanol; (60:40, A:B)
 flow rate 1.2 mL/min
 column temp. 50 °C
 detector UV, 250 nm
 injection 1 µL
 sample methyl-, benzylparaben, 50 mg/L; ethylparaben, 30 mg/L;
 propyl-, butylparaben, 100 mg/L; 2-phenoxyethanol, 1.5 g/L;
 1-phenoxy-2-propanol, 3 g/L; all in 40% methanol
 Application No. **G005384**



HPLC Analysis of Cosmetic Preservatives on Ascentis® Express RP-Amide at Elevated Temperature (0.6 mL/min)

column . . . Ascentis Express RP-Amide, 10 cm x 3 mm I.D., 2.7 µm particles (53918-U)
 mobile phase (A) water; (B) methanol; (60:40, A:B)
 flow rate 0.6 mL/min
 column temp. 50 °C
 detector UV, 250 nm
 injection 1 µL
 sample methyl-, benzylparaben, 50 mg/L; ethylparaben, 30 mg/L;
 propyl-, butylparaben, 100 mg/L; 2-phenoxyethanol, 1.5 g/L;
 1-phenoxy-2-propanol, 3 g/L; all in 40% methanol
 Application No. **G005383**

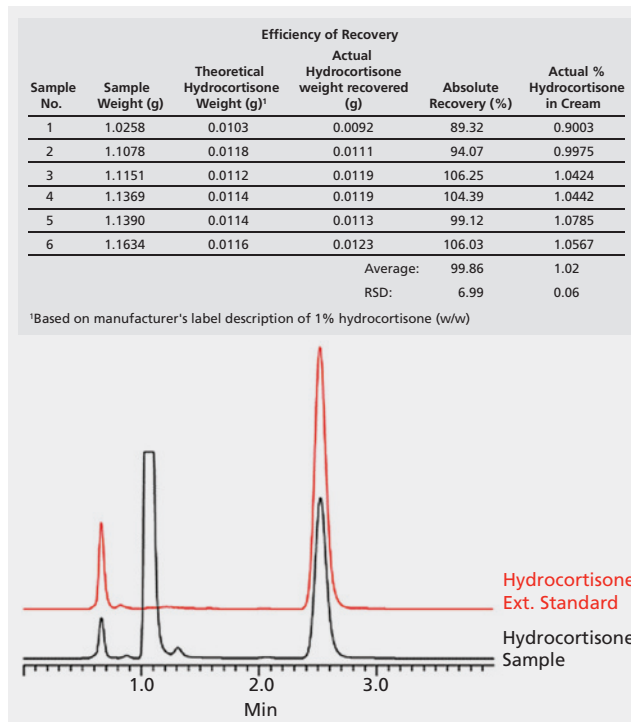


HPLC Analysis of Hydrocortisone in Topical Cream on Discovery® HS C18 after SPE using Discovery® DSC-Si

Sample Pre-treatment:

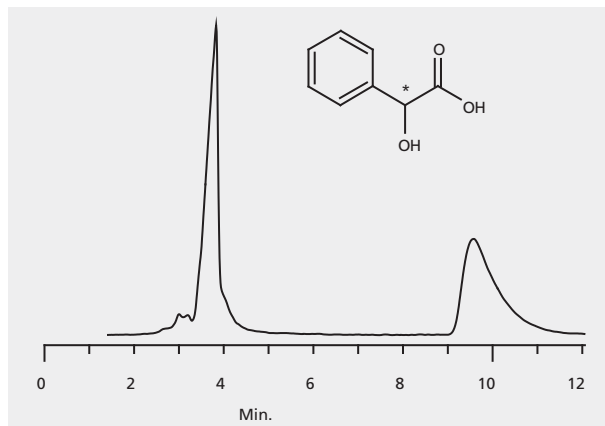
Disolve 1 g 1% hydrocortisone topical hand cream in 10 mL ethyl acetate. Dilute 2 mL of ethyl acetate-cream sample with 8 mL hexane:ethyl acetate (2:1, v/v).

sample preparation SPE (Solid Phase Extraction)
 sample addition hydrocortisone topical hand cream in hexane:ethylacetate
 SPE tube/cartridge Discovery DSC-Si, 500 mg/3 mL (52695-U)
 condition 1 mL hexane:ethyl acetate (2:1, v/v)
 sample addition 1 mL
 washing 1 mL hexane:ethyl acetate (2:1, v/v)
 elution 1 mL methanol:DI water (1:1, v/v)
 eluate post-treatment dilute eluate to 2 mL with methanol:DI water (1:1, v/v)
 column Discovery HS C18, 15 cm x 4.6 mm I.D., 5 µm particles (568520-U)
 mobile phase (A) methanol; (B) DI water (1:1, A:B)
 flow rate 1 mL/min
 column temp. 35 °C
 detector UV, 220 nm
 injection 10 µL
 Application No. **G003765**



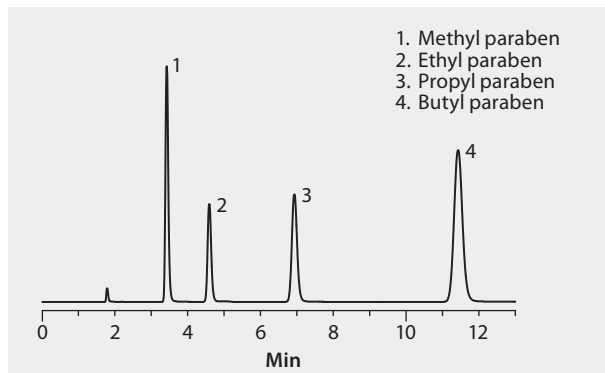
HPLC Analysis of Mandelic Acid Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase 0.1 wt% ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. **G004610**



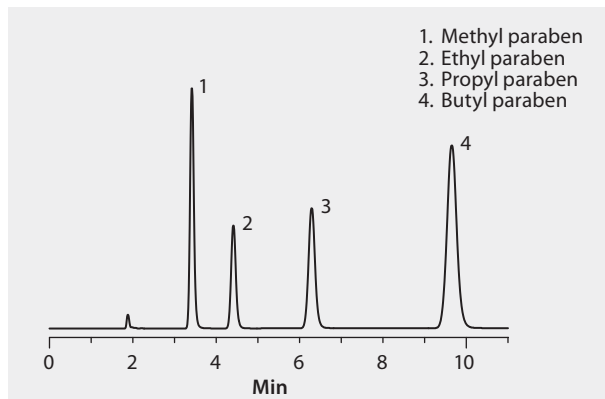
HPLC Analysis of Paraben Preservatives on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase (A) acetonitrile: (B) water, (30:70, A:B)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 10 µL
Application No. **G001234**



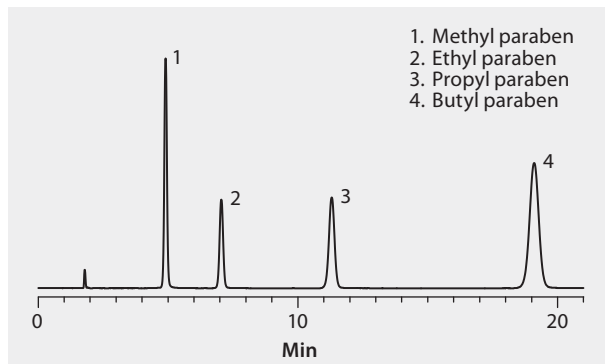
HPLC Analysis of Paraben Preservatives on Discovery® C8

column Discovery C8, 15 cm × 4.6 mm I.D., 5 µm particles (59353-U)
mobile phase (A) acetonitrile: (B) water, (30:70, A:B)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 10 µL
Application No. **G001236**



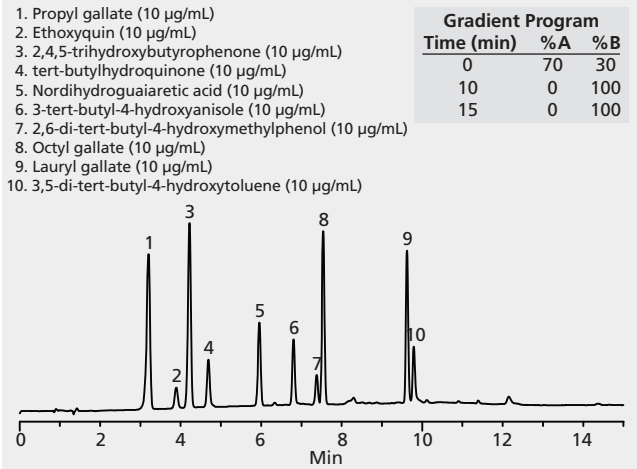
HPLC Analysis of Paraben Preservatives on Discovery® RP-AmideC16

column . . . Discovery RP-Amide C16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase (A) acetonitrile: (B) water, (40:60, A:B)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 10 µL
Application No. **G001235**



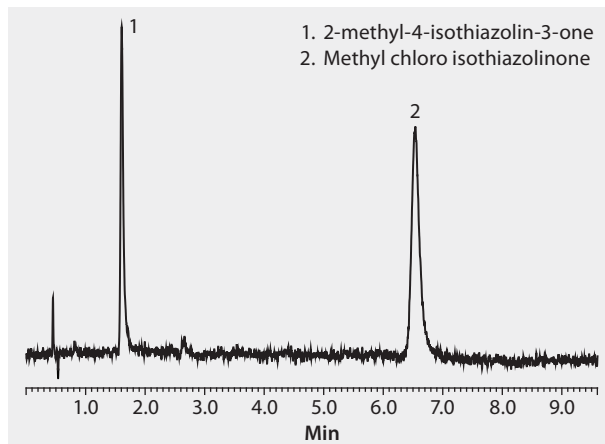
HPLC Analysis of Phenolic Antioxidants on Ascentis® C8

column Ascentis C8, 15 cm x 4.6 mm I.D., 5 µm particles (581424-U)
 mobile phase (A) 5% acetic acid; (B) (50:50) methanol:acetonitrile
 flow rate 2.0 mL/min
 column temp. 30 °C
 detector UV, 280 nm
 injection 10 µL
 sample as indicated in 50:50 acetonitrile:2-propanol
 Application No. **G003054**



UHPLC Analysis of Kathon on Titan™ C18 Using MS Detection

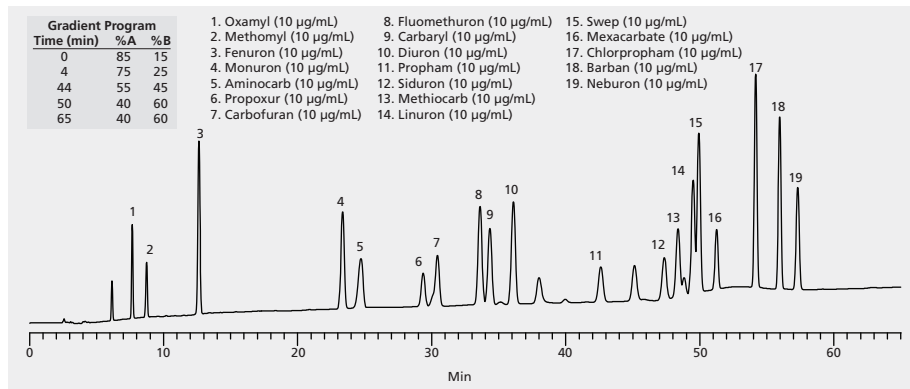
column Titan C18 50 mm x 2.1 mm, I.D, 1.9 µm particles (577122-U)
mobile phase (A) 0.1% formic acid in water (B):methanol
flow rate 500 µL/min
detector MS, ESI (+) MRM TIC
detector Diode Array at 275 nm
injection 1.0 µL
sample Diluted Kathon at 1 ug/ml in 95:5 0.1% formic acid in water::methanol
Application No. [G006148](#)



Environmental

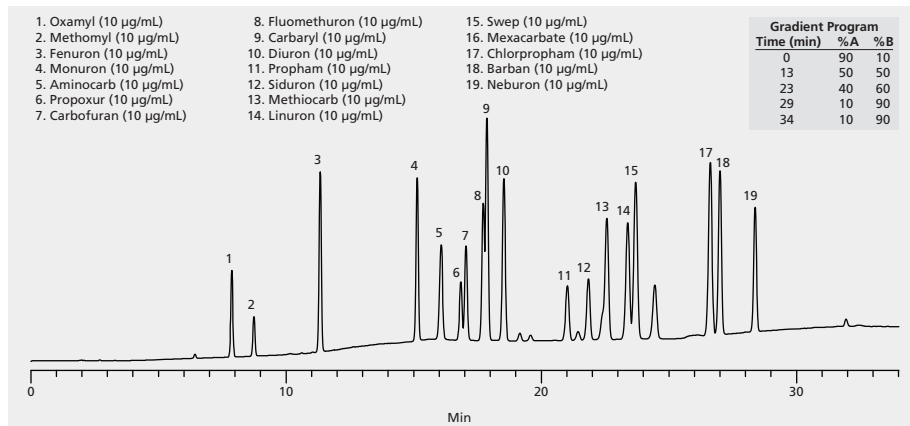
EPA Method 632: HPLC Analysis of Pesticides on Ascentis® C8

column Ascentis C8, 25 cm x 4.6 mm I.D., 5 µm particles (581425-U)
 mobile phase (A) DI water; (B) acetonitrile
 flow rate 1.0 mL/min
 column temp. 30 °C
 detector UV, 210 nm
 injection 10 µL
 sample as indicated in 16% acetonitrile in DI water
 Application No. **G003239**



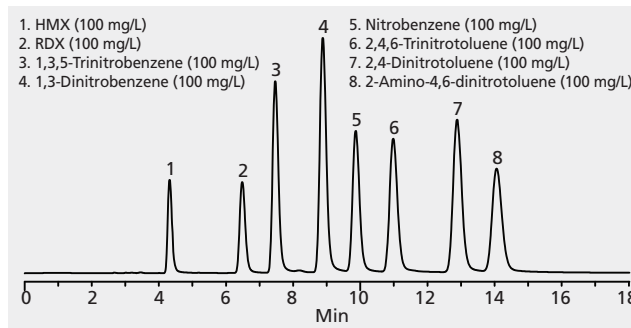
EPA Method 632: HPLC Analysis of Pesticides on Ascentis® C18

column Ascentis C18, 25 cm x 4.6 mm I.D., 5 µm particles (581325-U)
 mobile phase (A) water; (B) acetonitrile
 flow rate 1.0 mL/min
 column temp. 30 °C
 detector UV, 210 nm
 injection 10 µL
 sample as indicated in 16% acetonitrile in water
 Application No. **G003194**



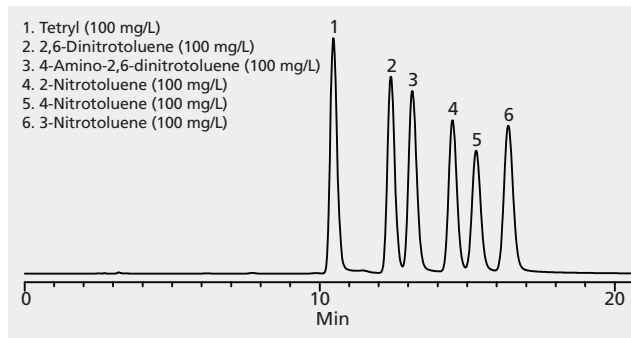
EPA Method 8330: HPLC Analysis of Nitroaromatics and Nitramines, Mix A on Ascentis® C18

column Ascentis C18, 25 cm x 2.1 mm I.D., 5 µm particles (581305-U)
mobile phase (A) water: (B) methanol; (50:50, A:B)
flow rate 0.2 mL/min
column temp. 60 °C
detector UV, 254 nm
injection 1 µL
sample acetonitrile
Application No. [G003278](#)



EPA Method 8330: HPLC Analysis of Nitroaromatics and Nitroamines, Mix B on Ascentis® C18

column Ascentis C18, 25 cm x 2.1 mm I.D., 5 µm particles (581305-U)
mobile phase (A) water;(B) methanol;(50:50, A:B)
flow rate 0.2 mL/min
column temp. 60 °C
detector UV, 254 nm
injection 1 µL
sample as indicated in acetonitrile
Application No. [G003285](#)



HPLC Analysis of Acidic Herbicides in Water on a Polymeric C18 Column after SPE using Supelclean™ ENVI™-Carb

using Zymark AutoTrace Extraction WorkStation 1.20

sample preparation SPE (Solid Phase Extraction)
sample/matrix Fresh 1 L water samples, dechlorinated with sodium thiosulfate when necessary, at ambient temperature and pH.

SPE tube/cartridge Supelclean ENVI-Carb, 250 mg/6 mL (57092)
condition 10 mL DI water at 20 mL/min
sample addition 0.9 L water sample at 20 mL/min
drying 10 min using clean nitrogen
washing 10 mL DI water at 20 mL/min
elution 10 mL 0.1% phosphoric acid in methylene chloride:acetonitrile (80:20) at 5 mL/min

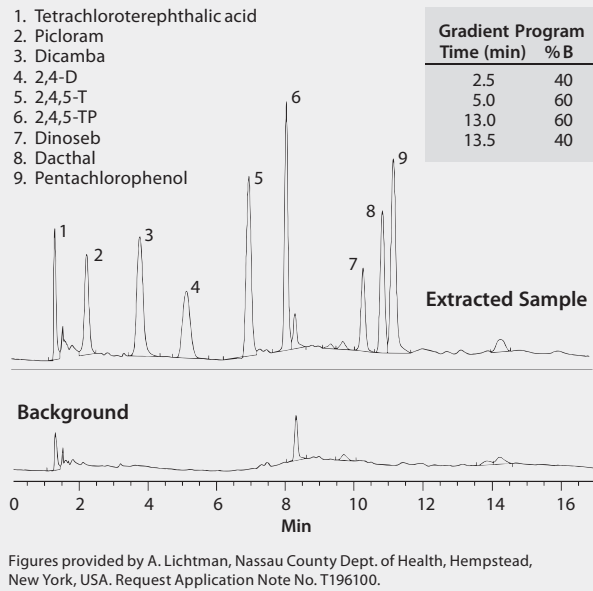
column polymeric-coated silica-based PAH specialty column, 20 cm × 3 mm I.D., 5 μm (Supelco equivalent, SUPELCOSIL LC-PAH, available upon request)

mobile phase gradient, (A): 0.05% phosphoric acid in DI water; (B): acetonitrile
flow rate 0.5 mL/min
column temp. 50 °C

detector photodiode array- peak width: 0.053 min,
sampling interval: 0.320 sec, monitor 210 nm & 225 nm

injection 10 μL of extract (4-5 ppb each analyte in water)

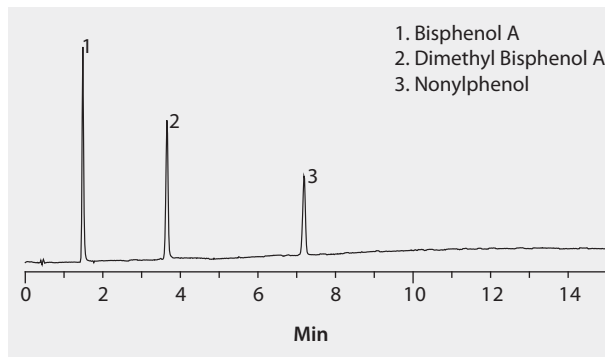
Application No. 796-0150



HPLC Analysis of Bisphenol A, Dimethylbisphenol A and Nonylphenol on Ascentis® Express RP-Amide (UV Detection)

This application demonstrates the suitability of Ascentis Express C18 for the efficient separation of milk thistle related compounds

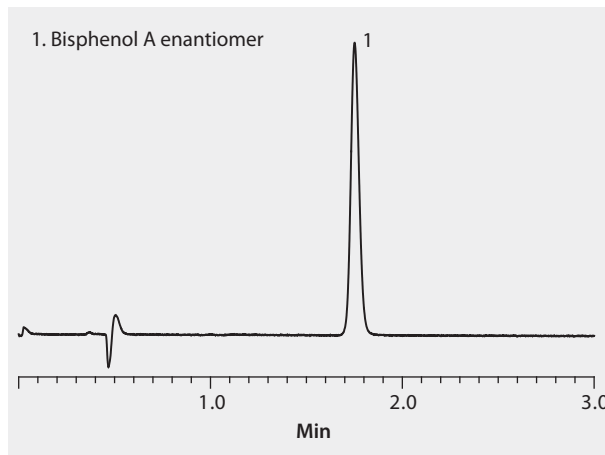
column . . . Ascentis Express RP-Amide, 5 cm x 4.6 mm I.D., 2.7 µm particles (53922-U)
mobile phase (A) water; (B) acetonitrile
gradient 50 to 100% B in 10 min
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 280 nm
injection 10 µL
sample 50 mg/L of each in 50:50, water: acetonitrile
Application No. [G005681](#)



HPLC Analysis of Bisphenol A in Water on Ascentis® Express C18 after SPE using Supelclean™ ENVI-18

Bisphenol A is a contaminant that can leach into aqueous solutions from polycarbonate plastics or metal cans; it may impact human development and reproduction. This application demonstrates the extraction and analysis of bisphenol A from water.

SPE tube/cartridge . . . Supelclean ENVI-18, 500 mg/6 mL glass SPE tube (54331-U)
 condition 1 mL 1% formic acid in acetonitrile, then 1 mL water
 sample 5 mL spiked water blank, concentration of 0.2 µg/mL
 elution 2 mL 1% formic acid in acetonitrile
 eluate post-treatment 1 mL aliquot of eluent, and evaporate/reconstitute
 to 0.5 mL in acetonitrile
 column . . . Ascentis Express C18, 10 cm x 2.1 mm I.D., 2.7 µm particles (53823-U)
 mobile phase (A) water;
 (B) acetonitrile; (60:40, A:B)
 flow rate 0.4 mL/min
 pressure 3270 psi (256 bar)
 column temp. 35 °C
 detector UV, 230 nm
 injection 1 µL
 Application No. **G005530**



HPLC Analysis of β -Blockers and β -Agonists in Urine and Wastewater on a C18 Column after SPE using SupelMIP® SPE-Beta-Receptor

Sample Pre-treatment:

Horse urine was centrifuged at 3000 g for 10 min, diluted 1:1 (v/v) with DI water, adjusted to pH 7. Wastewater was filtered with 1 μ m filter paper and adjusted to pH 6-7. Samples were spiked with 10 beta-agonists and beta-blockers at the level of 1 ng/mL.

sample preparation SPE (Solid Phase Extraction)
sample/matrix horse urine or waste water spiked with
10 beta-agonists and beta-blockers at 1 ng/mL

SPE tube/cartridge SupelMIP SPE - Beta-Receptor, 25 mg/10 mL (LRC) (53223-U)
condition 1 mL acetonitrile; 1 mL DI water

sample addition 1 mL
washing 3 x 1 mL DI water; 1 mL acetonitrile; 1 mL 60% acetonitrile/40% DI
water; apply 2 min of full vacuum to dry the tube after each step

elution 2 x 1 mL 1% formic acid in acetonitrile
column C18, 5 cm x 3 mm I.D., 3 μ m particles
eluate post-treatment evaporate under nitrogen and reconstitute with
150 μ L 5% acetonitrile in 10 mM ammonium acetate,

pH 4.6 prior to LC-MS-MS analysis

mobile phase (A) 10 mM ammonium acetate,
pH 4.6 (adjusted with acetic acid); and (B) acetonitrile

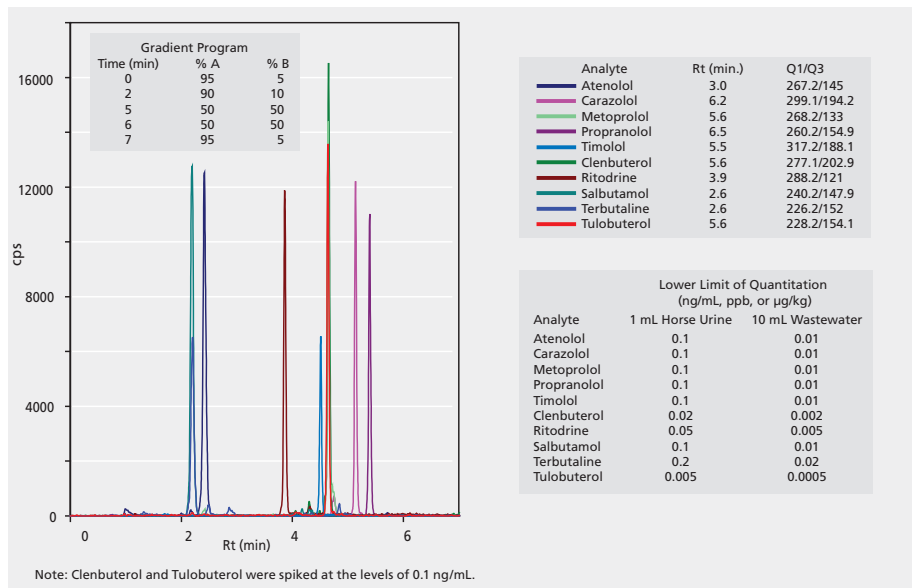
flow rate 0.5 mL/min

column temp. ambient

detector MS/MS, ESI(+)

injection 20 μ L

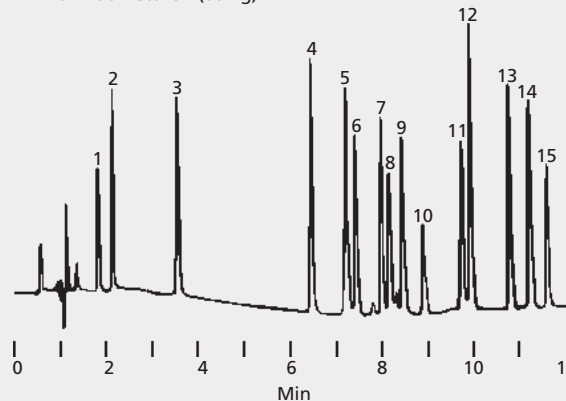
Application No. [G004059](#)



HPLC Analysis of Carbamate and Urea Pesticides on SUPELCOSM LC-8

column SUPELCOSM LC-8, 15 cm × 4.6 mm I.D., 5 μm particles (58220-U)
mobile phase (A) acetonitrile; (B) water
gradient 18:82 to 65:35 in 9 min, hold 3 min
flow rate 2 mL/min
column temp. 35 °C
detector UV, 240 nm
injection 10 μL
Application No. [794-0803](#)

- | | |
|-------------------------|--------------------------|
| 1. Methomyl (80 ng) | 9. Diuron (80 ng) |
| 2. Oxamyl (80 ng) | 10. Propham (80 ng) |
| 3. Fenuron (80 ng) | 11. Siduron (80 ng) |
| 4. Monuron (80 ng) | 12. Linuron (80 ng) |
| 5. Carbofuran (1000 ng) | 13. Chlorpropham (80 ng) |
| 6. Propoxur (800 ng) | 14. Barban (80 ng) |
| 7. Carbaryl (200 ng) | 15. Neburon (80 ng) |
| 8. Fluometuron (80 ng) | |



HPLC Analysis of Metabolites of 7,12-Dimethylbenz[a]anthracene on SUPELCOTM LC-18

column SUPELCOTM LC-18, 25 cm × 4.6 mm I.D., 5 μm particles (58298)
 mobile phase . . (A) methanol:(B) water, (50:50, A:B), 10 min to 100:0 at 2.5% /min
 flow rate 0.8 mL/min
 detector fluorescence
 sample rat liver, 9000 × g supernatant fraction from Aroclor-treated animals
 Application No. 713-1043

- | | |
|--|---|
| 1. 2-OH-DMBA(t-diol) | 11. 7-OHM-12-MBA-4-ol |
| 2. 7-OHM-12-MBA-(t-10,11-diol) | 12. 7-M-12-OHMBA-(3-ol) |
| 3. 7-M-12-OHMBA-(t-8,9-diol) | 13. 7-M-12-OHMBA-2-ol |
| 4. 7-OHM-12-MBA-(t-8,9-diol) | 14. 7-OHM-12-MBA |
| 5. 7-OHM-(t-3,4-diol) | 15. 7-M-12-OHMBA |
| 6. Mixed diols, incl. DMBA-(t-8,9-diol & t-10,11-diol) | 16. DMBA-2-ol |
| 7. Position of 7,12-bis-OHMBA | 17. DMBA-3-ol |
| 8. 7-OHM-12-MBA-2-ol | 18. DMBA-4-ol |
| 9. 7-OHM-12-MBA-(3-ol) | 19. DMBA |
| 10. 7-M-12-OHMNA-4-ol | (parentheses = tentative identifications) |

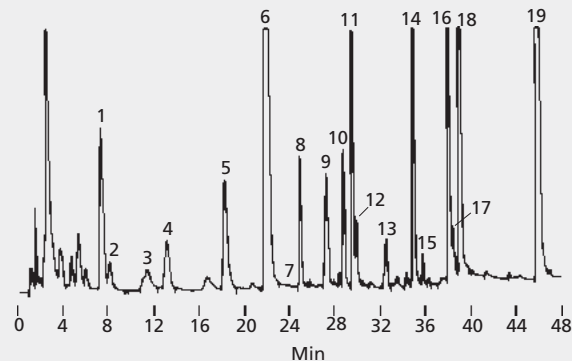
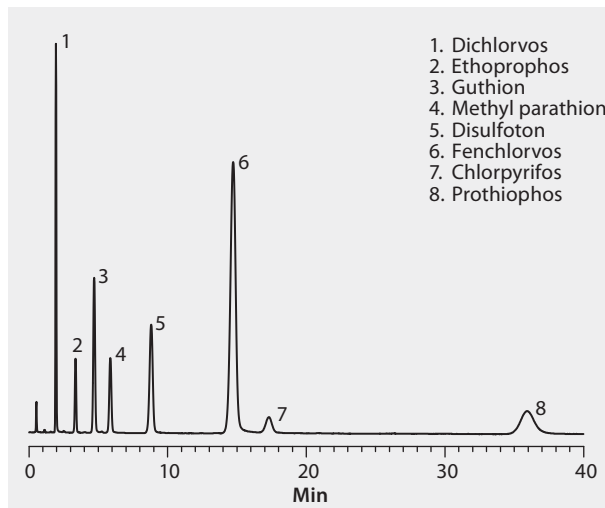


Figure provided by Drs. J. Milner and J. Grunau, University of Illinois, Urbana, Illinois, USA.

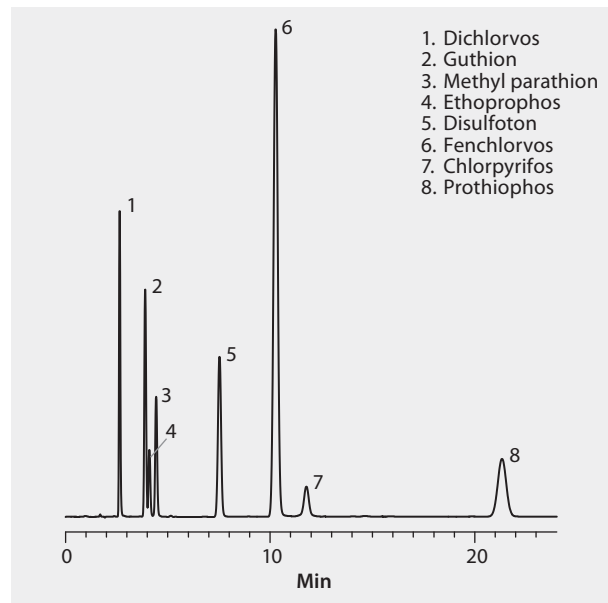
HPLC Analysis of Organophosphorus Pesticides on Discovery® Cyano

column Discovery Cyano, 15 cm × 4.6 mm I.D., 5 µm particles (59356-U)
mobile phase (A) water: (B) acetonitrile, (75:25, A:B)
flow rate 2 mL/min
column temp. 20 °C
detector UV, 214 nm
injection 1 µL
Application No. **G001030**



HPLC Analysis of Organophosphorus Pesticides on Discovery® RP-Amide C16

column . . . Discovery RP-AmideC16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase (A) acetonitrile: (B) water; (60:40, A:B)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 214 nm
injection 1 µL
Application No. **G001031**



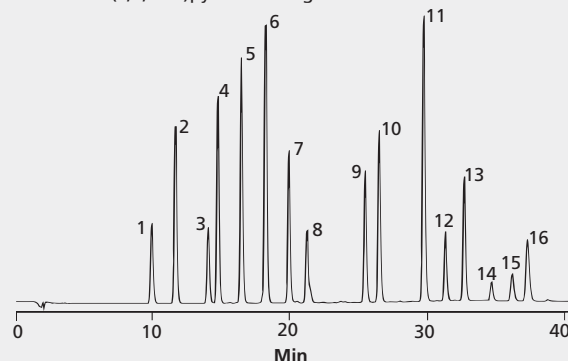
HPLC Analysis of PAHs in Water on SUPELCOSIL™ LC-PAH after SPME using 100 µm PDMS Fiber

sample/matrix 5 µL PAH mix (Cat. No. 4-8743) in 5 mL water
 SPME fiber polydimethylsiloxane, 100 µm (57301)
 extraction immersion, 30 min (rapid stirring)
 desorption process static, 200 µL acetonitrile:water, 40:60, 2 min
 column SUPELCOSIL LC-PAH, 15 cm × 4.6 mm I.D., 5 µm particles (58318)
 gradient 0 min - 50% A; 5 min - 50% A; 30 min - 100% A; 45 min - 100% A
 flow rate 0-2 min: 0.2 mL/min 2-45 min: 1.0 mL/min
 mobile phase (A) acetonitrile:(B) water
 detector UV, 254 nm
 Application No. [796-0086](#)

1. Naphthalene 1,000 ng/mL
2. Acenaphthylene 2,000 ng/mL
3. Acenaphthene 1,000 ng/mL
4. Fluorene 200 ng/mL
5. Phenanthrene 100 ng/mL
6. Anthracene 100 ng/mL
7. Fluoranthene 200 ng/mL
8. Pyrene 100 ng/mL
9. Benzo(a)anthracene 100 ng/mL
10. Chrysene 100 ng/mL
11. Benzo(b)fluoranthene 200 ng/mL
12. Benzo(k)fluoranthene 100 ng/mL
13. Benzo(a)pyrene 100 ng/mL
14. Dibenzo(a,h)anthracene 200 ng/mL
15. Benzo(ghi)perylene 200 ng/mL
16. Indeno(1,2,3-cd)pyrene 100 ng/mL

Gradient Program	
Time (min)	% ACN
0	50
5	50
30	100
45	100

Flow increased at 2.0 min



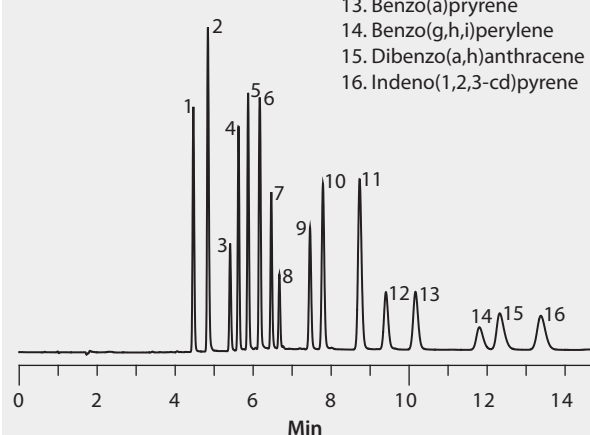
HPLC Analysis of PAHs on SUPELCOSIL™ LC-PAH

PAHs are traditionally evaluated using an acetonitrile/water gradient. Recently customers are looking for alternatives to this method using a methanol/water gradient due to the risk of another acetonitrile shortage, solvent costs, and toxicity to the environment. This analysis demonstrates the separation using a methanol gradient.

column SUPELCOSIL LC-PAH, 15 cm x 4.6 mm I.D., 5 µm particles (58318)
 mobile phase (A) water, (B) methanol
 gradient 55 to 100% B in 5 min; held at 100%B for 10 min
 flow rate 1.5 mL/min
 column temp. 35 °C
 detector UV, 254 nm
 injection 5 µL
 sample EPA 610 mix
 Application No. **G005559**

1. Naphthalene
2. Acenaphthalene
3. Acenaphthene
4. Fluorene
5. Phenanthrene
6. Anthracene

7. Fluoranthene
8. Pyrene
9. Benzo(a)anthracene
10. Chrysene
11. Benzo(b)fluoranthene
12. Benzo(k)fluoranthene
13. Benzo(a)pyrene
14. Benzo(g,h,i)perylene
15. Dibenzo(a,h)anthracene
16. Indeno(1,2,3-cd)pyrene



HPLC Analysis of Paraquat and Diquat on SUPELCOSIL™ LC-18 after SPE using ENVI™-8 DSK

Refer to US EPA Method 549.1 for full details

Sample Pre-treatment:

250 mL drinking water. Adjust water sample to pH to 10.5 ± 0.2 with 10% sodium hydroxide or 10% hydrochloric acid

sample preparation SPE (Solid Phase Extraction)

sample/matrix drinking water adjusted to pH to 10.

sample preparation ENVI-8 DSK, 47 mm (57172)

SPE tube/cartridge ENVI-8 DSK SPE Disk, 47 mm (57172)

condition 10 mL acetonitrile; 2×10 mL reagent water; 10 mL conditioning

solvent A (5 g cetyl trimethyl ammonium bromide and

5 mL conc. ammonium hydroxide in 500 mL DI water, dilute to 1 L);

(2×10 mL reagent water; 10 mL conditioning

solvent B (10 g hexanesulfonic acid, sodium salt and

10 mL conc. ammonium hydroxide in 250 mL DI water, dilute to 500 mL))

sample addition 250 mL water 100 mL/min

elution 0.5-1.0 mL acetonitrile (to cover/solvate disk); 2×4 mL eluting solution

(13.5 mL orthophosphoric acid and 10.3 mL diethylamine

in 500 mL DI water, dilute to 1 L)

column SUPELCOSIL LC-18, 15 cm \times 4.6 mm I.D., 5 μ m particles (58230-U)

mobile phase 3.5 mL triethylamine and 1.0 g 1-hexane-sulfonic acid, sodium salt to

800 mL DI H₂O add orthophosphoric acid to pH 2.5, dilute to 1 L

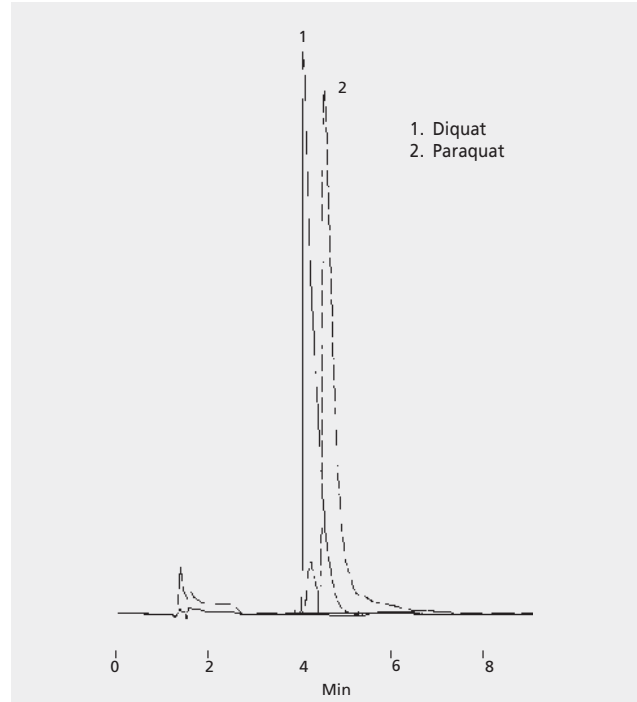
flow rate 1.0 mL/min

column temp. 35 °C

detector photodiode array, diquat - 308 nm, paraquat - 257 nm

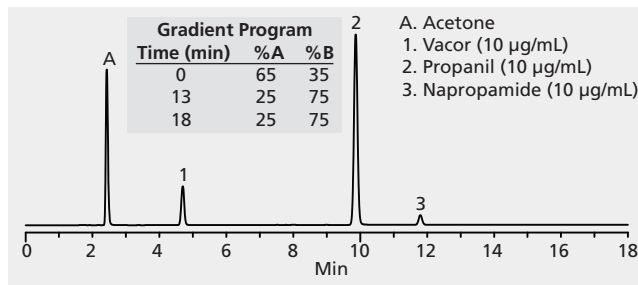
injection 100 μ L

Application No. **794-0715**



HPLC Analysis of Pesticides on Ascentis® C8 (15 cm x 4.6 mm x 5 µm)

column Ascentis C8, 15 cm x 4.6 mm I.D., 5 µm particles (581424-U)
 mobile phase (A) DI water; (B) acetonitrile
 flow rate 1.0 mL/min
 column temp. 35 °C
 detector UV, 254 nm
 injection 100 µL
 sample as indicated in 2.2% 90:10 acetonitrile:acetone in DI water
 Application No. **G003121**



HPLC Analysis of Phenyl Urea Pesticides on Ascentis® Express C18 Phase

This separation illustrates the use of the highly efficient 2.7 µm Ascentis Express Fused-Core C18 stationary phase in the analysis of some popular herbicides. The short run times allow analyses using isocratic conditions so that column equilibration time is not required between runs.

Response Time: 0.02 sec.

Flow Cell: 2.5 µL semi-micro

column . . . Ascentis® Express C18, 10 cm x 4.6 mm I.D., 2.7 µm particles (53827-U)
mobile phase (A) 0.025 M potassium phosphate buffer, adj. to pH = 2.5,
(B) acetonitrile; (50:50, A:B)

flow rate 2.0 mL/min

pressure 300 bar

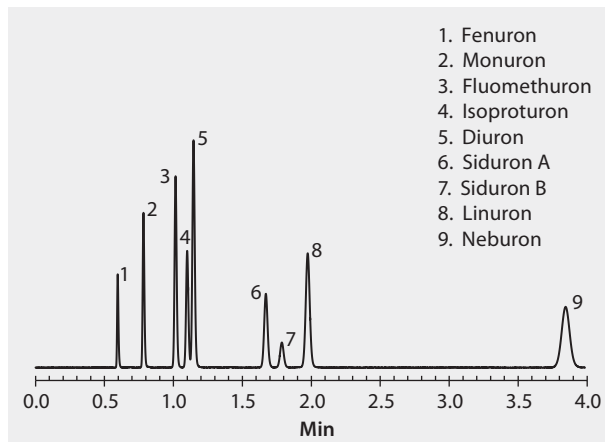
column temp. 30 °C

detector UV 245 nm, VWD

injection 0.5 µL

sample acetonitrile

Application No. [G006189](#)

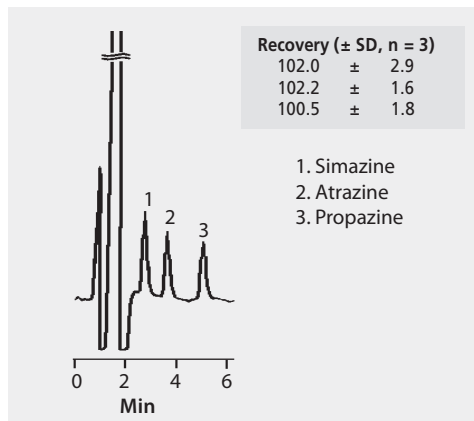


HPLC Analysis of Triazine Herbicides in Grass on SUPELCOSIL™ LC-8-DB after SPE using Supelclean™ LC-SCX

Sample Pre-treatment:

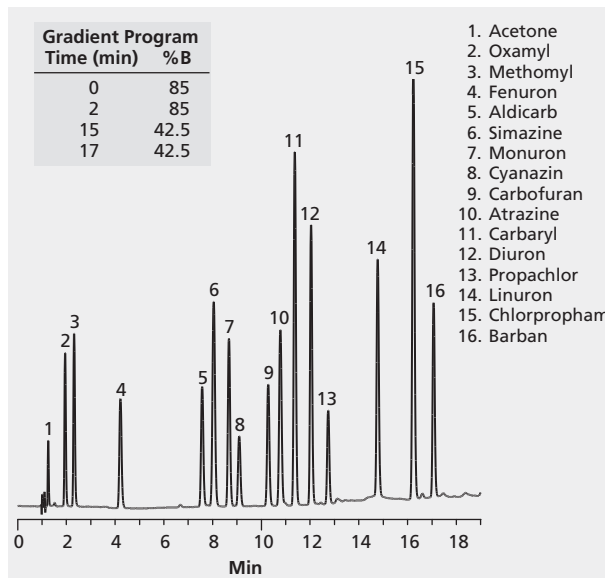
5 g fresh grass clippings spiked with 2 ppm each herbicide. Add 4 g anhydrous sodium sulfate and 20 mL methylene chloride:acetone (80:20). Shake 20 min and allow mixture to stand 1 min.

sample preparation SPE (Solid Phase Extraction)
 sample/matrix fresh grass clippings spiked with herbicides at 2 ppm
 SPE tube/cartridge Supelclean LC-SCX, 500 mg/3 mL (57018)
 condition 1 mL methylene chloride
 sample addition 2 mL grass extract. Wash with 2 x 2 mL acetonitrile.
 drying Dry packing for 5 min. under nitrogen purge
 washing Dry packing for 5 min under nitrogen purge; wash with 2 x 2 mL DI water
 elution 1.5 mL methanol
 eluate post-treatment dilute to 2 mL with DI water
 column SUPELCOSIL LC-8-DB, 15 cm x 4.6 mm I.D.,
 5 µm with guard column (58347)
 mobile phase (A) acetonitrile; (B) water; (45:55, A:B)
 flow rate 1.5 mL/min
 detector UV, 254 nm
 injection 100 µL
 Application No. **84-109**



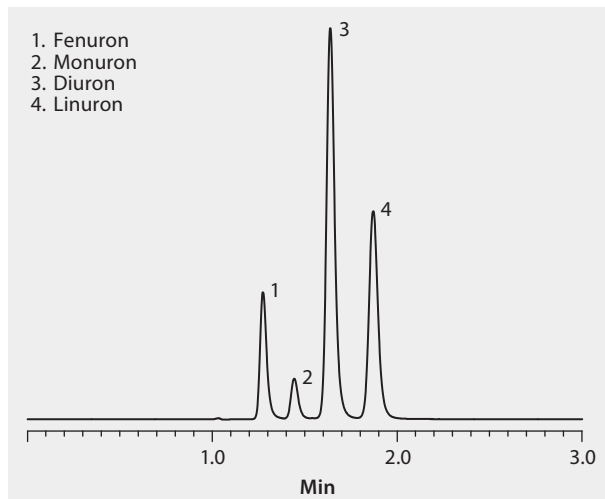
HPLC Analysis of Urea, Carbamate, Triazine, Aniline Pesticides on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
 mobile phase (A) acetonitrile; (B) water
 flow rate 2 mL/min
 column temp. 20 °C
 detector UV, 214 nm
 injection 1 µL
 Application No. **G000948**



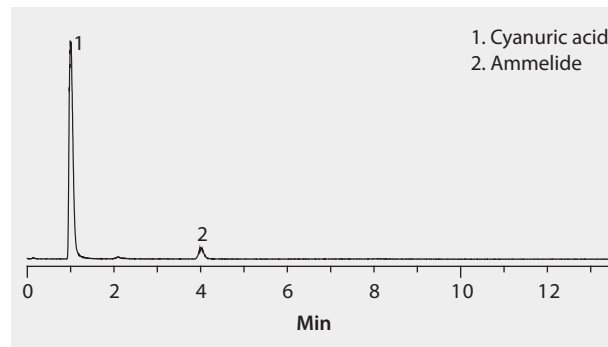
HPLC Analysis of Urea Pesticides on Discovery® Cyano

column Discovery Cyano, 15 cm × 4.6 mm I.D., 5 µm particles (59356-U)
mobile phase (A) water: (B) acetonitrile; (60:40, A:B)
flow rate 2 mL/min
column temp. 20 °C
detector UV, 214 nm
injection 1 µL
Application No. **G001067**



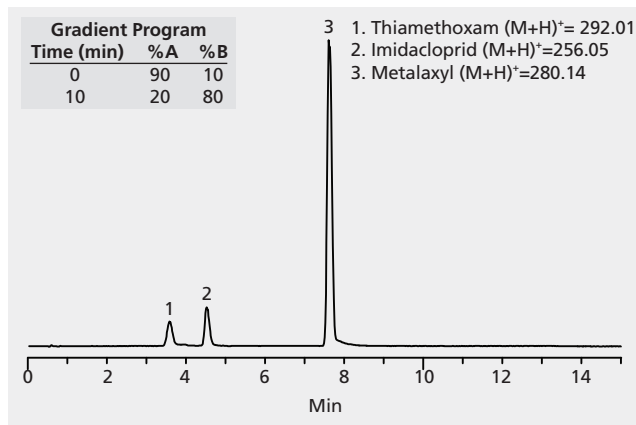
LC-MS Analysis of Cyanuric Acid on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 5 cm x 2.1 mm I.D., 2.7 µm particles (53934-U)
mobile phase 5 mM ammonium formate in 95:5 (v/v) acetonitrile:water
flow rate 0.2 mL/min
pressure 328 psi (22.6 bar)
column temp. 35 °C
detector MS, ESI(-), SIR mode
injection 2 µL
sample 1 µg/mL in mobile phase
Application No. **G005690**



LC-MS Analysis of Pesticides on Ascentis® C18 (5 cm x 2.1 mm x 3 µm)

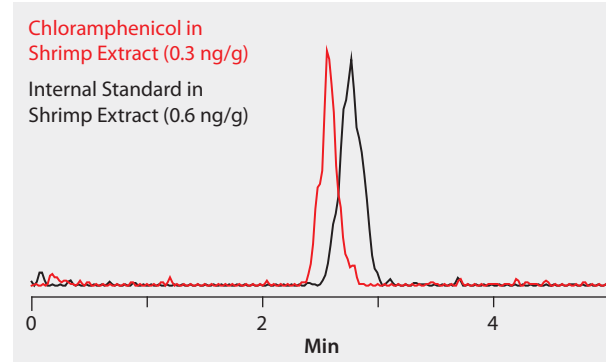
column Ascentis C18, 5 cm x 2.1 mm I.D., 3 µm particles (581300-U)
 mobile phase (A) 0.1% ammonium acetate, pH unadjusted; (B) acetonitrile
 flow rate 0.2 mL/min
 column temp. 35 °C
 detector MS, (+) ESI, Selected Ion Recording Mode
 injection 5 µL
 sample 1 µg/mL each in 90:10 water:acetonitrile
 Application No. **G003130**



LC-MS Analysis of Chloramphenicol in Shrimp on Ascentis® Express C18 Using Z-Sep+ Cleanup

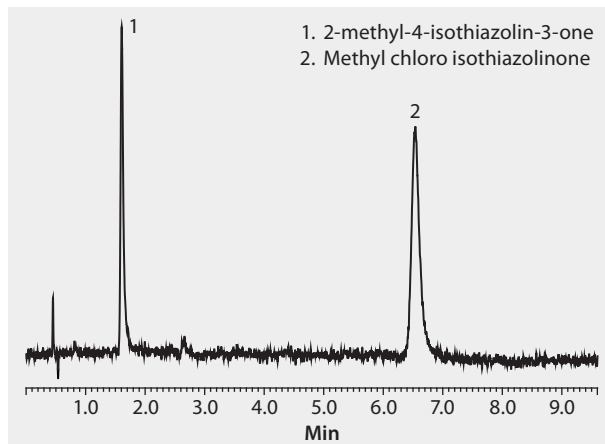
This application demonstrates the superior cleanup associated with Z-Sep+ using QuEChERS approach.

sample preparation	SPE (Solid Phase Extraction)
sample/matrix	1.0 g shrimp
extraction	9 mL acetonitrile, then 90 μ L of formic acid
extraction process	post treatment: 8 mL supernatant evaporated to dryness and reconstituted with 1 mL water
clean-up tube	Supel™ Que Z-Sep+ tube, 12 mL, 500 mg (55296-U)
clean-up process	clean-up volume: 9 mL
column	Ascentis Express C18, 5 cm X 2.1mm, 2.7 μ m particles (53822-U)
mobile phase	(A) Water; (B) Acetonitrile
gradient	15% B for 0.1 min, 15-80% in 1.9 min, held at 80% for 1.5 min, 80-15% in 0.5 min, at 15% for 3 min
flow rate	0.5 mL/min
column temp.	Ambient
detector	MS, ESI(+), MRM, m/z 320.9/151.9, 325.9/157.0
injection	10 μ L
Application No.	G006249



UHPLC Analysis of Kathon on Titan™ C18 Using MS Detection

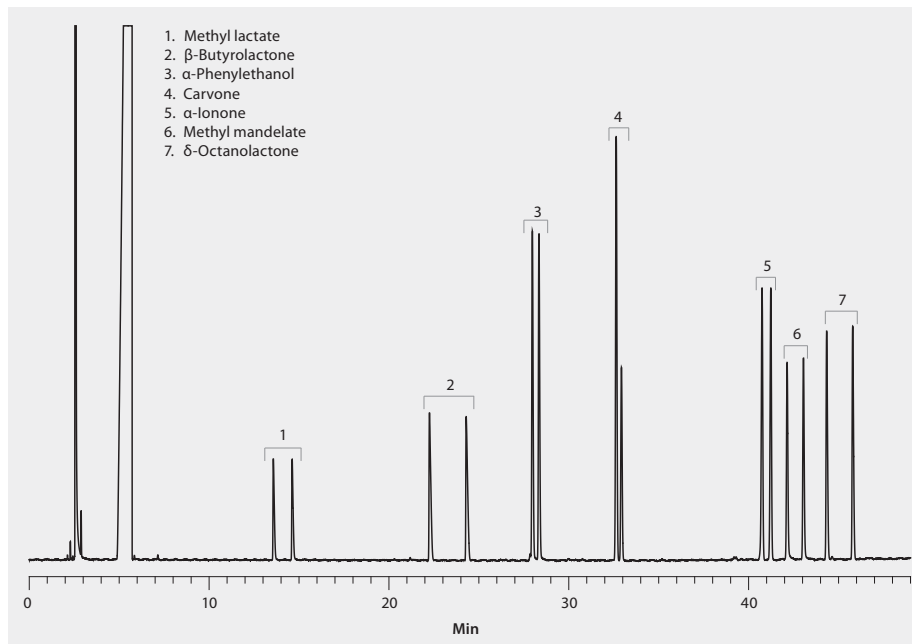
column Titan C18 50 mm x 2.1 mm, I.D, 1.9 µm particles (577122-U)
mobile phase (A) 0.1% formic acid in water (B):methanol
flow rate 500 µL/min
detector MS, ESI (+) MRM TIC
detector Diode Array at 275 nm
injection 1.0 µL
sample Diluted Kathon at 1 ug/ml in 95:5 0.1% formic acid in water::methanol
Application No. [G006148](#)



Flavors and Fragrances

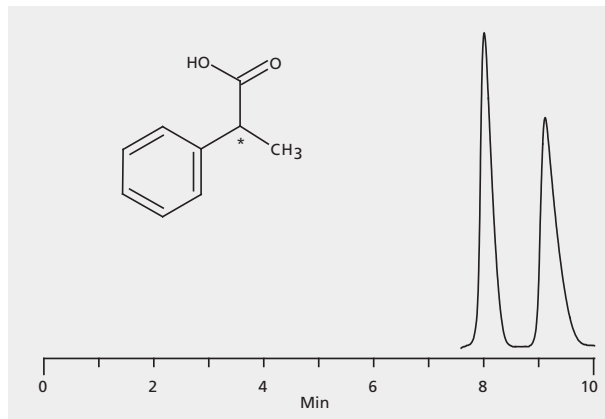
GC Analysis of Volatile Flavor Compound Enantiomers on Astec CHIRALDEX® G-TA

column Astec CHIRALDEX G-TA, 30 m x 0.25 mm I.D., 0.12 μ m (73033AST)
oven 60 $^{\circ}$ C, 2 $^{\circ}$ C/ min to 160 $^{\circ}$ C, hold 20 min
inj. temp. 250 $^{\circ}$ C
detector FID, 250 $^{\circ}$ C
carrier gas helium, 30 cm/sec, set at 75 $^{\circ}$ C
injection 1 μ L, split 100:1
Application No. **G006117**



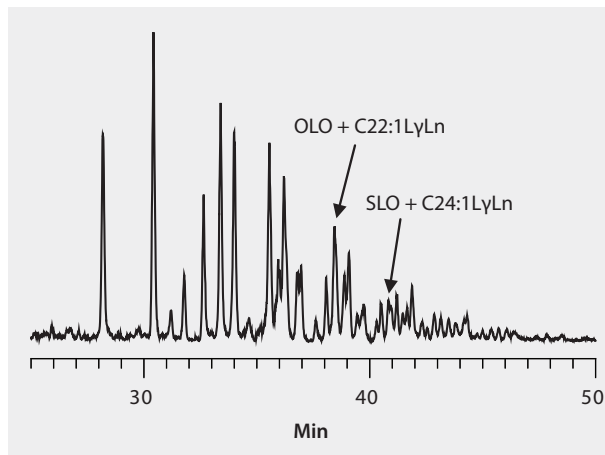
HPLC Analysis of 2-Phenylpropionic Acid Enantiomers on Astec® CYCLOBOND® I 2000 HP-RSP

column CYCLOBOND I 2000 HP-RSP, 25 cm x 4.6 mm I.D.,
5 µm particles (24024AST)
mobile phase . . (A) 10 mM ammonium acetate, pH 4.0; (B) acetonitrile; (75:25, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 235 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004717**



HPLC Analysis of Triacylglycerols (TAG) of Borago Officinalis Oil on Ascentis® Express C18

column . . . Ascentis Express C18, 15 cm x 4.6 mm I.D., 2.7 μ m particles (53829-U)
 mobile phase (A) acetonitrile; (B) isopropyl alcohol
 gradient 0% B held for 50 min; to 70% B in 5 min; to 0% B in 1 min
 flow rate 1 mL/min
 detector MS, APCI(+); mass spectral range, 250-1200 m/z;
 interval, 0.5 s; scan speed, 2143 amu/s; nebulizing gas (N2) flow, 4.0 L/min;
 interface temperature, 400 °C; (heat block, 230 °C;
 desolvation line (DL) temperature, 250 °C; DL voltage, 34 V;
 probe voltage, +4.5 kV; Qarray voltage, 1.0 V;
 RF voltage, 90 V; detection gain, 1.05 kV)
 injection 2 μ L
 sample Borago Officinalis, 40 mg diluted in 10 mL of hexane
 Application No. **G005602**



Food and Beverages

HPLC Analysis of Acrylamide in Fried Potato Chips on Discovery® HS F5 after SPE using Discovery® DSC-MCAX and DSC-18

sample preparation SPE (Solid Phase Extraction)

sample/matrix Finely grind 2.0 g of potato chips, place in 20 mL vial and add 10 mL water. Mix using vortex until mixture forms a thick paste. (Place sample in centrifuge tubes and centrifuge at 16.1 rcf for 5 min. Extract aqueous portion of sample leaving oil layer and solids.)

SPE tube/cartridge Discovery DSC-MCAX, 300 mg/3 mL (52784-U)

SPE tube/cartridge Discovery DSC-18, 1g/6mL (52606-U)

condition connect a Discovery DSC-MCAX SPE tube to the top of a Discovery DSC-18 SPE tube using an SPE tube adapter, pass 1 mL methanol, then 1 mL DI water through both SPE tubes until the tubes are dry

sample addition 1 mL of aqueous extract

washing 1 mL DI water

elution removing upper MCAX SPE tube, pass 2 mL methanol through lower DSC-18 SPE tube

eluate post-treatment evaporate to dryness with nitrogen at 30 °C, reconstitute in 0.5 mL DI water

column Discovery HS F5, 15 cm x 4.6 mm I.D., 3 µm particles (567507-U)

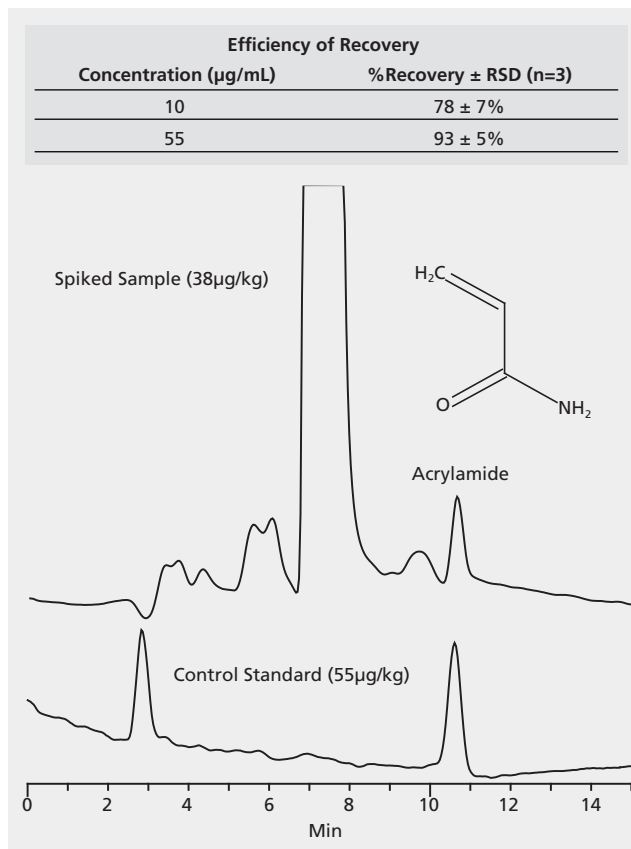
mobile phase 100% ultra-pure water

column temp. 35 °C

detector ESI+

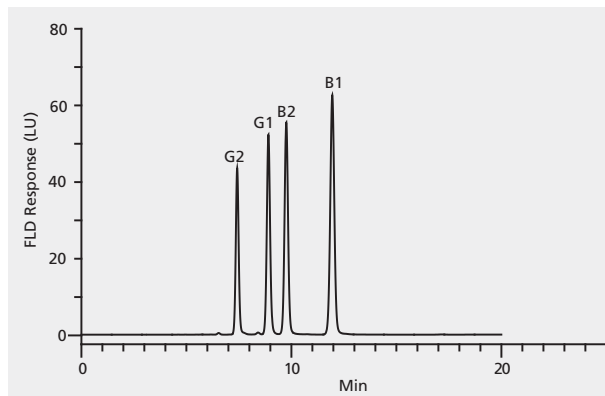
injection 5 µL

Application No. [G003759](#)



HPLC Analysis of Aflatoxin Analogs on Ascentis® C18

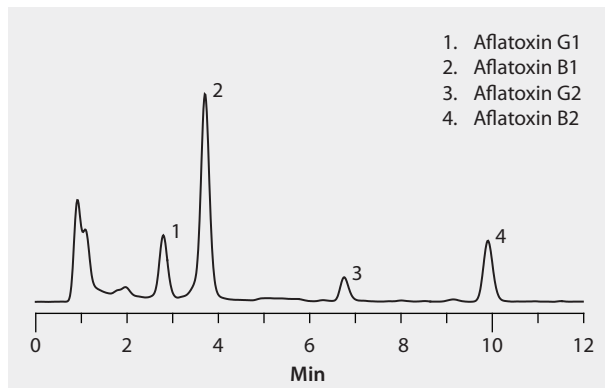
column Ascentis C18, 15 cm × 4.6 mm I.D., 3 μm particles (581322-U)
mobile phase (A) acetonitrile: (B) methanol: (C) water; (20:20:60, A:B:C)
flow rate 1.0 mL/min
column temp. 30 °C or 50 °C
detector fluorescence, 360 nm excitation, 455 nm emission
injection 20 μL
sample Aflatoxin Standard Mix, diluted 1:1 with water
Application No. [G004166](#)



HPLC Analysis of Aflatoxins B1, B2, G1 and G2 in Corn on Ascentis® Express C18 after SPE using Supel™ Tox AflaZea and Fluorescence Detection

Aflatoxins are closely related compounds produced as secondary metabolites of fungi. They are found in grains and nuts like corn, wheat or peanuts. Shown here is a rapid, sensitive method to extract these compounds from corn using SPE cartridges specifically designed for aflatoxins, Supel Tox AflaZea (aflatoxin zearalenone), which removes interferences from grains, feeds, TMR samples, peanuts, peanut products and aqueous solutions. Analysis was via HPLC on Ascentis Express Fused-Core C18 columns.

sample preparation SPE (Solid Phase Extraction)
 sample/matrix 25 g corn meal in 100 mL acetonitrile:water (84:16)
 SPE tube/cartridge Supel™ Tox AflaZea, 6 mL (55314-U)
 sample addition 2 mL
 elution collect sample in 5 mL silanized glass vial
 eluate post-treatment transfer 200 µL sample, add 300 µL TFA derivatization solution (70:20:10 water:TFA:acetic acid), heat in microreactor 20 min at 65 °C, cool, add 580 µL deionized water, vortex
 column Ascentis Express C18, 15 cm x 2.1 mm I.D., 2.7 µm particles (53825-U)
 mobile phase (A) water; (B) acetonitrile; (80:20, A:B)
 flow rate 0.350 mL/min
 pressure 325 psi (22.4 bar)
 column temp. 35 °C
 detector FL, Ex 360 nm, Em 440 nm
 injection 20 µL
 Application No. [G005922](#)



HPLC Analysis of Aflatoxins on Ascentis® Express C18

Aflatoxins are a complex of closely related toxins produced as secondary metabolites of fungi. They are found in grains and nuts such as corn, wheat, or peanuts. They are produced by *aspergillus flavus* and *a. Parasiticus*. Members of the group include aflatoxin b1, aflatoxin b2, aflatoxin g1, aflatoxin g2, aflatoxin m1, and aflatoxin m2.

column . . . Ascentis Express C18, 10 cm x 2.1 mm I.D., 2.7 µm particles (53823-U)
mobile phase (A) water; (B) methanol; (C) acetonitrile; (720:120:120, A:B:C)
containing 0.780 g/L potassium bromide, 230 µL/L nitric acid

flow rate 0.400 mL/min

pressure 4568 psi (315 bar)

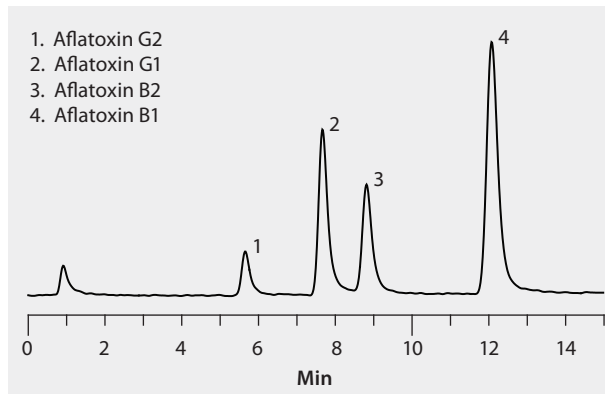
column temp. 35 °C

detector FLD excitation = 360 nm, emission = 440 nm

injection 20 µL

sample 200 µL spiked 84:16 acetonitrile:di water in 880 µL di water,
Spike concentrations: B1 = 16 ppb; B2 = 4 ppb;
G1 = 16 ppb; B2 = 4 ppb

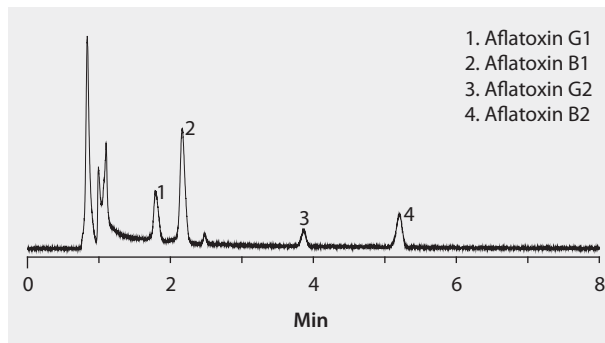
Application No. **G005908**



HPLC Analysis of Aflatoxins on Ascentis® Express C18 with Fluorescence Detection

column . . . Ascentis Express C18, 15 cm x 4.6 mm I.D., 2.7 µm particles (53829-U)
mobile phase (A) water; (B) acetonitrile; (75:25, A:B)
flow rate 2.0 mL/min
pressure 6381 psi (440 bar)
column temp. 35 °C
detector Fluorescence, Ex 360 nm, Em 440 nm
injection 50 µL
sample 200 µL aflatoxin standard in acetonitrile; 0.5 µg/mL B2 and G2;
2 µg/mL B1 and G1; 800 µL delivatization solution: 70% water,
20% TFA and 10% acetic acid
heat for 9 min at 65 °C

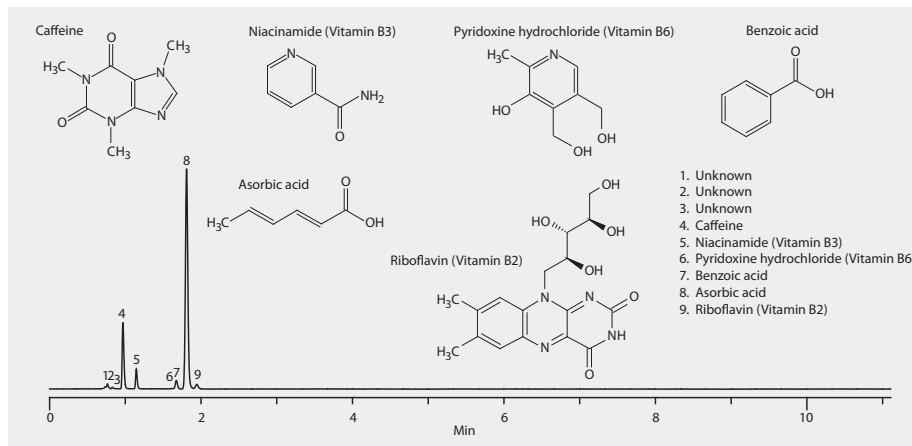
Application No. **G005662**



HPLC Analysis of an Energy Drink on Ascentis® Express HILIC, 10 cm (UV Detection)

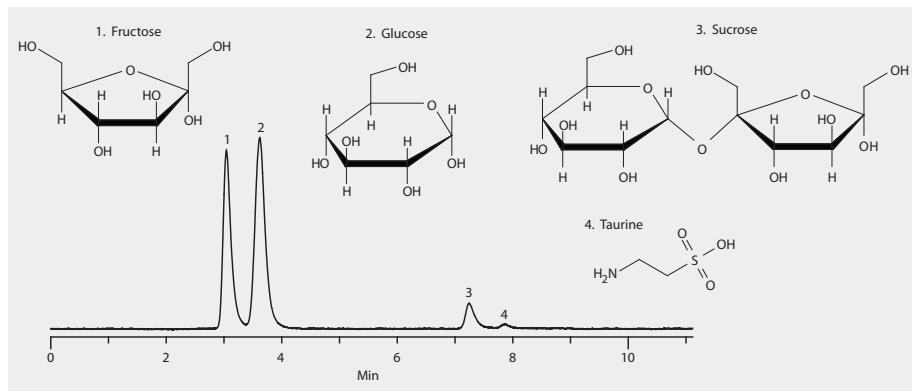
column . . . Ascentis Express HILIC, 5 cm x 3 mm I.D., 2.7 µm particles (53967-U)
 mobile phase . . . (A) 100 mM ammonium acetate, pH 5 (titrated with acetic acid);
 (B) water; (C) acetonitrile; (9:1:90, A:B:C)

flow rate 0.6 mL/min
 column temp. 35 °C
 detector UV, 254 nm
 injection 2 µL
 sample Energy Drink Diluted 1:9 in acetonitrile
 Application No. **G005387**



HPLC Analysis of an Energy Drink on Ascentis® Express HILIC (ELSD Detection)

column . . . Ascentis Express HILIC, 5 cm x 3 mm I.D., 2.7 µm particles (53967-U)
 mobile phase (A) 100 mM ammonium acetate, pH 5 (titrated with acetic acid) (B) water (C) acetonitrile; (9:1:90, A:B:C)
 flow rate 0.6 mL/min
 column temp. 35 °C
 detector ELSD, 55° C, 3.5 bar nitrogen
 injection 2 µL
 sample Energy Drink Diluted 1:9 in acetonitrile
 Application No. **G005388**



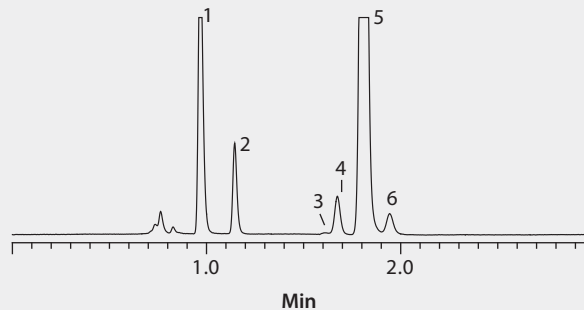
HPLC Analysis of an Energy Drink on Ascentis® Express HILIC (UV Detection)

This application demonstrates the suitability of Ascentis Express HILIC for the efficient separation of common drink additives used in caffeinated energy drinks. The analysis was performed with UV and ELSD detectors in series, this chromatogram being from the UV.

column . . . Ascentis Express HILIC, 10 cm x 3.0 mm I.D., 2.7 µm particles (53970-U)
mobile phase (A) 100 mM ammonium acetate, pH 5.0 with acetic acid;
(B) water; (C) acetonitrile; (09:01:90, A:B:C)

flow rate 0.6 mL/min
pressure 812 psi (56 bar)
column temp. 35 °C
detector UV, 254 nm
injection 2 µL
sample Dilute 1:9 in acetonitrile
Application No. [G005753](#)

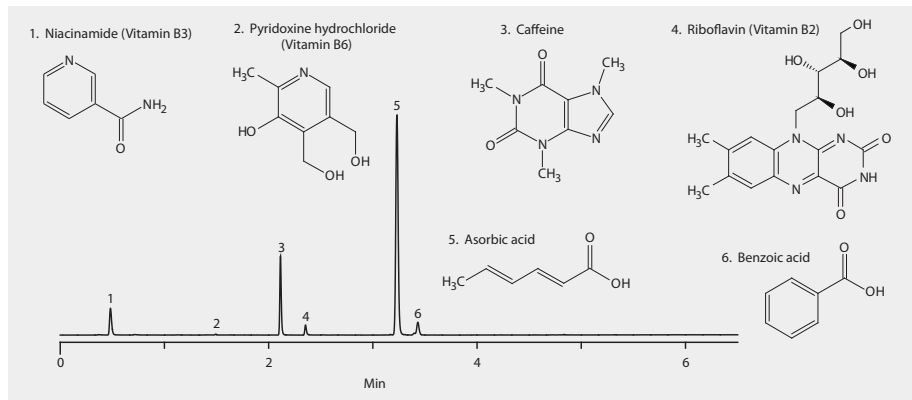
1. Caffeine
2. Niacinamide (Vitamin B3)
3. Pyridoxine hydrochloride (Vitamin B6)
4. Benzoic acid
5. Sorbic acid
6. Riboflavin (Vitamin B2)



HPLC Analysis of an Energy Drink on Ascentis® Express RP-Amide (UV detection)

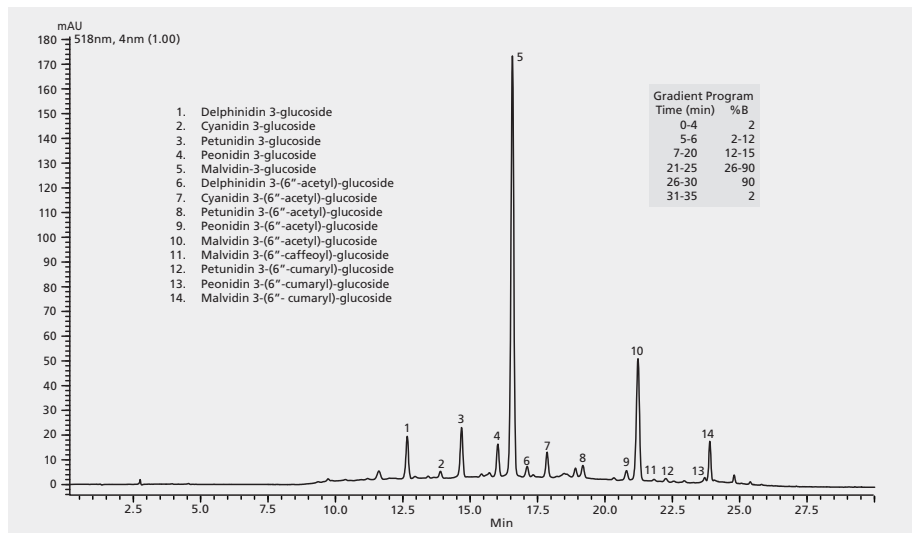
This application demonstrates the suitability of Ascentis Express RP-Amide for the efficient separation of common drink additives used in caffeinated energy drinks.

column . . . Ascentis Express RP-Amide, 5 cm x 3 mm I.D., 2.7 μm particles (53916-U)
 mobile phase (A) water with 0.1% TFA; (B) acetonitrile with 0.1% TFA
 flow rate 0.6 mL/min
 pressure 1146 psi (79 bar)
 column temp. 35 °C
 detector UV, 254 nm
 injection 2 μL
 sample Energy Drink Diluted 1:9 in acetonitrile
 Application No. [G005389](#)



HPLC Analysis of Anthocyanins in Red Wine on Ascentis® C18

column Ascentis C18, 25 cm × 4.6 mm I.D., 5 µm particles (581325-U)
 mobile phase . . (A) water:formic acid (9:1), (B) acetonitrile:water:formic acid (5:4:1)
 flow rate 1 mL/min
 column temp. 25 °C
 detector VIS, 518 nm
 injection 10 µL
 sample red wine diluted with water, centrifuged
 and passed through a 0.45 µm filter
 Application No. **G003922**

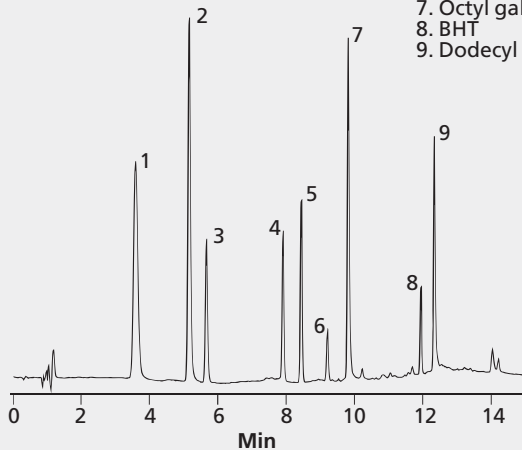


HPLC Analysis of Antioxidants on SUPELCOSIL™ LC-18

column SUPELCOSIL LC-18, 15 cm × 4.6 mm I.D., 5 µm particles (58230-U)
 mobile phase . . . (A) 5% acetic acid in deionized water; (B) acetonitrile:methanol (1:1)
 70% A/30% B to 100% B, linear gradient over 10 min, hold 10min
 flow rate 2 mL/min
 detector UV, 280 nm
 injection 10µL, 20 µg/mL each antioxidant
 Application No. [795-0438](#)

Gradient Program Time (min)	%A	%B
0	70	30
10	0	100
20	70	30

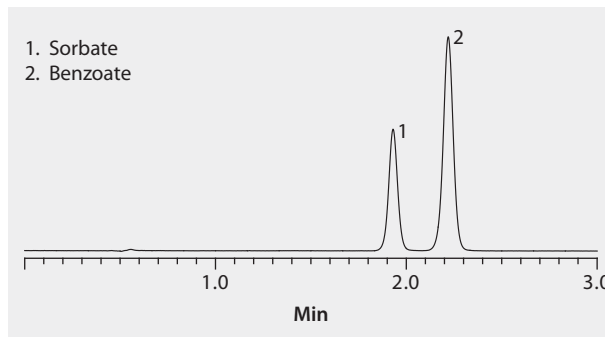
1. Propyl gallate
2. THBP
3. TBHQ
4. NDGA
5. BHA
6. Ionox 100
7. Octyl gallate
8. BHT
9. Dodecyl gallate



HPLC Analysis of Benzoate and Sorbate on Ascentis® Express RP-Amide

This application demonstrates the suitability of Ascentis Express RP-Amide for the efficient separation of sorbate and benzoate.

column . . . Ascentis Express RP-Amide, 5 cm x 3 mm I.D., 2.7 µm particles (53916-U)
mobile phase (A) 10 mM ammonium phosphate monobasic,
pH 2.5 with phosphoric acid; (B) ethanol; (75:25, A:B)
flow rate 0.4 mL/min
column temp. 35 °C
detector UV, 215 nm
injection 1 µL
sample 50 mg/L each
Application No. [G005672](#)



HPLC Analysis of Beverage Additives in Diet Cola on Ascentis® Express C18

This application demonstrates the suitability of Ascentis Express C18 for the efficient separation of common drink additives used in diet soda.

column . . . Ascentis Express C18, 10 cm x 3.0 mm I.D., 2.7 µm particles (53814-U)

mobile phase (A) 20 mM ammonium acetate, pH 4.7 with acetic acid; (B) acetonitrile; (90:10, A:B)

flow rate 0.6 mL/min

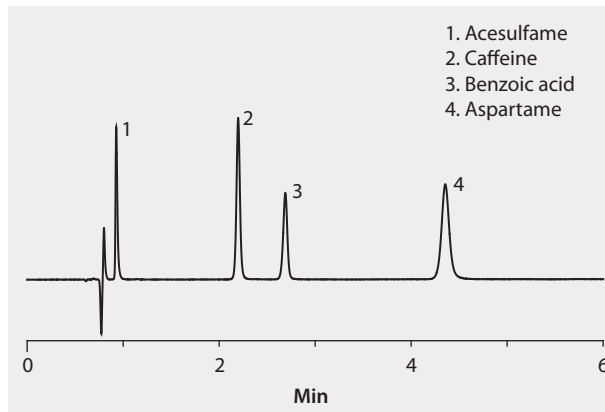
column temp. 40 °C

detector UV, 214 nm

injection 1 µL

sample 100 - 500 µg/mL in 95:5, buffer: acetonitrile

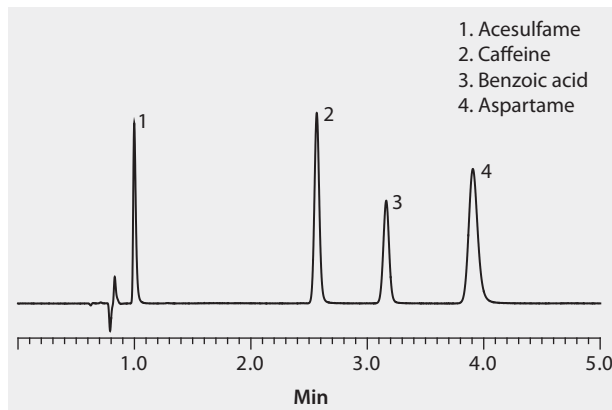
Application No. **G005677**



HPLC Analysis of Beverage Additives in Diet Cola on Ascentis® Express RP-Amide

This application demonstrates the suitability of Ascentis Express RP-Amide for the efficient separation of common drink additives used in diet cola.

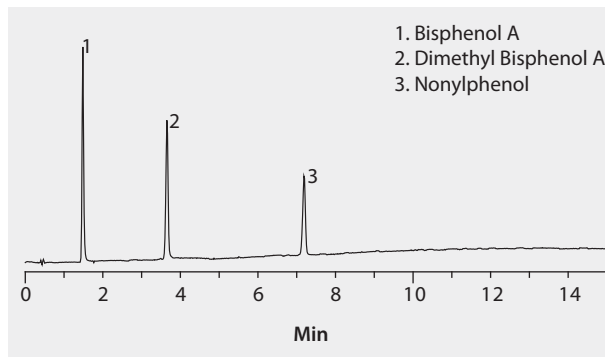
column Ascentis Express RP-Amide, 10 cm x 3.0 mm I.D.,
2.7 µm particles (53918-U)
mobile phase (A) 20 mM ammonium acetate, pH 4.7 with acetic acid;
(B) acetonitrile; (92:8, A:B)
flow rate 0.6 mL/min
column temp. 40 °C
detector UV, 214 nm
injection 1 µL
sample 500 - 1000 µg/mL in 95:5, buffer: acetonitrile
Application No. **G005678**



HPLC Analysis of Bisphenol A, Dimethylbisphenol A and Nonylphenol on Ascentis® Express RP-Amide (UV Detection)

This application demonstrates the suitability of Ascentis Express C18 for the efficient separation of milk thistle related compounds

column . . . Ascentis Express RP-Amide, 5 cm x 4.6 mm I.D., 2.7 µm particles (53922-U)
mobile phase (A) water; (B) acetonitrile
gradient 50 to 100% B in 10 min
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 280 nm
injection 10 µL
sample 50 mg/L of each in 50:50, water: acetonitrile
Application No. [G005681](#)



HPLC Analysis of Caffeine and Taurine on Ascentis® Express HILIC Column using Evaporative Light Scattering Detection (ELSD)

This application demonstrates the suitability of Ascentis Express HILIC for the efficient separation of caffeine and taurine. Elution is by aqueous normal phase (ANP) as an increase in organic will increase retention.

column . . . Ascentis Express HILIC, 5 cm x 3.0 mm I.D., 2.7 µm particles (53967-U)

mobile phase (A) 100 mM ammonium formate, pH 3.0 with formic acid;
(B) acetonitrile; (10:90, A:B)

flow rate 0.6 mL/min

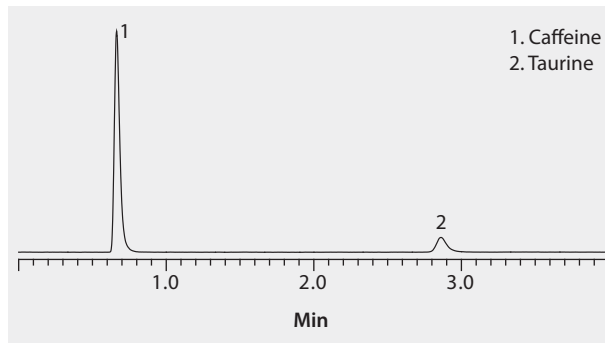
column temp. 25 °C

detector ELSD, 55 °C, 3.5 bar nitrogen

injection 2 µL

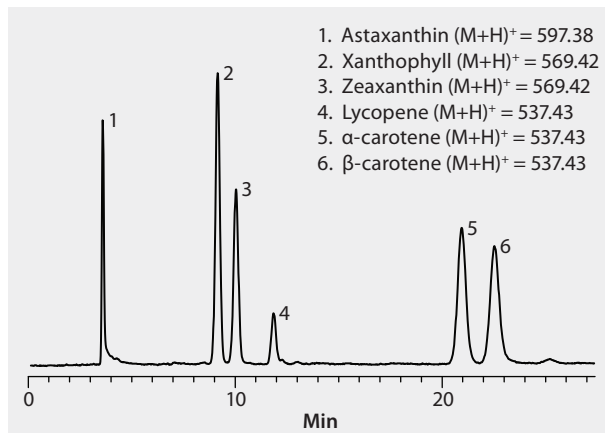
sample 1000 µg/mL in 10:90, water: acetonitrile

Application No. [G005682](#)



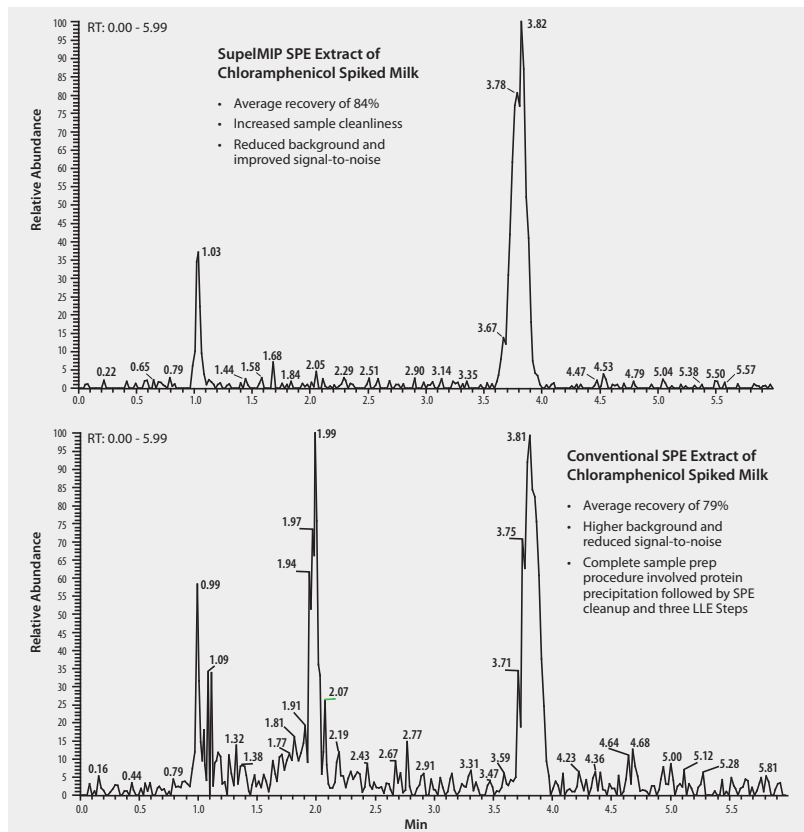
HPLC Analysis of Carotene Compounds on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase 100% acetonitrile
flow rate 1.0 mL/min
column temp. 35 °C
detector MS, ESI(+) in selective ion monitoring (SIR) mode
injection 5 µL
sample 10 µg/mL each in 100% acetonitrile
Application No. **G003138**



HPLC Analysis of Chloramphenicol in Milk on Ascentis® C18 after SPE using SupelMIP® SPE-Chloramphenicol

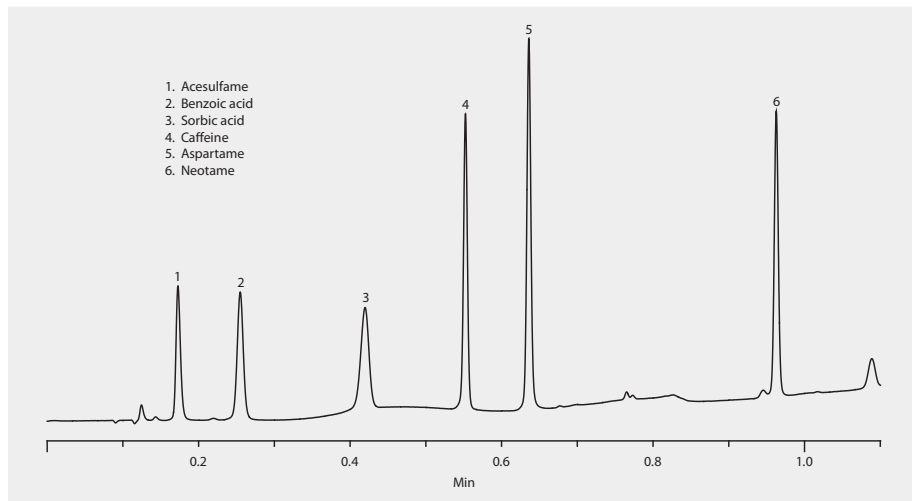
sample preparation SPE (Solid Phase Extraction)
 sample addition whole pasteurized milk spiked with chloramphenicol
 at 15 ng/mL and 38 ng/mL
 SPE tube/cartridge SupelMIP SPE - Chloramphenicol, 25 mg/10mL (LRC) (53210-U)
 condition 1 mL methanol; 1 mL DI water
 sample addition 1 mL
 washing 2 x 1 mL MS-grade water, 1 mL 5% acetonitrile in 0.5% acetic acid,
 2 x 1 mL MS-grade water, 1 mL 20% acetonitrile in 1% ammonium
 hydroxide. (dry SPE tubes for 15 min. under gentle vacuum;
 3 x 1 mL dichloromethane; dry SPE tubes for 1 min. under gentle vacuum)
 elution elute chloramphenicol with 2 x 1 mL methanol:acetic acid:MS-grade
 water (89:1:10, v/v/v)
 eluate post-treatment evaporate combined eluate to dryness at 50 °C under
 nitrogen. reconstitute in 150 mL LC mobile phase prior to LC-MS analysis
 column Ascentis C18, 2.1 mm x 10 cm I.D., 3 µm particles (581301-U)
 mobile phase (A) 100 mM ammonium acetate: (B) MS-grade water:
 (C) acetonitrile (10:60:30, A:B:C)
 flow rate 0.2 mL/min
 column temp. 35 °C
 detector MS, ESI(-), 320-323 m/z range
 injection 5 µL
 Application No. **G004433**



HPLC Analysis of Diet Soda Additives on Ascentis® Express C18

This application demonstrates the suitability of Ascentis Express C18 for the efficient separation of common drink additives used in diet cola.

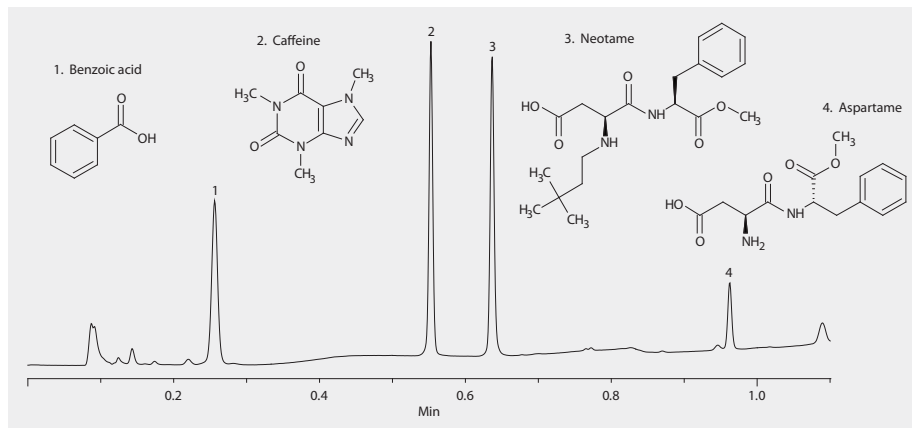
column . . . Ascentis Express C18, 3 cm x 4.6 mm I.D., 2.7 µm particles (53818-U)
mobile phase 20% A constant; 75 to 20% B, 5 to 60% C in 1 min;
held at 20% B, 60% C for 0.1 min
pressure 3191 psi (220 bar)
flow rate 3 mL/min
column temp. 40 °C
detector UV, 214 nm
injection 1 µL
sample (Diet Soda 100 - 500 µg/mL in buffer)
Application No. **G005392**



HPLC Analysis of Diet Soda Spiked with Neotame on Ascentis® Express C18

This application demonstrates the suitability of Ascentis Express C18 for the efficient separation of common drink additives used in diet soda.

column . . . Ascentis Express C18, 3 cm x 4.6 mm I.D., 2.7 μm particles (53818-U)
 mobile phase (A) 100 mM ammonium acetate,
 pH 5.6 (titrated with acetic acid); (B) water; (C) acetonitrile
 gradient 20% A constant; 75 to 20% B, 5 to 60% C in 1 min;
 held at 20% B, 60% C for 0.1 min
 flow rate 3 mL/min
 pressure 3191 psi (220 bar)
 column temp. 40 °C
 detector UV, 214 nm
 injection 1 μL
 sample neotame 350 μg/mL in diet cola
 Application No. [G005390](#)

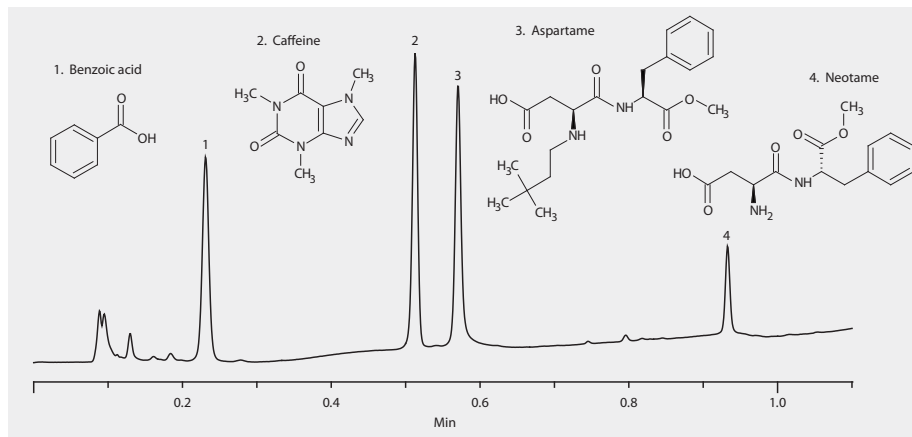


HPLC Analysis of Diet Soda Spiked with Neotame on Ascentis® Express RP-Amide

This application demonstrates the suitability of Ascentis Express RP-Amide for the efficient separation of common drink additives used in diet cola.

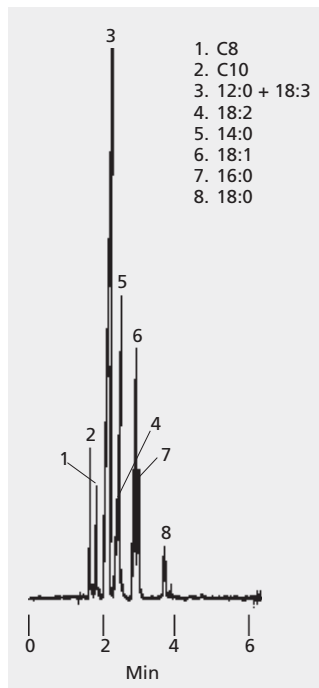
column . . . Ascentis Express RP-Amide, 3 cm x 4.6 mm I.D., 2.7 µm particles (53921-U)
 mobile phase (A) 100 mM ammonium acetate,
 pH 5.6 with acetic acid; (B) water; (C) acetonitrile
 gradient 20% A constant; 75 to 20% B, 5 to 60% C in 1 min;
 held at 20% B, 60% C for 0.1 min

flow rate 3 mL/min
 pressure 3336 psi (230 bar)
 column temp. 40 °C
 detector UV, 214 nm
 injection 1 mL/min
 sample diet soda spiked with neotame 350 µg/mL
 Application No. **G005391**



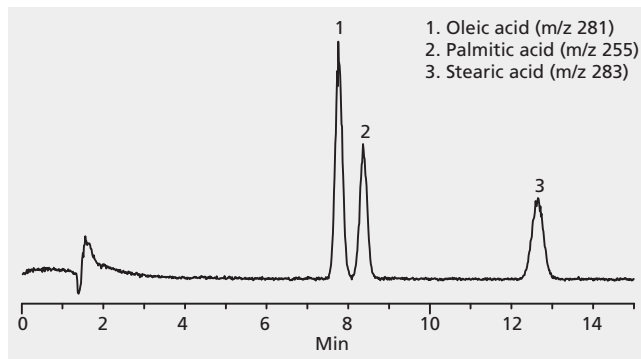
HPLC Analysis of Fatty Acid Methyl Esters (FAMES) on SUPELCOSIL™ LC-18

column SUPELCOSIL LC-18, 25 cm × 4.6 mm I.D., 5 μm particles (58298)
mobile phase (A) acetonitrile; (B) acetone; (59.0:41.0, v/v, A:B)
flow rate 1 mL/min
detector RI
injection 10 μL of 9% C8 to C18 saturated and unsaturated FAMES in mobile phase
Application No. [797-0501](#)



HPLC Analysis of Fatty Acids on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 0.1% formic acid in water; (B) acetonitrile; (5:95, A:B)
flow rate 1.0 mL/min., split to detector
column temp. 35 °C
detector ESI(-)
injection 5 µL
sample 10 µg/mL in acetonitrile
Application No. [G002905](#)



HPLC Analysis of Flavonoids in Lime Juice on Ascentis® Express C18

Flavonoids are polyphenolic compounds ubiquitous in nature and classified, according to their chemical structure, into flavonols, flavones, flavanones, isoflavones, catechins, anthocyanidins and chalcones. They are widely present in fruits, vegetables, leaves, nuts, seeds, bark and beverages (tea, coffee, beer, wine and fruit drinks).

sample preparation SPE (Solid Phase Extraction)

sample/matrix . . . lime juice hand-squeezed in laboratory, centrifuged and filtered through a 0.45 µm nylon filter disc (Acrodisc)

column . . . Ascentis Express C18, 5 cm x 4.6 mm I.D., 2.7 µm particles (53826-U)

mobile phase (A) water/formic acid (99.9:0.1);

(B) water/acetonitrile/isopropanol/formic acid (39.9:20:40:0.1)

gradient 10% B for 3 min; 10 to 34% B in 30 min; 34 to 100% B in 1 min; held at 100% B for 6 min; 100 to 10% B in 1 min

flow rate 0.8 mL/min

column temp. ambient

detector PDA: 190–370 nm; chromatogram extracted at 283 nm

detector ESI-MS: mass spectral range, 250–700 m/z; interval, 0.5 s;

scan speed, 938 amu/s; nebulizing gas (N₂) flow, 1.5 L/min;

(interface temperature, 350 °C; heat block, 300 °C;

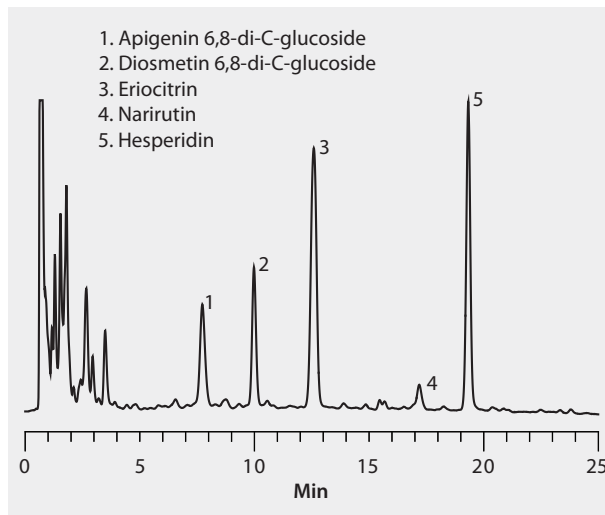
desolvation line (DL) temperature, 300 °C; DL voltage, 34 V;

probe voltage, +4.5 kV; Qarray voltage, 1.0 V; RF voltage, 90 V;

detection gain, 1.05 kV)

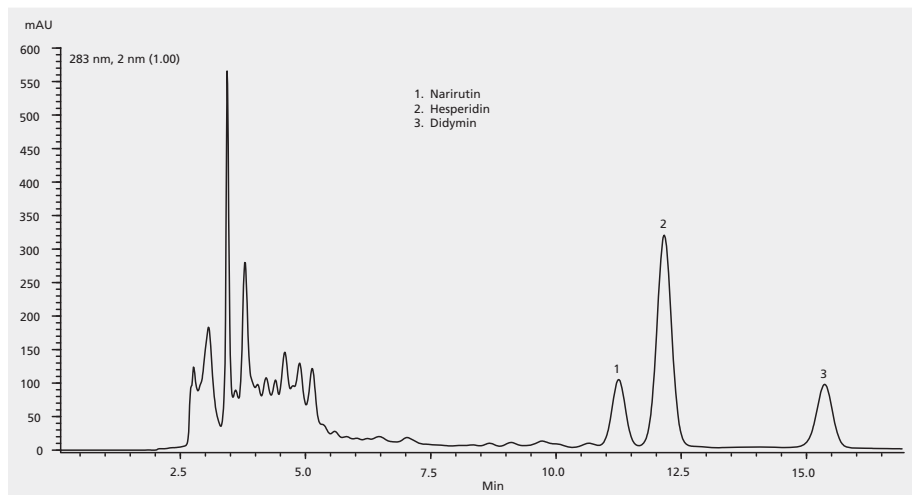
injection 2 µL

Application No. **G005593**



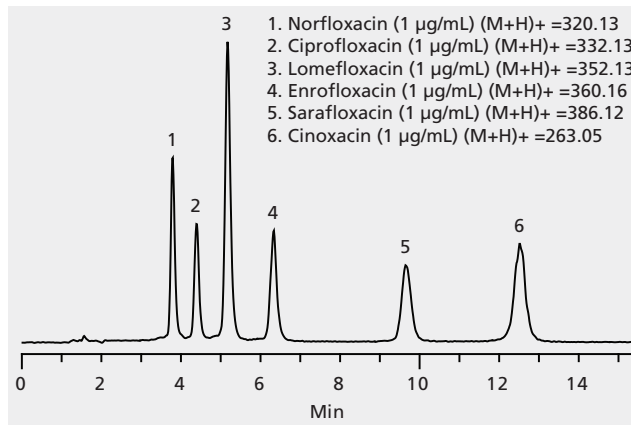
HPLC Analysis of Flavonoids in Orange Juice on Ascentis® C18

column Ascentis C18, 25 cm × 4.6 mm I.D., 5 µm particles (581325-U)
mobile phase (A) formic acid: (B) 2-propanol:
(C) acetonitrile: (D) water (0.1:10:12:78, A:B:C:D)
flow rate 0.8 mL/min
column temp. 25 °C
detector PDA, 283 nm
injection 10 µL
sample orange juice, passed through a 0.45 µm filter
Application No. **G003936**



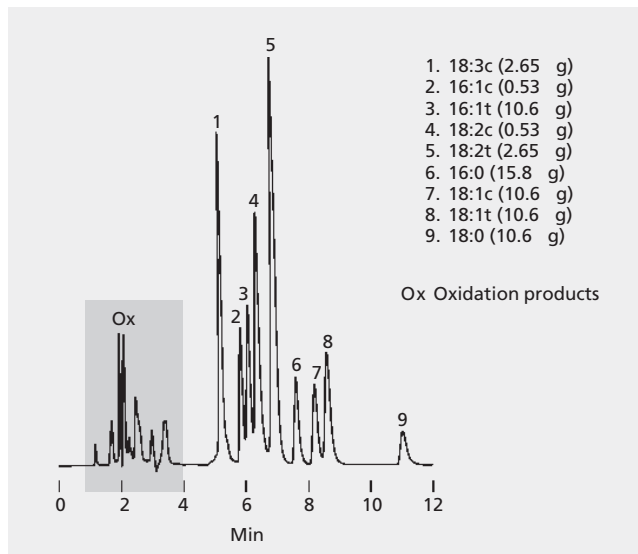
HPLC Analysis of Fluoroquinolone Antibiotics on Ascentis® Phenyl

column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase (A) 13 mM ammonium formate (pH 3.0 with concentrated formic acid); (B) acetonitrile; (80:20, A:B)
flow rate 1 mL/min, split to the MS
column temp. 35 °C
detector MS, ESI (+) in selected ion recording (SIR) mode
injection 5 µL
sample as indicated in 80:20, 13 mM ammonium formate (pH 3.0 with concentrated formic acid):acetonitrile
Application No. **G003713**



HPLC Analysis of Free Fatty Acids on SUPELCOSIL™ LC-8

column SUPELCOSIL LC-8, 15 cm × 4.6 mm I.D., 3 μm particles (58983)
 mobile phase acetonitrile:tetrahydrofuran: 0.1% phosphoric acid (50.4:21.6:28)
 flow rate 1 mL/min
 column temp. 35 °C
 detector UV, 215 nm
 injection 10 μL
 Application No. **713-0969**



HPLC Analysis of Fusarium Mycotoxins on Ascentis® Express Phenyl-Hexyl

The trichothecene vomitoxins of *Fusarium* are significant plant pathogens of grain and forage crops that can lead to anorexic effects with livestock. This application demonstrates resolution of deoxynivalenol and three of its analogs.

column Ascentis Express Phenyl-Hexyl, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53336-U)

mobile phase (A) water, acetonitrile, 90:10; (B) acetonitrile

gradient 0% B held for 0.5 min; to 15% B in 1 min; held at 15% B for 6 min

flow rate 0.3 mL/min

pressure 192 bar (2780 psi)

column temp. 30 °C

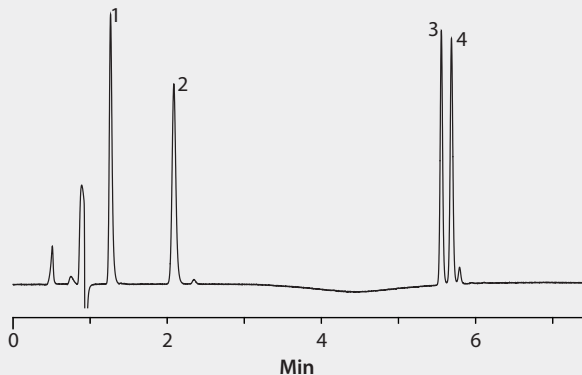
detector UV, 218 nm

injection 10 µL

sample 5 mg/L ea. in 95:5, water:acetonitrile

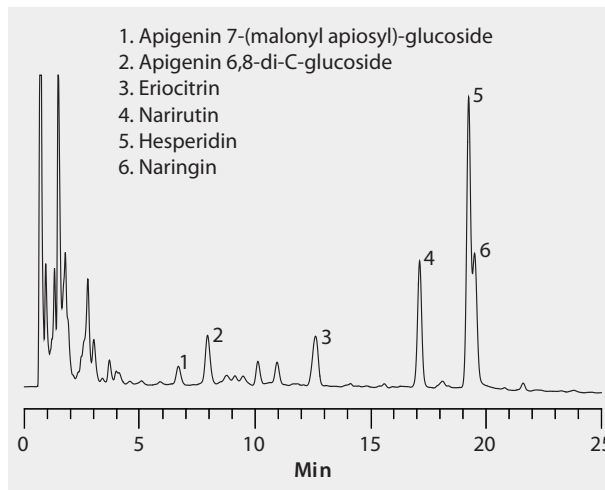
Application No. **G005539**

1. Nivalenol
2. Deoxynivalenol
3. 15-Acetyldeoxynivalenol
4. 3-Acetyldeoxynivalenol



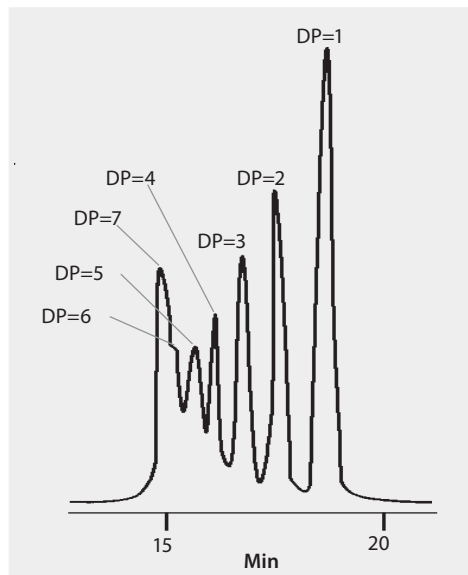
HPLC Analysis of Grapefruit Juice on Ascentis® Express C18 Column

sample preparation SPE (Solid Phase Extraction)
 sample/matrix grapefruit juice hand-squeezed in laboratory, centrifuged
 and filtered through a 0.45 µm nylon filter disc (Acrodisc)
 column Ascentis Express C18, 5 cm x 4.6 mm I.D., 2.7 µm particles (53826-U)
 mobile phase (A) water/formic acid (99.9:0.1);
 (B) water/acetonitrile/isopropanol/formic acid (39.9:20:40:0.1)
 gradient 10% B for 3 min; 10 to 34% B in 30 min; 34 to 100% B in 1 min;
 held at 100% B for 6 min; 100 to 10% B in 1 min
 flow rate 0.8 mL/min
 column temp. ambient
 detector PDA: 190–370 nm; chromatogram extracted at 283 nm
 detector ESI-MS: mass spectral range, 250–700 m/z; interval, 0.5 s;
 scan speed, 938 amu/s; nebulizing gas (N2) flow, 1.5 L/min;
 interface temperature, 350 °C; (heat block, 300 °C;
 desolvation line (DL) temperature, 300 °C; DL voltage, 34 V;
 probe voltage, +4.5 kV; Qarray voltage, 1.0 V; RF voltage, 90 V;
 detection gain, 1.05 kV.)
 injection 2 µL
 Application No. **G005592**



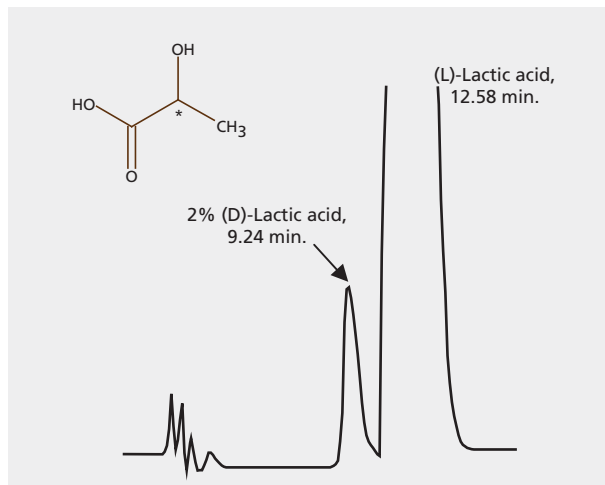
HPLC Analysis of Hydrolyzed β -Cyclodextrin on TSKgel® G-Oligo-PW

column TSKgel G-Oligo-PW, 30 cm \times 7.8 mm I.D., 6 μ m particles (808031)
mobile phase distilled water
flow rate 1 mL/min
column temp. 60 °C
detector RI
Application No. [713-0917](#)



HPLC Analysis of Lactic Acid Enantiomers on Astec® CLC-L, Trace Level Detection

column Astec CLC-L, 15 cm x 4.6 mm I.D., 5 µm particles (53123AST)
mobile phase 5 mM copper sulfate
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
sample 5 mg/mL in water
Application No. [G004663](#)

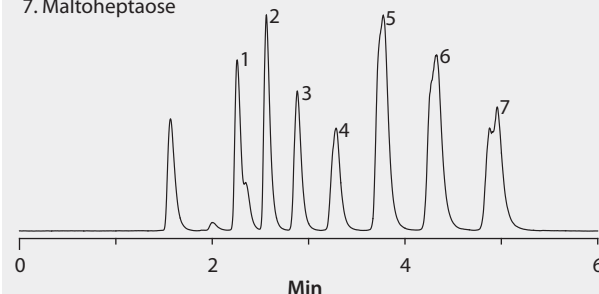


HPLC Analysis of Mannose and Maltose Sugars on Ascentis® Express HILIC

This application demonstrates the suitability of the Ascentis Express HILIC for the analysis of sugars. Structures along with the optimized chromatogram obtained on the Ascentis Express HILIC are presented. Separation is by normal-phase mechanism as a decrease in mobile phase water content results in increased retention.

column . . . Ascentis Express HILIC, 15 cm x 4.6 mm I.D., 2.7 µm particles (53981-U)
mobile phase (A) water; (B) acetonitrile; (25:75, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector ELSD, 55 °C, 3.5 bar nitrogen
injection 10 µL
Application No. **G005745**

1. Mannose
2. Maltose
3. Maltotriose
4. Maltotetraose
5. Maltopentaose
6. Maltohexaose
7. Maltoheptaose



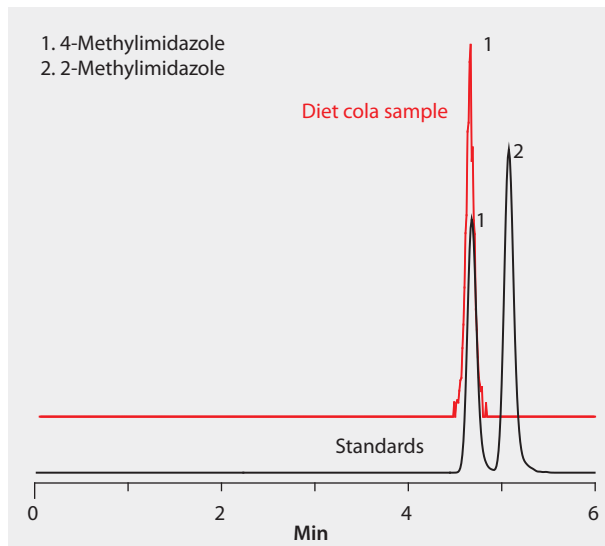
HPLC Analysis of Methylimidazoles in Diet Cola on Ascentis® Express HILIC

This method features fast analysis of methylimidazole derivatives used in caramel-colored carbonated beverages.

The purpose of this study was to develop a fast analytical method for analyzing for 2-methylimidazole and 4-methylimidazole in caramel colored carbonated beverages. The FDA has recently increased the awareness of the potential hazards of methylimidazole. These compounds can be found in caramel additives used in a broad range of food stuff. In this study the focus is the levels of methylimidazole in various colas. Methylimidazoles are a difficult group of compounds to analyze due their polar nature and low molecular weight. Traditional reversed phase separation are unsuccessful in retaining these small polar compounds, with most methods utilizing ion-exchange resins for analysis. Other common methods are GC analysis with sample derivitization.

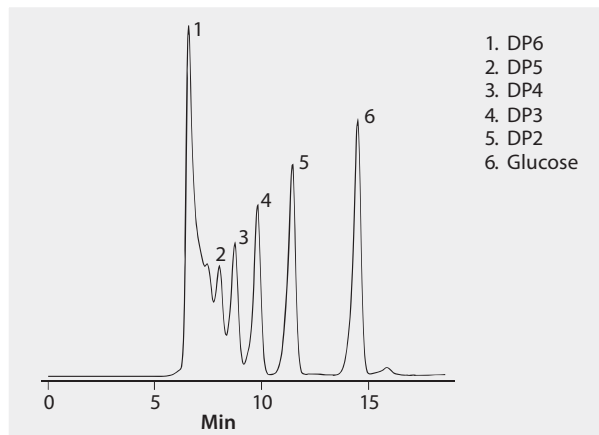
column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)
mobile phase 2 mM ammonium formate in 5:95, water:acetonitrile,
to pH 4.4 with formic acid

flow rate 0.6 mL/min
column temp. 50 °C
detector ESI(+), 50-800 m/z
injection 1 µL
sample 200 mg/L in methanol
Application No. **G005469**



HPLC Analysis of Oligosaccharides from Dark Corn Syrup on SUPELCOGEL™ Ag

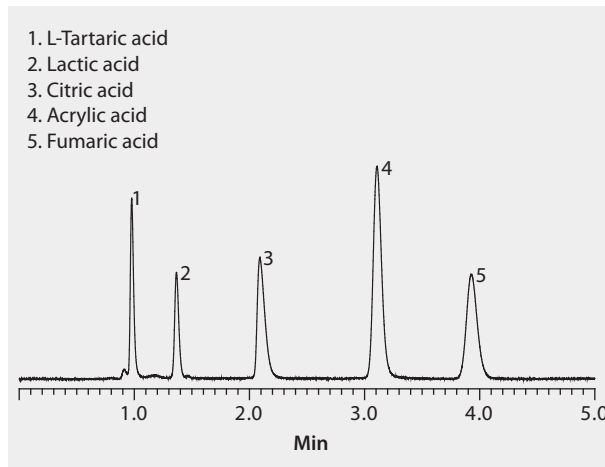
column SUPELCOGEL Ag, 30 cm × 7.8 mm I.D. (59315)
mobile phase water
flow rate 0.5 mL/min
column temp. 85 °C
detector RI
injection 10 µL of 1g syrup/10 mL DI water, filtered (0.20 µm filter)
Application No. [794-0029](#)



HPLC Analysis of Organic Acids on Ascentis® Express RP-Amide

This application demonstrates the suitability of Ascentis Express RP-Amide for the analysis of organic acids under 100% aqueous conditions.

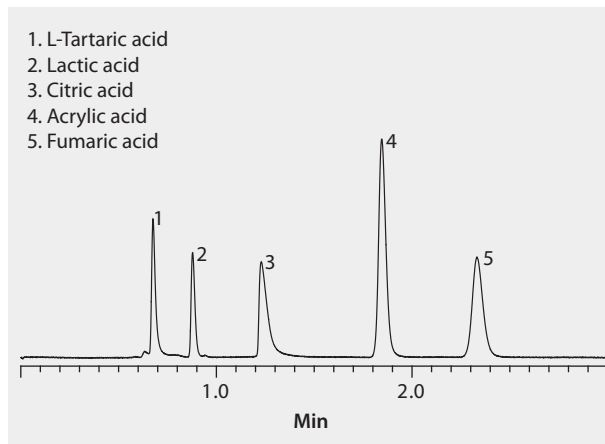
column Ascentis Express RP-Amide, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53913-U)
mobile phase (A) 0.1% (v/v) TFA in (B) water
flow rate 0.3 mL/min
column temp. 35 °C
detector UV, 210 nm
injection 1 µL
sample 0.2 - 4 g/L in mobile phase
Application No. [G005714](#)



HPLC Analysis of Organic Acids on Ascentis® RP-Amide

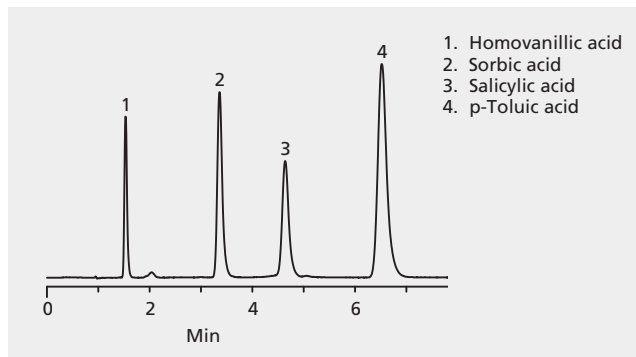
This application demonstrates the suitability of Ascentis RP-Amide for the analysis of organic acids under 100% aqueous conditions.

column Ascentis RP-Amide, 10 cm x 2.1 mm I.D., 3 µm particles (565301-U)
mobile phase (A) 0.1% (v/v) TFA in (B) water
flow rate 0.3 mL/min
column temp. 35 °C
detector UV, 210 nm
injection 1 µL
sample 0.2 - 4 g/L in mobile phase
Application No. **G005715**



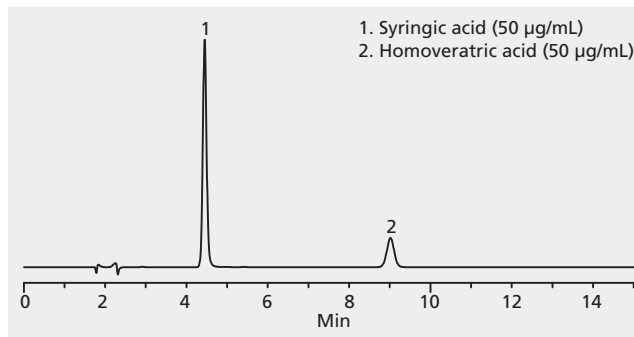
HPLC Analysis of Organic Acids on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase (A) methanol; (B) water, 0.1% TFA (40:60, A:B)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 10 µL
sample 1 mg/mL each analyte
Application No. [797-0657](#)



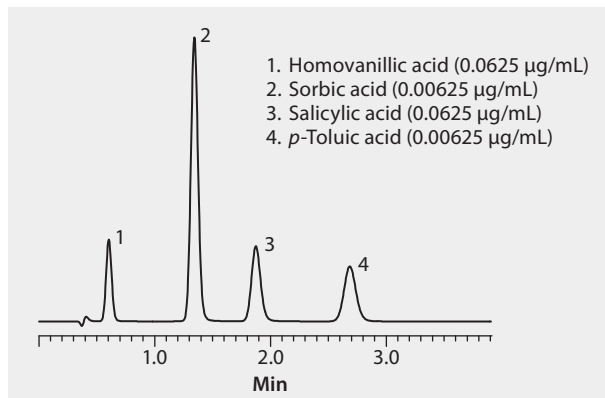
HPLC Analysis of Organic Acids on Ascentis® C8

column Ascentis C8, 15 cm x 4.6 mm I.D., 5 µm particles (581424-U)
mobile phase (A) 10 mM ammonium phosphate monobasic
(pH 2.50 with phosphoric acid); (B) acetonitrile; (80:20, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample as indicated in mobile phase
Application No. **G003160**



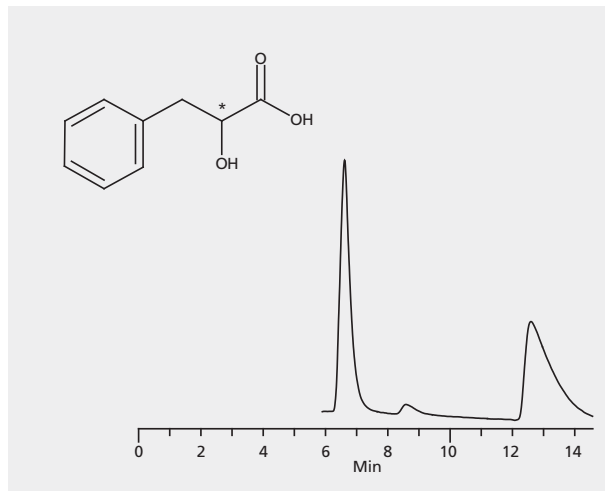
HPLC Analysis of Organic Acids on Discovery® C18

column Discovery C18, 5 cm × 4.6 mm I.D., 5 µm particles (504947)
mobile phase (A) 0.1% TFA in (B) water:methanol; (60:40, A:B)
flow rate 2.0 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 10 µL
Application No. **G001431**



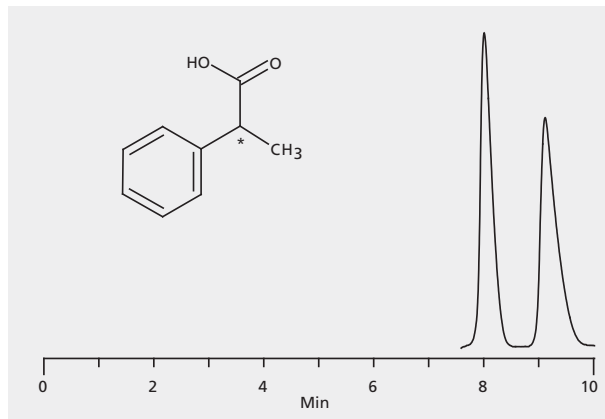
HPLC Analysis of 3-Phenyllactic Acid Enantiomers on Astec® CHIROBIOTIC® R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
mobile phase 0.1% ammonium acetate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 0.5 µL
sample 1 mg/mL in methanol
Application No. **G004680**



HPLC Analysis of 2-Phenylpropionic Acid Enantiomers on Astec® CYCLOBOND® I 2000 HP-RSP

column CYCLOBOND I 2000 HP-RSP, 25 cm x 4.6 mm I.D.,
5 µm particles (24024AST)
mobile phase . . . (A) 10 mM ammonium acetate, pH 4.0; (B) acetonitrile; (75:25, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 235 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004717**



HPLC Analysis of Phenyl Urea Pesticides on Ascentis® Express C18 Phase

This separation illustrates the use of the highly efficient 2.7 µm Ascentis Express Fused-Core C18 stationary phase in the analysis of some popular herbicides. The short run times allow analyses using isocratic conditions so that column equilibration time is not required between runs.

Response Time: 0.02 sec.

Flow Cell: 2.5 µL semi-micro

column . . . Ascentis® Express C18, 10 cm x 4.6 mm I.D., 2.7 µm particles (53827-U)

mobile phase (A) 0.025 M potassium phosphate buffer, adj. to pH = 2.5, (B) acetonitrile; (50:50, A:B)

flow rate 2.0 mL/min

pressure 300 bar

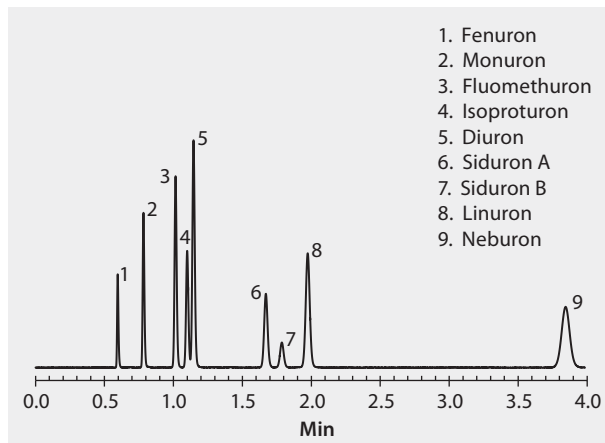
column temp. 30 °C

detector UV 245 nm, VWD

injection 0.5 µL

sample acetonitrile

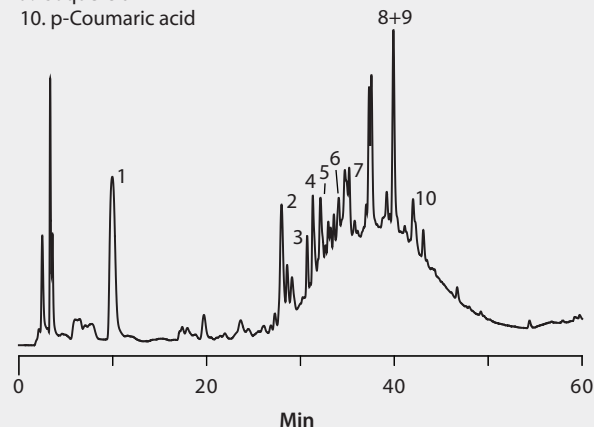
Application No. [G006189](#)



HPLC Analysis of Polyphenols in Nero d'Avola Red Wine on Discovery® HS C18 (UV 280 nm)

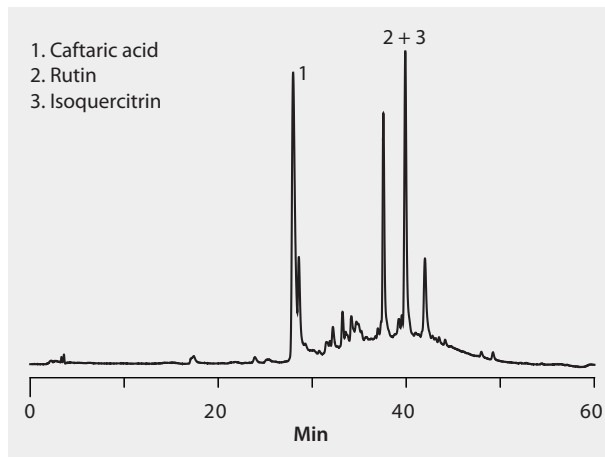
sample/matrix Nero d'Avola wine sample filtered prior injection
through a 0.45 µm nylon membrane
column Discovery HS C18, 15 cm x 2.1 mm I.D., 3 µm particles (569255-U)
mobile phase (A) water, pH 3 with formic acid;
(B) acetonitrile, pH 3 with formic acid
flow rate 0.2 mL/min
column temp. 30 °C
detector UV, 280 nm
injection 5 µL
Application No. **G005595**

1. Gallic acid
2. Caftaric acid
3. Catechin
4. Procyanidin
5. Caffeic acid
6. Epicatechin
7. Ethylgallate
8. Rutin
9. Isoquercitrin
10. p-Coumaric acid



HPLC Analysis of Polyphenols in Nero d'Avola Red Wine on Discovery® HS C18 (UV 354 nm)

sample/matrix Nero d'Avola wine sample filtered prior injection
through a 0.45 µm nylon membrane
column Discovery HS C18, 15 cm x 2.1 mm I.D., 3 µm particles (569255-U)
mobile phase (A) water, pH 3 with fomic acid;
(B) Acetonitrile, pH 3 with fomic acid
flow rate 0.2 mL/min
column temp. 30 °C
detector UV, 354 nm
injection 5 µL
Application No. **G005596**



HPLC Analysis of Pullulan on an SRT® SEC-300 Gel Filtration Column

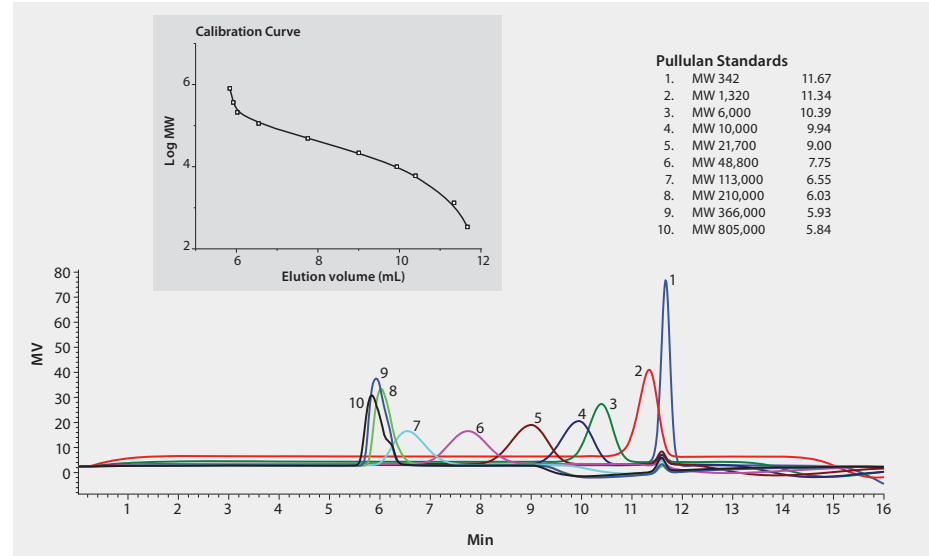
Pullulan is a water-soluble polysaccharide polymer consisting of glucan units. Pullulan is used in the manufacture of edible films that are used in breath fresheners and mints and is also used as a food additive. Another use of pullulan is as calibration standards in gel filtration chromatography.

Gel filtration chromatography (GFC) is used to determine the molecular mass composition of pullulan and many other water-soluble polymers using silica- or polymer-based particles that have been modified with a chemically bonded hydrophilic coating.

In this particular example, a SRT SEC-300 column from Sepax Technologies was used to analyze several pullulan standards. In the accompanying table shows retention volumes for the pullulan standards and the molecular mass of each; this data was then used to construct the calibration curve which allows the calculation of the molecular mass and distribution of an unknown pullulan polymer or other polymers of similar geometrical shape.

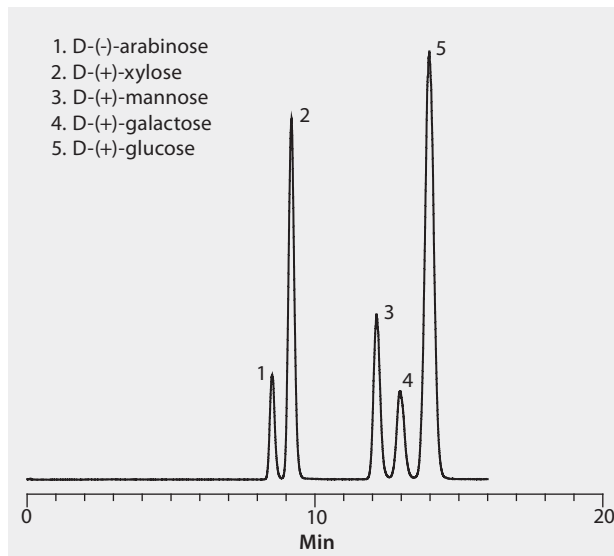
column SRT SEC-300, 30 cm x 7.8 mm I.D., 5 μ m, 300 Å (Z777051)
 mobile phase 150 mM phosphate Buffer, pH 7.0
 flow rate 1.0 mL/min
 pressure 600 psi (41.4 bar)
 column temp. 25 °C
 detector RI (30° C)
 injection 20 μ L
 sample 10 mg/mL in mobile phase 0.342 kD, 1.32 kD, 6 kD, 10 kD, 21.7 kD,
 48.8 kD 113 kD, 210 kD, 366 kD and 805 kD

Application No. **G006202**



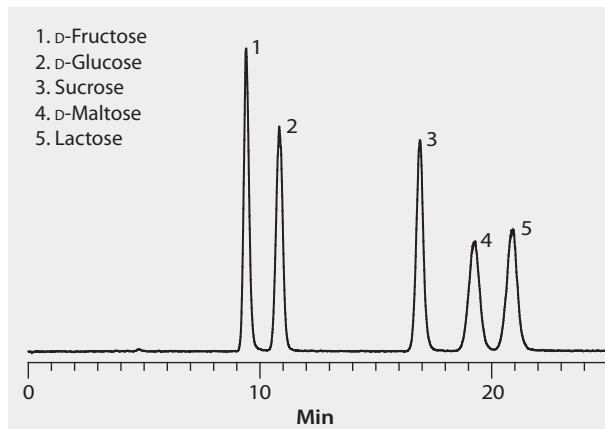
HPLC Analysis of Simple Underivatized Sugars on apHera™ NH2

column apHera NH2, 15 cm × 4.6 mm I.D., 5 µm particles (56401AST)
mobile phase (A) water: (B) acetonitrile; (20:80, A:B)
flow rate 1.0 mL/min
column temp. 25 °C
detector ELSD, 45 °C, 3.5 psi nitrogen
injection 10 µL
sample 500 µg/mL in 30:70, water: acetonitrile
Application No. [G003996](#)



HPLC Analysis of Sugars and Sugar Enantiomers on Astec® CYCLOBOND® I 2000

column CYCLOBOND I 2000, 25 cm x 4.6 mm I.D., 5 µm particles (20024AST)
mobile phase (A) water; (B) acetonitrile; (15:85, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector ELSD at 35°C and 3.2 bar nitrogen
injection 10 µL
sample 0.5 mg/mL each in water:acetonitrile, 25:75
Application No. [G004682](#)

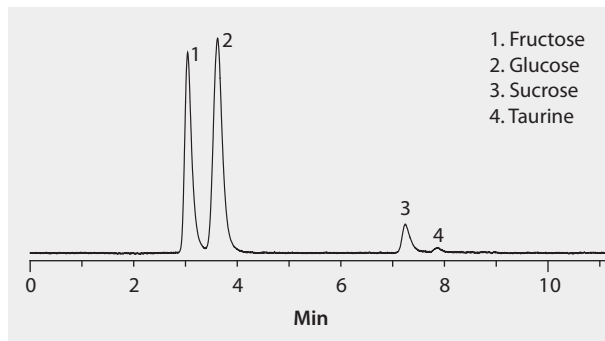


HPLC Analysis of Sugars and Taurine in an Energy Drink on Ascentis® Express HILIC using UV and ELSD Detection in Series

This application demonstrates the suitability of Ascentis Express HILIC for the efficient separation of common drink additives used in caffeinated energy drinks. The analysis was performed with UV and ELSD detectors in series, this chromatogram being from the ELSD.

column . . . Ascentis Express HILIC, 10 cm x 3.0 mm I.D., 2.7 µm particles (53970-U)
mobile phase (A) 100 mM ammonium acetate, pH 5.0 with acetic acid;
(B) water; (C) acetonitrile; (09:01:90, A:B:C)

flow rate 0.6 mL/min
pressure 812 psi (56 bar)
column temp. 35 °C
detector ELSD, 55 °C, 3.5 bar nitrogen
injection 2 µL
sample dilute 1:9 in acetonitrile
Application No. [G005751](#)



HPLC Analysis of Sugars by HILIC Chromatography using Ascentis® Express OH-5 Column with ELSD Detection

This application shows the analysis of sugars by HILIC Chromatography with ELSD detection. The purpose of the work shown here was to develop a HILIC method that could quickly separate mono- and di-saccharides with good sensitivity and reproducibility utilizing the Ascentis Express OH-5 column and an Evaporative Light Scattering Detector (ELSD) detector.

column . . . Ascentis Express OH-5, 15 cm x 4.6 mm, I.D., 2.7 µm particles (53778-U)

mobile phase (A) 0.005 M ammonium formate, pH 3.15 with concentrated TFA (B) acetonitrile (30:70, A:B)

flow rate 0.5 mL/min

pressure 841 psi (58 bar)

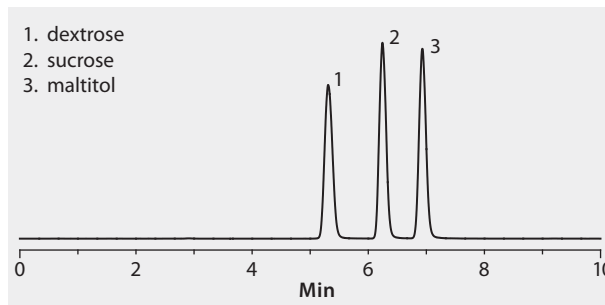
column temp. 35 °C

detector ELSD (detector other: Nebulizer 60° C, Evaporator 80° C,
Gas flow 1.60 SLM (Standard Liters/ Minute), LED 100%,
Smoothing 5.0 S, PMT (Photomultiplier) Gain 1.0)

injection 10 µL

sample 0.5 mg/mL each prepared in 50:50 Water:Acetonitrile

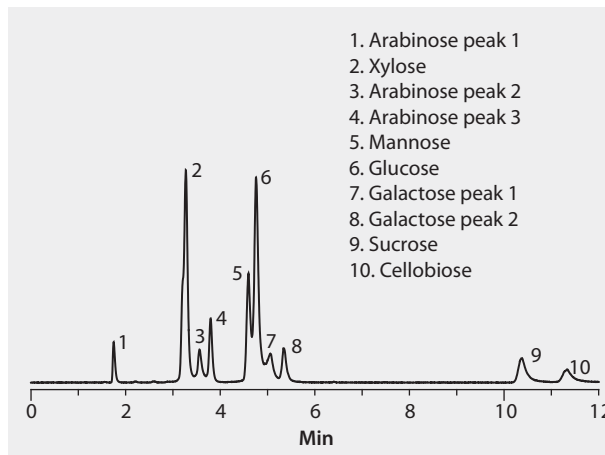
Application No. [G005902](#)



HPLC Analysis of Sugars on Ascentis® Express HILIC (Mobile Phase 5:95)

This application demonstrates the suitability of the Ascentis Express HILIC for the analysis of sugars. Structures along with the optimized chromatogram obtained on the Ascentis Express HILIC are presented. Separation is by normal-phase mechanism as a decrease in mobile phase water content results in increased retention

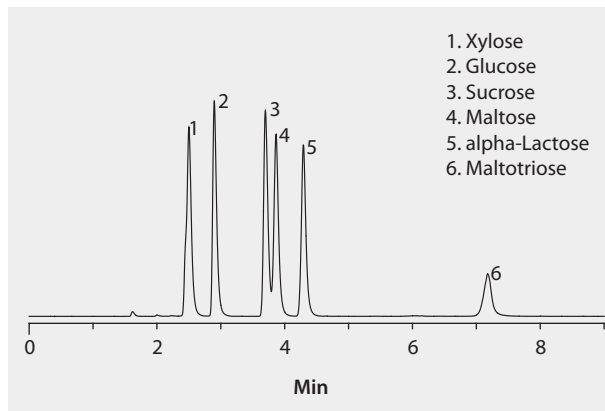
column . . . Ascentis Express HILIC, 15 cm x 4.6 mm I.D., 2.7 µm particles (53981-U)
mobile phase (A) water; (B) acetonitrile; (5:95, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector ELSD, 55 °C, 3.5 bar nitrogen
injection 10 µL
Application No. **G005744**



HPLC Analysis of Sugars on Ascentis® Express HILIC (Mobile Phase 15:85)

This application demonstrates the suitability of the Ascentis Express HILIC for the analysis of sugars. Structures along with the optimized chromatogram obtained on the Ascentis Express HILIC are presented. Separation is by normal-phase mechanism as a decrease in mobile phase water content results in increased retention.

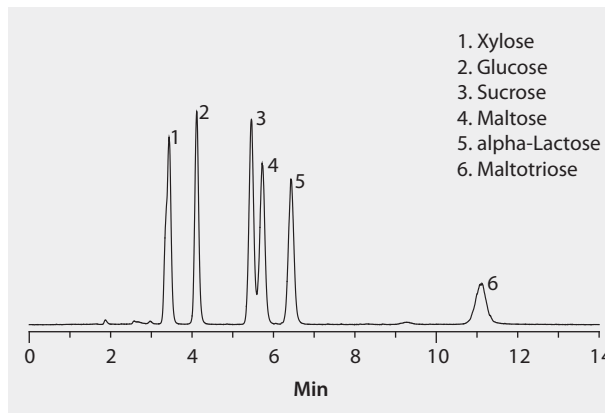
column . . . Ascentis Express HILIC, 15 cm x 4.6 mm I.D., 2.7 µm particles (53981-U)
mobile phase (A) water; (B) acetonitrile; (15:85, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector ELSD, 55 °C, 3.5 bar nitrogen
injection 10 µL
Application No. **G005746**



HPLC Analysis of Sugars on Ascentis® Si

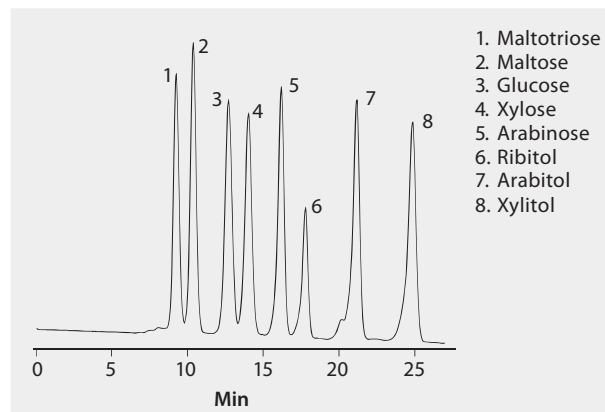
This application demonstrates the suitability of the Ascentis Si for the analysis of sugars. Structures along with the optimized chromatogram obtained on the Ascentis Si are presented. Separation is by normal-phase mechanism as a decrease in mobile phase water content results in increased retention.

column Ascentis Si, 15 cm x 4.6 mm I.D., 5 µm particles (581512-U)
mobile phase (A) water; (B) acetonitrile; (15:85, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector ELSD, 55 °C, 3.5 bar nitrogen
injection 10 µL
Application No. **G005747**



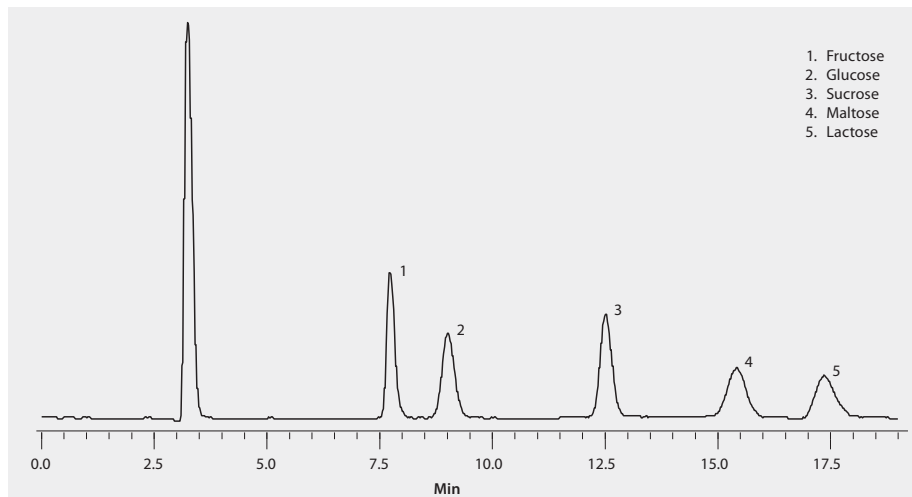
HPLC Analysis of Sugars on SUPELCOGEL™ Ca

column SUPELCOGEL Ca, 30 cm × 7.8 mm I.D., 9 µm particles (59305-U)
mobile phase water
flow rate 1.5 mL/min
column temp. 80 °C
detector RI
injection 10 µL, 2.5 mg/mL each analyte in water
Application No. [795-0016](#)



HPLC Analysis of Sugars on SUPELCOSIL™ LC-NH2

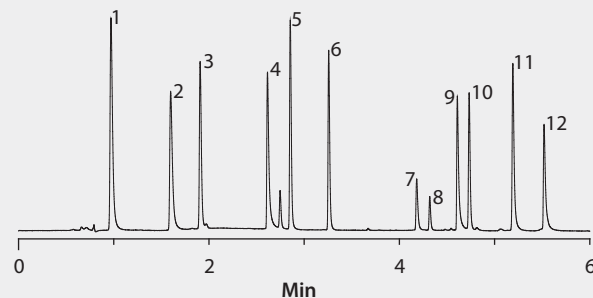
column SUPELCOSIL LC-NH2, 25 cm x 4.6 mm I.D., 5 µm particles (58338)
mobile phase (A) water; (B) acetonitrile; (25:75, A:B)
flow rate 1 mL/min
temp. ambient
detector refractive index (RI)
injection 2 µL
sample 10 mg/mL in water
Application No. **G006195**



HPLC Analysis of Synthetic Food Dyes on Ascentis® Express C18

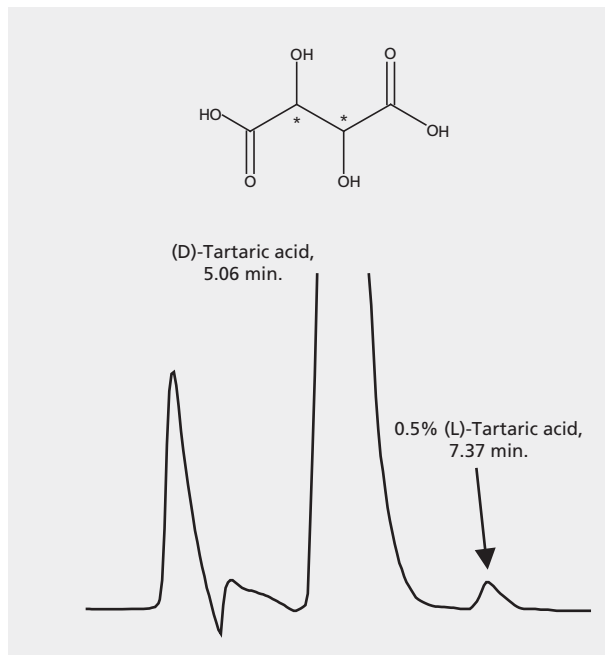
column . . . Ascentis Express C18, 10 cm x 2.1 mm I.D., 2.7 µm particles (53823-U)
 mobile phase (A) 100 mM ammonium phosphate monobasic, pH 7.0 with
 ammonium hydroxide; (B) water; (C) acetonitrile
 gradient 10% A constant; 85 to 25% B, 5 to 65% C in 6 min;
 25% B, 65% C held for 5 min
 flow rate 0.3 mL/min
 column temp. 40 °C
 detector UV, 254 nm
 injection 5 µL
 sample 20 µg/mL each in water
 Application No. **G005650**

- | | |
|------------------------------|-----------------|
| 1. Tartrazine | 7. Fast green |
| 2. Amaranth | 8. Erioglaucine |
| 3. Indigo carmine | 9. Erythrosin B |
| 4. New coccine (Acid Red 18) | 10. Acid red |
| 5. Sunset yellow FCF | 11. Phloxine B |
| 6. Allura red | 12. Rose bengal |



HPLC Analysis of Tartaric Acid Enantiomers on Astec® CLC-D, Trace Level Detection

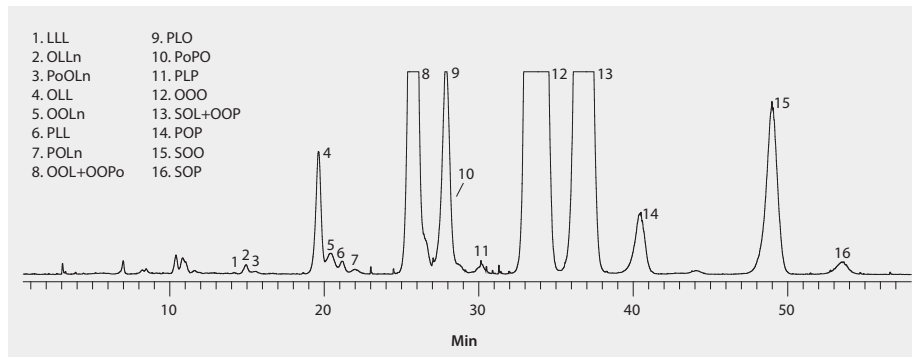
column Astec CLC-D, 15 cm x 4.6 mm I.D., 5 µm particles (53023AST)
mobile phase 3 mM copper sulfate, pH 3.2
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
sample 5 mg/mL in water
Application No. [G004665](#)



HPLC Analysis of Triacylglycerols in Olive Oil on Discovery® HS C18 after Sample Prep using Discovery® DSC-Si (Acetone-Acetonitrile Mobile Phase, ELSD Detection)

Olive oil was pre-cleaned using Silica SPE, analyzed as 5% sample in acetone (w/v).

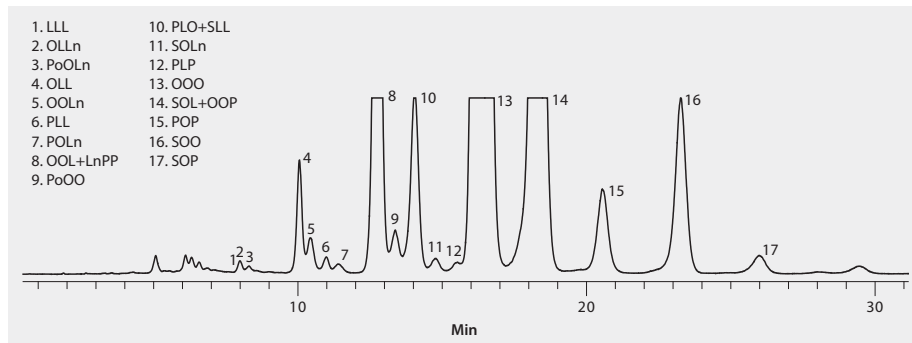
SPE tube/cartridge Discovery DSC-Si, 1 gm/6 mL (52656-U)
 condition 6 mL hexane
 sample addition 0.12 g oil in 0.5 mL hexane
 elution 10 mL hexane-diethyl ether 87-13 (v/v)
 eluate post-treatment evaporation to dryness, reconstituted into 2 mL acetone
 column Discovery HS C18, 25 cm x 4.6 mm I.D., 5 µm particles (568523-U)
 mobile phase (A) acetone; (B) acetonitrile; (60:40, A:B)
 flow rate 1.5 mL/min
 pressure 914 psi (63 bar)
 column temp. 30 °C
 detector ELSD
 injection 5 µL
 Application No. **G005863**



HPLC Analysis of Triacylglycerols in Olive Oil on Discovery® HS C18 after Sample Prep using Discovery® DSC-Si (Propionitrile Mobile Phase, ELSD Detection)

Olive oil was pre-cleaned using Silica SPE, analyzed as 5% sample in acetone (w/v).

SPE tube/cartridge Discovery DSC-Si, 1 gm/6 mL (52656-U)
 condition 6 mL hexane
 sample addition 0.12 g oil in 0.5 mL hexane
 elution 10 mL hexane-diethyl ether 87-13 (v/v)
 eluate post-treatment evaporation to dryness, reconstituted into 2 mL acetone
 column Discovery HS C18, 25 cm x 4.6 mm I.D., 5 µm particles (568523-U)
 mobile phase propionitrile
 flow rate 1.5 mL/min
 pressure 1117 psi (77 bar)
 column temp. 30 °C
 detector ELSD
 injection 5 µL
 Application No. **G005864**

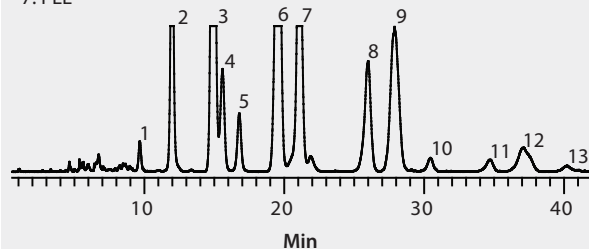


HPLC Analysis of Triacylglycerols in Soybean Oil on Discovery® HS C18 (Acetone-Acetonitrile Mobile Phase, ELSD Detection)

Soybean oil was analyzed as 5% diluted sample in acetone (w/v)

column Discovery HS C18, 25 cm x 4.6 mm I.D., 5 µm particles (568523-U)
 mobile phase (A) acetone; (B) acetonitrile; (60:40, A:B)
 flow rate 1.5 mL/min
 pressure 914 psi (63 bar)
 column temp. 30 °C
 detector ELSD
 injection 5 µL
 sample 5% soybean oil in acetone (w/v)
 Application No. **G005877**

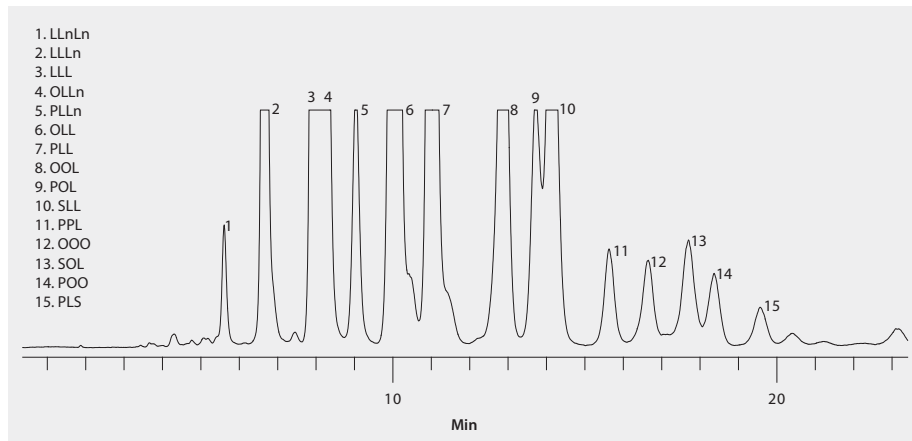
- | | |
|----------|-------------|
| 1. LLnLn | 8. OOL |
| 2. LLLn | 9. POL+SLL |
| 3. LLL | 10. PPL |
| 4. OLLn | 11. OOO |
| 5. PLLn | 12. SOL+POO |
| 6. OLL | 13. POP |
| 7. PLL | |



HPLC Analysis of Triacylglycerols in Soybean Oil on Discovery® HS C18 after Sample Prep using Discovery® DSC-Si (Propionitrile Mobile Phase, ELSD Detection)

Soybean oil was cleaned using Silica SPE and analyzed as 5% sample in acetone (w/v).

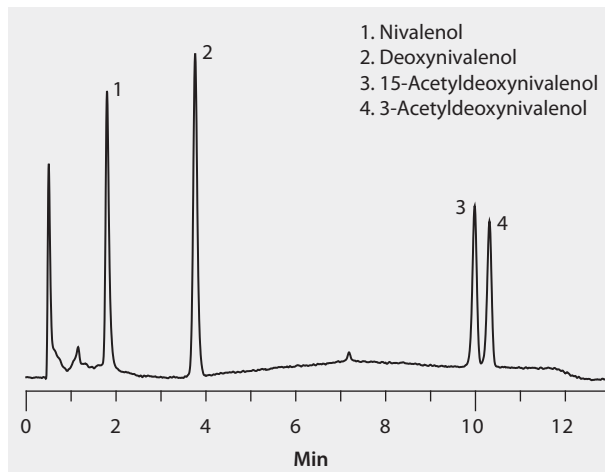
condition 6 mL hexane
 SPE tube/cartridge Discovery DSC-Si, 1 gm/6 mL (52656-U)
 sample addition 0.12 g oil in 0.5 mL hexane
 elution 10 mL hexane-diethyl ether 87-13 (v/v)
 eluate post-treatment vaporation to dryness, reconstituted into 2 mL acetone
 column Discovery HS C18, 25 cm x 4.6 mm I.D., 5 µm particles (568523-U)
 mobile phase propionitrile
 flow rate 1.5 mL/min
 pressure 1117 psi (77 bar)
 column temp. 30 °C
 detector ELSD
 injection 5 µL
 Application No. **G005865**



HPLC Analysis of B-Trichothecenes on Ascentis® Express C18

Mycotoxins are toxic secondary metabolites produced by fungi. Those chemicals exist in food as a result of fungal infection of crops. Mycotoxins have strong resistance to decomposition and digestion, so they remain in the food chain in meat and dairy products. They also resist to temperature, such as cooking and freezing. Their effects on human and animal health include death, cancer, weakened immune systems and as allergens or irritants.

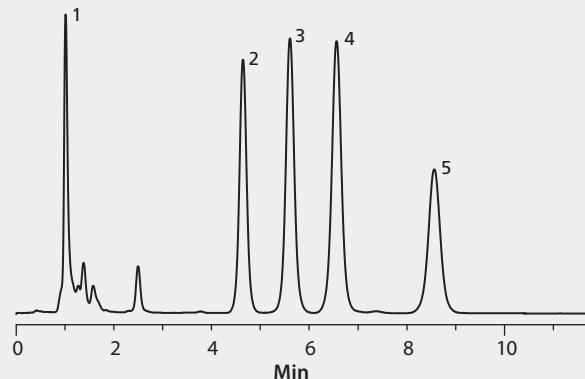
column Ascentis Express C18, 10 cm x 3 mm I.D., 2.7 µm particles (53814-U)
 mobile phase (A) water:acetonitrile:methanol (92:4:4); (B) acetonitrile
 gradient 0% B held for 5 minutes, to 8% B in 3 minutes, 8% B held for 2 minutes
 flow rate 0.8 mL/min
 pressure 4061 psi (280 bar)
 column temp. 35 °C
 detector UV, 220 nm
 injection 40 µL
 sample 2 ppm each in water:methanol:acetonitrile (92:4:4)
 Application No. [G005561](#)



HPLC Analysis of Vitamins, Fat Soluble (A and E) on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase (A) methanol: (B) water (95:5, A:B)
flow rate 2 mL/min
column temp. 30 °C
detector UV, 290 nm
injection 10 µL
Application No. **G000911A**

1. Retinol acetate (Vitamin A acetate), 50 µg/mL
2. δ-Tocopherol, 165 µg/mL
3. γ-Tocopherol, 200 µg/mL
4. α-Tocopherol (Vitamin E), 292 µg/mL
5. α-Tocopherol acetate (Vitamin E acetate), 405 µg/mL



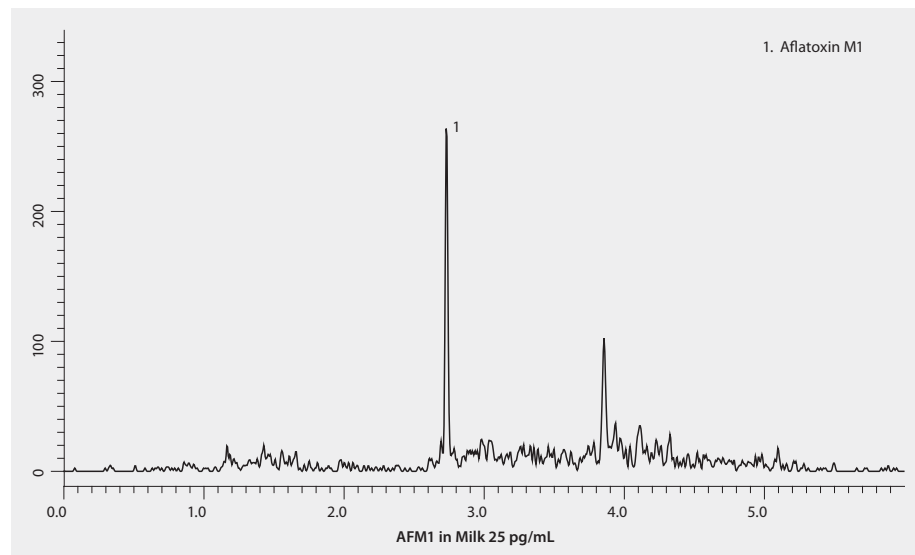
LC-MS Analysis of Aflatoxin M1 in Milk on Ascentis® Express HILIC after SPE using Supel™ Tox AflaZea, Quantifying Picogram Concentrations

Aflatoxin M1 is the metabolite of Aflatoxin B1 and can be found in milk products when animals have been fed aflatoxin-contaminated feeds. Aflatoxins are positively associated with hepatocellular carcinomas. Aflatoxin M1 was detected in milk and quantified at concentrations of 25 pg/mL. Sample preparation included a protein precipitation with solvent partitioning and sample clean-up using Supel Tox AflaZea SPE tubes. Analysis was performed via LC-MS using an Ascentis Express C18, 5 cm x 2.1 mm I.D., 2.7 µm HPLC column for the separation. Detection and quantification of aflatoxin M1 at 25 pg/mL satisfies the current regulatory requirements for aflatoxin M1 for EU treaty participants as stated in EC 1881/2006.

Sample pretreatment: centrifuge 45 g liquid milk for 60 min at 5000 rpm (RCF 4863 xg), cool at 0 °C for 30 minutes, remove fat layer, transfer middle layer to collection flask, add 20 mL acetonitrile to 50 mL centrifuge tube, add 20 mL of sample to acetonitrile, add contents of 1 Supel Q non-buffered tube, immediately disperse salt, quickly place on shaker for 5 minutes, centrifuge at 5000 rpm for 20 min, remove top layer (loading solution)

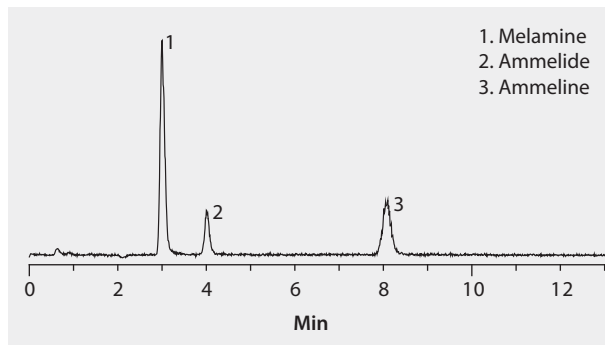
sample preparation SPE (Solid Phase Extraction)
 sample/matrix cow milk
 SPE tube/cartridge Supel™ Tox AflaZea, 6 mL (55314-U)
 sample addition 10 mL, 2 drop/second using vacuum
 washing 2 x 2 mL acetonitrile (collect with sample)
 eluate post-treatment evaporate to dryness at 70 °C using nitrogen
 sample preparation reconstitute in 500 µL 20:80 acetonitrile:water,
 filter into 750 µL poly vial using PVDF filter, 0.2 µm
 column ... Ascentis Express C18, 50 cm x 2.1 mm I.D., 2.7 µm particles (53822-U)
 mobile phase (A) 0.1% (v/v) formic acid; (B) acetonitrile
 gradient 90% A for 0.5 min; to 10% A in 0.5 min; held at 10% for 3 min;
 to 90% A in 0.10 min; held at 90% A for 3 min
 flow rate 0.4 mL/min
 column temp. ambient

detector MS/MS (MRM transitions)
 injection 10 µL
 Application No. G006300



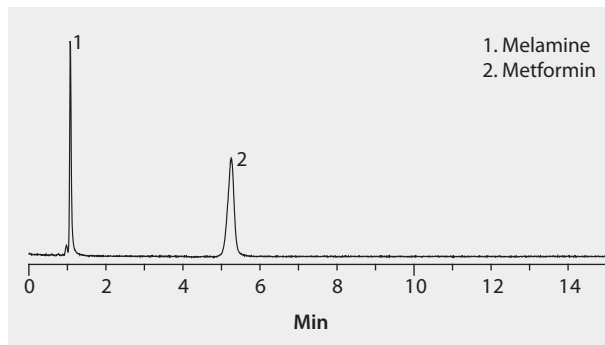
LC-MS Analysis of Melamine and Hydrolysis Products on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 5 cm x 2.1 mm I.D., 2.7 µm particles (53934-U)
mobile phase 5 mM ammonium formate in 95:5 (v/v) acetonitrile:water
flow rate 0.2 mL/min
column temp. 35 °C
detector MS, ESI(+), full scan
injection 2 µL
sample 1 mg/L in mobile phase
Application No. [G005708](#)



LC-MS Analysis of Melamine and Metformin on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 5 cm x 3 mm I.D., 2.7 μ m particles (53967-U)
mobile phase . . . (A) 10 mM ammonium formate in water; (B) acetonitrile; (5:95, A:B)
flow rate 1.0 mL/min
pressure 551 psi (38 bar)
column temp. 25 $^{\circ}$ C
detector ESI(+), SIR, m/z 127, 130
injection 2 μ L
sample 1 mg/L
Application No. [G005754](#)

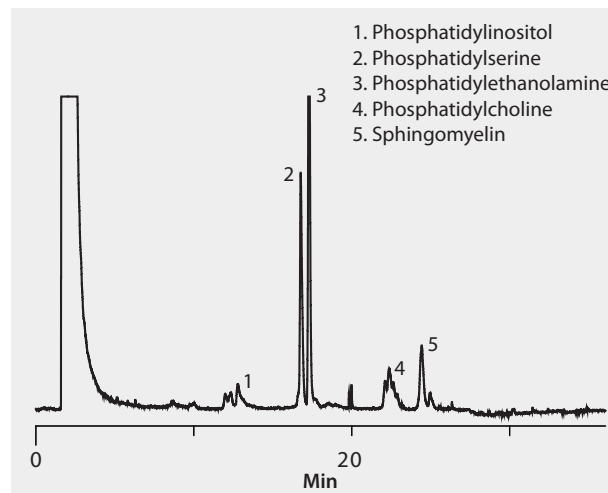


LC-MS Analysis of Phospholipids in Milk on Ascentis® Express HILIC after SPE using Supelclean™ Si, Shotgun HPLC Analysis

Extraction of the lipid fraction was carried out from 10 mL of the cow's milk sample, according to the Folch method to ensure the exhaustive extraction of the whole lipid content. The total extract was evaporated under vacuum, and the final dry residue (400 mg) was re-dissolved in chloroform/methanol 2:1 (v/v). Lipid extract (100 mg) was afterward dissolved in 1 mL mixture of chloroform/methanol (2:1, v/v). After the cartridge has been conditioned with hexane, the non-polar lipids were eluted with 3 mL of hexane/diethyl-ether (8:2, v/v) and 3 mL of hexane/diethyl-ether (1:1, v/v). Recovery of PLs from the cartridge was obtained by two-step elution, using 4 mL of methanol as first extraction solvent, and subsequently 2 mL of methanol followed by 2 mL of chloroform/methanol/water (3:5:2, v/v/v). The recovered fraction was dried under a gentle stream of nitrogen, yielding 49.7 mg dry residue. The residue was finally re-dissolved in chloroform/methanol (2:1, v/v).

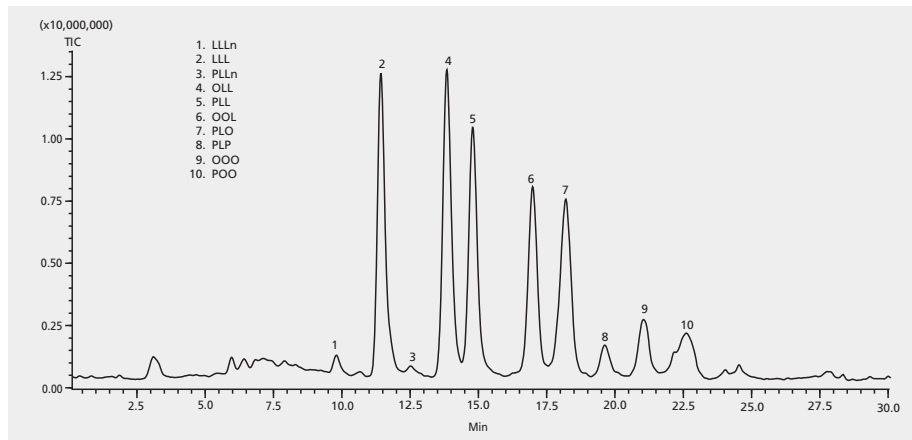
sample/matrix . . . Phospholipids from 10 mL cow's milk (Folch method extraction)
 SPE tube/cartridge Supelclean LC-Si, 1 g/6 mL (57051)
 condition hexane
 sample addition 1 mL extract in chloroform/methanol (2:1, v/v)
 washing 3 mL of hexane/diethylether (8:2, v/v) and 3 mL of
 hexane/diethylether (1:1, v/v) to remove nonpolar lipids
 elution 1 x 4 mL methanol, followed by 1 x 2 mL methanol, followed
 by 1 x 2 mL chloroform/methanol/water (3:5:2, v/v/v).
 eluate post-treatment . . . dry under a gentle stream of nitrogen, redissolved residue in
 chloroform/methanol (2:1, v/v)
 column . . . Ascentis Express HILIC, 15 cm x 4.6 mm I.D., 2.7 µm particles (53981-U)
 mobile phase (A) acetonitrile; (B) acetonitrile:water (2:1)
 gradient 0% B held for 5 min; to 30% B in 5 min; to 100% B in 20 min;
 held at 100% B for 10 min; to 0% B in 1 min
 flow rate 0.7 mL/min
 column temp. ambient

detector ELSD. nebulizing gas (nitrogen) flow: 2 mL/min (180 KPa); drift tube temperature: 50 °C
 injection 5 µL
 Application No. G005600



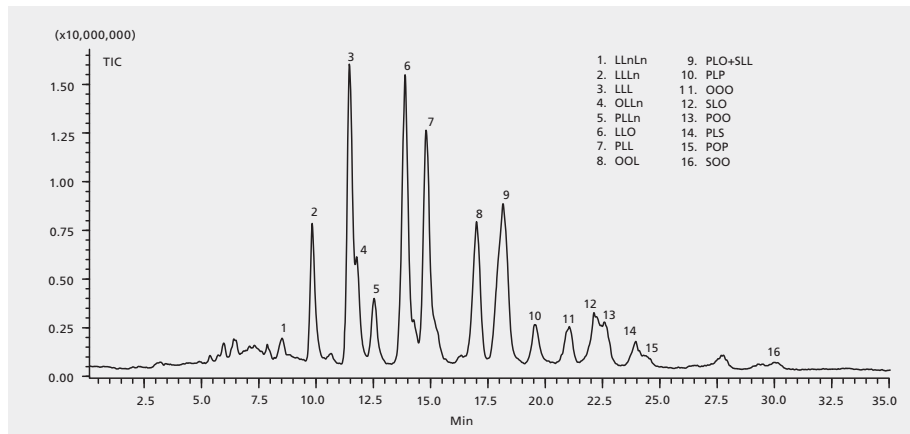
LC-MS Analysis of Triglycerides in Corn Oil on Ascentis® C18

column two Ascentis C18, 15 cm × 2.1 mm I.D.,
3 μm particles connected in series (581302-U)
mobile phase (A) 2-propanol; (B) acetonitrile; (60:40, A:B)
flow rate 0.2 mL/min
column temp. 25 °C
detector APCI/MS positive ion mode
injection 2 μL
sample corn oil weighed and diluted in acetone (10 mg in 1 ml w/v)
Application No. **G003921**



LC-MS Analysis of Triglycerides in Soybean Oil on Ascentis® C18

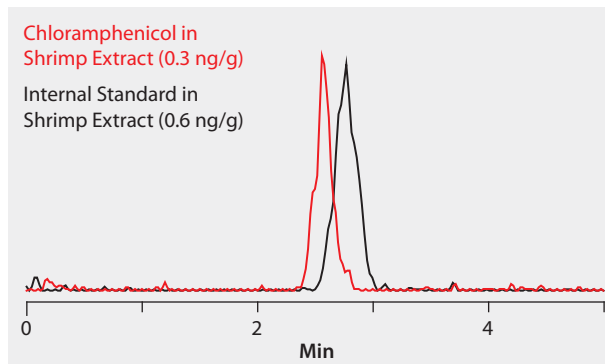
column two Ascentis C18, 15 cm × 2.1 mm I.D.,
 3 μm particles connected in series (581302-U)
 mobile phase (A) 2-propanol; (B) acetonitrile; (60:40, A:B)
 flow rate 0.2 mL/min
 column temp. 25 °C
 detector MS APCI mode
 injection 2 μL
 sample soybean oil weighed and diluted in acetone (10 mg in 1 ml w/v)
 Application No. **G003923**



LC-MS Analysis of Chloramphenicol in Shrimp on Ascentis® Express C18 Using Z-Sep+ Cleanup

This application demonstrates the superior cleanup associated with Z-Sep+ using QuEChERS approach.

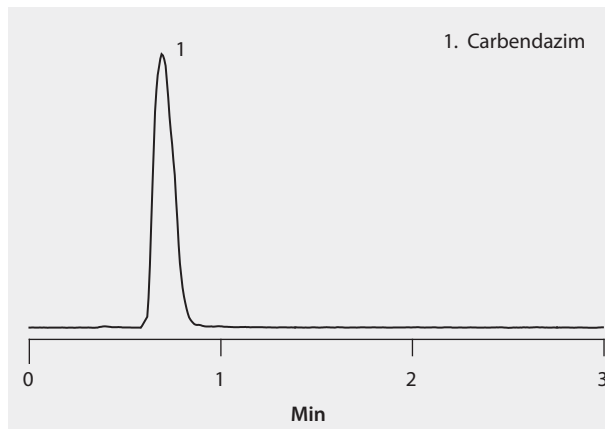
sample preparation SPE (Solid Phase Extraction)
 sample/matrix 1.0 g shrimp
 extraction 9 mL acetonitrile, then 90 μ L of formic acid
 extraction process post treatment: 8 mL supernatant evaporated
 to dryness and reconstituted with 1 mL water
 clean-up tube Supel™ Que Z-Sep+ tube, 12 mL, 500 mg (55296-U)
 clean-up process clean-up volume: 9 mL
 column Ascentis Express C18, 5 cm X 2.1mm, 2.7 μ m particles (53822-U)
 mobile phase (A) Water; (B) Acetonitrile
 gradient 15% B for 0.1 min, 15-80% in 1.9 min,
 held at 80% for 1.5 min, 80-15% in 0.5 min, at 15% for 3 min
 flow rate 0.5 mL/min
 column temp. Ambient
 detector MS, ESI(+), MRM, m/z 320.9/151.9, 325.9/157.0
 injection 10 μ L
 Application No. [G006249](#)



LC-MS/MS Analysis of Carbendazim in Orange Juice (Spiked) on Ascentis® Express C18 after Supel™ QuE PSA/C18 QuEChERS Cleanup

Simple and fast extraction and analytical method were developed for analysis of fungicide carbendazim in orange juice samples. QuEChERS extraction method was used with PSA/C18 cleanup. Ascentis Express C18 column chromatography was coupled to MS/MS detection with limits of detection at 0,1 ppb.

sample preparation Dispersive (QuEChERS)
 sample/matrix orange juice spiked with carbendazim at 1 ppb
 extraction tube Supel™ QuE Citrate (EN) Tube (55227-U)
 extraction process add 10 mL of orange juice with pulp to a 50 mL empty extraction tube (55248-U); add carbendazim at 1 ppb; add 10 mL acetonitrile; (shake for 1 minute; add contents of citrate extraction tube (55227-U); shake for 1 min; centrifuge at 3200 rpm for 5 minutes)
 clean-up tube Supel-Q™ PSA/C18 (55288-U)
 clean-up process transfer 0.7 mL of the acetonitrile layer to the PSA/C18 cleanup tube (55288-U); shake 1 minute; (centrifuge for 3 minutes at 3400 rpm; remove 0.25 mL of the supernatant; mix with 0.25 mL water for LC-MS analysis)
 column Ascentis Express C18, 5 cm x 2.1 mm I.D., 2.7 µm particles (53822-U)
 mobile phase A) 10 mM ammonium acetate in water; (B) 10 mM ammonium acetate in methanol
 gradient 0-1 min: 30% B; 1.5-3.5 min: 100% B; 3.5-7 min: 30% B
 flow rate 0-1 min: 0.3 mL/min; 1.5-7 min: 0.5 mL/min
 column temp. 30 °C
 detector MS, ESI(+), MRM, m/z 192/160, 192/132
 injection 5 µL
 Application No. **G005619**

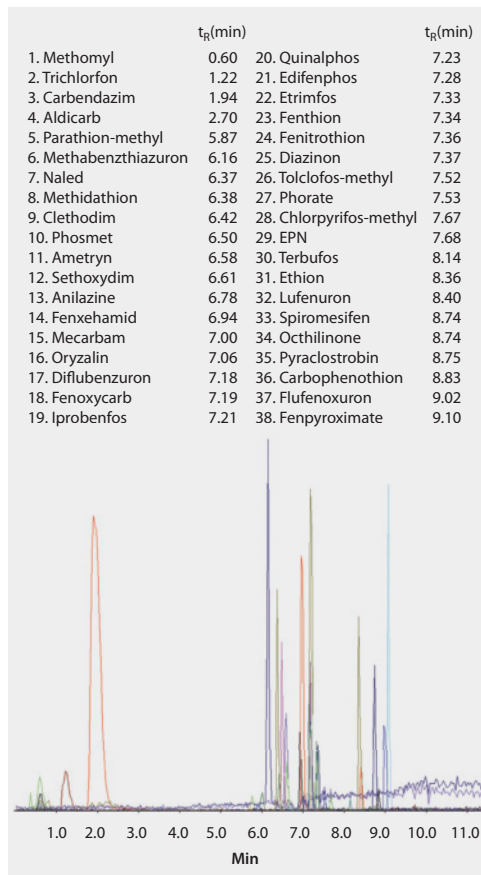


LC-MS/MS of Pesticides in Oranges on Ascentis® Express C18 after Sample Prep using Supel™ Que Z-Sep/C18 QuEChERS sorbent

Sample pretreatment: 10 g of pureed oranges homogenized with rind; spike at 50 ppb by adding 16.75 µL of a pesticide mix containing each analyte at 30 µg/mL

This demonstrates the application of the Z-Sep/C18 sorbent to the cleanup of fruits in the LC-MS-MS analysis of polar pesticides including organo-phosphates, carbamates and benzoylureas

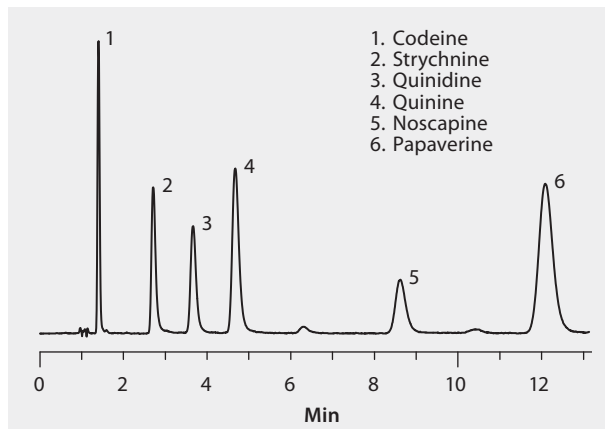
sample preparation Dispersive (QuEChERS)
 sample/matrix . . . 10 g of pureed oranges (homogenized with rind); spike at 50 ppb (add 16.75 µL of a custom made pesticide mix, each analyte at 30 µg/mL)
 extraction tube Supel™ QuE Citrate (EN) Tube (55227-U)
 extraction process . . . add 10 mL acetonitrile; shake for 1 minute; add contents of a Supel QuE citrate extraction tube (55227-U); shake immediately for 1 minute; centrifuge at 3200 rpm for 5 minutes
 clean-up tube Supel-Q™ PSA/C18 (55284-U)
 clean-up process . . . transfer 0.7 mL of the acetonitrile layer into a Supel QuE Z-Sep/C18 cleanup tube (55284-U); shake for 1 minute; centrifuge at 5000 rpm for 5 minutes; (transfer 0.2 mL of the supernatant into an empty 1.5 mL centrifuge tube; add 0.2 mL of water; centrifuge at 5000 rpm for 2 minutes.)
 column . . . Ascentis Express C18, 5 cm x 2.1 mm I.D., 2.7 µm particles (53822-U)
 mobile phase (A) 10 mM ammonium acetate in water; (B) 10 mM ammonium acetate in acetonitrile
 gradient . . . Hold at 30% B for 1 min; 30% to 80% B in 2 min; hold at 80% B for 4 min; hold at 100% B for 3 min; hold at 30% B for 3 min
 flow rate 0.3 mL/min
 pressure 2730 psi (188 bar)
 column temp. 30 °C
 detector MS/MS, ESI positive
 Application No. **G005645**



Forensics and Toxicology

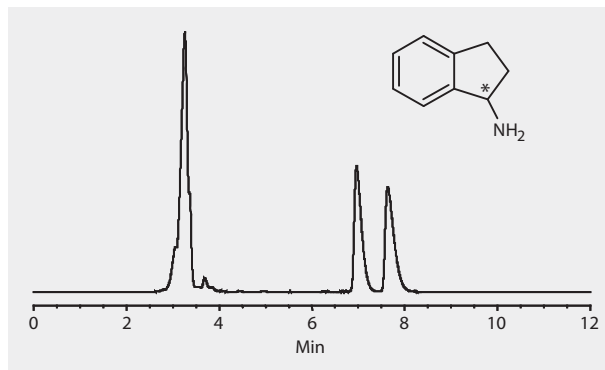
HPLC Analysis of Alkaloids on Discovery®
RP-AmideC16

column . . . Discovery RP-AmideC16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase (A) methanol; (B) 25 mM potassium phosphate,
dibasic, pH 3.0; (20:80, A:B)
flow rate 2 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
Application No. **G000235**



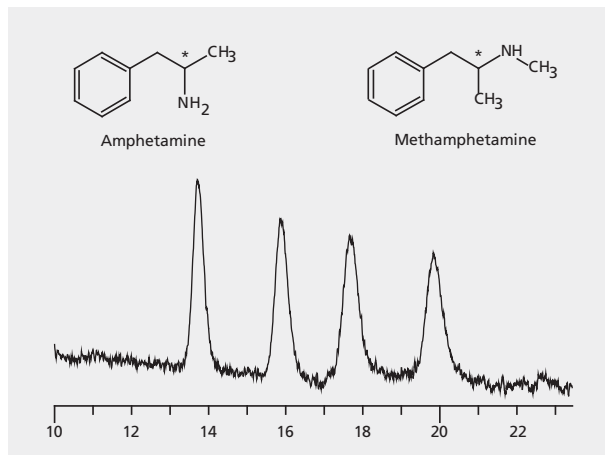
HPLC Analysis of 1-Aminoindan Enantiomers on LARIHC™ CF6-P

column . . . LARIHC CF6-P, 25 cm x 4.6 mm I.D., 5 µm particles (AZYP Part No.L1001, available from Supelco/Sigma-Aldrich as a custom item)
mobile phase (A) methanol: (B) acetonitrile: (C) acetic acid: (D) triethylamine, (70:30:0.3:0.2, A:B:C:D)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 5 µL
sample 1-Aminoindan, 0.3 mg/mL in ethanol
Application No. **G005255**



HPLC Analysis of Amphetamine and Methamphetamine Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase (A) methanol; (B) acetic acid;
(C) ammonium hydroxide; (99.88:0.1:0.01, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 210 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004467](#)



HPLC Analysis of Amphetamines in Urine on Discovery® HS F5 after SPE using Discovery® DSC-MCAX and Standard C18

Sample Pre-Treatment:

1 mL human urine was spiked with 2 mg/mL amphetamine and methylamphetamine. The spiked sample was diluted 1:1 with 1:1 with 50 mM ammonium acetate, pH 6.0.

sample preparation SPE (Solid Phase Extraction)
sample/matrix human urine spiked amphetamine and methylamphetamine at with 2 mg/mL

SPE tube/cartridge Discovery DSC-MCAX, 100 mg/3mL (52783-U)
condition ... DSC-MCAX SPE tube: 1 mL methanol; 1 mL 50 mM ammonium acetate, pH 6.0; C-18 SPE tube: 1 mL methanol; 1 mL DI water

sample addition 1 mL
washing DSC-MCAX SPE tube: 1 mL 50 mM ammonium acetate, pH 6.0; 1 mL 1M acetic acid; 1mL methanol; C-18 SPE tube: 1 mL DI water; 1 mL 20% methanol

elution DSC-MCAX SPE tube: 1 mL 5% ammonium hydroxide in methanol; C-18 SPE tube: 1 mL methanol

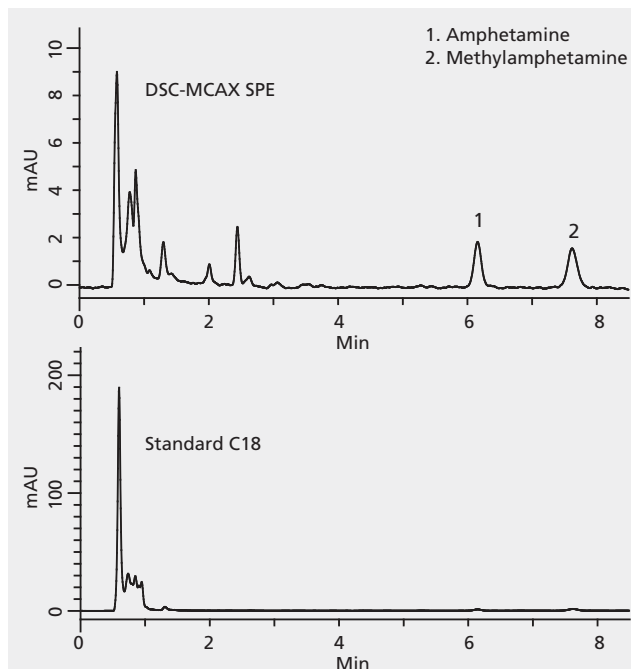
eluate post-treatment evaporate to dryness with nitrogen at room temperature, reconstitute in mobile phase

column Discovery HS F5, 15 cm x 4.6 mm I.D., 5 µm particles (567516-U)
mobile phase ... (A) 10 mM ammonium acetate, pH 4.5; (B) methanol; (35:65, A:B)

flow rate 2 mL/min
column temp. 40 °C

detector UV, 210 nm
injection 10 µL

Application No. [G003761](#)



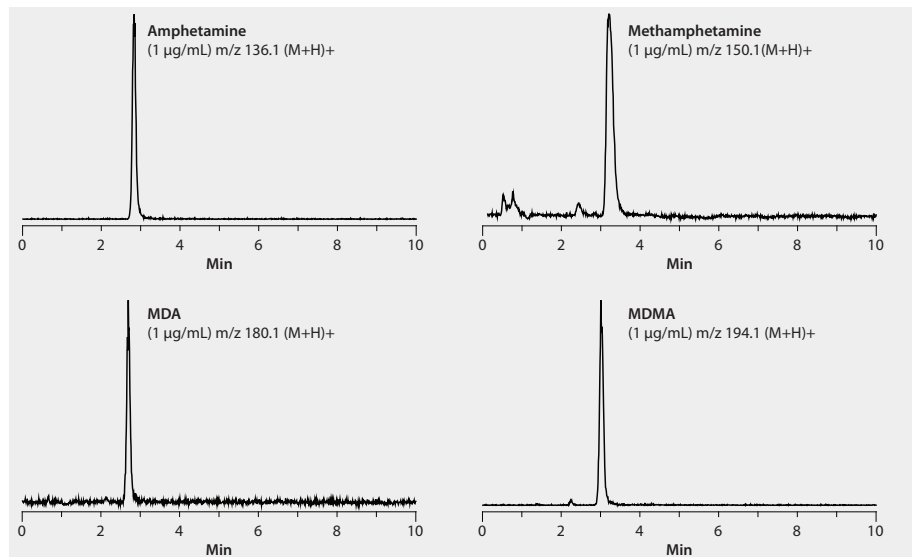
Discussion:

Note the Y-axis scale difference between DSC-MCAX and C18 SPE. DSC-MCAX SPE offered a maximum background height of ~9 mAU. In contrast, standard C18 background levels were 20 times greater than DSC-MCAX.

Also, on DSC-MCAX absolute recovery averaged at 100.3 and 101.7%, for amphetamine and methylamphetamine, respectively. On standard C18, absolute recovery averaged at 48 and 79% for the two compounds.

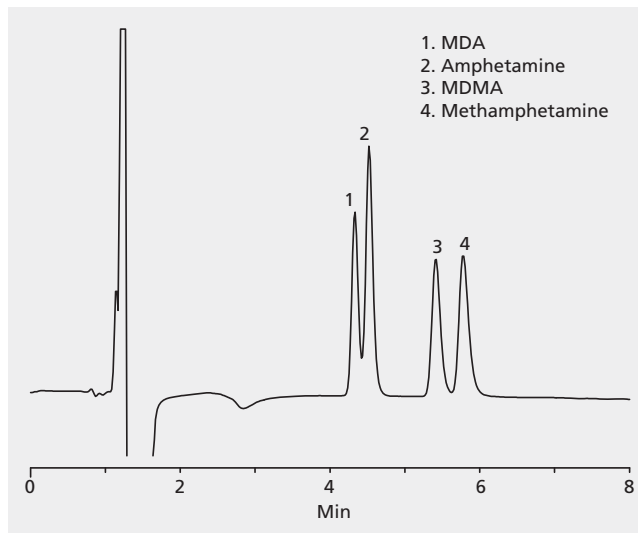
HPLC Analysis of Amphetamines on Discovery® HS F5

column Discovery HS F5, 5 cm x 2.1 mm I.D., 3 µm particles (567500-U)
mobile phase . . (A) 0.1% ammonium acetate in water; (B) 0.1% ammonium acetate
in acetonitrile; (C) acetonitrile; (10:30:60, A:B:C)
flow rate 0.2 mL/min
column temp. 35 °C
detector MS, ESI (+) in Single Ion Recording (SIR) Mode
injection 5 µL
sample 1 µg/mL in acetonitrile
Application No. **G003731**



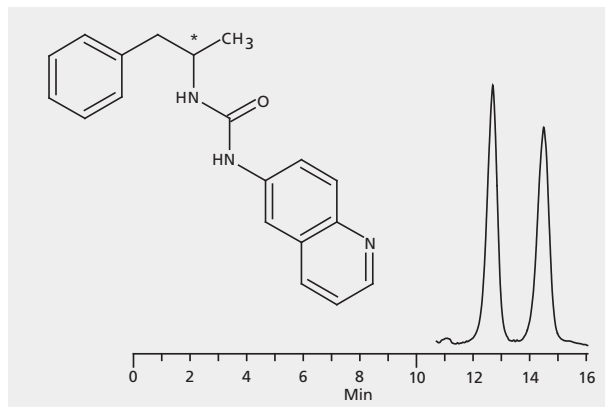
HPLC Analysis of Amphetamine, Methamphetamine, MDA, and MDMA on Discovery® HS F5

column Discovery HS F5, 15 cm × 4.6 mm I.D., 5 µm particles (567516-U)
mobile phase (A) 10 mM ammonium acetate in (B) water: acetonitrile (10:90)
flow rate 1.5 mL/min
column temp. 35 °C
detector UV, 210 nm
injection 5 µL
sample 50 µg/mL each (amphetamine, methamphetamine,
MDA and MDMA) in methanol
Application No. **G002081**



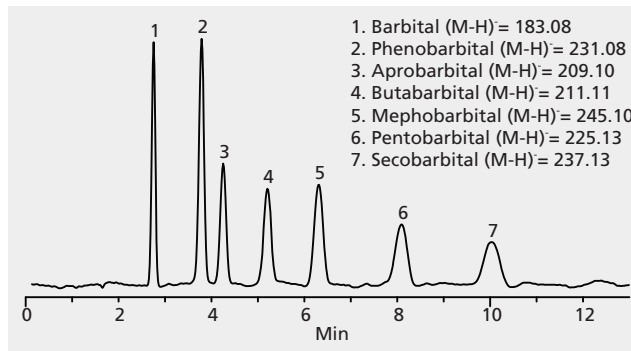
HPLC Analysis of AQC-Amphetamine Enantiomers on Astec® CYCLOBOND® I 2000 DMP

column . . . CYCLOBOND I 2000 DMP, 25 cm x 4.6 mm I.D., 5 µm particles (20724AST)
mobile phase . . . (A) 10 mM ammonium acetate, pH 4.1; (B) acetonitrile; (80:20, A:B)
flow rate 1 mL/min
column temp. 30 °C
detector UV, 220 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004696**



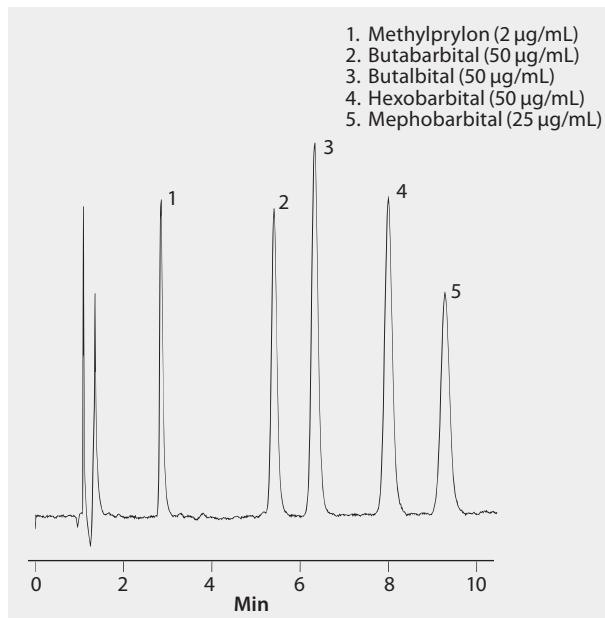
HPLC Analysis of Barbiturates on Ascentis® C8

column Ascentis C8, 15 cm x 4.6 mm I.D., 5 µm particles (581424-U)
mobile phase (A) methanol; (B) water (45:55, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 214 nm
injection 5 µL
sample 10 µg/mL each in 50:50 water:methanol
Application No. **G003307**



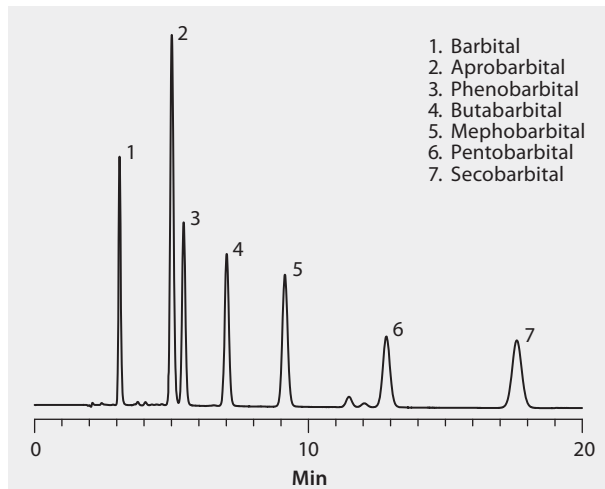
HPLC Analysis of Barbiturates on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase . . . (A) acetonitrile; (B) 25 mM potassium phosphate buffer, pH 6.9
(25:75, A:B)
flow rate 1.5 mL/min
column temp. ambient
detector UV, 254 nm
injection 25 µL
Application No. [713-0141](#)



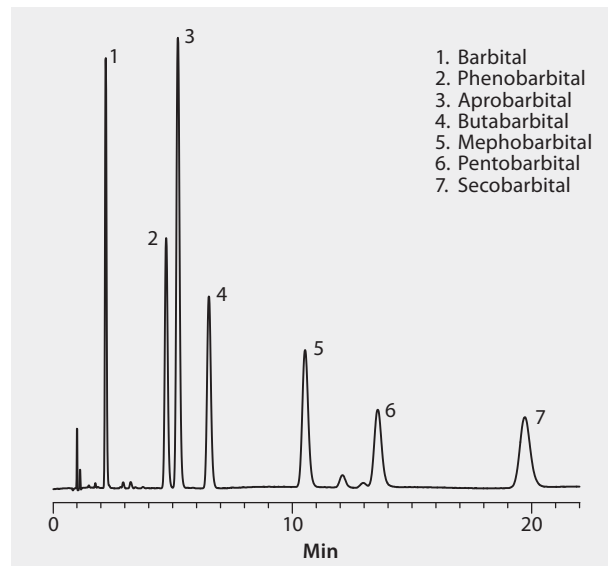
HPLC Analysis of Barbiturates on Discovery® C18, Unbuffered Mobile Phase

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase (A) methanol; (B) water (45:55, A:B)
flow rate 1 mL/min
column temp. ambient
detector UV, 214 nm
injection 10 µL
Application No. **G000190**



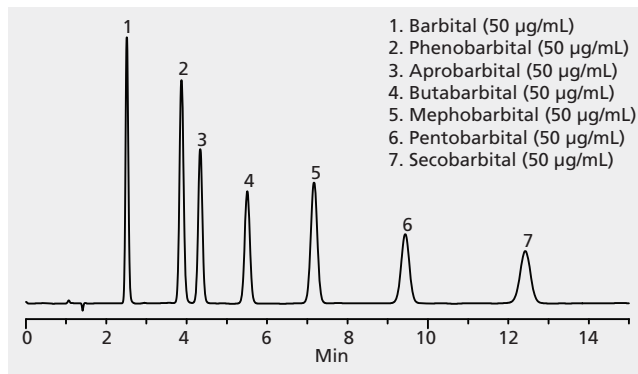
HPLC Analysis of Barbiturates on Discovery® RP-AmideC16

column . . . Discovery RP-AmideC16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase (A) methanol:acetonitrile, 60:40; (B) water; (25:75, A:B)
flow rate 2 mL/min
column temp. 30 °C
detector UV, 214 nm
injection 2 µL
Application No. **G000193**



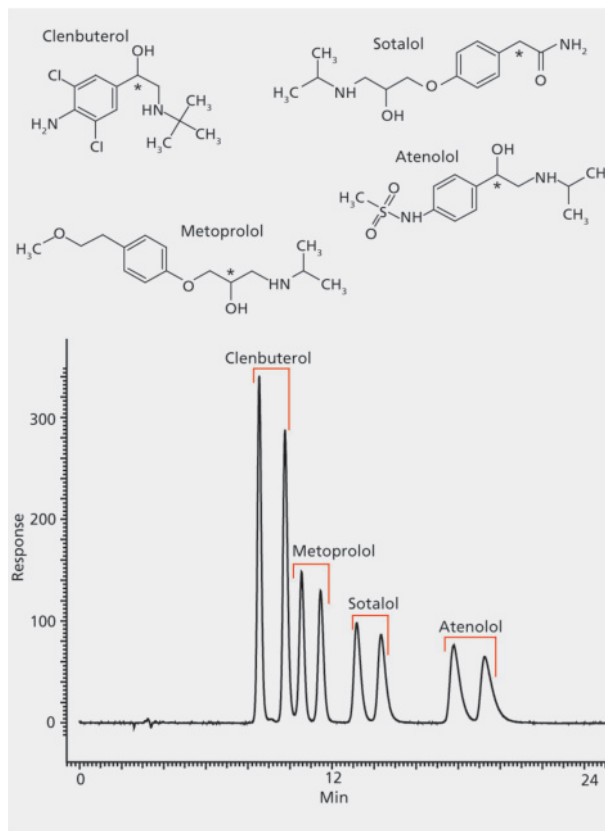
HPLC Analysis of Barbiturates on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) methanol; (B) water (50:50, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 214 nm
injection 10 µL
sample as indicated in 65:35 water:methanol
Application No. [G002877](#)



HPLC Analysis of Beta-Receptor Agonist Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm, 5 µm particles (12024AST)
 mobile phase 15 mM ammonium formate in methanol
 flow rate 1 mL/min
 column temp. 25 °C
 detector UV, 220 nm
 Application No. [G004337](#)



HPLC Analysis of Bufalin Toxin on Discovery® BIO Wide Pore C18

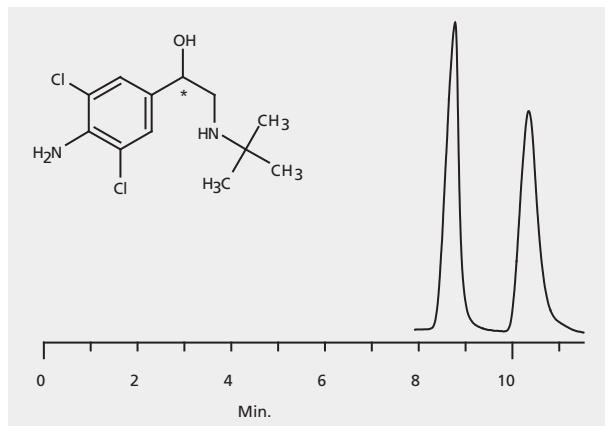
column Discovery BIO Wide Pore C18, 25 cm × 4.6 mm I.D.,
 5 µm particles (568223-U)
 mobile phase . . . (A) 0.1% TFA in water; (B) 0.1% TFA in acetonitrile:water (3:1, A:B)
 flow rate 1.3 mL/min
 column temp. ambient
 detector UV, 298 nm
 injection 10 µL bufalin, 0.5 mg/mL in acetonitrile
 Application No. **G001722**

Gradient Program	
Time (min)	%B
0	35
15	80
17	90
19	90
21	35
29	35



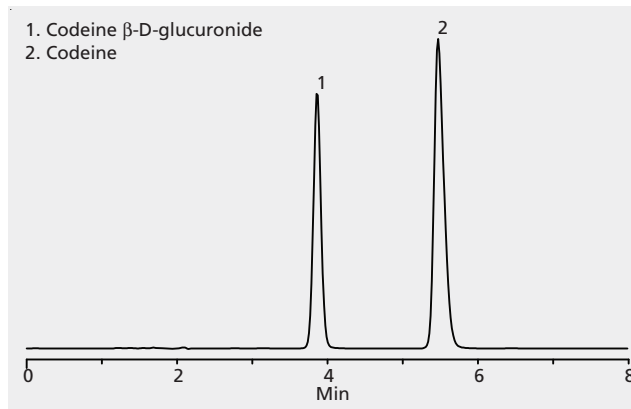
HPLC Analysis of Clenbuterol Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase 0.1 wt% ammonium trifluoroacetic acid in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004596](#)



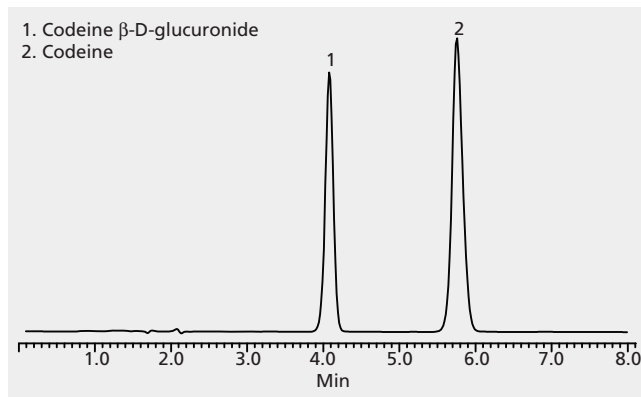
HPLC Analysis of Codeine and Metabolite on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile; (90:10, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002417**



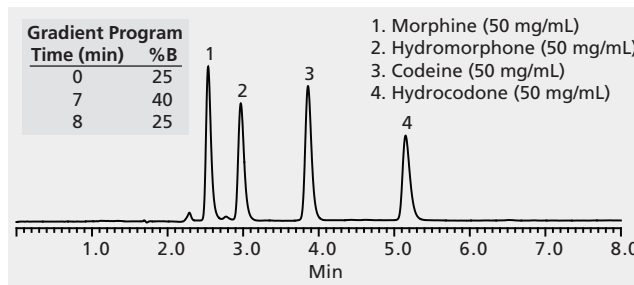
HPLC Analysis of Codeine and Metabolite on Ascentis® RP-Amide

column Ascentis RP-Amide 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile; (90:10, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002599**



HPLC Analysis of Drugs of Abuse on Ascentis® Phenyl

column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
 mobile phase (A) water with 0.1% ammonium acetate (pH 6.6, unadjusted);
 (B) acetonitrile with 0.1% ammonium acetate
 flow rate 1.0 mL/min
 column temp. 35 °C
 detector UV, 280 nm
 injection 10 µL
 sample as indicated in mobile phase A
 Application No. **G003701**



HPLC Analysis of Furosemide (Lasix) in Horse Serum on Discovery® C18 after SPE using Discovery® DSC-18

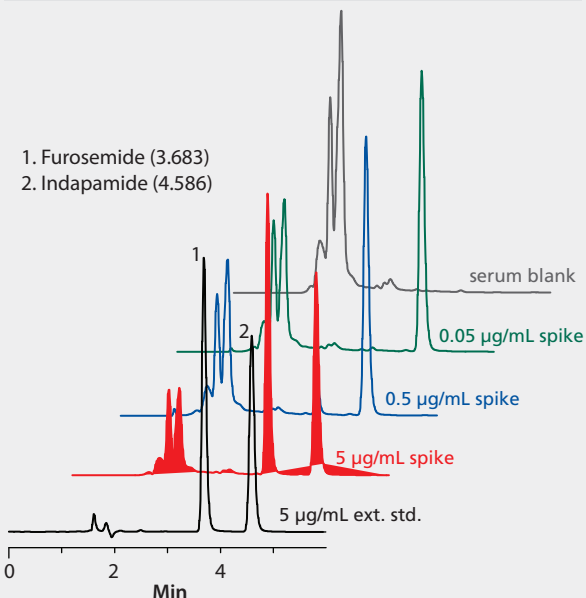
Sample Pre-treatment:

Neat horse serum was acidified with 10 mL 6 M HCl/mL serum. Internal standard (I.S.) blank was prepared by spiking acidified horse serum with indapamide at 10 mg/mL. Sample A = 10 mg/mL furosemide in I.S. blank. Sample B = 5 mg/mL furosemide in I.S. blank. Sample C = 0.5 mg/mL furosemide in I.S. blank. Sample D = 0.1 mg/mL furosemide in I.S. blank. Sample E = 0.05 mg/mL furosemide in I.S. blank.

sample preparation SPE (Solid Phase Extraction)
 sample/matrix acidified horse serum spiked with indapamide at 10 mg/mL
 SPE tube/cartridge Discovery DSC-18, 50 mg/1 mL (52601-U)
 condition 1 mL methanol; 1 mL 10 mM potassium phosphate, pH 3
 sample addition 1 mL
 washing 10 mM potassium phosphate, pH 3
 elution 1 mL 60% methanol in DI water.
 column Discovery C18, 15 cm x 4.6 mm I.D., 5 µm particles (504955)
 mobile phase (A) 10 mM KH₂PO₄, pH 3 (adjusted with H₃PO₄);
 (B) acetonitrile; (60:40, A:B)
 flow rate 1 mL/min
 column temp. 35 °C
 detector UV, 234 nm
 injection 10 µL
 Application No. **G003764**

Efficiency of Recovery

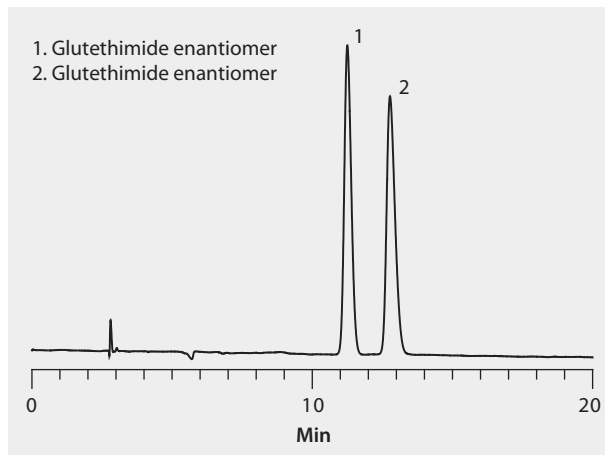
Sample	Concentration (µg/mL)	Avg. Response Factor	%Recovery ± RSD (n=3)
A	10.00	2.307	93.1 ± 3.1
B	5.00	1.168	100.8 ± 1.4
C	1.00	0.107	97.4 ± 2.8
D	0.50	0.065	120.7 ± 1.3
E	0.10	0.009	132.8 ± 8.3



HPLC Analysis of Glutethimide Enantiomers on Astec® Cellulose DMP

Glutethimide enantiomers are resolved by normal phase chromatography. Glutethimide is used to treat insomnia.

column . . . Astec Cellulose DMP, 25 cm x 4.6 mm I.D., 5 µm particles (51099AST)
mobile phase (A) heptane; (B) isopropanol; (80:20, A:B)
flow rate 1 mL/min
column temp. 30 °C
detector UV, 254 nm
injection 15 µL
sample glutethimide, 1 g/L in heptane:isopropanol (50:50)
Application No. **G005514**



HPLC Analysis of Hippuric and Methylhippuric Acids in Urine on SUPELCOSIL™ LC-18

Urinary excretion of hippuric acid and m-or p-methylhippuric acid in the urine is a test of exposure to toluene and m-or p-xylene vapors.

column SUPELCOSIL LC-18, 7.5 cm × 4.6 mm I.D., 3 μm particles (58984)

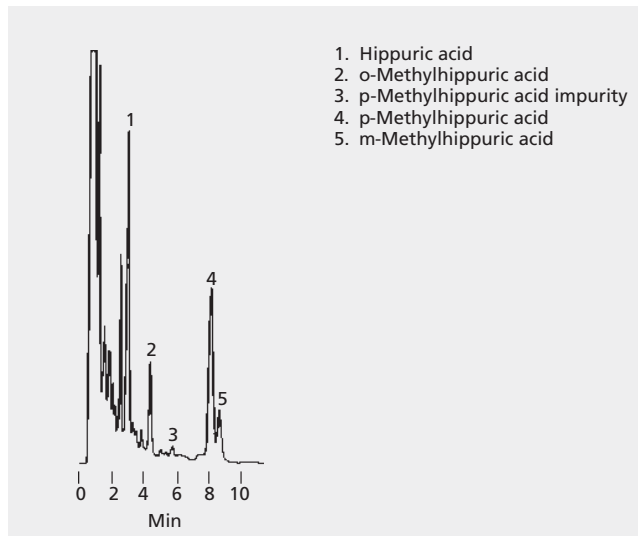
mobile phase (A) tetrahydrofuran:10 mM potassium phosphate, pH 3.0 (B) with phosphoric acid (3:97, A:B)

flow rate 1.5 mL/min

detector UV, 260 nm

injection . . . 10 μL spiked urine (300 μg/mL HA, o-MHA; 150 μg/mL m-MHA, p-MHA)

Application No. **713-0961A**

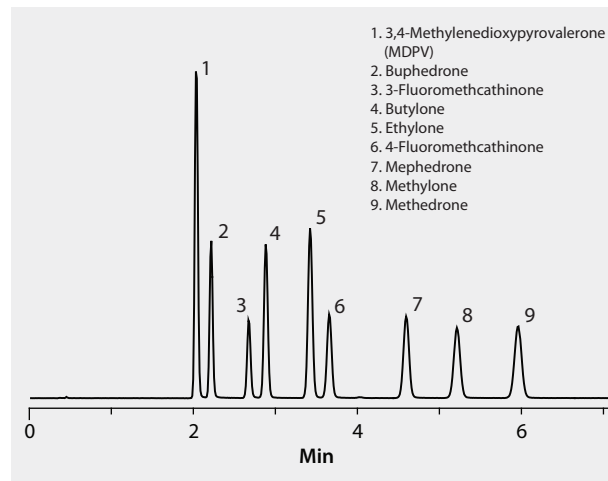


HPLC Analysis of Illicit Bath Salts on Ascentis® Express HILIC

With the rapid development of unregulated designer and synthetic compounds, the field of illicit drug testing has recently been met with a changing environment. Of most concern has been the development of a class of phenethylamine and cathinone compounds being marketed as “bath salts,” “jewelry cleaner,” or “plant food.” Though sold as “not for human consumption,” these compounds are reported to generate stimulating effects similar to that of methamphetamine, heroin, and 3,4- methylenedioxypropylvalerone (MDMA). For a period of time, these compounds could be acquired legally through the internet and head shops due to no direct legal control. In the US, both state and local governments have instituted bans on the sale of these bath salt compounds. Forensic testing facilities often experience difficulty in testing these compounds due to the fact that they are not detected under normal ELISA testing methods; additional more specific LC-MS methods are necessary. The challenge for LC-MS detection of these particular bath salts resides in three sets of isobaric compounds that require chromatographic resolution for positive confirmation. For example, both butylone and ethylone have the same mono isotopic mass, making these compounds indistinguishable, even when using accurate mass time of flight TOF-MS. Efficient chromatographic separation is necessary for accurate quantitation of these compounds. The polar basic nature of the bath salts makes these compounds difficult to retain on traditional reversed-phase C18 and even polar embedded stationary phases, making them prime subjects for HILIC chromatographic separation. Shown here is the fast, high-resolution separation of nine synthetic bath salts on Ascentis Express HILIC.

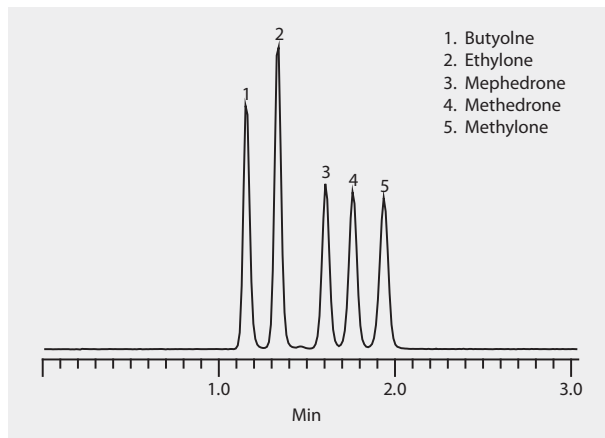
column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)
 mobile phase (A) acetonitrile; (B) 0.25 M ammonium formate;
 (98:2, A:B); premixed
 flow rate 0.6 mL/min
 pressure 1842 psi (127 bar)
 column temp. 35 °C

detector MS, ESI(+), TIC, m/z 100-1000
 injection 1 µL
 sample 200 µg/L ea. in acetonitrile
 Application No. G005537



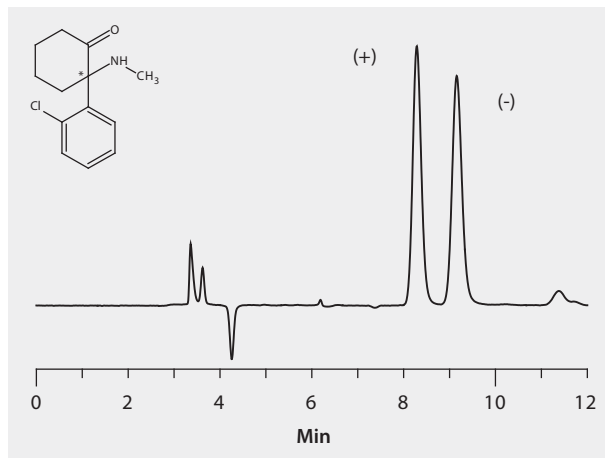
HPLC Analysis of Illicit Bath Salts on Ascentis® Express HILIC, Fast Analysis

With the rapid development of unregulated designer and synthetic compounds, the field of illicit drug testing has recently been met with a changing environment. Of most concern has been the development of a class of phenethylamine and cathinone compounds being marketed as “bath salts,” “jewelry cleaner,” or “plant food.” Though sold as “not for human consumption,” these compounds are reported to generate stimulating effects similar to that of methamphetamine, heroin, and 3,4- methylenedioxypyrovalerone (MDMA). For a period of time, these compounds could be acquired legally through the internet and head shops due to no direct legal control. In the US, both state and local governments have instituted bans on the sale of these bath salt compounds. Forensic testing facilities often experience difficulty in testing these compounds due to the fact that they are not detected under normal ELISA testing methods; additional more specific LC-MS methods are necessary. The challenge for LC-MS detection of these particular bath salts resides in three sets of isobaric compounds that require chromatographic resolution for positive confirmation. For example, both butylone and ethylone have the same mono isotopic mass, making these compounds indistinguishable, even when using accurate mass time of flight TOF-MS. Efficient chromatographic separation is necessary for accurate quantitation of these compounds. The polar basic nature of the bath salts makes these compounds difficult to retain on traditional reversed-phase C18 and even polar embedded stationary phases, making them prime subjects for HILIC chromatographic separation. Shown here is the fast, high-resolution separation of nine synthetic bath salts on Ascentis Express HILIC. column . . . Ascentis Express HILIC, 5 cm x 2.1 mm I.D., 2.7 µm particles (53934-U) mobile phase A: 5 mM ammonium formate (95:5 acetonitrile:water) flow rate 0.6 mL/min column temp. 35 °C detector ESI(+), TIC 100 - 1000 m/z sample 1 µL Application No. **G005444**



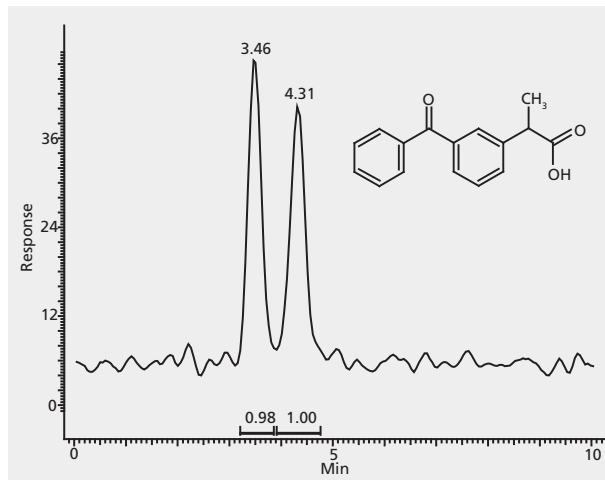
HPLC Analysis of Ketamine Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) heptane; (B) IPA; (C) DEA; (90:10:0.1, A:B:C)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G004990](#)



HPLC Analysis of Ketoprofen Enantiomers on Astec® CHIROBIOTIC® R (MS Detection)

column CHIROBIOTIC R, 15 cm x 2.1 mm, 5 µm particles (13019AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 5.6 (B) methanol; (70:30, A:B)
flow rate 0.2 mL/min
column temp. 35 °C
detector ESI(-)
Application No. **G004331**



HPLC Analysis of Metabolites of 7,12-Dimethylbenz[a]anthracene on SUPELCOSIL™ LC-18

column SUPELCOSIL LC-18, 25 cm × 4.6 mm I.D., 5 μm particles (58298)
 mobile phase . . (A) methanol:(B) water, (50:50, A:B), 10 min to 100:0 at 2.5% /min
 flow rate 0.8 mL/min
 detector fluorescence
 sample rat liver, 9000 × g supernatant fraction from Aroclor-treated animals
 Application No. 713-1043

- | | |
|--|---|
| 1. 2-OH-DMBA(t-diol) | 11. 7-OHM-12-MBA-4-ol |
| 2. 7-OHM-12-MBA-(t-10,11-diol) | 12. 7-M-12-OHMBA-(3-ol) |
| 3. 7-M-12-OHMBA-(t-8,9-diol) | 13. 7-M-12-OHMBA-2-ol |
| 4. 7-OHM-12-MBA-(t-8,9-diol) | 14. 7-OHM-12-MBA |
| 5. 7-OHM-(t-3,4-diol) | 15. 7-M-12-OHMBA |
| 6. Mixed diols, incl. DMBA-(t-8,9-diol & t-10,11-diol) | 16. DMBA-2-ol |
| 7. Position of 7,12-bis-OHMBA | 17. DMBA-3-ol |
| 8. 7-OHM-12-MBA-2-ol | 18. DMBA-4-ol |
| 9. 7-OHM-12-MBA-(3-ol) | 19. DMBA |
| 10. 7-M-12-OHMNA-4-ol | (parentheses = tentative identifications) |

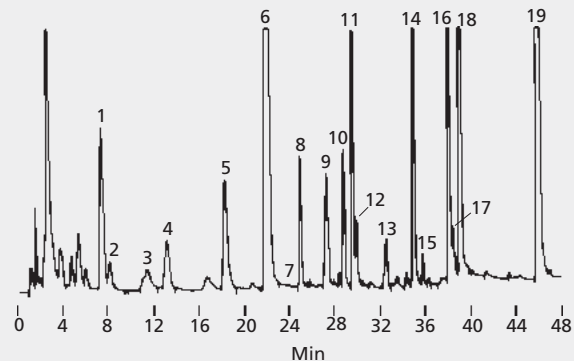
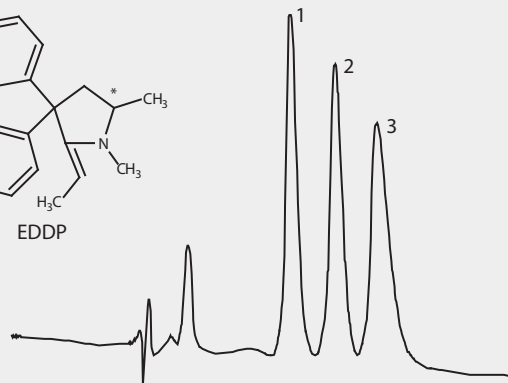
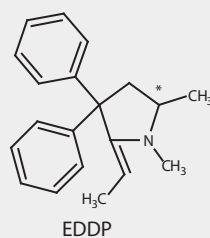


Figure provided by Drs. J. Milner and J. Grunau, University of Illinois, Urbana, Illinois, USA.

HPLC Analysis of Methadone Enantiomers and Methadone Metabolite EDDP on Astec® CYCLOBOND® I 2000 HP-RSP

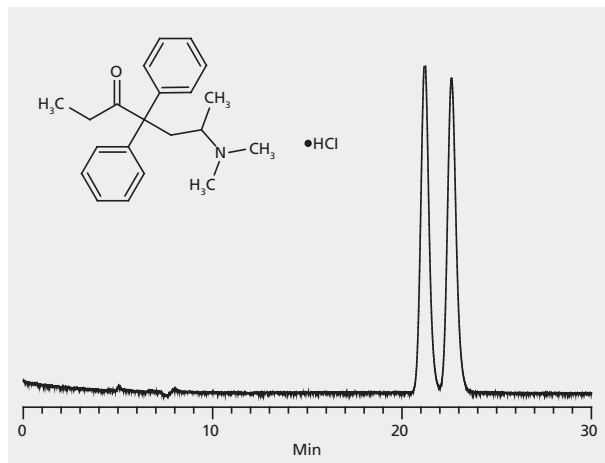
column CYCLOBOND I 2000 HP-RSP, 25 cm x 4.6 mm I.D.,
5 µm particles (24024AST)
mobile phase (A) 0.1% acetic acid; (B) acetonitrile; (80:20, A:B)
flow rate 0.8 mL/min
detector UV, 292 nm
Application No. **G004734**

Peak	Rt (min)	Peak ID
1	8.5	R-Methadone
2	9.7	S-Methadone
3	11.0	R,S-EDDP (2-ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine)



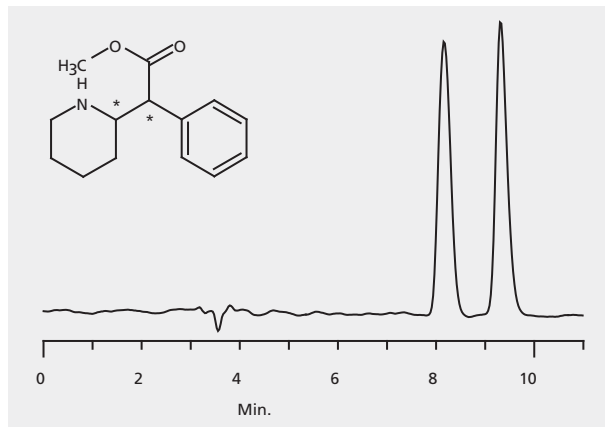
HPLC Analysis of Methadone Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase (A) methanol; (B) 20 mM ammonium formate; (95:5, A:B)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 205 nm
injection 2 µL
sample methadone, 1 mg/mL in mobile phase
Application No. [G004403](#)



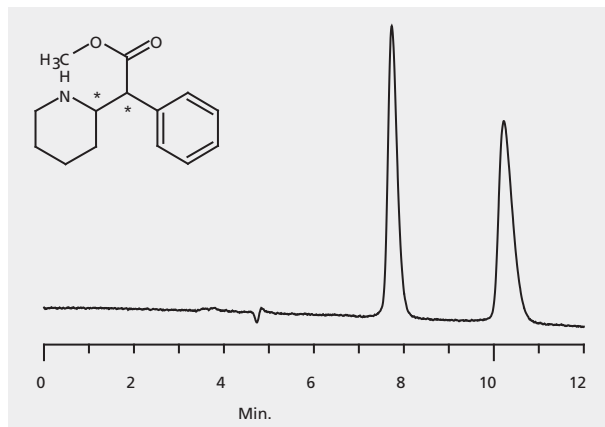
HPLC Analysis of Methylphenidate Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) methanol; (B) 1% triethylamine, pH 4/1; (95:5, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. **G004505**



HPLC Analysis of Methylphenidate (Ritalin) Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase 15 mM ammonium acetate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 215 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004504**



HPLC Analysis of 3-Methylpyrazole and 4-Methylpyrazole in Urine on Discovery® C18 after SPE using Discovery® DSC-SCX

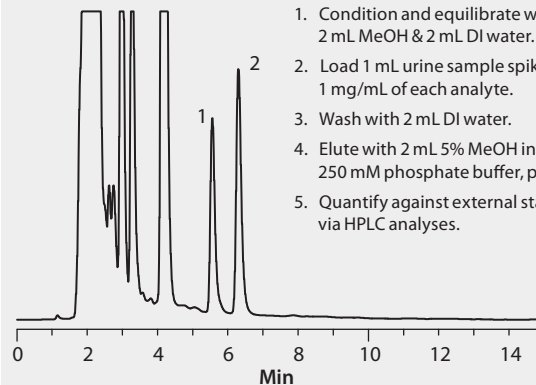
sample preparation SPE (Solid Phase Extraction)
 sample/matrix urine spiked with 3- and 4-methylpyrazole at 1 mg/mL
 SPE tube/cartridge Discovery DSC-SCX, 500 mg/3 mL (52686-U)
 condition 2 mL methanol; 2 mL DI water
 sample addition 1 mL
 washing 2 mL DI water
 elution 2 mL 5% methanol in 250 mM potassium phosphate buffer, pH 7.4
 column Discovery C18, 15 cm × 4.6 mm, 5 µm preceded by a
 2 cm guard column and 0.5 µm frit filter (504955)
 mobile phase MeOH:5 mM phosphate buffer, pH 6 (20:80)
 flow rate 1 mL/min
 column temp. 30 °C
 detector UV, 220 nm
 injection 25 µL, dilute urine extract
 Application No. **G001635**

Efficiency of Recovery

Compound (mg/mL)	Discovery DSC-SCX (n=3)		Leading Competitor SCX (n=2)	
	% Recovery	%RSD	%Recovery	%RSD
1. 3-methylpyrazole (1.0)	89.4	±10.2%	67.1	±20%
2. 4-methylpyrazole (1.0)	79.4	±6.8%	50.5	±30%

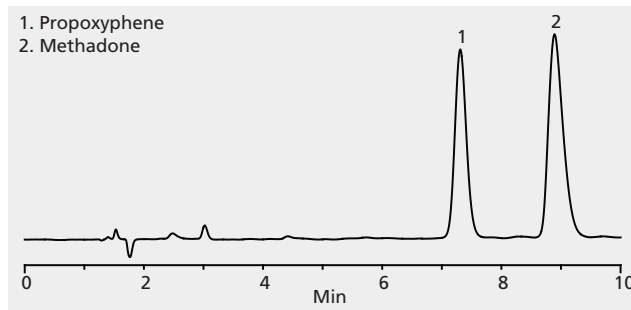
SPE Procedure

1. Condition and equilibrate with 2 mL MeOH & 2 mL DI water.
2. Load 1 mL urine sample spiked with 1 mg/mL of each analyte.
3. Wash with 2 mL DI water.
4. Elute with 2 mL 5% MeOH in 250 mM phosphate buffer, pH 7.4.
5. Quantify against external standards via HPLC analyses.



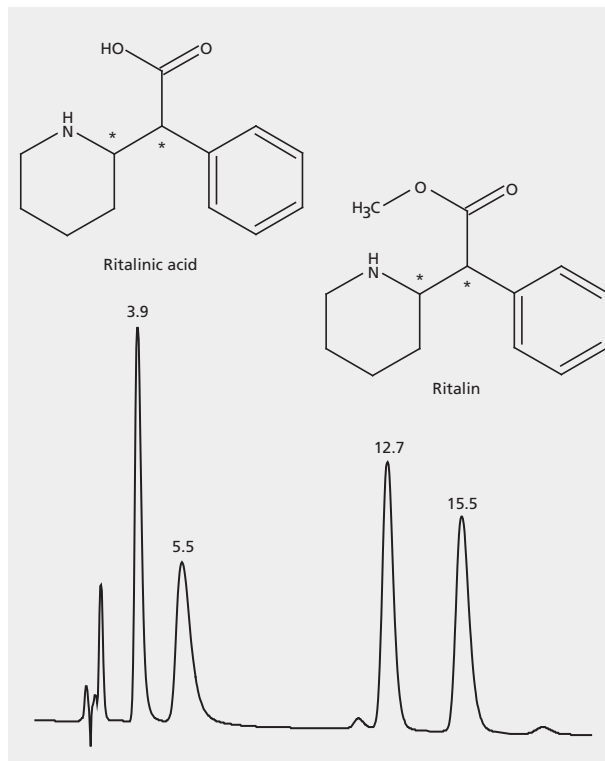
HPLC Analysis of Propoxyphene and Methadone on Ascentis® Phenyl

column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase . . . (A) water with 0.1% ammonium acetate: (B) methanol; (20:80, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL in 20:80, water:methanol
Application No. [G003699](#)



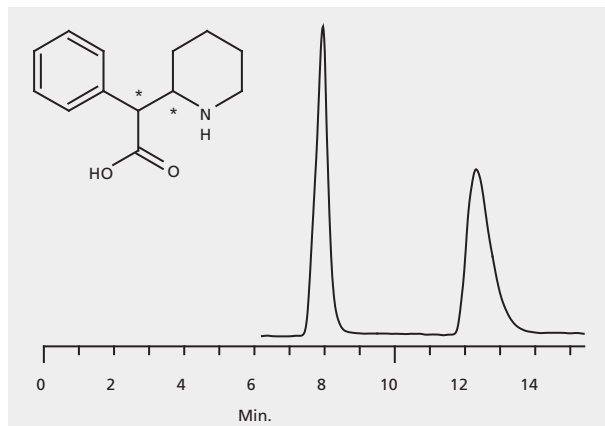
HPLC Analysis of Ritalinic Acid and Ritalin (Methylphenidate) Enantiomers on Astec® CHIROBIOTIC® V2 with T2 Guard Column

column CHIROBIOTIC T2 guard column, 2 cm x 4 mm I.D.,
5 µm particles (16100AST (requires holder 21150AST))
column CHIROBIOTIC V2, 15 cm x 4.6 mm I.D., 5 µm particles (15023AST)
mobile phase ... (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (7:93, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. **G004733**



HPLC Analysis of Ritalinic Acid Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase . . . (A) 10 mM ammonium acetate, pH 5.5; (B) acetonitrile; (70:30, A:B)
flow rate 0.9 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. **G004600**



HPLC Analysis of Spice Cannabinoids on Ascentis® Express C18

Synthetic cannabinoids (Spice) are a relatively new type of designer drug used as a pseudo-legal means to get a cannabis-type high. New synthetic cannabinoids are continually being introduced as suppliers tweak the molecular structures. The ability to rapidly and reliably identify the continually changing population of these compounds in the blood or urine suspected users is a significant analytical challenge facing forensic chemists.

column . . . Ascentis Express C18, 10 cm x 2.1 mm I.D., 2.7 µm particles (53823-U)
mobile phase (A) 5 mM ammonium formate water;

. (B) 5 mM ammonium formate (95:5, acetonitrile:water)

gradient 68 to 100% B in 8 min; held at 100% B for 2 min

flow rate 0.6 mL/min

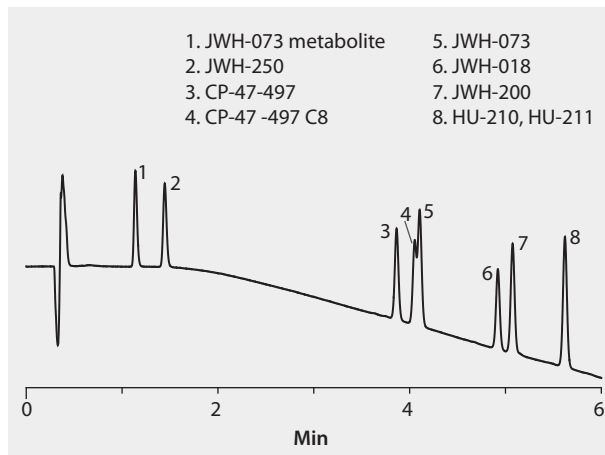
pressure 4351 psi (300 bar)

column temp. 30 °C

detector UV, 265 nm

injection 3 µL

Application No. **G005740**



HPLC Analysis of Spice Cannabinoids on Ascentis® Express F5

Synthetic cannabinoids (Spice) are a relatively new type of designer drug used as a pseudo-legal means to get a cannabis-type high. New synthetic cannabinoids are continually being introduced as suppliers tweak the molecular structures. The ability to rapidly and reliably identify the continually changing population of these compounds is a significant analytical challenge facing forensic chemists. A rapid separation of nine of these compounds on Ascentis Express F5 column is shown here.

column Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 µm particles (53569-U)
mobile phase (A) 50 mM ammonium formate;

(B) water; (C) acetonitrile; (10:35:55, A:B:C)

flow rate 0.6 mL/min

pressure 4075 psi (281 bar)

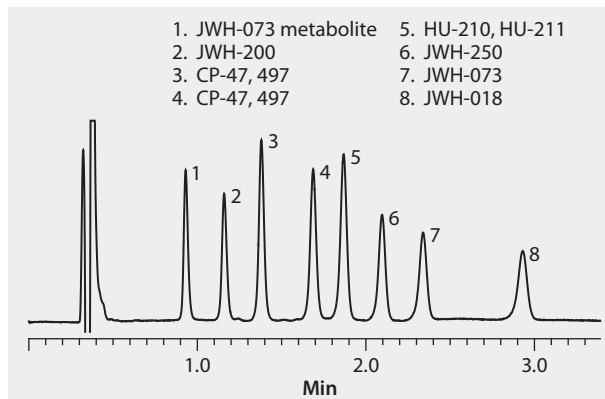
column temp. 30 °C

detector UV, 200 nm

injection 3 µL

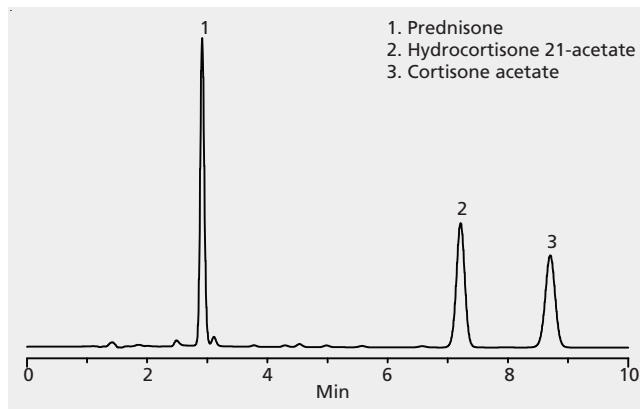
sample 100 µg/mL in 45:55 water:acetonitrile

Application No. [G005446](#)



HPLC Analysis of Steroids on Ascentis® C18 (Mobile phase: 60:40)

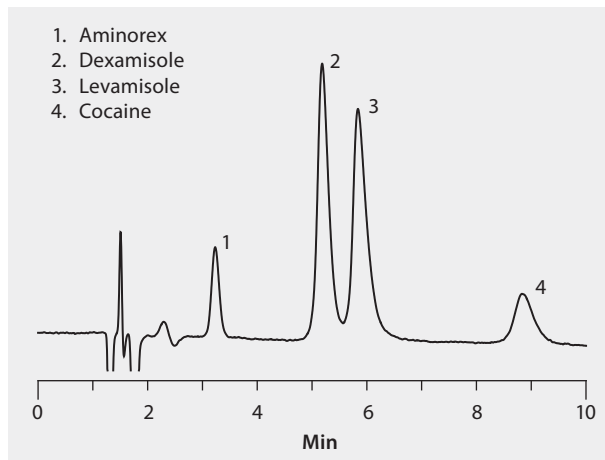
column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) water; (B) acetonitrile; (60:40, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002432**



HPLC Analysis of Tetramisole Enantiomers and Related Compounds on Astec® Cyclobond® I 2000 DMP

Cocaine is often found laced with levamisole (one of the tetramisole enantiomers) and aminorex is a metabolite of levamisole known to cause disorders.

column Astec CYCLOBOND I 2000 DMP 10 cm X 2.1 mm
mobile phase (A) 100 mM ammonium acetate,
pH 5 with acetic acid (B) acetonitrile, 90:10, v/v
flow rate 0.2 mL/min
pressure 360 psi
column temp. 35 °C
detector UV, 220 nm
injection 2.0 µL
sample 100 µg/mL tetramisole and 50 µg/mL each
cocaine and aminorex in water:methanol, 80:20, v/v
Application No. **G006305**



HPLC Analysis of Tetramisole Enantiomers on Astec® Cyclobond® I 2000 DMP

Cyclobond I 2000 DMP is effective at chiral recognition of tetramisole enantiomers. This method appears to be a suitable starting point for further development towards the LC/MS analysis of tetramisole in various matrices. The method is also a suitable replacement for published methods utilizing Cyclobond I 2000 SN (no longer available) for the analysis of Levamisole.

column ASTEC CYCLOBOND I 2000 DMP 25 cm x 4.6 mm I.D.,
5 µm particles (20724AST)

mobile phase (A) 100 mM ammonium acetate,
pH 5 with acetic acid (B) acetonitrile, 80:20, v/v

flow rate 1.0 mL/min

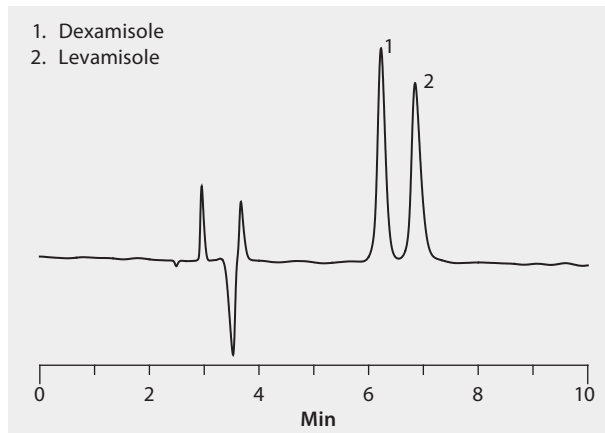
column temp. 35 °C

detector UV, 230 nm

injection 10 µL

sample 200 ug/mL tetramisole in mobile phase A:methanol, 80:20, v/v

Application No. G006293



Ref: 1. D. W. Armstrong, C. D. Chang, S. H Lee, *J. Chromatogr. A* **539**, 83-90 (1991)
2. M. Dolezalova, M. Tkaczykova, *J. Pharm. Biomed. Anal.* **25**, 407-415 (2001)

HPLC Chiral Analysis of Levamisole on Astec® Cyclobond® I 2000 DMP

Cyclobond I 2000 DMP is effective at chiral recognition of dexamisole from levamisole formulations. This method appears to be a suitable starting point for further development towards the analysis of levamisole chiral purity. The method is also a suitable replacement for published methods utilizing Cyclobond I 2000 SN which is no longer available.

column ASTEC CYCLOBOND I 2000 DMP 25 cm x 4.6 mm I.D.,
5µm particles (20724AST)

mobile phase (A) 100 mM ammonium acetate,
pH 5 with acetic acid (B) acetonitrile, 80:20, v/v

flow rate 1.0 mL/min

pressure 1600 psi (110 bar)

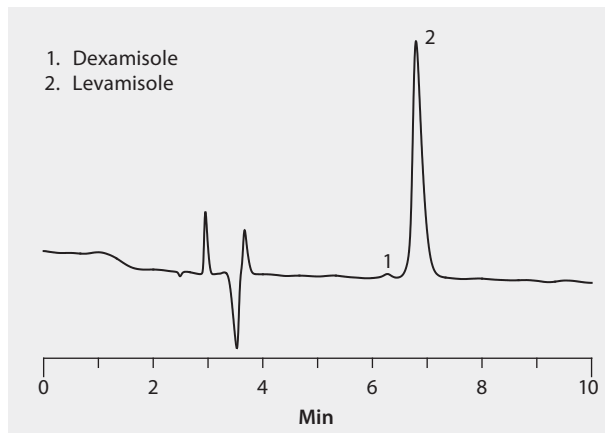
column temp. 35 °C

detector UV, 230 nm

injection 10 µL

sample 200 ug/mL tetramisole in mobile phase A:methanol, 80:20, v/v

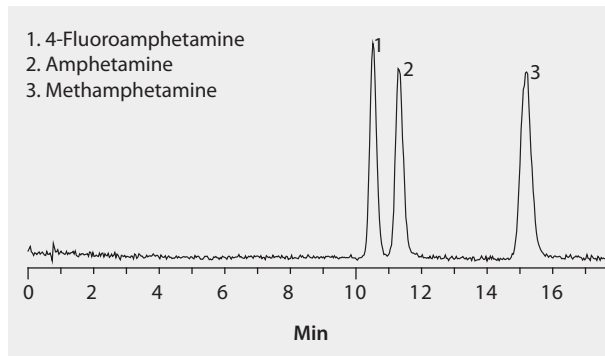
Application No. G006294



Ref: 1. D. W. Armstrong, C. D. Chang, S. H Lee, *J. Chromatogr. A* **539**, 83-90 (1991)
2. M. Dolezalova, M. Tkaczykova, *J. Pharm. Biomed. Anal.* **25**, 407-415 (2001)

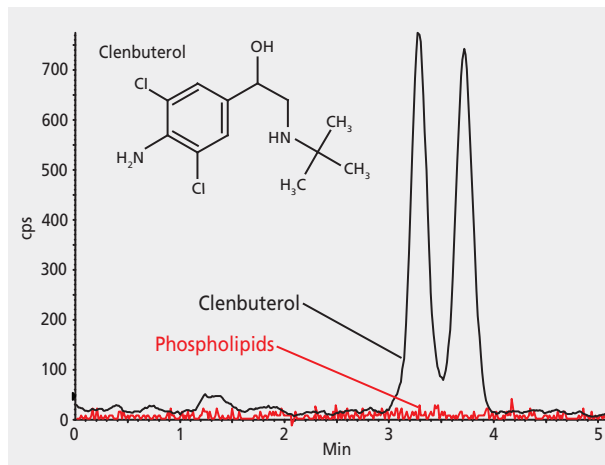
LC-MS Analysis of Amphetamines on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 10 cm x 3 mm I.D., 2.7 µm particles (53970-U)
mobile phase . . . (A) 1 mM ammonium acetate in (B) 10:90 (v/v) water:acetonitrile
flow rate 0.6 mL/min
pressure 1189 psi (82 bar)
column temp. 35 °C
detector ESI(+), full scan, m/z 110-200
injection 2 µL
sample 10 mg/L each in acetonitrile
Application No. **G005667**



LC-MS Analysis of Clenbuterol Enantiomers in Plasma on Astec® CHIROBIOTIC® T after SPE using HybridSPE®-Phospholipid

column CHIROBIOTIC T, 10 cm x 2.1 mm I.D., 5 µm particles (12018AST)
mobile phase 10 mM ammonium formate in methanol
flow rate 0.3 mL/min
column temp. 30 °C
detector ESI(+)
sample clenbuterol, 10 ng/mL in rat plasma
(phospholipids removed by extraction with HybridSPE-Phospholipid)
Application No. **G004245**

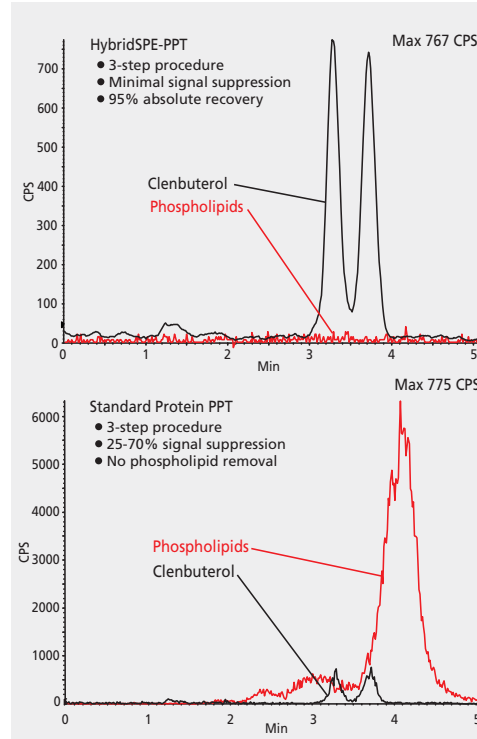


LC-MS Analysis of Clenbuterol In Plasma on Astec® CHIROBIOTIC® T with Phospholipid Removal Using HybridSPE® Phospholipid

The HybridSPE method provides significant improvement in LC-MS baseline. sample preparation SPE (Solid Phase Extraction) sample/matrix rat plasma spiked with clenbuterol enantiomers at 10 ng/mL SPE well plate HybridSPE-Precipitation 96-well Plate, 50 mg/well (575656-U) sample addition 100 µL spiked rat plasma followed by 300 µL 1% formic acid in acetonitrile. Mix by vortexing the HybridSPE-PPT plate briefly.

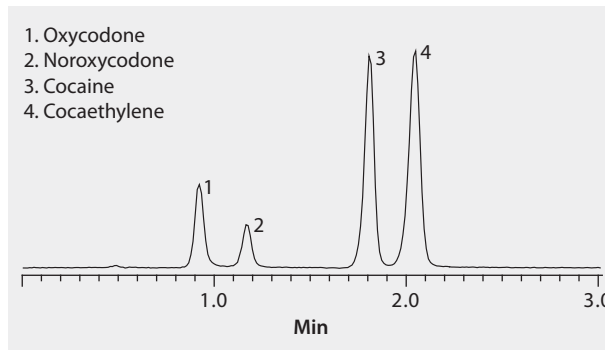
elution apply vacuum column CHIROBIOTIC T, 10 cm x 2.1 mm I.D., 5 µm particles (12018AST) mobile phase 10 mM ammonium formate in methanol flow rate 0.3 mL/min column temp. 30 °C detector ABI 3200 QT; ESI(+), MRM: 184/104 m/z (phospholipids); 277.2/203.1 m/z (clenbuterol)

injection 10 µL Application No. **G004431**



LC-MS Analysis of Cocaine, Cocaethylene, Oxycodone, and Noroxycodone on Discovery® HS F5

column Discovery HS F5, 5 cm x 2.1 mm I.D., 3 µm particles (567500-U)
mobile phase (A) 10 mM ammonium formate in water, pH 6.8;
(B) 10mM ammonium formate in acetonitrile, pH 6.8; (10:90, A:B)
flow rate 0.3 mL/min
column temp. 35 °C
detector ESI(+)
injection 2 µL
sample 200 ng/mL in 25:75, water:acetonitrile
Application No. [G005687](#)



LC-MS Analysis of Dermorphin in Horse Plasma on Ascentis® Express F5

Dermorphin is a heptapeptide derived from frogs. It is a painkiller, and used illicitly in racehorses so they continue to run through the pain.

column . . . Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 µm particles (53569-U)

sample 2 mM ammonium formate (90:10 acetonitrile:water)
adjusted to pH 4.5 with formic acid

flow rate 0.4 mL/min

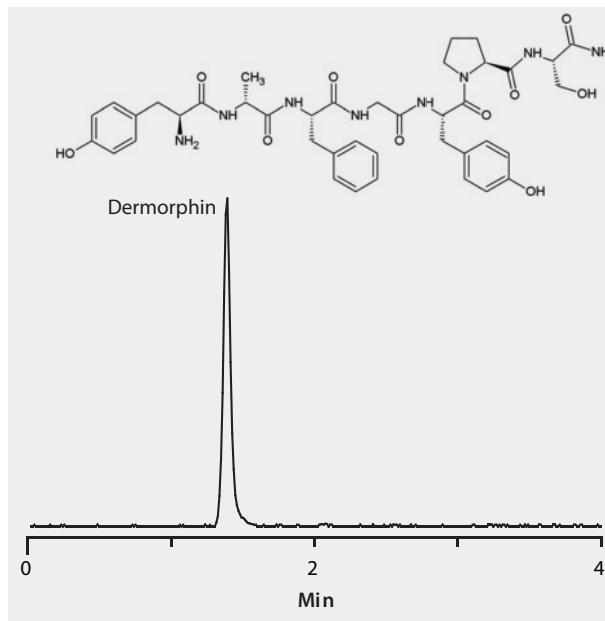
column temp. 35 °C

detector . . . ESI(+), TIC 100 – 1000 m/z; APCI (+), XIC m/z = 150.1, 203.7, 378.2

injection 1 µL

sample 10 µg/mL in 75:25 acetonitrile:water

Application No. [G005826](#)



LC-MS Analysis of Drugs of Abuse on Ascentis® Express RP-Amide

This application demonstrates the suitability of Ascentis Express RP-Amide for the efficient separation of common drink additives used in diet cola

column Ascentis Express RP Amide, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53913-U)

mobile phase (A) 10 mM ammonium formate in water;
(B) 10mM ammonium formate in acetonitrile; (75:25, A:B)

flow rate 0.2 mL/min

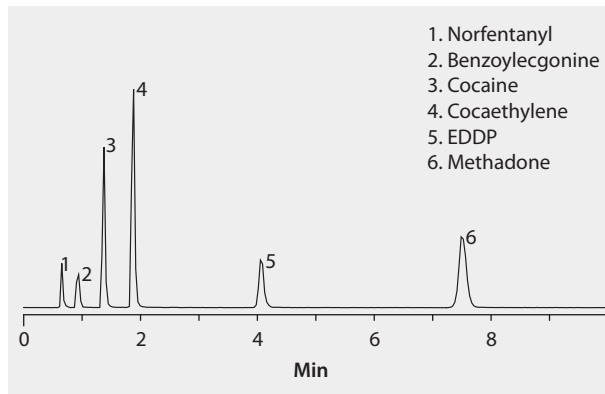
column temp. 35 °C

detector ESI(+)

injection 2 µL

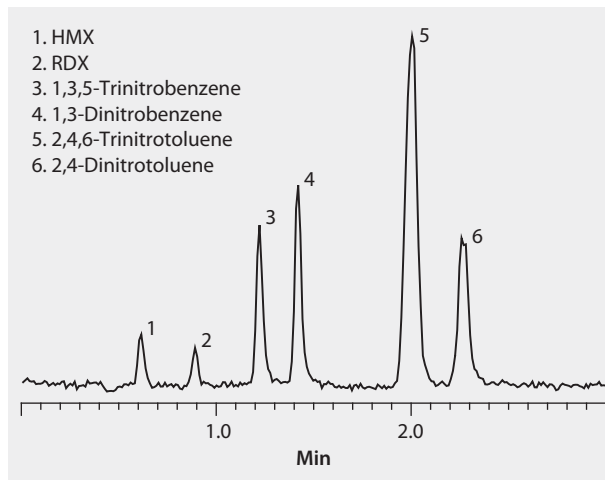
sample 500 ng/mL in water

Application No. **G005695**



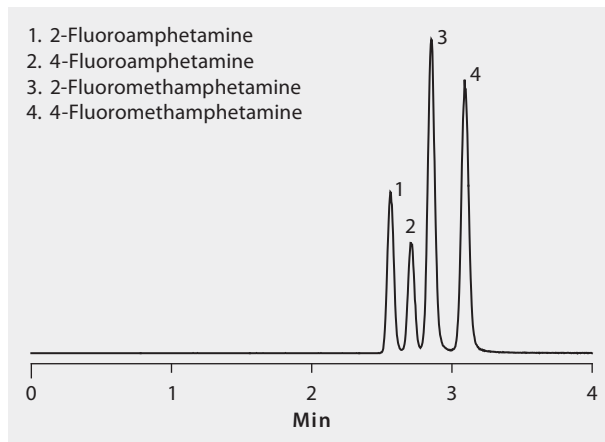
LC-MS Analysis of Explosives on Ascentis® Express C18

column . . . Ascentis Express C18, 10 cm x 3.0 mm I.D., 2.7 µm particles (53814-U)
mobile phase (A) methanol; (B) water; (50:50, A:B)
flow rate 0.9 mL/min
column temp. 50 °C
detector MS: APCI(-)
injection 5 µL
sample 100 ng/mL in 50:50, methanol:water
Application No. **G005608**



LC-MS Analysis of Fluoroamphetamine Drugs of Abuse on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)
gradient 5 mM ammonium formate in acetonitrile:water (90:10, v/v)
flow rate 0.4 mL/min
column temp. 35 °C
detector TOF/MS
injection 2.0 µL
sample 300 ng/mL in acetonitrile
Application No. [G006165](#)



LC-MS Analysis of Illicit Bath Salts in Urine on Ascentis® Express HILIC after Solid Phase Extraction (SPE) on Supel™-Select SCX

The designer drugs known as "bath salts" are synthetic stimulants and illegal in most states as of 2011. This application demonstrates the analysis of bath salts extracted from human urine samples using polymeric solid phase extraction (SPE) sample preparation followed by hydrophilic interaction liquid chromatography (HILIC) analysis with TOF-MS detection. HILIC conditions on the Ascentis Express HILIC (Si) phase are used for fast, high-resolution separation of nine synthetic bath salts. Recoveries greater than 65% were observed for all analytes except MDPV (43.7%). The Figure illustrates the detection of bath salts in the spiked urine sample after SPE sample cleanup. Notice there are no interfering peaks in the chromatogram, demonstrating the effectiveness of the SPE sample cleanup.

sample/matrix . . . Urine samples were spiked to a level of 100 ng/mL with each target analyte. (To ensure full ionization of the analytes, spiked samples were treated with formic acid to a final concentration of 0.1% formic acid.)

SPE tube/cartridge Supel-Select SCX, 30 mg/1 mL (54240-U)

condition 1 mL 1% formic acid acetonitrile then 1 mL water

sample addition 1 mL spiked water blank or urine

washing 1 mL water, 1 mL 1% formic acid acetonitrile, 1 mL water

elution 2 mL 10% ammonium hydroxide in acetonitrile

eluate post-treatment . . . thoroughly mix via vortex agitation, evaporate 1 mL aliquot to dryness, reconstitute in 100 µL water:methanol

column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)

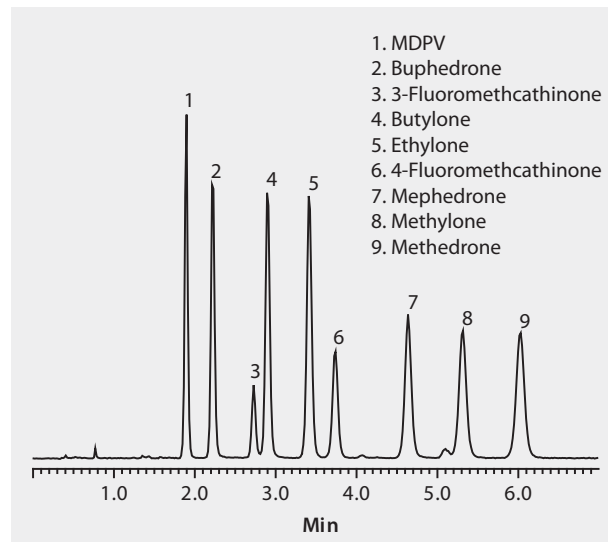
mobile phase (A) 5 mM ammonium formate acetonitrile;
(B) 5 mM ammonium formate water; (98:2, A:B); premixed

flow rate 0.6 mL/min

pressure 1842 psi (127 bar)

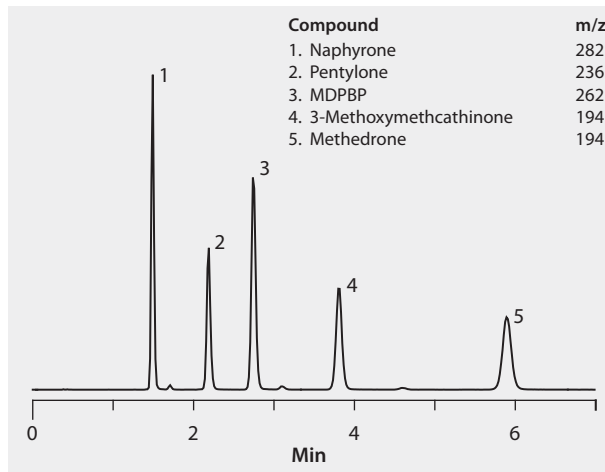
column temp. 35 °C

detector MS, ESI(+), TIC, m/z 100-1000
injection 1 µL
sample 200 µg/L ea. in acetonitrile
Application No. G005796



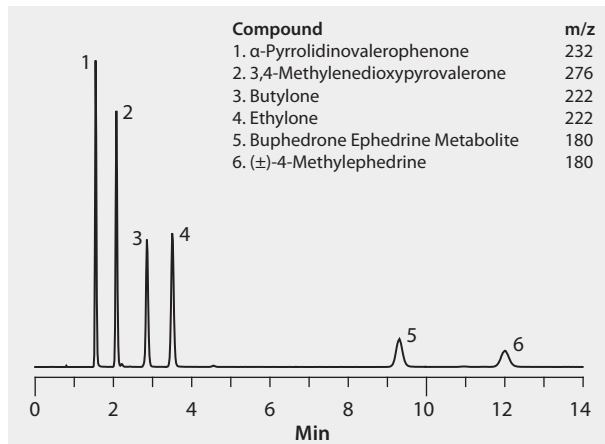
LC-MS Analysis of Illicit Bath Salts on Ascentis® Express HILIC, Set 1

column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)
mobile phase . . . 5 mM ammonium formate in (A) acetonitrile; (B) water; (98:2, A,B)
flow rate 0.6 mL/min
pressure 267 psi (18.4 bar)
column temp. 35 °C
detector MS, ESI(+) TOF, Summed Ion Chromatogram
injection 2 µL
sample 500 ng/mL in acetonitrile
Application No. **G005910**



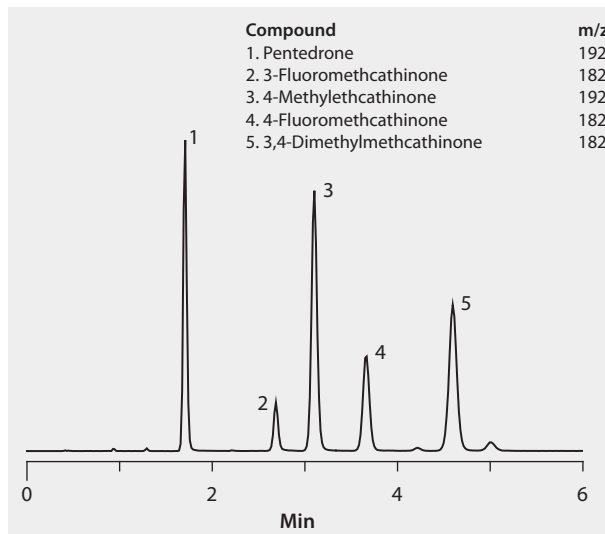
LC-MS Analysis of Illicit Bath Salts on Ascentis® Express HILIC, Set 2

column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)
mobile phase . . . (A) 5 mM ammonium formate in acetonitrile; (B) water; (98:2, A;B)
flow rate 0.6 mL/min
pressure 267 psi (18.4 bar)
column temp. 35 °C
detector MS, ESI(+) TOF, Summed Ion Chromatogram
injection 2 µL
sample 500 ng/mL in acetonitrile
Application No. **G005911**



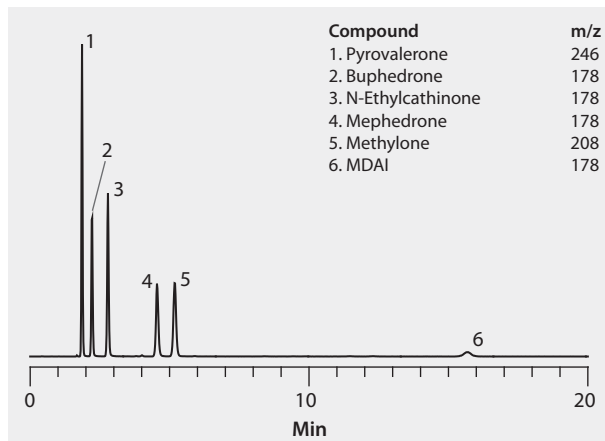
LC-MS Analysis of Illicit Bath Salts on Ascentis® Express HILIC, Set 3

column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)
 mobile phase . . . (A) 5 mM ammonium formate in acetonitrile; (B) water; (98:2, A:B)
 flow rate 0.6 mL/min
 pressure 267 psi (18.4 bar)
 column temp. 35 °C
 detector MS, ESI(+) TOF, Summed Ion Chromatogram
 injection 2 µL
 sample 500 ng/mL in acetonitrile
 Application No. **G005912**



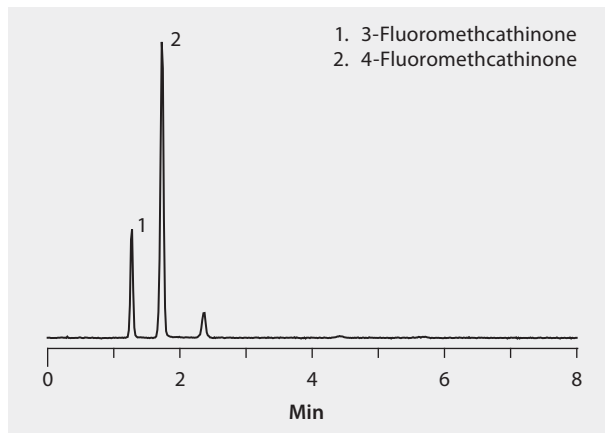
LC-MS Analysis of Illicit Bath Salts on Ascentis® Express HILIC, Set 4

column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)
mobile phase . . . 5 mM ammonium formate in (A) acetonitrile; (B) water; (98:2, A:B)
flow rate 0.6 mL/min
pressure 267 psi (18.4 bar)
column temp. 35 °C
detector MS, ESI(+) TOF, Summed Ion Chromatogram
injection 2 µL
sample 500 ng/mL in acetonitrile
Application No. **G005913**



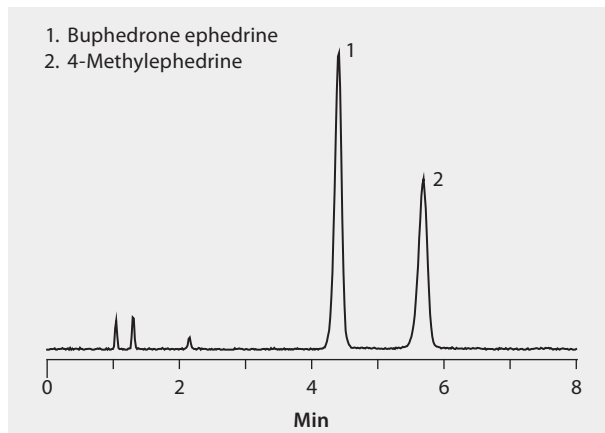
LC-MS Analysis of Isobaric Bath Salts 3- and 4-Fluoromethcathinone on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 5 cm x 2.1 mm I.D., 2.7 µm particles (53934-U)
mobile phase 5 mM ammonium formate (98:2 acetonitrile:water)
flow rate 0.6 mL/min
pressure 1262 psi (87 bar)
detector ESI(+), 182 m/z
injection 1.0 µL
sample 20 ng/mL
Application No. [G006224](#)



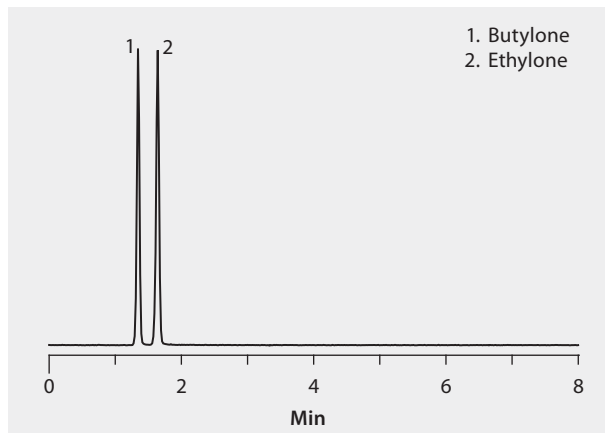
LC-MS Analysis of Isobaric Bath Salts Buphedrone Ephedrine and 4-Methylephedrine on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 5 cm x 2.1 mm I.D., 2.7 µm particles (53934-U)
mobile phase 5 mM ammonium formate (98:2 acetonitrile:water)
flow rate 0.6 mL/min
pressure 1262 psi (87 bar)
detector ESI(+), 180 m/z
injection 1.0 µL
sample 20 ng/mL
Application No. **G006226**



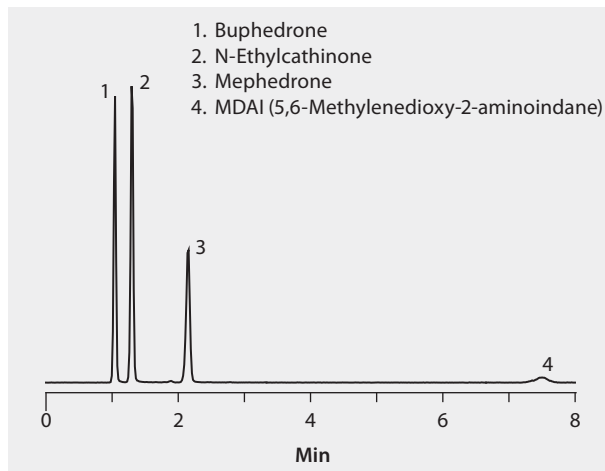
LC-MS Analysis of Isobaric Bath Salts Ethylone and Butylone on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 5 cm x 2.1 mm I.D., 2.7 µm particles (53934-U)
mobile phase 5 mM ammonium formate (98:2 acetonitrile:water)
flow rate 0.6 mL/min
pressure 1262 psi (87 bar)
column temp. 35 °C
detector ESI(+), 222 m/z
injection 1.0 µL
sample 20 ng/mL
Application No. **G006228**



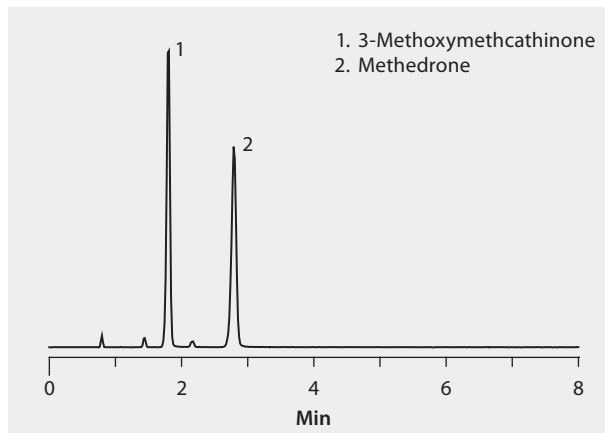
LC-MS Analysis of Isobaric Bath Salts Mephedrone, Buphedrone, N-Ethylcathinone and MDAI on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 5 cm x 2.1 mm I.D., 2.7 µm particles (53934-U)
mobile phase 5 mM ammonium formate (98:2 acetonitrile:water)
flow rate 0.6 mL/min
pressure 1262 psi (87 bar)
column temp. 35 °C
detector ESI(+), 178 m/z
injection 1.0 µL
sample 20 ng/mL
Application No. **G006227**



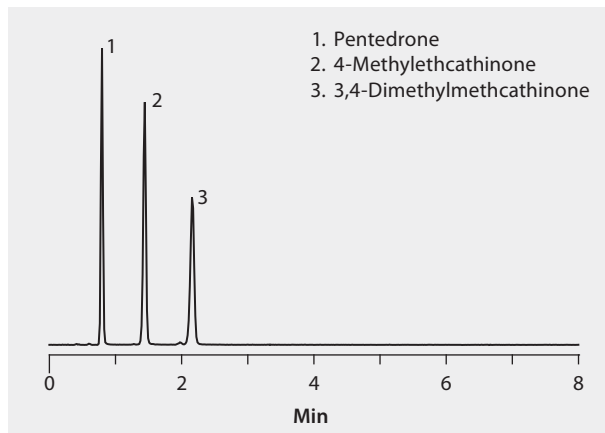
LC-MS Analysis of Isobaric Bath Salts 3-Methoxymethcathinone and Methedrone on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 5 cm x 2.1 mm I.D., 2.7 µm particles (53934-U)
mobile phase (5 mM ammonium formate (98:2 acetonitrile:water))
flow rate 0.6 mL/min
pressure 1262 psi (87 bar)
detector ESI(+), 194 m/z
injection 1.0 µL
sample 20 ng/mL
Application No. **G006225**



LC-MS Analysis of Isobaric Bath Salts Pentdrone, 4-Methylethcathinone and 3,4-Dimethylmethcathinone on Ascentis® Express HILIC

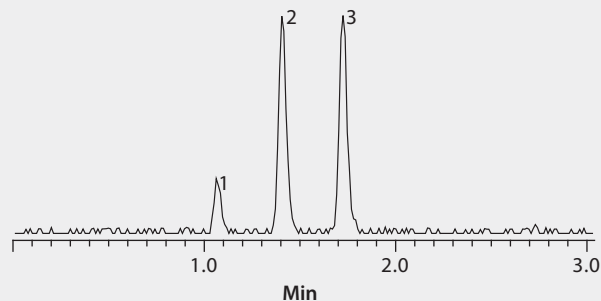
column . . . Ascentis Express HILIC, 5 cm x 2.1 mm I.D., 2.7 µm particles (53934-U)
mobile phase 5 mM ammonium formate (98:2 acetonitrile:water)
flow rate 0.6 mL/min
pressure 1262 psi (87 bar)
column temp. 35 °C
detector ESI(+), 192 m/z
injection 1.0 µL
sample 20 ng/mL
Application No. **G006229**



LC-MS Analysis of Methadone and Metabolites EDDP and EMDP on Ascentis® Express RP Amide

column Ascentis Express RP Amide, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53913-U)
mobile phase (A) 10 mM ammonium formate in water, pH 3.6;
(B) 10 mM ammonium formate in acetonitrile, pH 3.6; (65:35, A:B)
flow rate 0.5 mL/min
column temp. 35 °C
detector ESI(+), m/z 100-1000
injection 0.5 µL
sample 200 µg/L in 25:75, water: acetonitrile
Application No. **G005709**

1. EDDP (2-Ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine)
2. Methadone
3. EMDP (2-Ethyl-5-methyl-3,3-diphenylpyrrolidine)



LC-MS/MS Analysis of Spice Compounds from Plasma on Ascentis® Express F5 after SPE using HybridSPE®-Phospholipid

Synthetic cannabinoids (Spice) are a relatively new type of designer drug used as a pseudo-legal means to get a cannabis-type high. New synthetic cannabinoids are continually being introduced as suppliers tweak the molecular structures. The ability to rapidly and reliably identify the continually changing population of these compounds in the blood or urine suspected users is a significant analytical challenge facing forensic chemists. A four prong approach using column selectivity, high purity solvents, effective sample prep, and reference standards, was used to develop a method to rapidly isolate and identify Spice cannabinoids from plasma. The Ascentis Express F5 column gave the necessary resolution, and the LC-MS CHROMASOLV solvents and additives gave adduct-free response for maximum sensitivity. Sample prep employing the HybridSPE-Phospholipid was rapid and effective and the Cerilliant reference standards enabled confident identification.

sample/matrix rabbit plasma, unfiltered K2-EDTA spiked with
Spice cannabinoids (5 ng/mL each)

SPE tube/cartridge HybridSPE-Phospholipid, 96-well plate,
50 mg bed wt., 2 mL well vol (575656-U)

sample addition to each well add 100 µL plasma, followed by a 300 µL of
1% formic acid in acetonitrile, agitate on orbital shaker for 2 minutes

elution attach collection plate and apply vacuum at 10" Hg for 4 minutes

column Ascentis Express F5, 5 cm x 2.1 mm I.D., 2.7 µm particles (53567-U)

mobile phase (A) 10 mM ammonium formate in water,
pH 6.8 (unadjusted); (B) acetonitrile; (50:50; A:B)

flow rate 0.3 mL/min

pressure 1296 psi (89 bar)

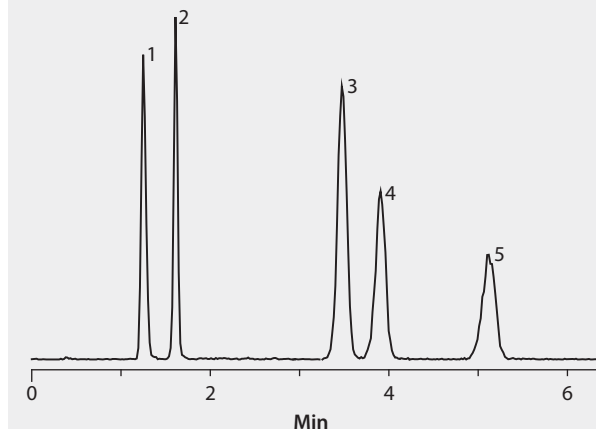
column temp. 35 °C

detector MS, ESI(+), MRM, m/z 344/155 (JWH-073 metabolite), 385/155 (JWH-200),
336/121 (JWH-250), 328/155 (JWH-073), and 342/155 (JWH-018)

injection 2 µL

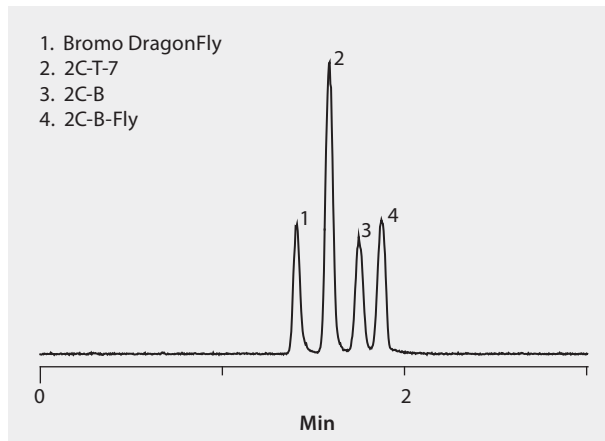
Application No. G005786

1. JWH-073 3-hydroxybutyl metabolite
2. JWH-200
(1-(2-Morpholin-4-ylethyl)indol-3-yl)-naphthalen-1-ylmethanone)
3. JWH-250
(2-(2-Methoxyphenyl)-1-(1-penylindol-3-yl)ethanone)
4. JWH-073
(Naphthalen-1-yl-(1-butylindol-3-yl)methanone)
5. JWH-018
(Naphthalen-1-yl-(1-pentylindol-3-3yl)methanone)



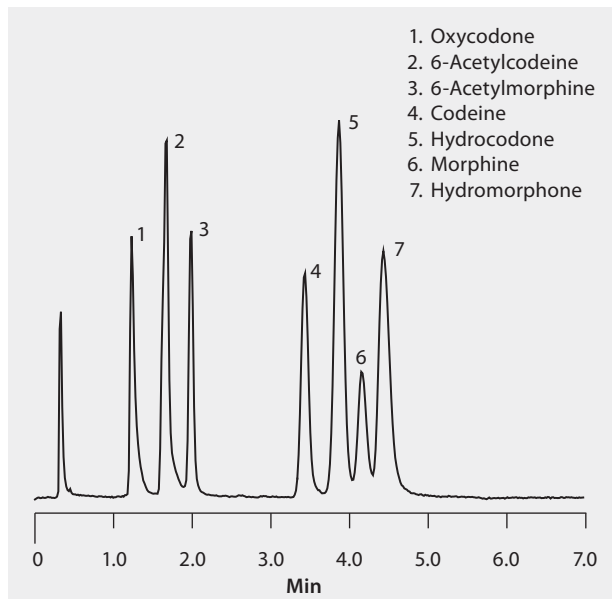
LC-MS (TOF) Analysis of 2C Amine Drugs of Abuse on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 5 cm x 2.1 mm I.D., 2.7 µm particles (53934-U)
mobile phase 2 mM ammonium formate in 90:10 (v:v) acetonitrile:water
flow rate 0.4 mL/min
pressure 943 psi (65 bar)
column temp. 35 °C
detector TOF/MS
injection 2 µL
sample 300 ng/mL in acetonitrile
Application No. [G006152](#)



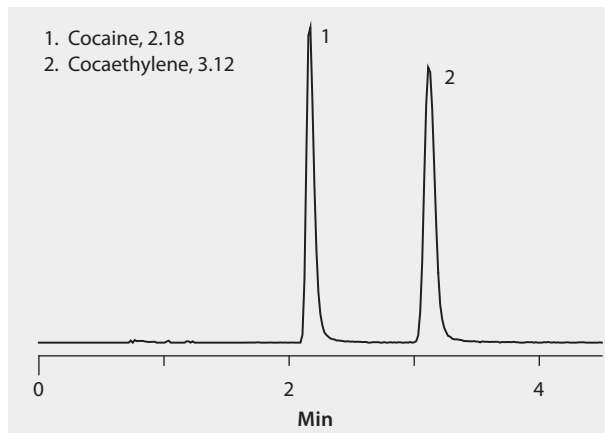
LC-MS (TOF) Analysis of Opioids and Opiate-Dependence Management Drugs on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 5 cm x 2.1 mm I.D., 2.7 µm particles (53934-U)
mobile phase 2 mM ammonium formate in 90:10 (v:v) acetonitrile:water
flow rate 0.3 mL/min
column temp. 55 °C
detector TOF/MS
injection 2 µL
sample 400 ng/mL in acetonitrile
Application No. **G006153**



UHPLC Analysis of Cocaine and Cocaethylene on Titan™ C18

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 °C
detector MS, XIC m/z 304.15 and 318.17
injection 2 µL
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. **G006091**

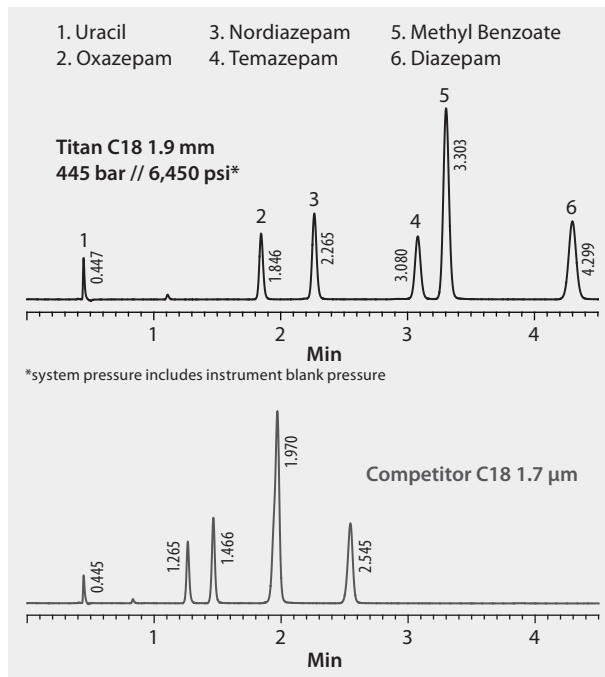


UHPLC Analysis of Diazepam and Metabolites on Titan™ C18, Competitive Comparison

This application shows a comparison between Titan™ C18 and a competitive column for diazepam and its metabolites using a MS compatible mobile phase.

Used 75 µm I.D. x 250 mm L tubing in system.

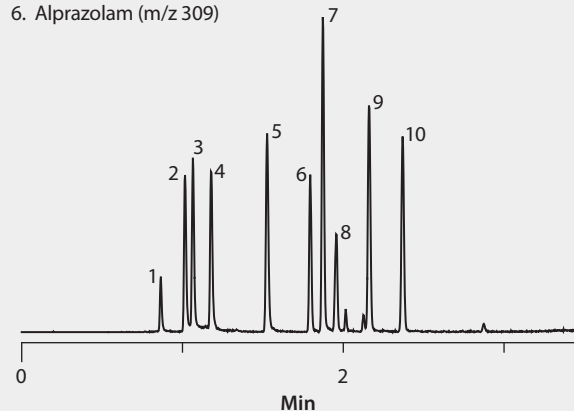
column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
 mobile phase (A) 0.1% formic acid; (B) acetonitrile; (60:40, A:B)
 pressure 6450 psi (445 bar)
 column temp. 35 °C
 detector UV, 254 nm
 Application No. **G006001**



UHPLC Analysis of Heroin and Related Compounds on Titan™ C18

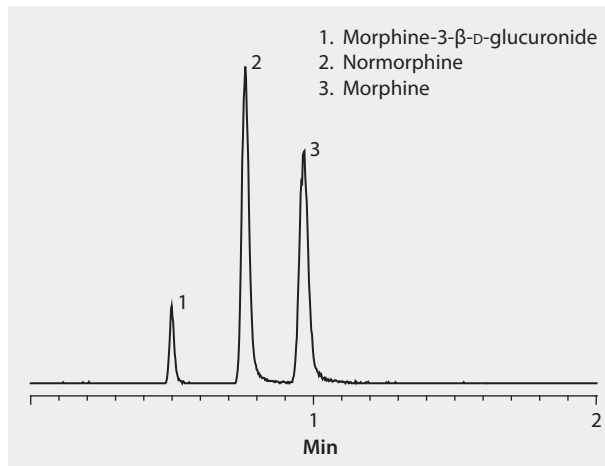
column Titan C18 5 cm x 2.1 mm I.D., 1.9 µm particles (577122-U)
 mobile phase (A) 5 mM ammonium acetate in 95:5, water:acetonitrile;
 (B) 5 mM ammonium acetate in 5:95, water:acetonitrile
 gradient 0 to 100% B in 3 min, held at 100% B for 1 min
 flow rate 0.6 mL/min
 pressure 6770 psi (467 bar)
 column temp. 35 °C
 detector MS-TOF, XIC
 injection 0.5 µL
 sample 1 µg/mL in 95:5, water:methanol
 Application No. **G006116**

- | | |
|-----------------------------------|----------------------------|
| 1. Morphine (m/z 286) | 7. Papaverine (m/z 340) |
| 2. Procaine (m/z 237) | 8. Flunitrazepam (m/z 314) |
| 3. Codeine (m/z 300) | 9. Diazepam (m/z 285) |
| 4. 3-Monoacetylmorphine (m/z 328) | 10. Noscapine (m/z 414) |
| 5. Heroin (m/z 370) | |
| 6. Alprazolam (m/z 309) | |



UHPLC Analysis of Morphine and Metabolites on Titan™ C18 using MS Detection

column Titan C18, 5 cm x 2.1 mm I.D., 1.9 µm particles (577122-U)
mobile phase (A) water with 0.1% formic acid;
(B) acetonitrile with 0.1% formic acid ; (95:5, A:B)
flow rate 0.4 mL/min
pressure 4960 psi (342 bar)
column temp. 25 °C
detector MS-TOF, XIC
injection 0.5 µL
sample 1 µg/mL in 99:1, water:methanol
Application No. **G006115**



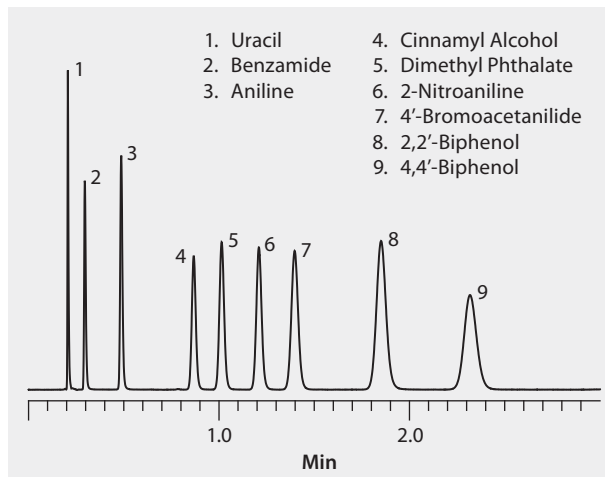
General Analytical

HPLC Analysis of Column Test Mixture on
Ascentis® Express 5µm RP-Amide

This application shows a test mixture of compounds of widely varying polarity on the 5µm RPA Ascentis Express column.

column Ascentis Express RPA 15 cm x 4.6 mm, 5 µm particles (50773-U)
 mobile phase . . (A) 20 mM potassium phosphate, pH 7; (B) acetonitrile; (70:30, A:B)
 flow rate 4.0 mL/min
 pressure 4467 psi (308 bar)
 column temp. 26 °C
 detector UV, 254 nm
 injection 5.0 µL
 sample 1. Uracil (0.016 mg/mL), 2. Benzamide (0.161 mg/mL),
 3. Aniline (0.161 mg/mL), 4. Cinnamyl Alcohol (0.016 mg/mL),
 5. Dimethyl Phthalate (0.323 mg/mL), (6. 2-Nitroaniline (0.081 mg/mL),
 7. 4'-Bromoacetanilide (0.040 mg/mL), 8. 2,2'-Biphenol (0.161 mg/mL),
 9. 4,4'-Biphenol (0.040 mg/mL), in 50/50 Water/Acetonitrile)

Application No. **G006279**

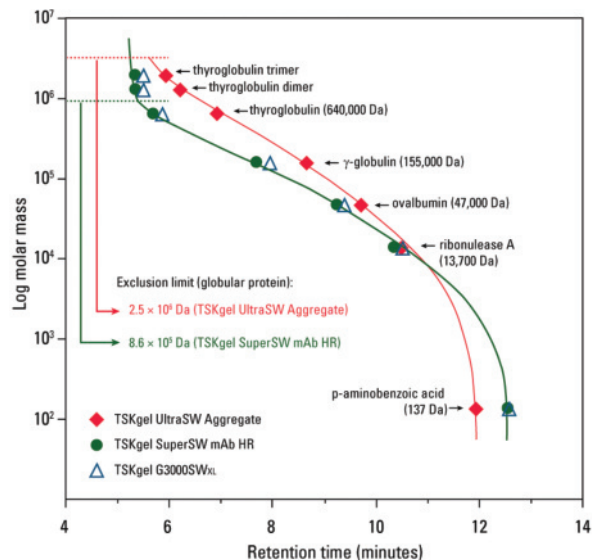


Life Science and Biopharma

Calibration Curves for TSKgel® SW mAb Columns

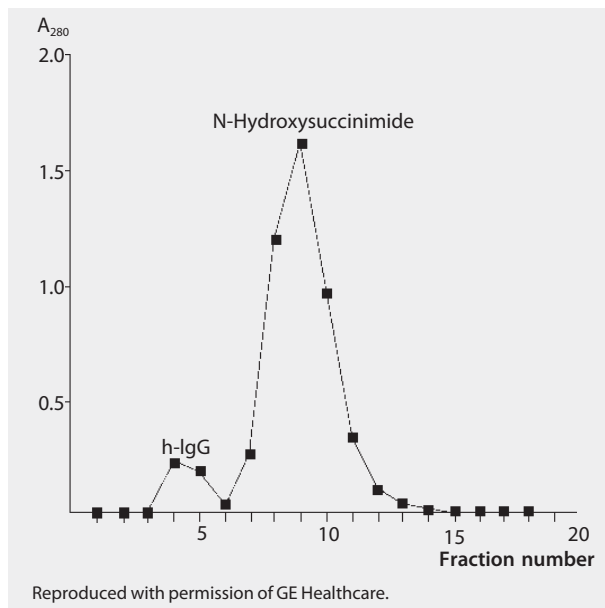
In gel filtration chromatography, the calibration curve of a column shows the relationship between retention time or retention volume of a set of water-soluble polymer or protein standards vs. the logarithm of their molecular masses. The linear portion of a calibration curve is used to estimate the molecular mass of an unknown protein. An expanded linear range is desirable as it allows for a wider variety of molecular masses to be analyzed with that column. This example shows the calibration curves for TSKgel® SuperSW mAb HTP, TSKgel SuperSW mAb HR, TSKgel UltraSW Aggregate and the industry standard TSKgel G3000SWxl column using several commonly available globular proteins and p-aminobenzoic acid as a small MW marker to indicate the void volume of the column. The exclusion volume of the column is indicated by a trimer of thyroglobulin. [Note that the calibration curve of the 15 cm x 4.6 mm ID TSKgel SuperSW mAb HTP column is not included in the Figure as the column volume is very small and the packing material in the column is the same as the TSKgel SuperSW mAb HR column].

column . . . TSKgel SuperSW mAb HR, 30 cm x 7.8 mm I.D., 4 µm particles (822854)
 column . . . TSKgel UltraSW Aggregate, 30 cm x 7.8 mm I.D., 3 µm particles (822856)
 column TSKgel G3000SWxl, 30 cm x 7.8 mm I.D., 5 µm particles (808541)
 mobile phase . . . 0.2 M sodium phosphate buffer, pH 6.7 and 0.05% sodium azide
 flow rate 1.0 mL/min
 column temp. Ambient
 detector UV, 280 nm
 injection 10 µL
 Application No. **G006277**



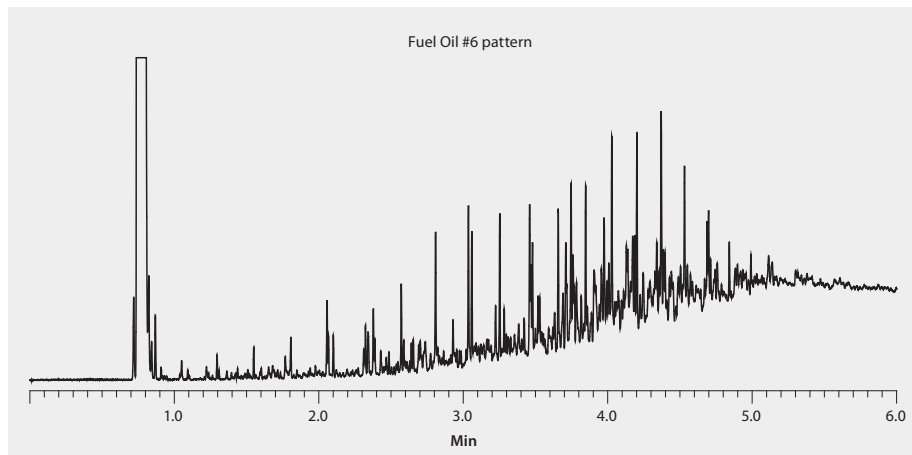
Desalting of Immunoglobulins (IgG, Human) on HiTrap® Desalting Cartridge

column HiTrap Desalting Cartridge, 5 mL (54822)
mobile phase 0.2 M sodium carbonate buffer, pH 8.5
detector UV, 280 nm
injection 0.5 mL unbound human IgG in 0.2 M sodium carbonate buffer after coupling to a HiTrap NHS 1 mL column. Fraction volume 0.5 mL
Application No. [796-0403](#)



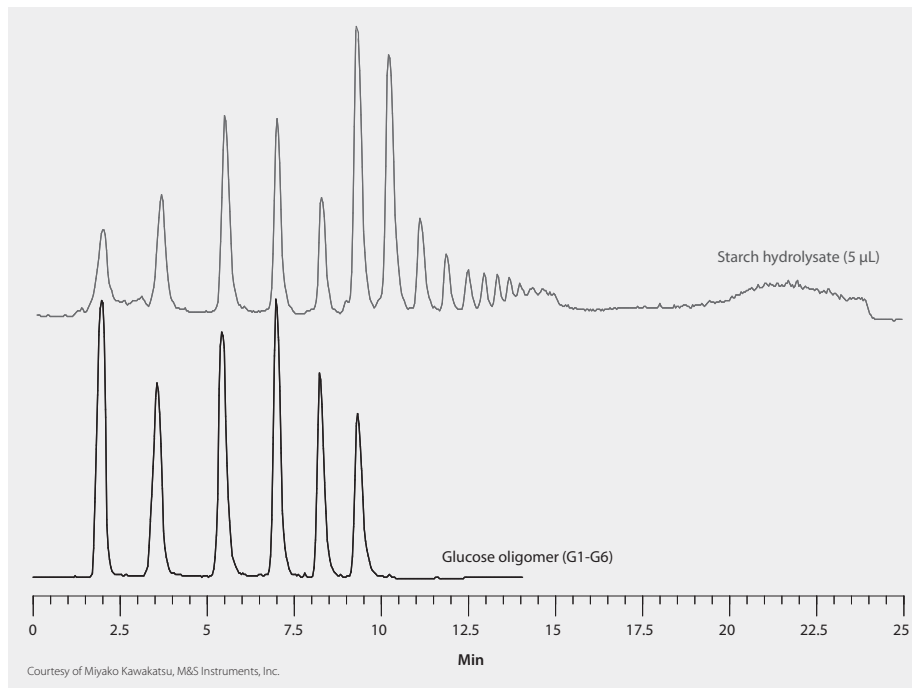
GC Analysis of Fuel Oil #6 on Equity®-1 (15 m x 0.10 mm I.D., 0.10 µm), Fast GC Analysis

column Equity-1, 15 m x 0.10 mm I.D., 0.10 µm (28039-U)
oven 80 °C, 50 °C/min to 325 °C
inj. temp. 250 °C
detector FID, 350 °C
carrier gas hydrogen, 45 cm/sec constant
injection 0.3 µL, 100:1 split, 0.1 min pre-injection dwell time
liner 2 mm I.D., straight
sample No.6 Fuel Oil standard, 20 mg/mL in hexane:chloroform (47536-U)
Application No. **G003908**



HPLC Analysis Carbohydrates on Proteomix® SAX-NP5

column Proteomix SAX-NP5, 15 cm x 4.6 mm I.D., 5 µm particles (Z777228)
mobile phase (A) 0.05% (25% ammonium hydroxide) in acetonitrile;
(B) 0.05% (25% ammonium hydroxide) in water
gradient 15 to 80% B in 20 min
flow rate 0.7 mL/min
temp. 35 °C
detector ELSD
sample Corn starch hydrolysate; glucose oligomer (G1 to G6)
Application No. **G005958**



HPLC Analysis MAb Variants on Proteomix® SCX-NP5, Fast Analysis

Due to the low pressure of Proteomix SCX, faster analysis and high resolution can be achieved with a higher flow rate.

column Proteomix SCX-NP5, 25 cm x 4.6 mm I.D., 5 µm particles (Z777164)

mobile phase . . . (A) 2.4 mM Tris, 1.5 mM imidazole, 11.6 mM piperazine, pH 6.0;

(B) A + 0.5 M NaCl, pH 10.5

gradient top (0.8 mL/min): 5% B held for 5 min; to 29.5% B in 35 min;

bottom (1.5 mL/min): 5% B held for 2.7 min; to 29.5% B in 18.6 min

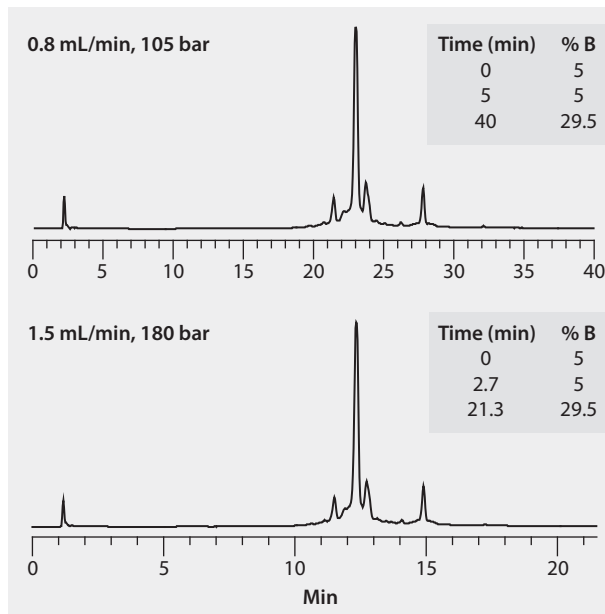
flow rate 0.8 mL/min or 1.5 mL/min

detector UV 280 nm

injection 20 µL

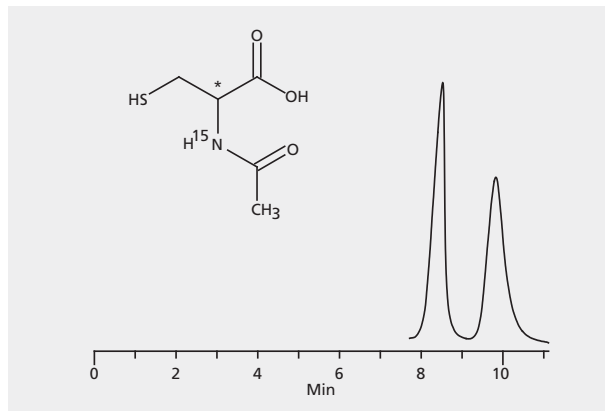
sample MAb 321, 5 mg/mL

Application No. **G006032**



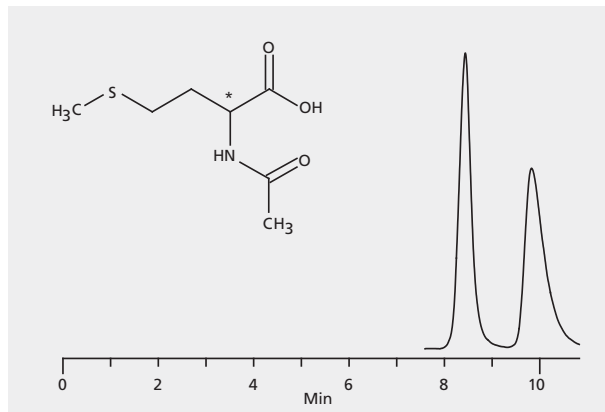
HPLC Analysis of ^{15}N -Acetylcysteine Enantiomers on Astec® (R,R) P-CAP™

column Astec (R,R) P-CAP, 25 cm x 4.6 mm I.D., 5 μm particles (31024AST)
mobile phase 20 mM ammonium acetate in: (A) acetonitrile;
(B) methanol; (70:30, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 1 μL
sample 5 mg/mL in methanol
Application No. **G004719**



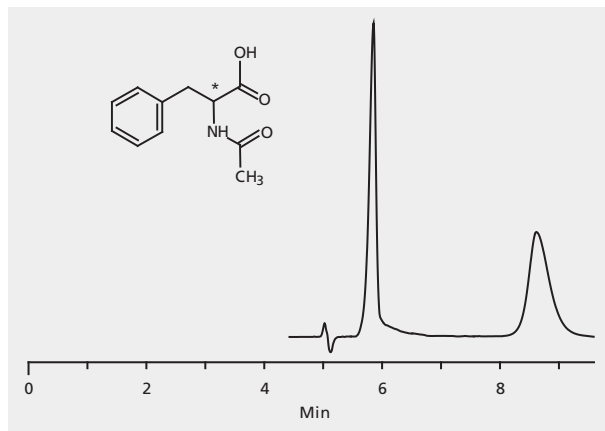
HPLC Analysis of N-Acetylmethionine Enantiomers on Astec® (R,R) P-CAP™

column Astec (R,R) P-CAP, 25 cm x 4.6 mm I.D., 5 µm particles (31024AST)
mobile phase 20 mM ammonium acetate in: (A) acetonitrile;
(B) methanol; (70:30, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004722**



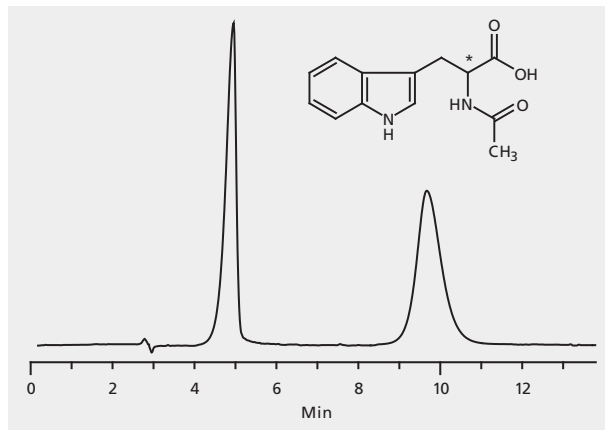
HPLC Analysis of N-Acetylphenylalanine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 0.1% triethylamine acetate, pH 3.8; (B) ethanol; (20:80, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 225 nm
injection 5 µL
sample 5 mg/mL in methanol
Application No. [G004556](#)



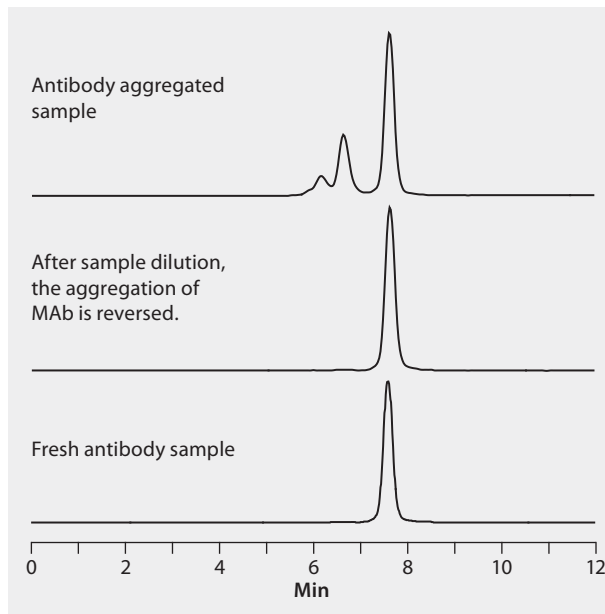
HPLC Analysis of N-Acetyltryptophan Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) 20 mM ammonium acetate; (B) methanol; (70:30, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample 5 mg/mL in methanol
Application No. [G004555](#)



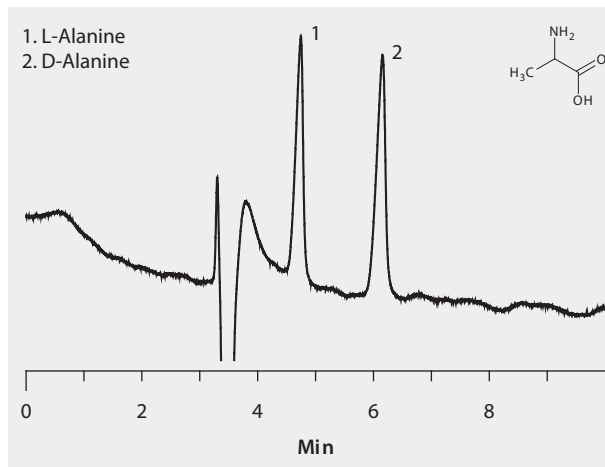
HPLC Analysis of Aggregated Antibodies on Zenix® SEC-300, Fast Analysis

column . . . Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles, 300 Å (Z777033)
mobile phase 150 mM sodium phosphate, pH 7
flow rate 1.0 mL/min
column temp. 25 °C
detector UV, 280 nm
injection 2.9 µL
sample antibody sample (17 mg/mL)
Application No. **G006174**



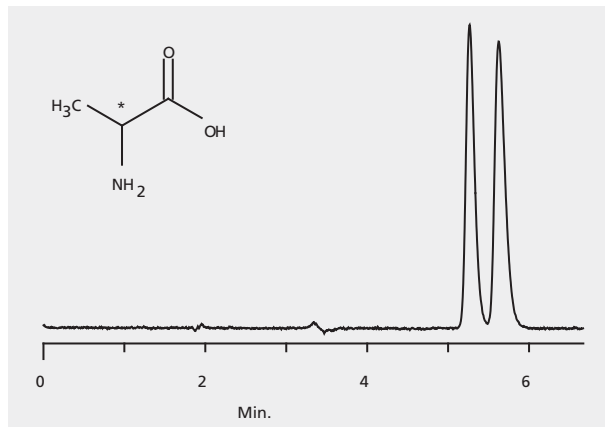
HPLC Analysis of Alanine Enantiomers on Astec® CHIROBIOTIC® T (Formic Acid Mobile Phase Modifier)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (30:70:0.02, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 300 mg /mL in 30:70 water:methanol
Application No. **G005330**



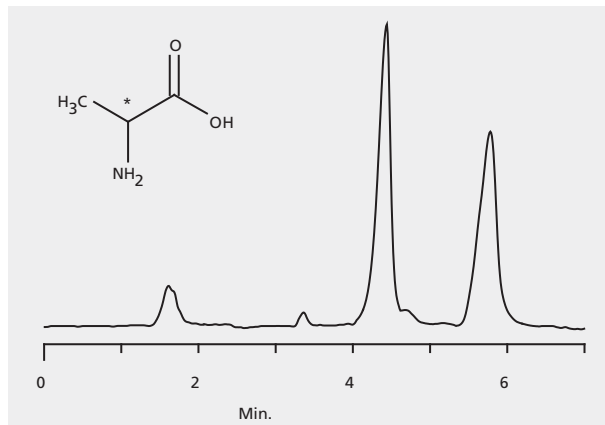
HPLC Analysis of Alanine Enantiomers on Astec® CHIROBIOTIC® T (No Mobile Phase Modifier)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) acetonitrile; (50:50, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. [G004485](#)



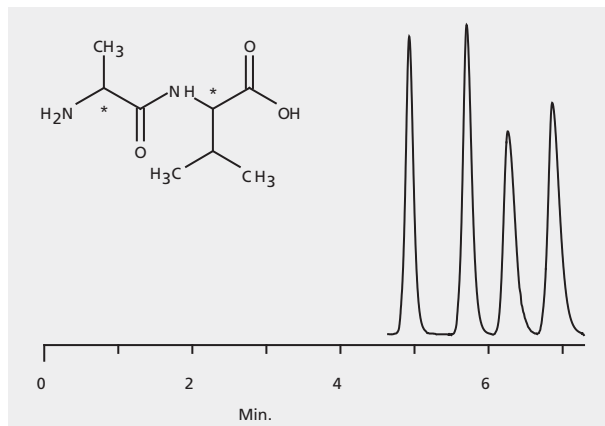
HPLC Analysis of Alanine Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase (A) water; (B) acetonitrile; (50:50, A:B)
flow rate 0.8 mL/min
column temp. 25 °C
detector UV, 210 nm
injection 2 µL
sample 5 mg/mL in methanol
Application No. [G004603](#)



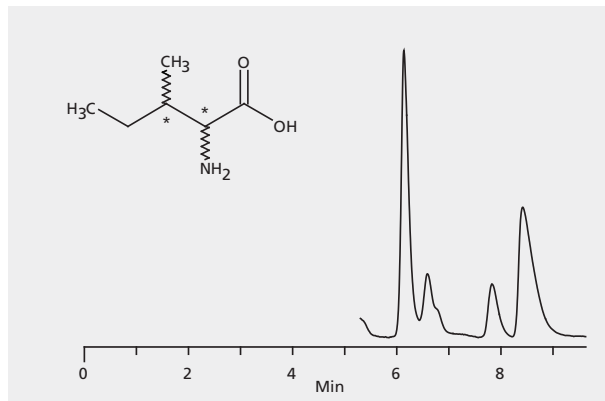
HPLC Analysis of Alanylvaline Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 10 mM ammonium acetate, pH 4.1; (B) acetonitrile; (50:50, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. **G004582**



HPLC Analysis of Alloisoleucine Enantiomers on Astec® CHIROBIOTIC® R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
mobile phase (A) water; (B) methanol; (40:60, A:B)
flow rate 0.6 mL/min
column temp. 25 °C
detector UV, 210 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. **G004676**



HPLC Analysis of Amino Acids, Polar Neutral and Acidic on Ascentis® Si

column Ascentis Si, 10 cm x 2.1 mm I.D., 5 µm particles (581508-U)
 mobile phase (A) 100 mM ammonium formate (pH 3.0, with formic acid);
 (B) water; (C) acetonitrile

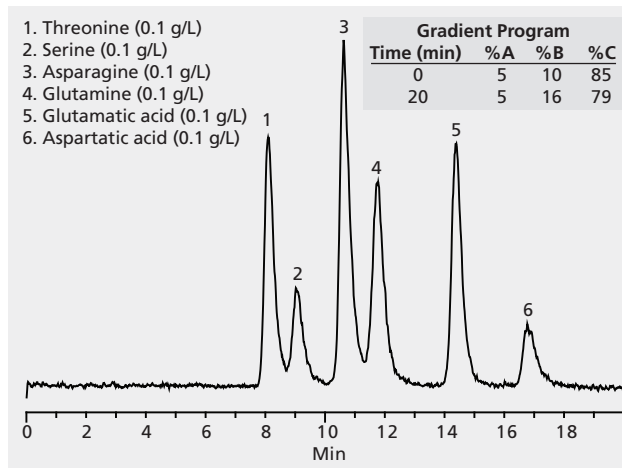
flow rate 0.3 mL/min
 column temp. 35 °C

detector ESI (+), full scan

injection 2 µL

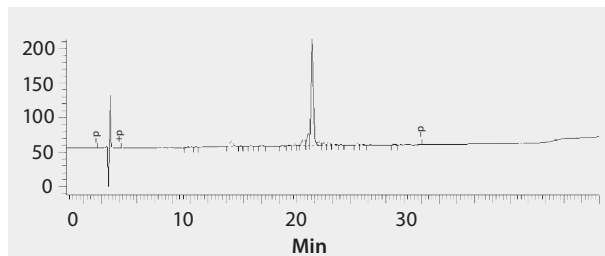
sample as indicated, in 10:90, (50 mM ammonium
 formate/formic acid, (pH 3.0):acetonitrile

Application No. **G003722**



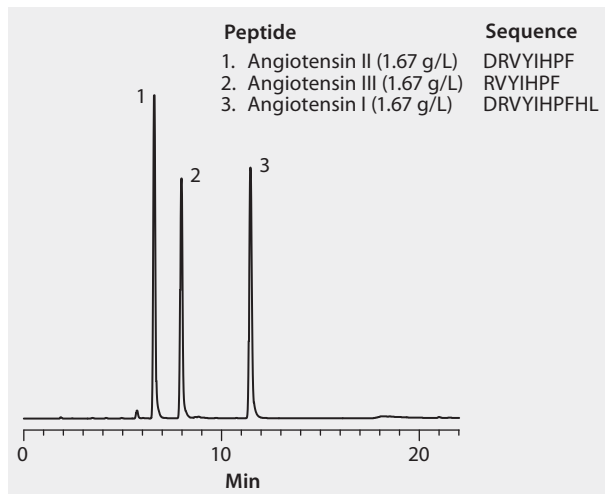
HPLC Analysis of Amyloid β -Protein Fragment 10-35 on Discovery® BIO Wide Pore C18

column Discovery BIO Wide Pore C18, 25 cm \times 4.6 mm I.D.,
5 μ m particles (568223-U)
mobile phase (A) 0.1% TFA in water; (B) 0.1% TFA in
water:0.1% TFA in acetonitrile; (25:75)
flow rate 1.3 mL/min
column temp. 30 $^{\circ}$ C
detector UV, 215 nm
injection 10 μ L, 1 mg/mL in water
Application No. [G001589](#)



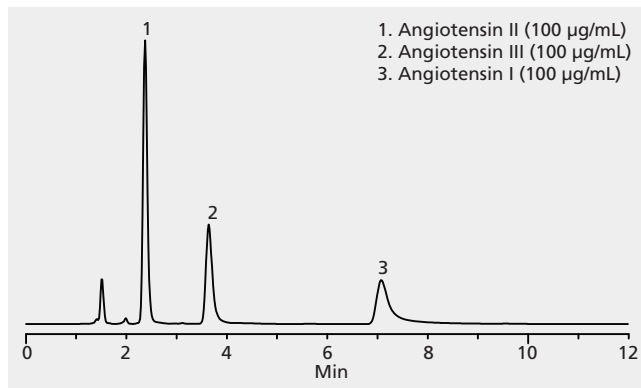
HPLC Analysis of Angiotensins on Discovery® BIO Wide Pore C8

column Discovery BIO Wide Pore C8, 15 cm × 4.6 mm I.D.,
5 µm particles (568322-U)
mobile phase (A) 10 mM NH₄H₂PO₄/ NH₄OH, pH 7; (B) 50:50,
(20 mM NH₄H₂PO₄/ NH₄OH, pH 7):CH₃CN
gradient 30-60% B in 15 min
flow rate 1 mL/min
column temp. 30 °C
detector UV, 215 nm
injection 6 µL in water
Application No. **G001503B**



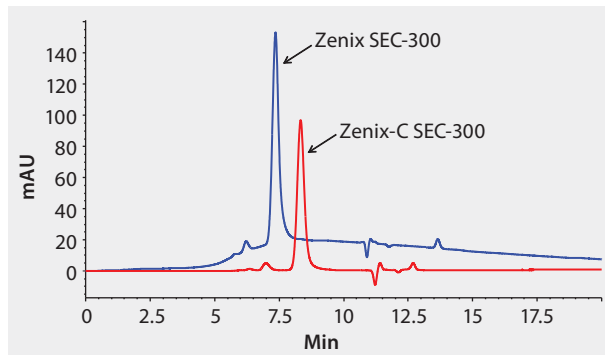
HPLC Analysis of Angiotensins on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 5 mM ammonium phosphate (pH 7.0 with ammonium
hydroxide); (B) acetonitrile; (77.5:22.5, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 215 nm
injection 10 µL
sample as indicated in mobile phase
Application No. **G002914**



HPLC Analysis of an mPEG-peptide on Zenix® SEC Phases

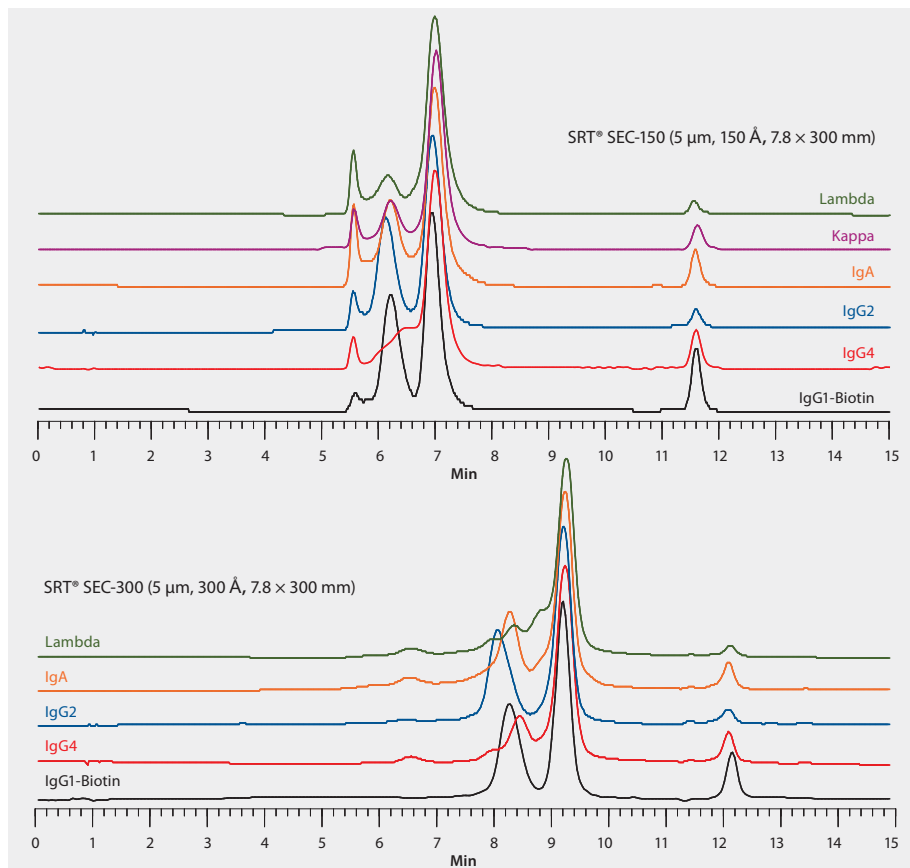
column . . . Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 μ m particles, 300 Å (Z777033)
column . . . Zenix C SEC-300, 30 cm x 7.8mm I.D., 3 μ m particles, 300 Å (Z777092)
mobile phase 150 mM Sodium Phosphate Buffer, pH 7.0
flow rate 1.0 mL/min
column temp. 25 °C
detector UV, 214 nm
injection 20 μ L
sample 20kD mPEG-MAL (methoxy-PEG-Maleimide) (1mg/mL)
Application No. **G006178**



HPLC Analysis of Antibody Isotypes on SRT® Gel Filtration Columns

A change in the relative concentration of IgG subclasses (IgG1, IgG2, IgG3 and IgG4) in tissue indicates a change in immunological response. These chromatograms show the elution profiles of several IgG subclasses, including lambda and Kappa light chains and biotinylated IgG1. Note that some of the aggregate peaks in front of the main component are partially excluded on the smaller (SEC-150) pore size column, but not on the 300 Angstrom pore size column.

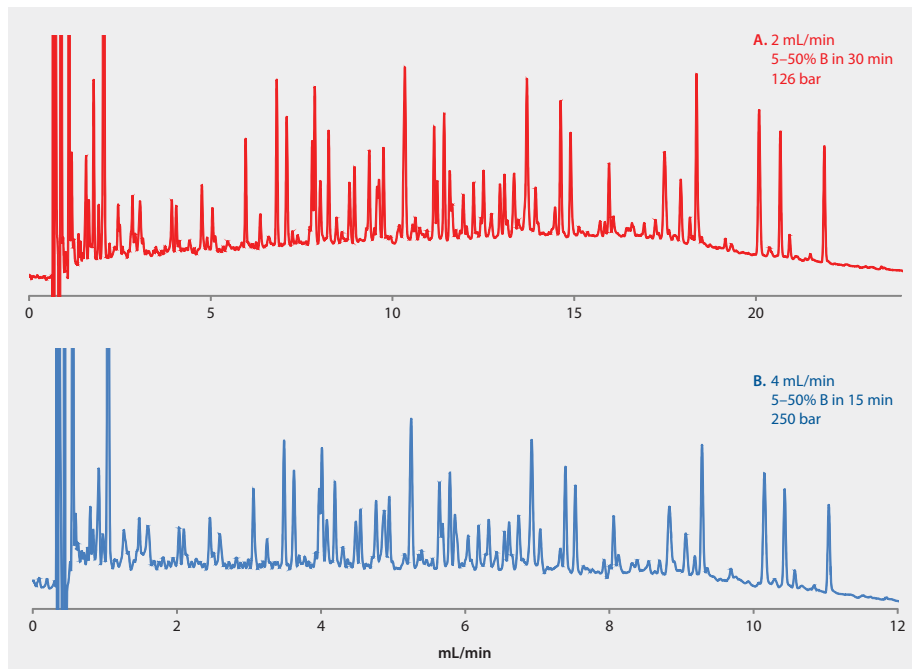
column . . . SRT SEC-300, 30 cm x 7.8 mm I.D., 5 µm particles, 300 Å (Z777051)
 column . . . SRT SEC-150, 30 cm x 7.8 mm I.D., 5 µm particles, 150 Å (Z777045)
 mobile phase 150 mM phosphate buffer, pH 7.0
 flow rate 1.0 mL/min
 column temp. Ambient
 detector UV, 214 nm
 Application No. **G006180**



HPLC Analysis of Apotransferrin Tryptic Digest on BIOshell™ A160 Peptide C18, Comparison of Different Flow Rates and Pressures

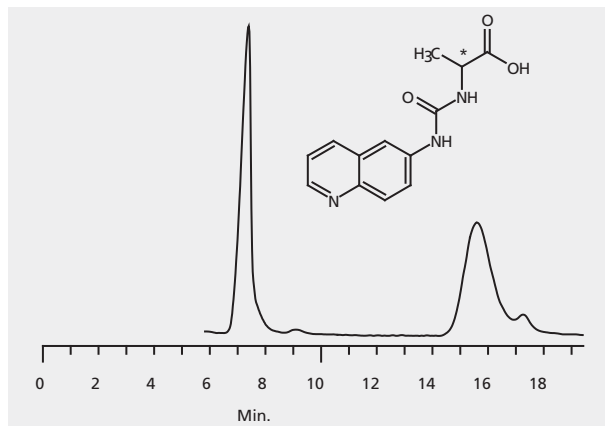
BIOshell columns packed with five micron Fused-Core particles feature modest back pressures, which allows the use of very high flow rates as is demonstrated in the two chromatograms, one of which was obtained at 2mL/min, the other at 4mL/min. Note that at 4mL/min the gradient time was reduced in half to keep the gradient volume constant. At a flow rate of 4mL/min the back pressure for this 15cm x 4.6mm column is 250 bar (approx. 3500 psi), which illustrates that these high efficiency columns can be operated on standard HPLC systems.

column BIOSHELL A160 Peptide C18, 15 cm x 4.6 mm I.D.,
5 µm particles (67015-U)
mobile phase (A): water/0.1% TFA (B): acetonitrile/0.1% TFA
gradient 5-50%B in 30 minutes; 5-50%B in 15 minutes;
flow rate 2 mL/min or 4/mL minute
pressure 126 bar, 250 bar
column temp. 60 °C
detector UV, 215 nm
injection 15 µL
sample 1 mg/mL in water/0.1% TFA
Application No. **G006220**



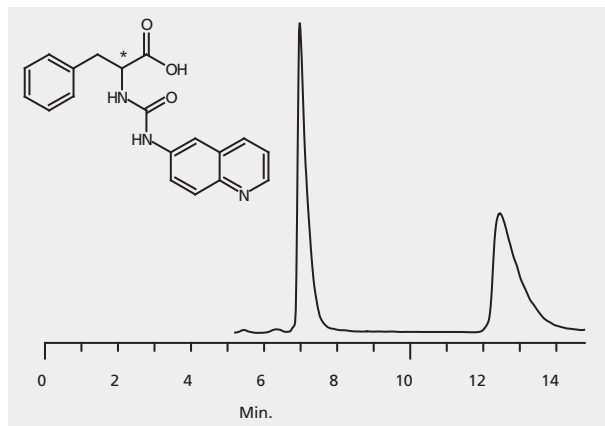
HPLC Analysis of AQC-Alanine Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (50:50, A:B)
flow rate 0.9 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 0.5 µL
sample 2 mg/mL in methanol
Application No. [G004602](#)



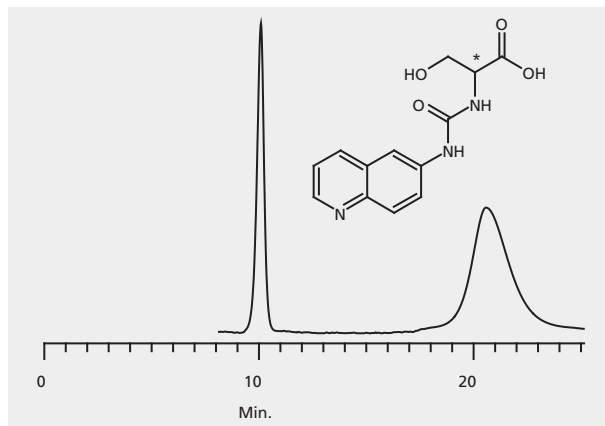
HPLC Analysis of AQC-Phenylalanine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 10 mM ammonium acetate, pH 4.1; (B) methanol; (50:50, A:B)
flow rate 0.9 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. **G004583**



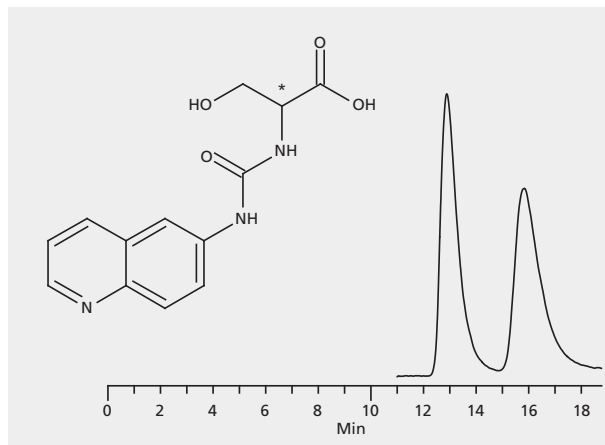
HPLC Analysis of AQC-Serine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 10 mM ammonium acetate, pH 4.1; (B) methanol; (70:30, A:B)
flow rate 0.9 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004576**



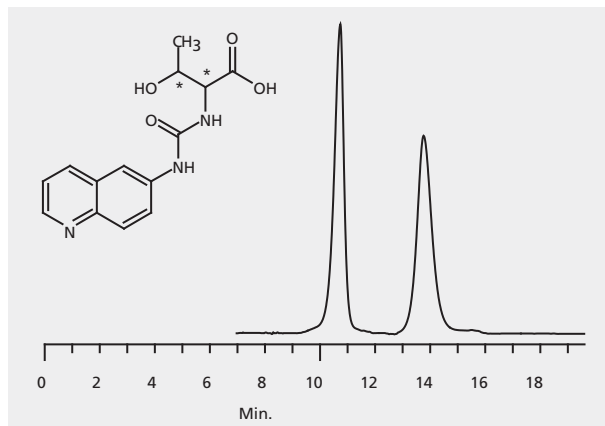
HPLC Analysis of AQC-Serine Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (70:30, A:B)
flow rate 0.9 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 0.5 µL
sample 2 mg/mL in methanol
Application No. **G004739**



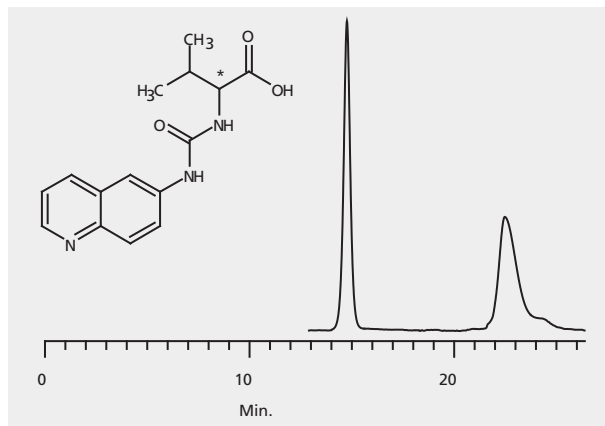
HPLC Analysis of AQC-Threonine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (90:10, A:B)
flow rate 0.9 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004578**



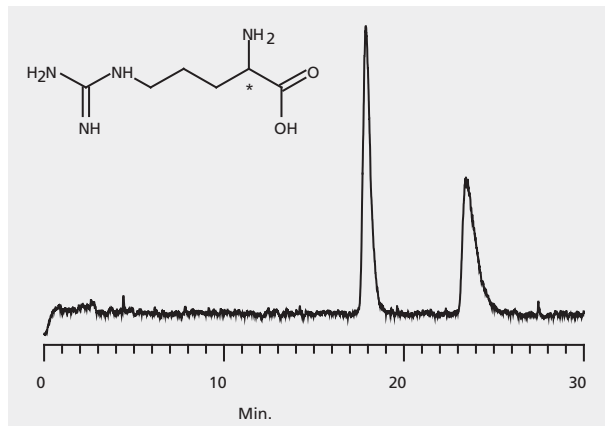
HPLC Analysis of AQC-Valine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 10 mM ammonium acetate, pH 4.1; (B) methanol; (70:30, A:B)
flow rate 0.9 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004577**



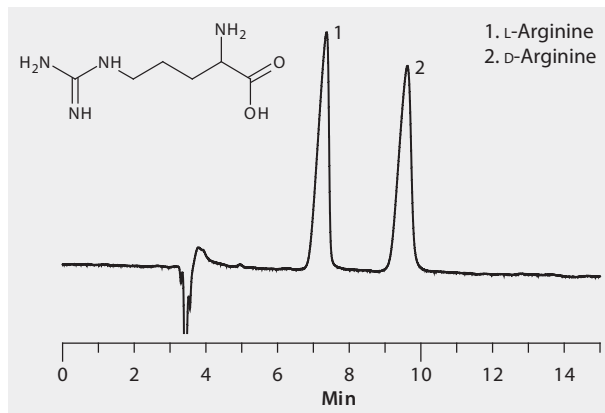
HPLC Analysis of Arginine Enantiomers on Astec® CHIROBIOTIC® T (23 °C)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (50:50, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 205 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004487](#)



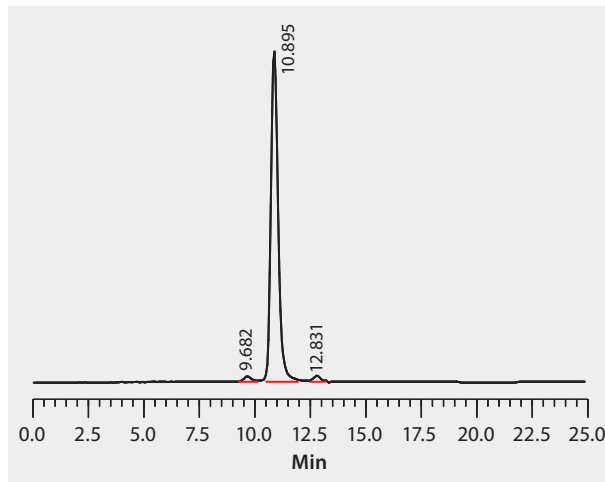
HPLC Analysis of Arginine Enantiomers on Astec® CHIROBIOTIC® T (25 °C)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water, (B) methanol; (C) formic acid; (30:70:0.02, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 300 µg /mL in 30:70 water:methanol
Application No. **G005331**



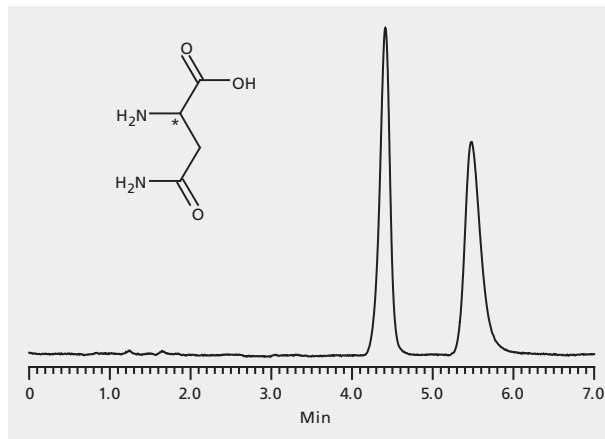
HPLC Analysis of Asparaginase on Zenix® SEC-150

column Zenix SEC-150, 30 cm x 7.8 mm I.D., 3 µm particles (Z777018)
mobile phase 150 mM sodium phosphate, pH 7.0
flow rate 0.6 mL/min
pressure 1015 psi (70 bar)
column temp. ambient
detector UV, 280 nm
inj. temp. 5 µL
sample asparaginase (2.0 mg/mL in water), RT 10.895 minute,
MW 5000-6000, pI 4.85
Application No. **G005973**



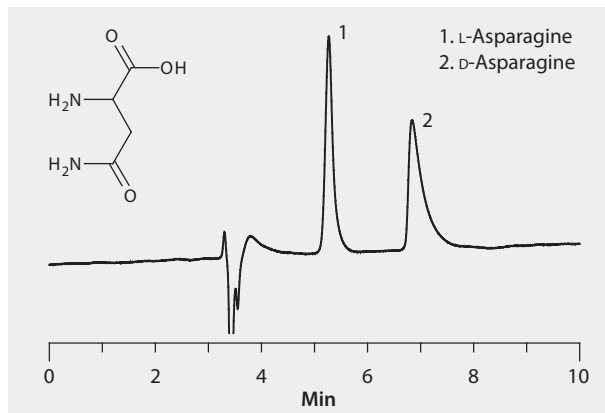
HPLC Analysis of Asparagine Enantiomers on Astec® CHIROBIOTIC® T (23 °C)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (50:50, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 205 nm
injection 5 µL
sample preparation 1 mg/mL in methanol
Application No. **G004488**



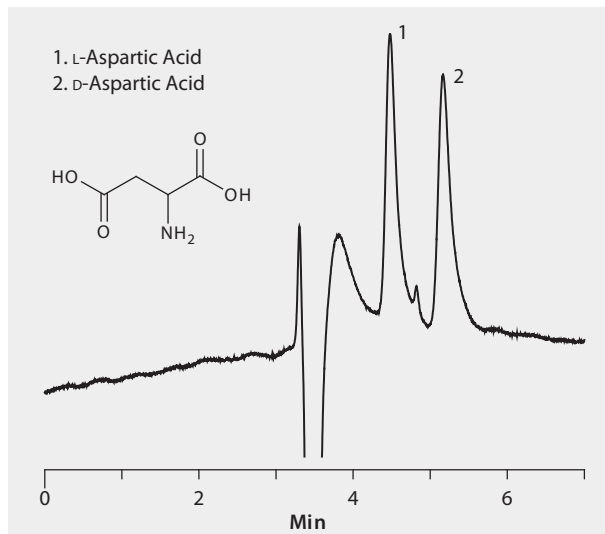
HPLC Analysis of Asparagine Enantiomers on Astec® CHIROBIOTIC® T (25 °C)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (30:70:0.02, A:B:C)
flow rate 1 mL/min
detector UV, 205 nm
column temp. 25 °C
injection 10 µL
sample 300 µg /mL in 30:70 water:methanol
Application No. [G005332](#)



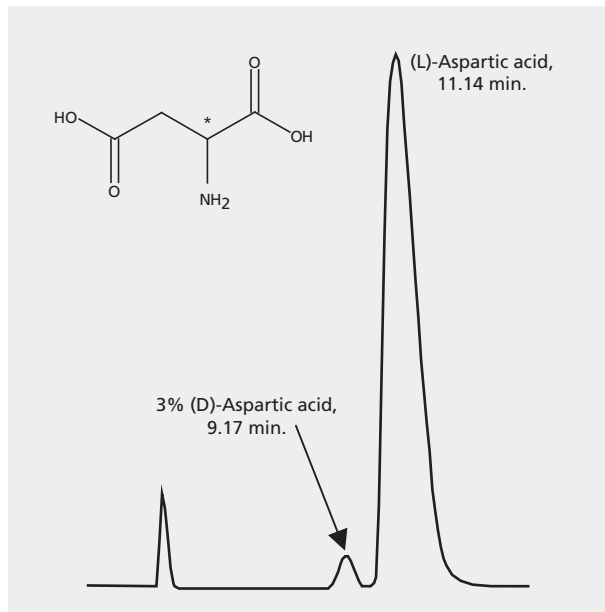
HPLC Analysis of Aspartic Acid Enantiomers on Astec® CHIROBIOTIC® T (Methanol Mobile Phase)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (30:70:0.02, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 300 µg/mL in 30:70 water:methanol
Application No. [G005333](#)



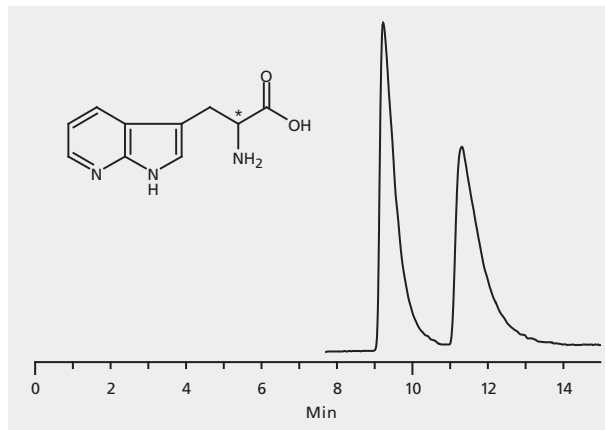
HPLC Analysis of Aspartic Acid Enantiomers on Astec® CLC-L, Trace Level Detection

column Astec CLC-L, 15 cm x 4.6 mm I.D., 5 µm particles (53123AST)
mobile phase 5 mM copper sulfate
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
sample 5 mg/mL in water
Application No. [G004664](#)



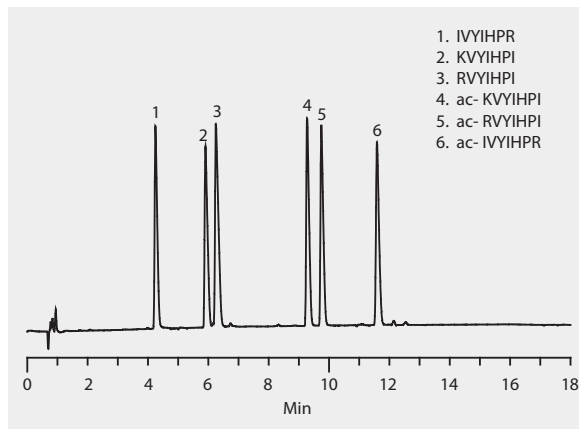
HPLC Analysis of 7-Azatryptophan Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (70:30, A:B)
flow rate 0.8 mL/min
column temp. ambient
detector UV, 210 nm
injection 5 µL
sample 5 mg/mL in methanol/water/ammonium hydroxide
Application No. [G004538](#)



HPLC Analysis of Basic Peptides (Angiotensin Analogs) on Ascentis® Express Peptide ES-C18

column Ascentis Express Peptide ES-C18, 10 cm x 3 mm I.D.,
2.7 µm particles (53313-U)
mobile phase (A) 0.1% (v/v) formic acid, pH 4.0 (titrated with ammonium
hydroxide); (B) 50:50, (0.175% formic acid in water,
pH 4.0) : acetonitrile
gradient 20 to 50% B in 15 min
flow rate 0.6 mL/min
pressure 3002 psi (207 bar)
column temp. 35 °C
detector UV, 215 nm
injection 2.0 µL
sample 0.5 g/L ea. peptide
Application No. **G005379**

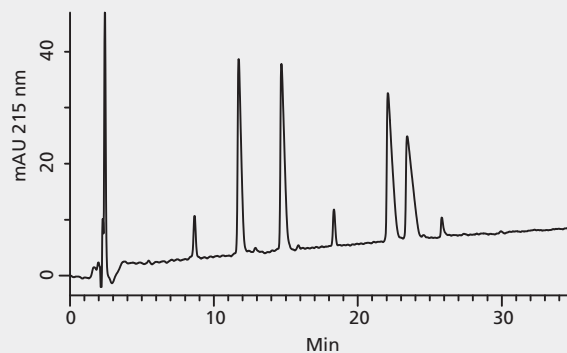


HPLC Analysis of Basic Peptides on Discovery® BIO Wide Pore C18, No TFA

column Discovery BIO Wide Pore C18, 15 cm × 2.1 mm I.D.,
5 µm particles (568202-U)
mobile phase (A) 25 mM formic acid in water; (B) 50:50 (25 mM formic
acid in water):(20 mM formic acid in acetonitrile)
flow rate 0.20 mL/min
column temp. 35 °C
detector UV, 215 nm
injection 0.5 µL (~0.25 µg each peptide)
Application No. [G001642A](#)

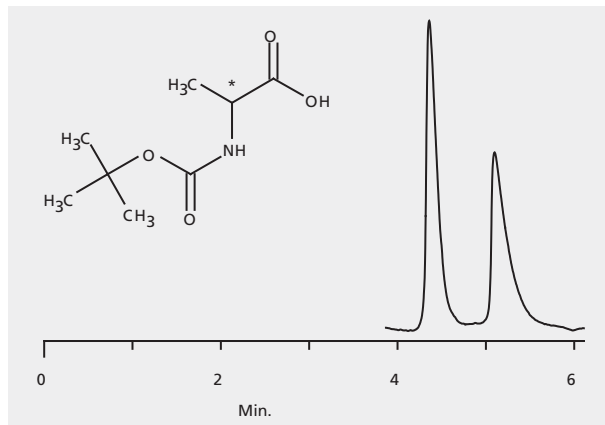
Peptide 1: ac-GGGLGGAGGLK-amide
Peptide 2: ac-KYGLGGAGGLK-amide
Peptide 3: ac-GGALKALKGLK-amide
Peptide 4: ac-KYALKALKGLK-amide

Gradient Program	
Time (min)	%B
0	15
45	60



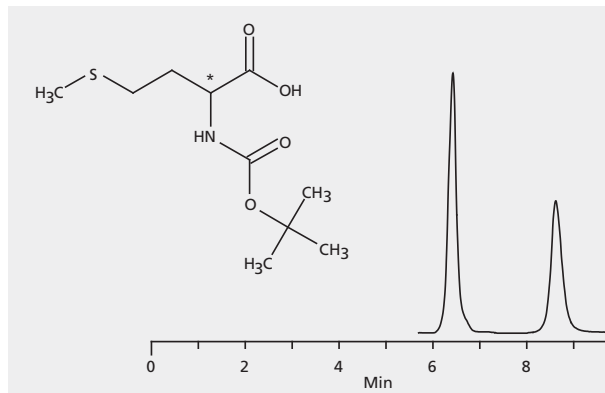
HPLC Analysis of t-BOC-Alanine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 6; (B) methanol; (90:10, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 5 mg/mL in methanol
Application No. [G004573](#)



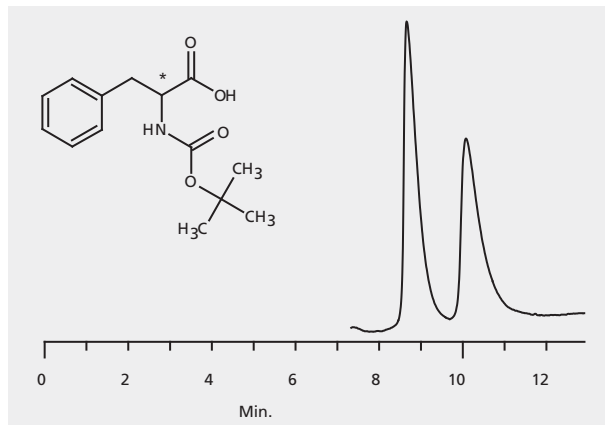
HPLC Analysis of t-BOC-Methionine Enantiomers on Astec® (R,R) P-CAP™

column Astec (R,R) P-CAP, 25 cm x 4.6 mm I.D., 5 µm particles (31024AST)
mobile phase 20 mM ammonium acetate in: (A) acetonitrile;
(B) methanol; (70:30, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 2 µL
sample 5 mg/mL in methanol
Application No. **G004723**



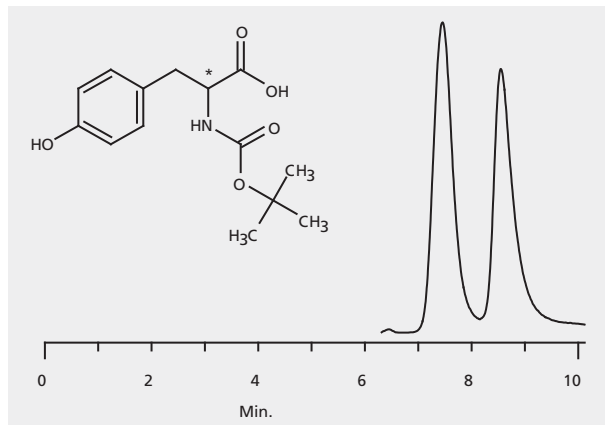
HPLC Analysis of t-BOC-Phenylalanine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 6; (B) methanol; (90:10, A:B)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004585**



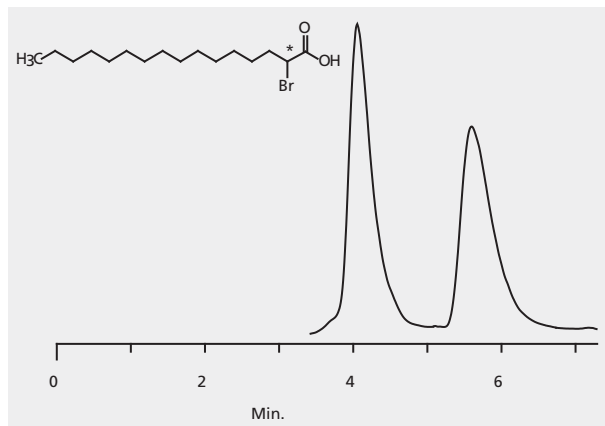
HPLC Analysis of t-BOC-Tyrosine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 6; (B) methanol; (90:10, A:B)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004572](#)



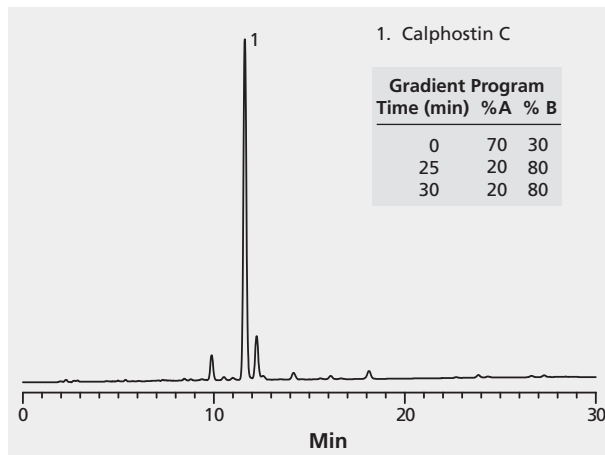
HPLC Analysis of α -Bromopalmitic Acid Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 μ m particles (16024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 5.5; (B) methanol; (40:60, A:B)
flow rate 0.9 mL/min
column temp. 25 $^{\circ}$ C
detector UV, 230 nm
injection 5 μ L
sample 2 mg/mL in methanol
Application No. **G004601**



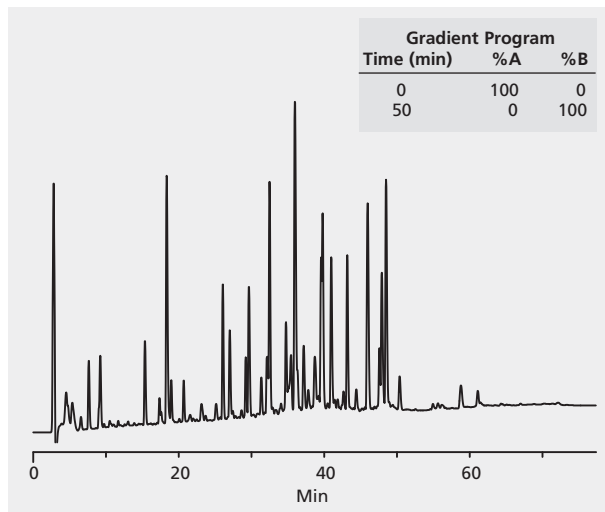
HPLC Analysis of Calphostin C on Discovery® HS C18

column Discovery HS C18, 25 cm × 2.1 mm I.D., 5 µm particles (568503-U)
mobile phase (A) (0.1% phosphorus acid in water):(0.1% phosphorus acid in acetonitrile); (B) 0.1% phosphorus acid in acetonitrile; (50:50, A:B)
flow rate 0.2 mL/min
column temp. 24 °C
detector UV, 254 nm
injection 3 µL
sample Calphostin C (0.25 g/L) in 40% MeOH, 0.025% TFA
Application No. **G002574**



HPLC Analysis of Carboxymethylated Apohemoglobin (Horse) Tryptic Digest on Discovery® BIO Wide Pore C18

column Discovery BIO Wide Pore C18, 15 cm × 2.1 mm I.D.,
3 μm particles (568222-U)
mobile phase (A) 0.1% TFA in water; (B) 0.1% TFA in
water:0.1% TFA in acetonitrile, 50:50;
gradient 0-100% B in 50 min
flow rate 0.2 mL/min
column temp. 35°C
detector UV, 220 nm
injection 5 μL, each at 0.8 mg/mL in 0.1% TFA
Application No. **G001719**



HPLC Analysis of Carboxymethylated Apohemoglobin Tryptic Digest on Discovery® BIO Wide Pore C18

column Discovery BIO Wide Pore C18, 15 cm × 4.6 mm I.D.,
5 µm particles (568222-U)

mobile phase . . . (A) (0.1% TFA in water):(0.1% TFA in acetonitrile) 95:5; (B) (0.1%
TFA in water):(0.1% TFA in acetonitrile):50:50;

gradient 0-100% B in 65 min

flow rate 1 mL/min

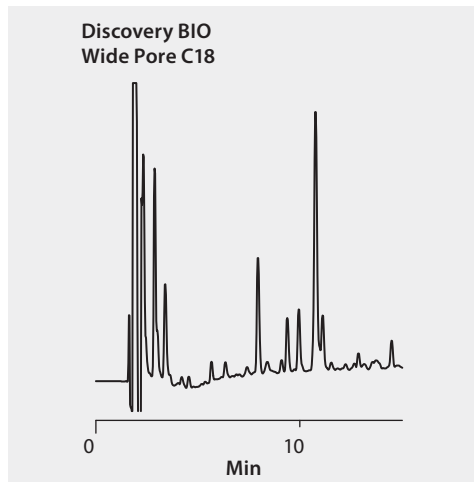
column temp. 30 °C

detector UV, 215 nm

injection 50 µL

sample carboxymethylated apohemoglobin tryptic digest
in 50 mM ammonium bicarbonate

Application No. **G001505A**



HPLC Analysis of Carboxymethylated Apohemoglobin Tryptic Digest on Discovery® BIO Wide Pore C5

column Discovery BIO Wide Pore C5, 15 cm × 4.6 mm I.D.,
5 µm particles (568422-U)

mobile phase (A) 0.1% TFA in water:0.1% TFA in acetonitrile, 95:5;
(B) 0.1% TFA in water:0.1% TFA in acetonitrile; 50:50

gradient 0-100% B in 65 min

flow rate 1 mL/min

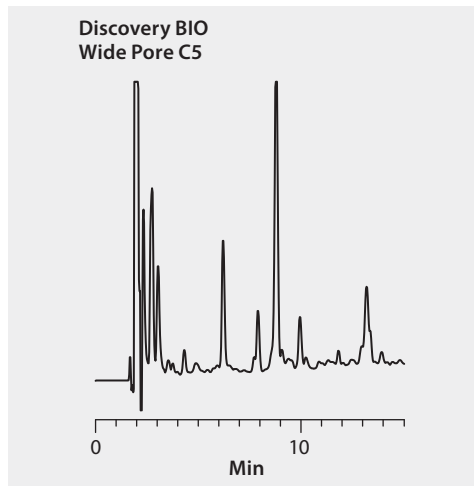
column temp. 30 °C

detector UV, 215 nm

injection 50 µL

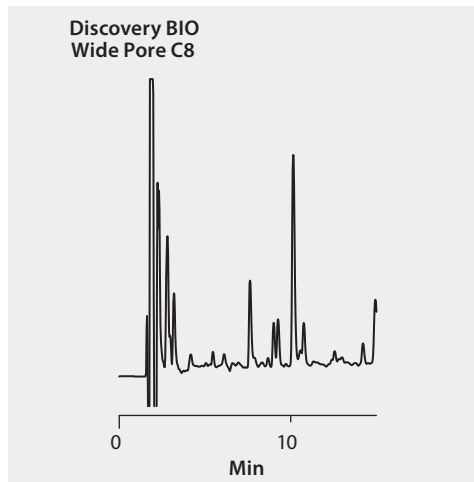
sample carboxymethylated apohemoglobin tryptic digest
in 50 mM ammonium bicarbonate

Application No. **G001506A**



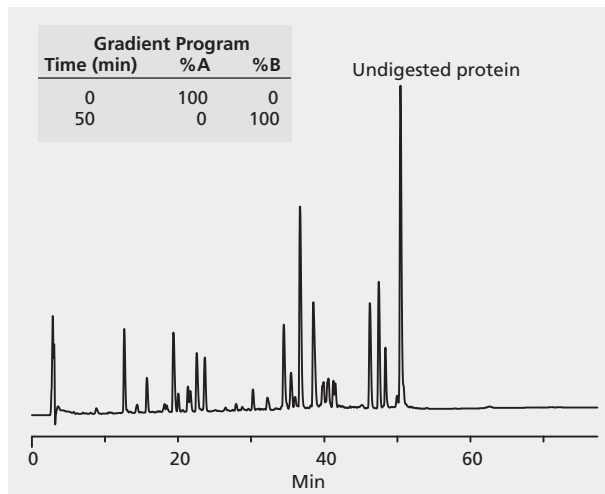
HPLC Analysis of Carboxymethylated Apohemoglobin Tryptic Digest on Discovery® BIO Wide Pore C8

column Discovery BIO Wide Pore C8, 15 cm × 4.6 mm I.D.,
5 µm particles (568322-U)
mobile phase . . . (A) 0.1% TFA in water:0.1% TFA in acetonitrile, 95:5; (B) 0.1% TFA
in water::0.1% TFA in acetonitrile, 50:50.
gradient 0-100% B in 65 min
flow rate 1 mL/min
column temp. 30 °C
detector UV, 215 nm
injection 50 µL
sample carboxymethylated apohemoglobin tryptic digest
in 50 mM ammonium bicarbonate
Application No. **G001504A**



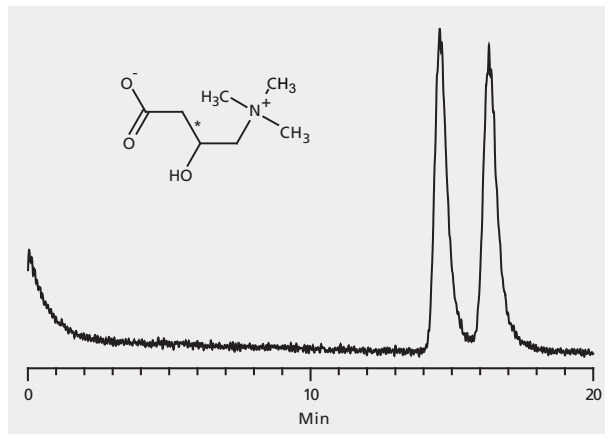
HPLC Analysis of Carboxymethylated Cytochrome c (Chicken) Tryptic Digest on Discovery® BIO Wide Pore C18

column Discovery BIO Wide Pore C18, 15 cm × 2.1 mm I.D.,
3 μm particles (567202-U)
mobile phase (A) water/0.1% TFA;
(B) (water/0.1%TFA):(acetonitrile/0.1% TFA); 50:50
flow rate 0.20 mL/min
column temp. 35 °C
detector UV, 215 nm
injection 5 μL
Application No. **G001721**



HPLC Analysis of Carnitine Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase (A) 5 mM ammonium acetate, pH 6; (B) methanol; (25:75, A:B)
flow rate 0.6 mL/min
column temp. 35 °C
detector ESI(+)-MS (m/z = 162)
injection 5 µL
sample 1 µg/mL in mobile phase
Application No. [G004524](#)



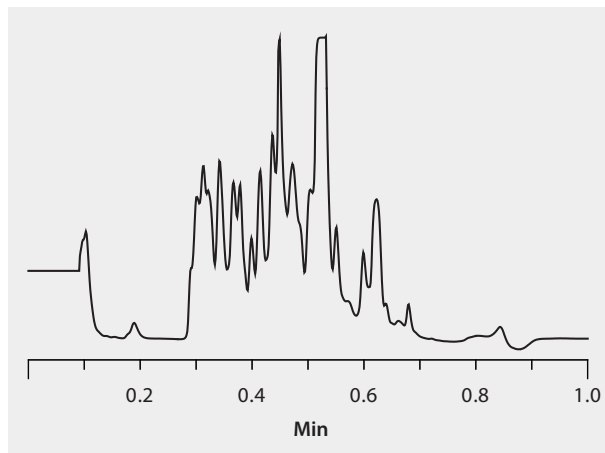
HPLC Analysis of α -Casein Tryptic Digest on Ascentis® Express Peptide ES-C18

LC-MS-based shotgun proteomics relies both on the power of the separation techniques, and the sensitivity of detection methods. As a viable alternative to classical approaches in this field, we developed a fully automated, comprehensive 2D LC system, in which RP LC x RP LC was coupled to MS detection, for the first time, and applied for the analysis of tryptic digests obtained from α -casein and dephosphorylated α -casein. The use of a significantly different pH in the two dimensions allowed to attain high peak capacity, despite the employment of novel identical stationary phases. Furthermore, such a combination addresses compatibility issues, thus allowing straightforward interfacing in on-line 2D LC configuration, as well as direct linkage to mass spectrometer. A theoretical peak capacity of approximately 8500 was calculated for the set-up employing four serially coupled C18 columns in the first dimension (4 columns, each 15 cm x 2.1 mm I.D., 2.7 μ m particles), operated under basic conditions, and 3 cm length of the same stationary phase (3 cm x 4.6 mm I.D., 2.7 μ m particles), under acidic conditions for fast second dimension analysis.

Sample Prep: one-tenth gram of α -casein was dissolved in 10 mL of 0.01 M ammonium formate buffer, and the pH was adjusted to 8.0 with ammonium hydroxide; the solution was heated in a boiling water bath for 6 min. After the solution cooled, 2.0 mg of trypsin from bovine pancreas was added, and the mixture was allowed to react for 4 h at 37 °C; the reaction was quenched by adding 0.1% trifluoroacetic acid to pH 2. The digest were stored at 4°C and filtered prior to injection through a 0.45 μ m nylon membrane.

sample/matrix tryptic digested α -casein
 column Ascentis Express Peptide ES-C18, 3 cm x 4.6 mm I.D.,
 2.7 μ m particles (53316-U)
 mobile phase (A) 0.1% TFA in water; (B) 0.1% TFA in
 water:acetonitrile (10:90, A:B)
 gradient ... 0-0.05 min, 0-20% B; 0.05-0.40 min, to 40% B; 0.40-0.50 min, to 50% B;
 0.50-0.69 min, to 90% B; 0.69-0.70 min, to 0% B; held for 0.3 min
 flow rate 4 mL/min
 column temp. 35 °C

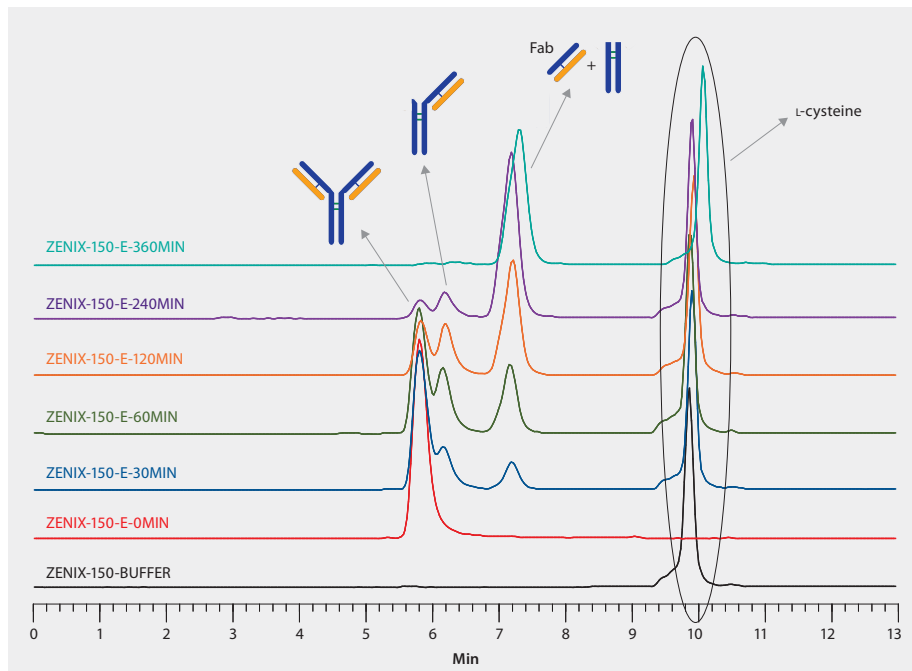
detector UV, 215 nm
 injection 2 μ L
 Application No. G005597



HPLC Analysis of Cetuximab Antibody Fragments from Papain Digestion on Zenix® SEC-150

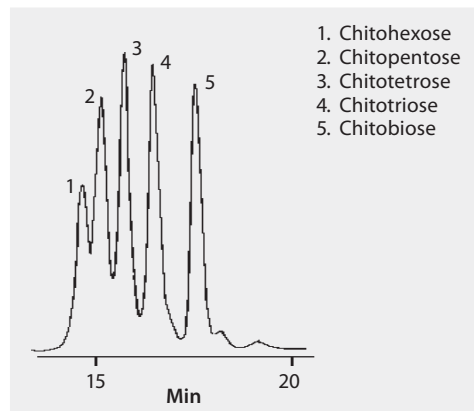
Papain digestion conditions: Buffer: 5.0 mM L-Cysteine, 2.0 mM EDTA and 300 mM NaCl; Enzyme: 80 µg/mL papain; Temperature: 37 °C; Time: 30 min, 60 min, 120 min, 240 min, and 360 min.

column . . . Zenix SEC-150, 30 cm x 7.8 mm I.D., 3 µm, 150 Å particles (Z777018)
 mobile phase 20 mM sodium phosphate, pH 7.0, 150 mM NaCl
 flow rate 1.0 mL/min
 column temp. 25 °C
 detector UV, 280 nm
 injection 10 µL
 sample Cetuximab ERBITUX®, papain digest
 Application No. G006172



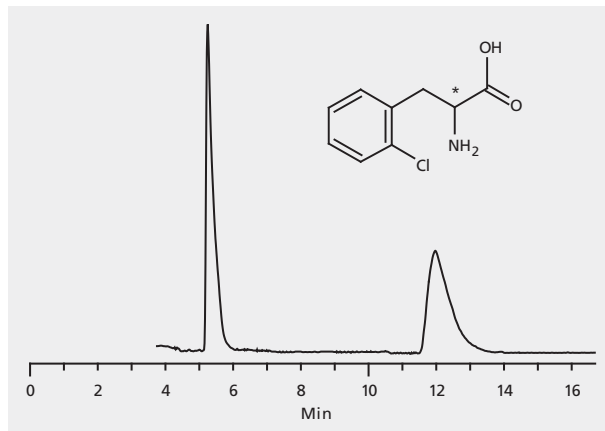
HPLC Analysis of Chito-Oligosaccharides on TSKgel® G-Oligo-PW

column TSKgel G-Oligo-PW, 30 cm × 7.8 mm I.D., 6 μm particles (808031)
flow rate 1 mL/min
column temp. 60 °C
detector RI
sample preparation distilled water
Application No. [794-0325](#)



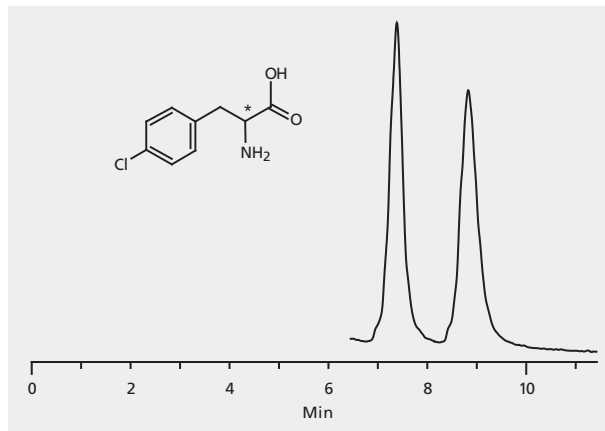
HPLC Analysis of o-Chlorophenylalanine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (70:30, A:B)
flow rate 1 mL/min
column temp. 22 °C
detector UV, 210 nm
injection 1 µL
sample 5 mg/mL in methanol
Application No. [G004550](#)



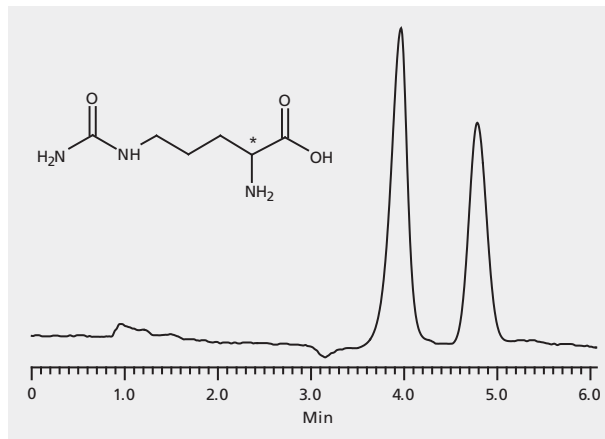
HPLC Analysis of p-Chlorophenylalanine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (50:50, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 230 nm
injection 5 µL
sample 3 mg/mL in methanol
Application No. [G004546](#)



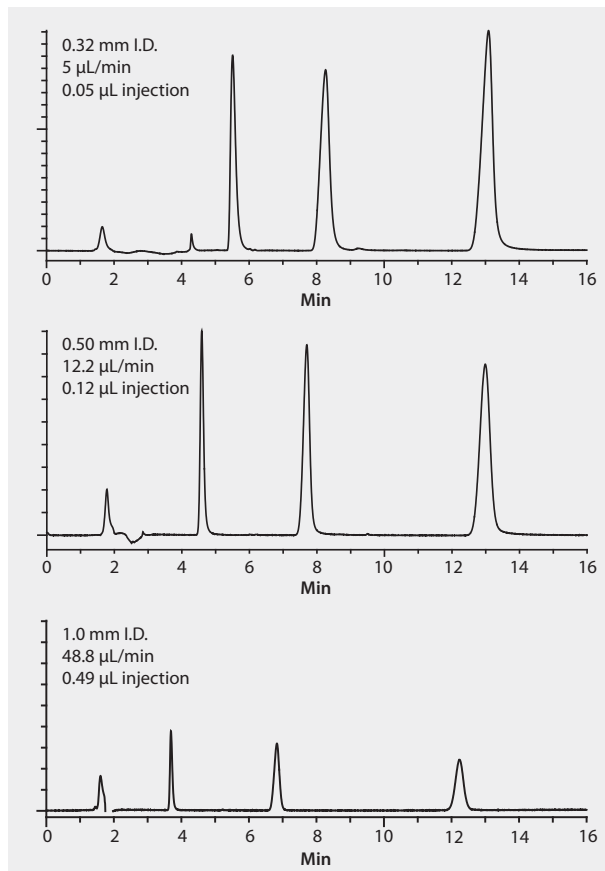
HPLC Analysis of Citrulline Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) acetonitrile; (50:50, A:B)
flow rate 0.6 mL/min
column temp. 25 °C
detector UV, 210 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. **G004531**



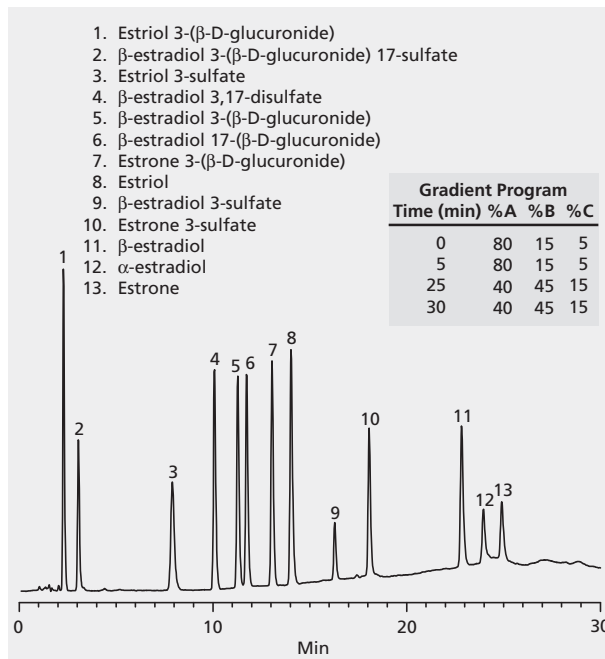
HPLC Analysis of Column Test Mix on Discovery® BIO Wide Pore C18, Effect of HPLC Column I.D. on Sensitivity

column Discovery BIO Wide Pore C18, 10 cm x various I.D., 3 μm particles
mobile phase (A) water; (B) acetonitrile; (65:35, A:B)
flow rate as indicated
column temp. ambient
detector UV, 254 nm
injection as indicated
sample acetophenone (0.1 μg), benzene (1 μg), toluene (1 μg)
Application No. [G004416](#)



HPLC Analysis of Conjugated Estrogens on Discovery® HS C18

column Discovery HS C18, 15 cm × 4.6 mm I.D., 5 µm particles (568522-U)
 mobile phase (A) 10 mM potassium phosphate (pH 7.01 unadjusted);
 (B) acetonitrile; (C) methanol
 flow rate 1 mL/min
 column temp. 30 °C
 detector UV, 220 nm
 injection 10 µL
 sample 10 µg/mL each in 60/40, water:acetonitrile
 Application No. **G002155**



HPLC Analysis of Creatine Kinase on Discovery® BIO PolyMA-WAX

Discovery BIO PolyMA-SCX and PolyMA-WAX columns give sharp, efficient peaks for a wide variety of proteins.

column . . . Discovery BIO PolyMA-SCX, 5 cm × 4.6 mm, 5 µm particles (59601-U)

mobile phase (A) 20 mM sodium phosphate, pH 7.0;
 (B) 20 mM sodium phosphate, 0.5M NaCl, pH 7.0

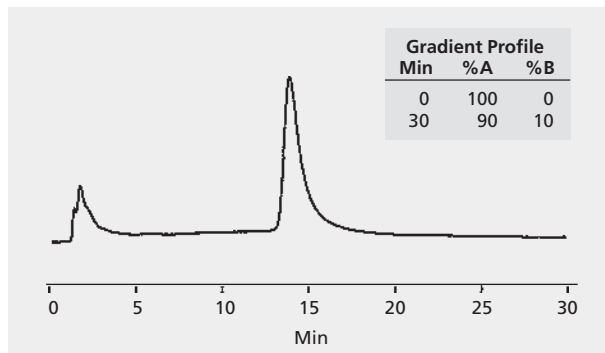
flow rate 0.5 mL/min

injection 10 µL

column temp. 25 °C

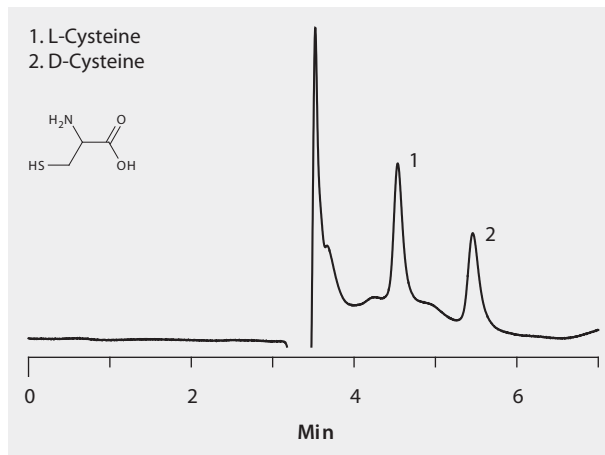
detector UV, 280 nm

Application No. **G001836**



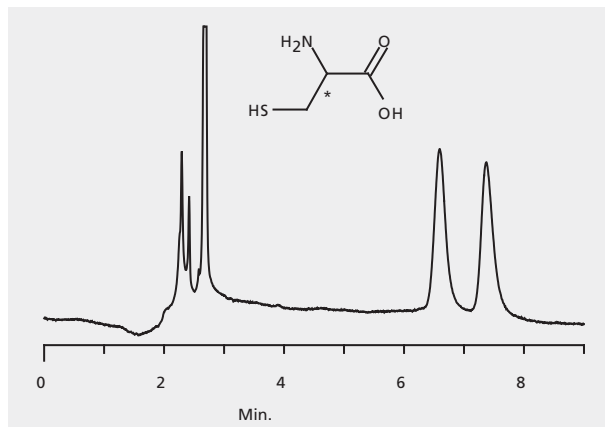
HPLC Analysis of Cysteine Enantiomers on Astec® CHIROBIOTIC® T (Formic Acid Mobile Phase Additive)

column . . . Astec CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (40:60:0.02, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample (200 µg /mL in 50:50 water:methanol)
Application No. [G005334](#)



HPLC Analysis of Cysteine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) acetonitrile; (30:70, A:B)
extraction tube 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004495**



HPLC Analysis of Cytochrome c Species Variants on Discovery® BIO PolyMA-SCX (Ion Exchange)

This Figure shows the separation of three cytochrome c variants on Discovery BIO PolyMA-SCX. Note the difference in elution order compared to the reversed-phase separation on Discovery BIO Wide Pore C18 shown in product G001581.

column . . . Discovery BIO PolyMA-SCX, 5 cm x 4.6 mm, 5 µm particles (59601-U)

mobile phase (A) 20 mM Bis-Tris HCl, pH 7.0;

(B) 20 mM Bis-Tris HCl, 0.5M NaCl, pH 7.0;

24 to 69% B in 20 min. (linear)

flow rate 0.5 mL/min

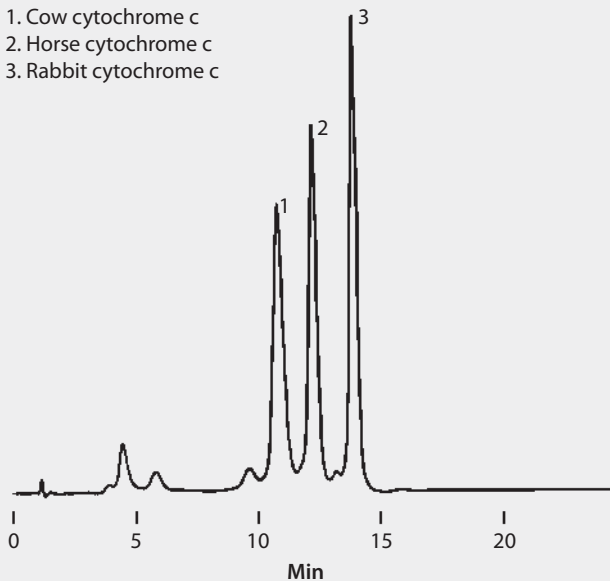
column temp. 25 °C

detector UV, 280 nm

injection 10 µg each variant

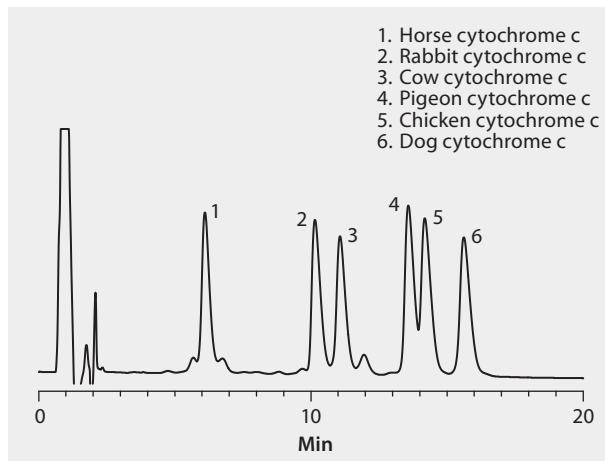
Application No. [796-0477](#)

1. Cow cytochrome c
2. Horse cytochrome c
3. Rabbit cytochrome c



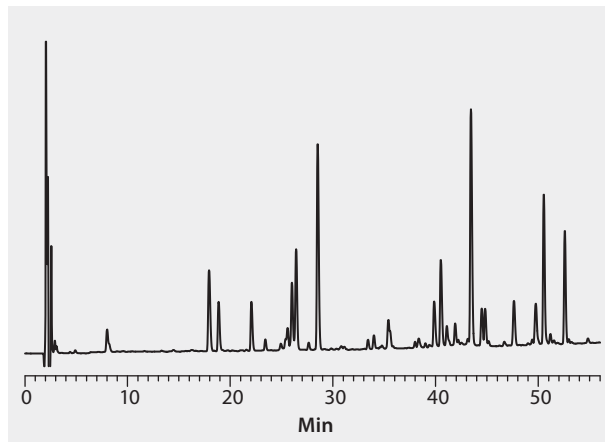
HPLC Analysis of Cytochrome c Species Variants on Discovery® BIO Wide Pore C18

column Discovery BIO Wide Pore C18, 15 cm × 4.6 mm I.D.,
5 µm particles (568222-U)
mobile phase (A) (0.1% TFA in water):(0.1% TFA in acetonitrile); (70:30),
(B) (0.1% TFA in water):(0.1% TFA in acetonitrile), 64:36
gradient 0-100% B in 30 min
flow rate 1 mL/min
column temp. ambient
detector UV, 220 nm
injection 12 µL each at 0.8 mg/mL in 0.1%TFA
Application No. **G001581**



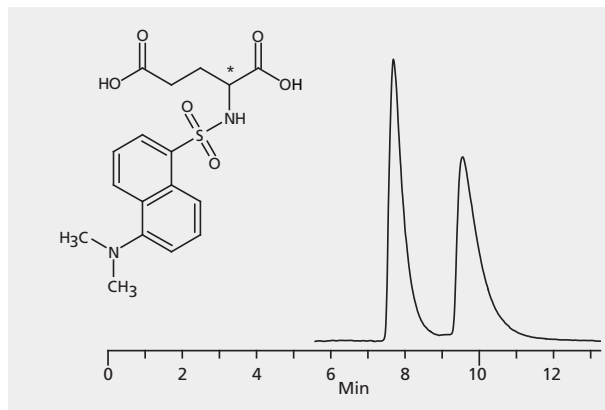
HPLC Analysis of Cytochrome c Tryptic Digest on Discovery® C18

column Discovery C18, 15cm × 4.6mm I.D., 5µm particles (504955)
mobile phase (A) 0.1% TFA, 3% n-propanol in water;
(B) 0.1% TFA, 3% n-propanol in acetonitrile
gradient 1-37% B in 72 min
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
Application No. **G000307**



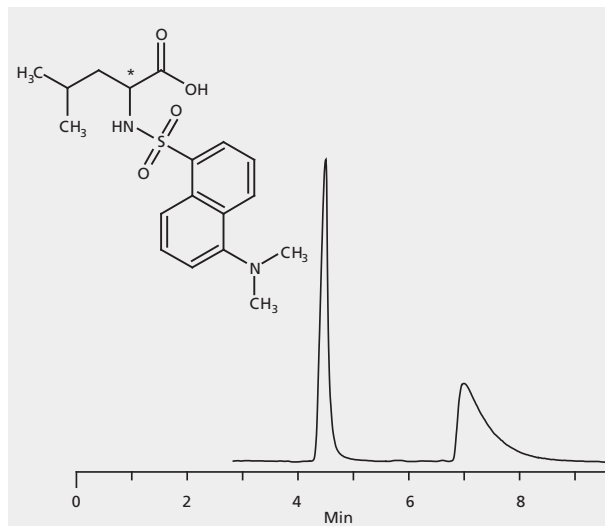
HPLC Analysis of Dansyl-Glutamic Acid Enantiomers on Astec® CHIROBIOTIC® R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
mobile phase 0.1 wt% ammonium trifluoroacetic acid in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 260 nm
injection 1 µL
sample 5 mg/mL in methanol
Application No. [G004669](#)



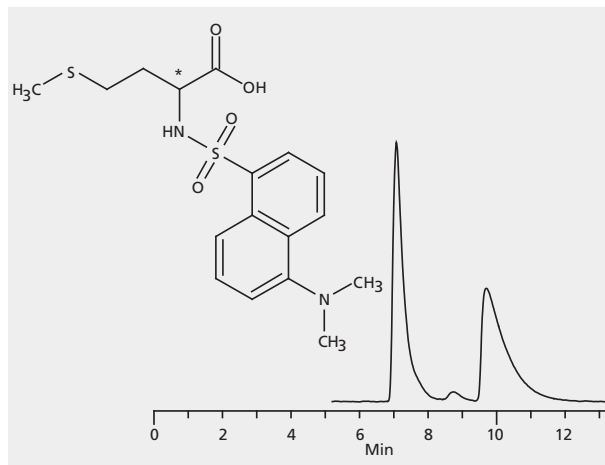
HPLC Analysis of Dansyl-Leucine Enantiomers on Astec® CHIROBIOTIC® R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
mobile phase 0.1 wt% ammonium trifluoroacetic acid in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 260 nm
injection 1 µL
sample 5 mg/mL in methanol
Application No. [G004670](#)



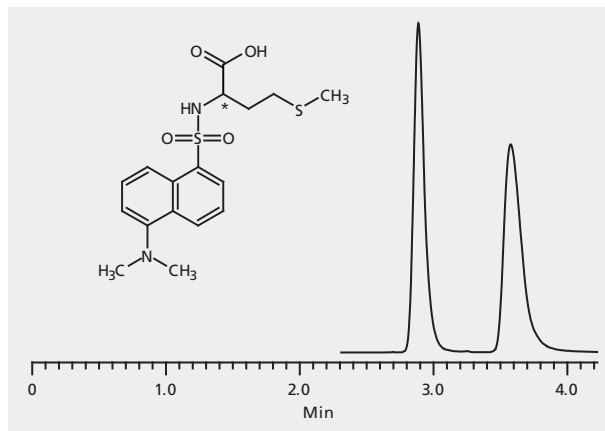
HPLC Analysis of Dansyl-Methionine Enantiomers on Astec® CHIROBIOTIC® R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
mobile phase 0.1 wt% ammonium trifluoroacetic acid in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 260 nm
injection 1 µL
sample 5 mg/mL in methanol
Application No. **G004671**



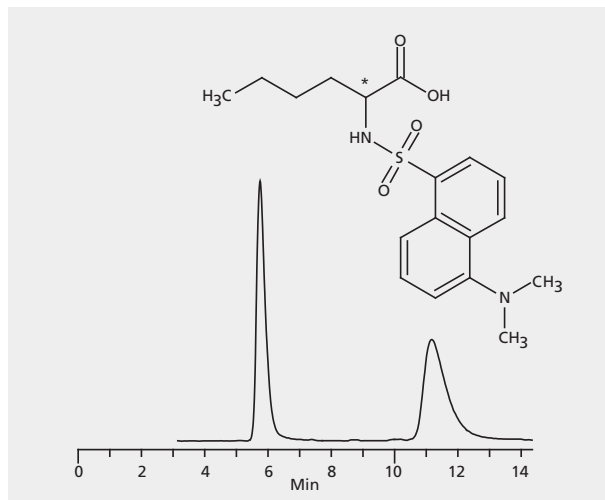
HPLC Analysis of Dansyl-Methionine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase 0.1 wt% ammonium acetate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 3 µL
sample 5 mg/mL in methanol
Application No. [G004558](#)



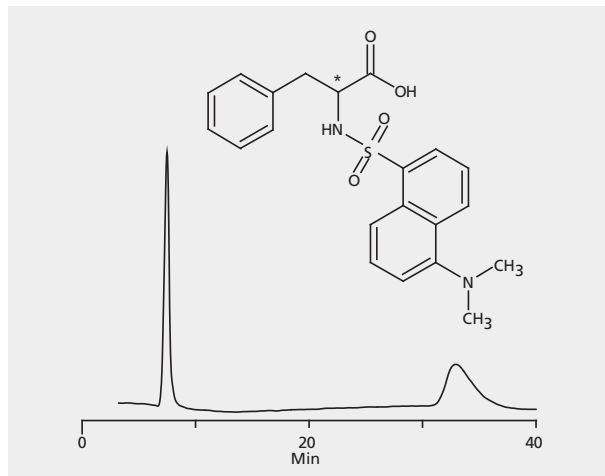
HPLC Analysis of Dansyl-Norleucine Enantiomers on Astec® CHIROBIOTIC® R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (70:30. A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 260 nm
injection 1 µL
sample 5 mg/mL in methanol
Application No. [G004672](#)



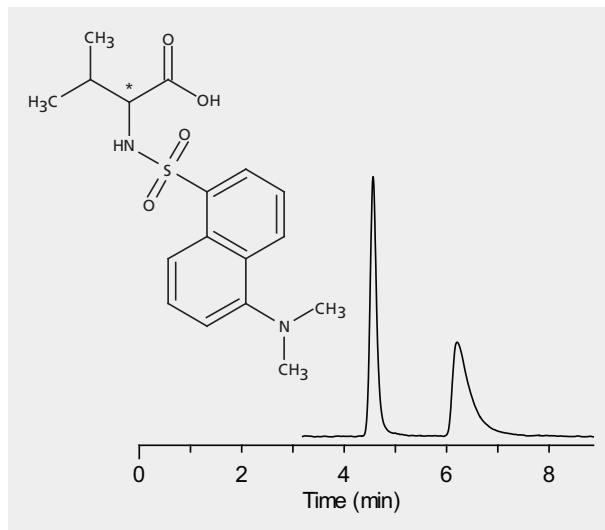
HPLC Analysis of Dansyl-Phenylalanine Enantiomers on Astec® CHIROBIOTIC® R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
mobile phase (A) 20 mM ammonium acetate; (B) methanol; (70:30, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 260 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004673](#)



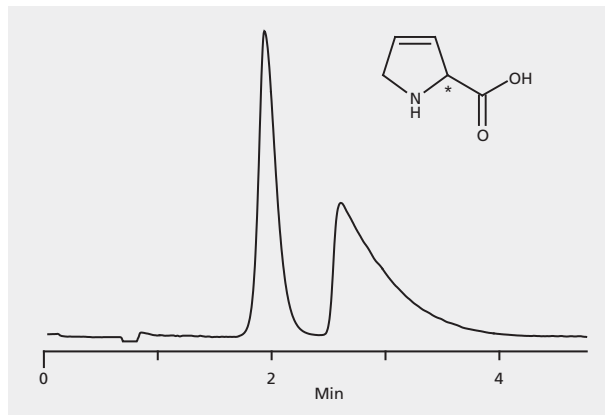
HPLC Analysis of Dansyl-Valine Enantiomers on Astec® CHIROBIOTIC® R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
mobile phase 0.1 wt% ammonium trifluoroacetic acid in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 260 nm
injection 1 µL
sample 5 mg/mL in methanol
Application No. [G004675](#)



HPLC Analysis of Dehydroproline Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase water
flow rate 2.5 mL/min
column temp. ambient
detector UV, 200 nm
injection 100 µL
sample 1 mg/mL in methanol
Application No. [G004528](#)



HPLC Analysis of Deoxyribonucleosides and Ribonucleosides on SUPELCOSIL™ LC-18-S

column SUPELCOSIL LC-18-S, 15 cm × 4.6 mm I.D., 5 μm particles (58931)
 mobile phase 0.05 M K₂HPO₄/KH₂PO₄, pH 4.0:methanol (A) 97.5:2.5; (B) 80:20
 flow rate 1 mL/min
 column temp. 30 °C
 detector UV, 254 nm
 sample nucleoside standards in water
 Application No. [713-0955](#)

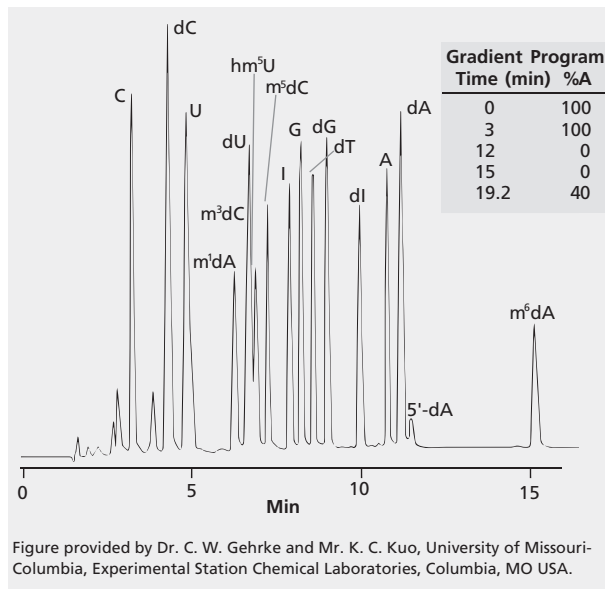
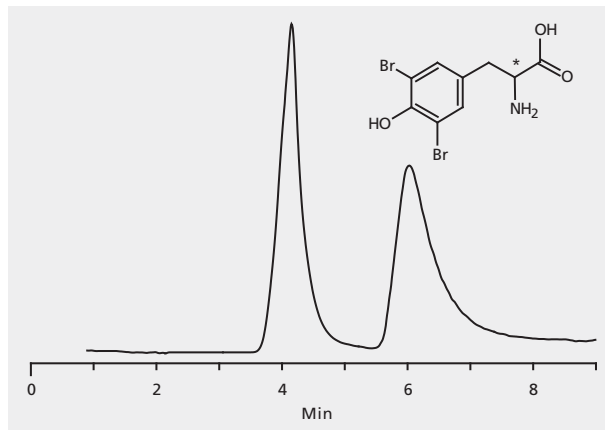


Figure provided by Dr. C. W. Gehrke and Mr. K. C. Kuo, University of Missouri-Columbia, Experimental Station Chemical Laboratories, Columbia, MO USA.

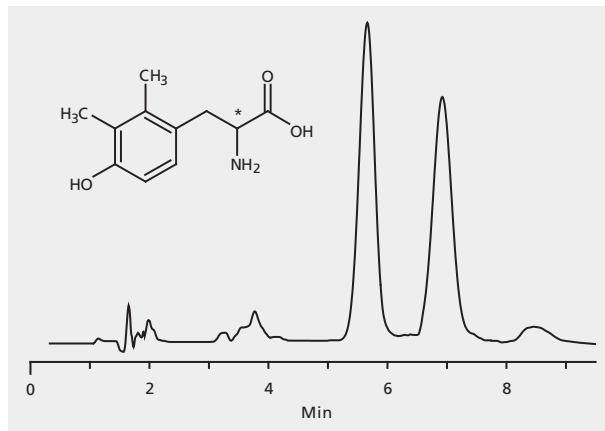
HPLC Analysis of 3,5-Dibromo-p-Tyrosine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (50:50, A:B)
flow rate 0.8 mL/min
column temp. 23 °C
detector UV, 254 nm
injection 2 µL
sample 2 mg/mL in methanol
Application No. **G004552**



HPLC Analysis of 2,3-Dimethyltyrosine Enantiomers on Astec® CHIROBIOTIC® T

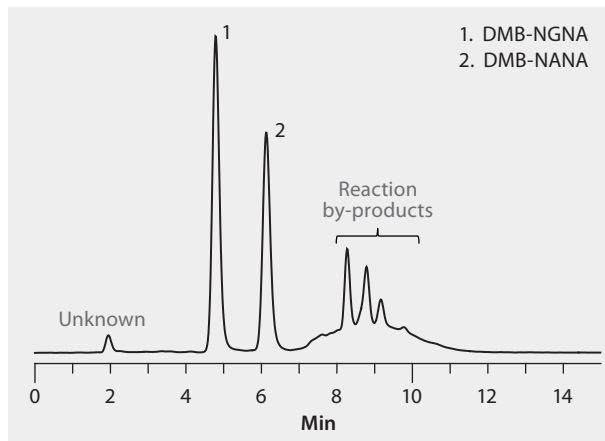
column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (70:30, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 210 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. **G004532**



HPLC Analysis of DMB-Labeled Sialic Acids on Ascentis® Express RP-Amide: Comparison of Biosimilars to Reference Materials

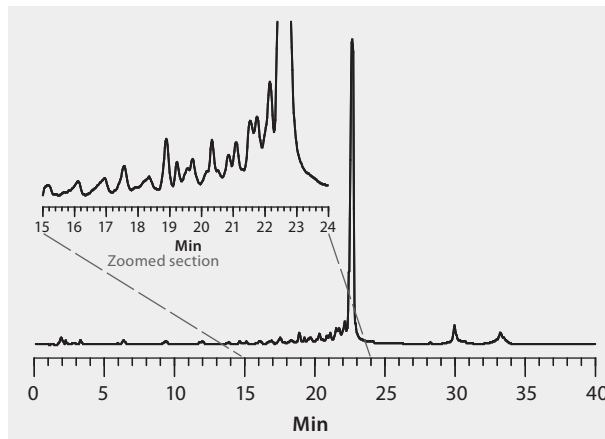
Sialic acids affect the bioavailability, function, stability, and metabolism of glycoproteins. Two forms of sialic acid are commonly present in therapeutic glycoproteins: N-acetylneuraminic acid (NANA) and N-glycolylneuraminic acid (NGNA). One of the most common quantification methods involves releasing sialic acids from the glycoprotein, derivatizing NANA and NGNA with 1,2-diamino-4, 5-methylenedioxybenzene (DMB), and analyzing by C18-HPLC with fluorescence detection. This procedure is subject to interference from peaks originating from excess reagent and other derivatized impurities, limiting sensitivity and reproducibility. The objectives of this study were to develop a significantly improved HPLC-fluorescence method for DMB-NANA and DMB-NGNA, and to apply this method to compare two candidate biosimilar therapeutic proteins to their respective reference materials.

column Ascentis® Express RP-Amide, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53913-U)
mobile phase (A) Water, 0.1% formic acid, (B) ACN, 0.1% formic acid
gradient 0-1 min 6% B; 1.01-4 min 20% B;
4.01-12 min 6% B, total run time 15 min
flow rate 0.2 mL/min
pressure 1300 psi (89.6 bar)
column temp. 30 °C
detector fluorescence, λ excitation = 373 nm, λ emission = 448 nm
injection 0.5 µL
sample Mix of DMB-labeled NGNA and NANAsialic acid, 5 mg/ml each
Application No. [G006199](#)



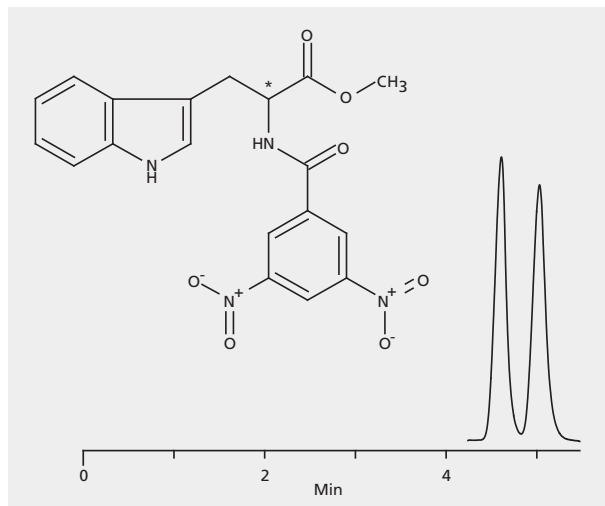
HPLC Analysis of DNA on Proteomix® WAX-NP5

column . . . Proteomix WAX-NP5, 15 cm x 4.6 mm I.D., 5 µm particles (Z777262)
mobile phase (A) 20 mmol Tris, pH 6.0; (B) A + 1.0 M NaCl
gradient 20 to 100% B in 40 min
flow rate 0.6 mL/min
pressure 1015 psi (70 bar)
temp. ambient
detector UV, 260 nm
injection 5 µL
sample DNA
Application No. **G005963**



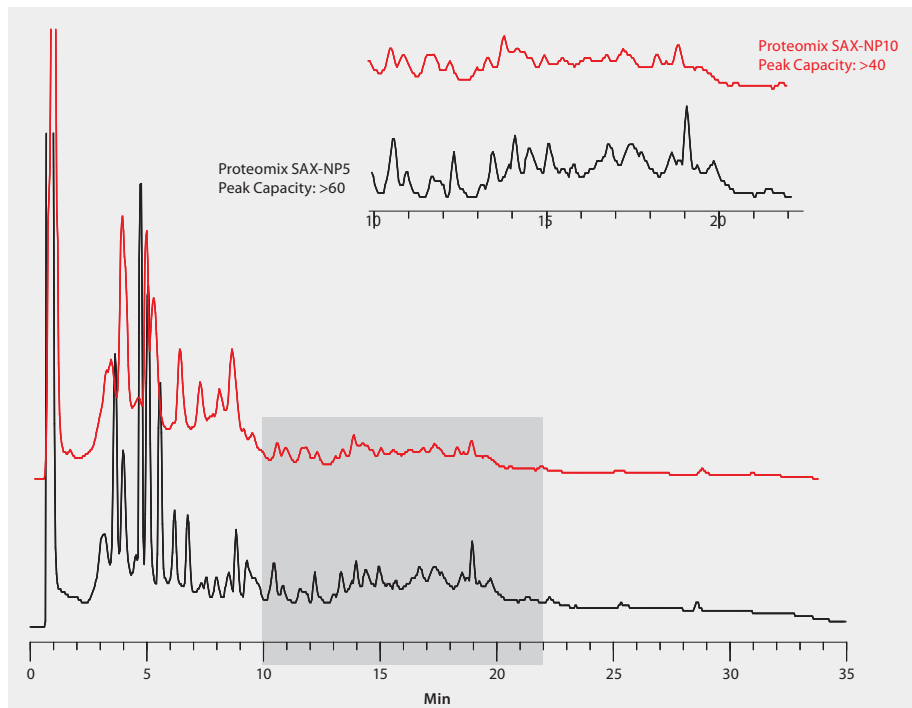
HPLC Analysis of 3,5-DNB-Tryptophan Methyl Ester Enantiomers on Astec® CYCLOBOND® I 2000 SN

column . . . CYCLOBOND I 2000 SN, 25 cm x 4.6 mm I.D., 5 µm particles (20524AST)
mobile phase ethanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004709](#)



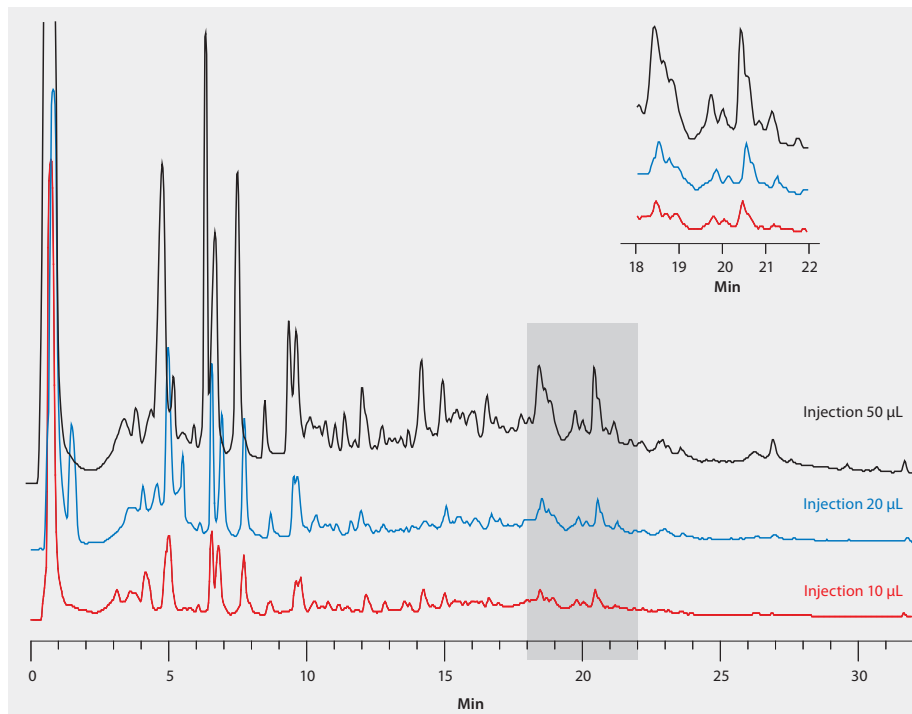
HPLC Analysis of E. coli Lysate on Proteomix® SAX Columns, Particle Size Comparison

flow rate 0.5 mL/min
 injection 10 µL
 mobile phase (A) 20 mM Tris, pH 9.0; (B) A + 0.5 M NaCl
 column temp. 25 °C
 column Proteomix SAX-NP5, 5 cm x 4.6mm I.D., 5 µm particles (Z777227)
 column Proteomix SAX-NP10, 5 cm x 4.6 mm I.D., 10 µm particles (Z777203)
 gradient 0 - 100%B in 30 min
 sample 2.5 mg/mL
 detector UV, 280 nm
 Application No. **G006129**



HPLC Analysis of E. coli Lysate on Proteomix® SAX-NP3, Demonstration of High Loading Capacity

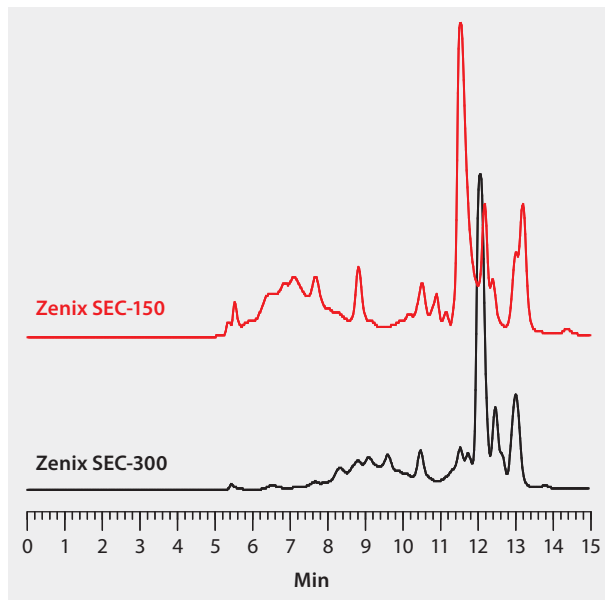
column Proteomix SAX-NP3, 5 cm x 4.6mm I.D., 3 µm particles (Z777219)
mobile phase (A) 20 mM Tris, pH 9.0; (B) A + 0.5 M NaCl
gradient 0 - 100% B in 30 min
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 280 nm
injection as indicated in figure
sample 2.5 mg/mL
Application No. **G006130**



HPLC Analysis of E. coli lysate with various pore size Zenix® columns

An cell lysate, produced by destroying the membranes of E. Coli cells, is analyzed on two Zenix gel filtration columns packed with 3 micron particles. The top chromatogram shows the peak profile on a 150 Å pore size Zenix SEC-150 gel filtration column, while the bottom chromatogram shows the same sample on a 300 Å pore size Zenix SEC-300 column. As expected, the peaks shift to longer retention times on the SEC-300 column. Although roughly the same number of components are visible in each chromatogram, the SEC-150 column does a better job of pulling the peaks apart, which helps when fractions need to be collected for further analysis.

column Zenix SEC-150, 30 cm x 7.8 mm I.D., 3 µm particles (Z777018)
 column Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777033)
 mobile phase 150 mM Phosphate Buffer, pH 7
 flow rate 1.0 mL/min
 column temp. Ambient
 detector UV, 214nm
 injection 10 µL
 sample E. coli lysate, 2.5 mg/mL
 Application No. **G006183**



HPLC Analysis of Elastase on Discovery® BIO PolyMA-SCX, Ion Exchange

Discovery BIO PolyMA-SCX and PolyMA-WAX columns give sharp, efficient peaks for a wide variety of proteins.

column Discovery BIO PolyMA-SCX, 5cm × 4.6mm, 5µm particles (59601-U)

mobile phase (A) 20 mM sodium phosphate, pH 7.0;

(B) 20 mM sodium phosphate, 0.5 M NaCl, pH 7.0

gradient 0 to 100% B in 30 min. (linear)

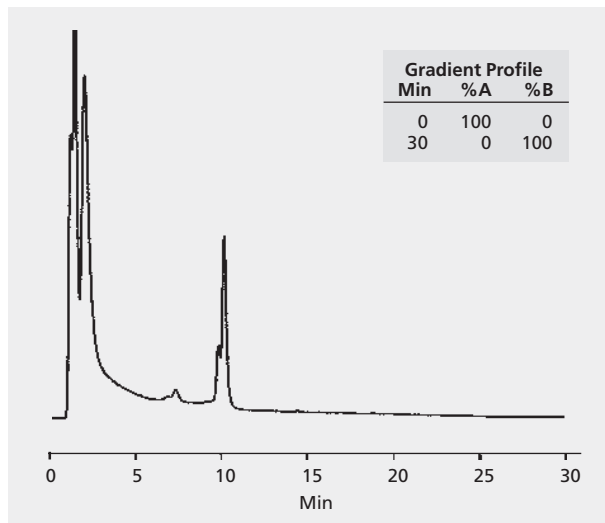
flow rate 0.5 mL/min

column temp. 25 °C

detector UV, 280 nm

injection 10 µL

Application No. [G001833](#)

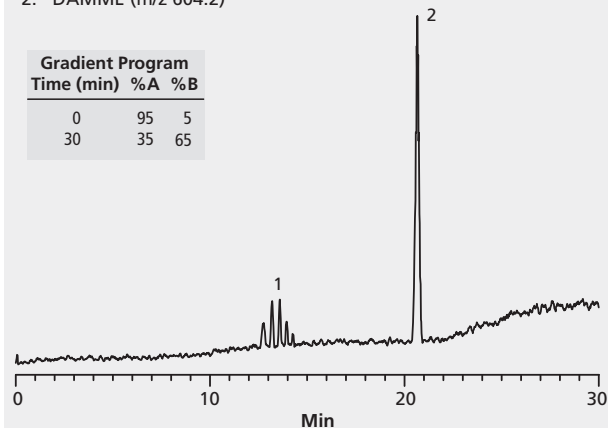


HPLC Analysis of Enkephalin Derivative (DAMME) on Discovery® HS F5

column Discovery HS F5, 10 cm × 2.1 mm I.D., 5 µm particles (568501-U)
 mobile phase (A) 25 mM HCO₂H in water; (B) 25 mM HCO₃H in acetonitrile
 flow rate 0.2 mL/min
 column temp. 22 °C
 detector ESI (+), full scan
 injection 2 µL
 sample 10 mg/L in 0.1% HCO₂H
 Application No. [G002572](#)

1. PEG contaminants (m/z 520.1, 564.1, 608.2, 652.2, 696.2)
2. DAMME (m/z 604.2)

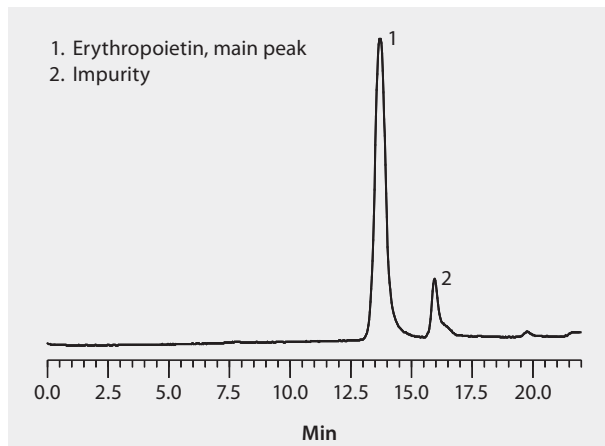
Gradient Program		
Time (min)	%A	%B
0	95	5
30	35	65



HPLC Analysis of Erythropoietin on SRT® SEC-300 Gel Filtration Column

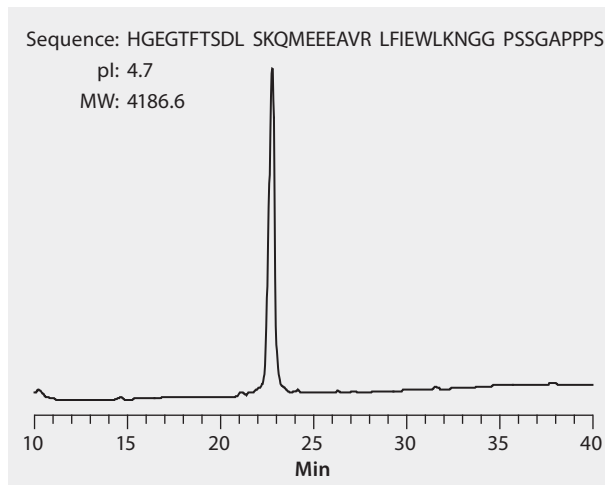
Erythropoietin (EPO) is a glycoprotein hormone that controls red blood cell production. EPO was one of the first genetically engineered therapeutic proteins. It is available under such brand names as Epogen and Aranesp for the treatment of anemia. Human EPO has a molecular mass of 34 kDa. The 5 micron SRT SEC-300 column is operated at a flow rate of 0.7 mL/min. Note that after the main peak, an impurity elutes at about 16 minutes.

column . . . SRT SEC-300, 30 cm x 7.8 mm I.D., 5 µm particles, 300 Å, (Z777051)
 mobile phase $\text{Na}_2\text{HPO}_4\text{-KH}_2\text{PO}_4\text{-NaCl}$
 flow rate 0.7 mL/min
 column temp. Ambient
 detector UV, 280 nm
 injection 20.0 µL
 sample EPO (Recombinant Human Erythropoietin)
 Application No. **G006182**



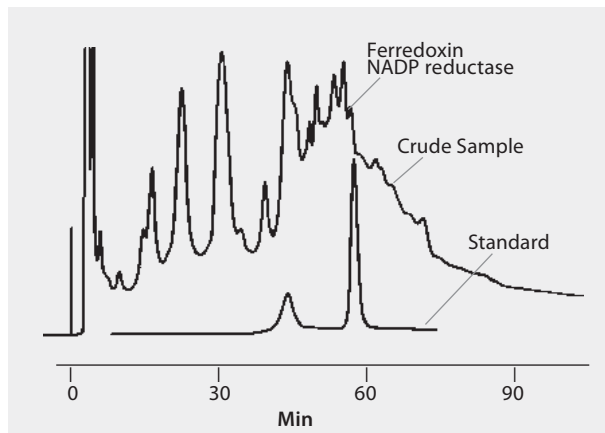
HPLC Analysis of Exenatide Acetate on Proteomix® SCX-NP5

column Proteomix SCX NP5, 25 cm x 4.6mm I.D., 5 µm particles (Z777161)
mobile phase (A) 10 mM monosodium phosphate:acetonitrile (56:44, v/v),
adjusted to pH to 2.0 with phosphoric acid;
(B) 0.5 M NaCl/10 mM monosodium phosphate:acetonitrile (56:44, v/v),
adjusted to pH to 2.0 with phosphoric acid)
gradient 0 to 65% B in 35 min; held for 5 min; to 0% B in 10 min
flow rate 1.0 mL/min
pressure 1653 psi (114 bar)
column temp. 40 °C
detector UV, 235 nm
injection 20 µL
sample 0.325 mg/mL exenatide acetate in mobile phase A
Application No. [G006163](#)



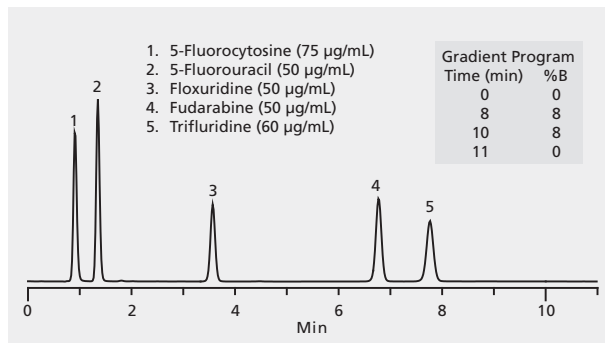
HPLC Analysis of Ferredoxin NADP Reductase on TSKgel® Phenyl-5PW

column TSKgel Phenyl-5PW column, 7.5 cm × 7.5 mm I.D.,
10 µm particles (807573)
mobile phase 60 min decreasing linear gradient from 1.5M to 0M ammonium
sulfate in 0.1M sodium phosphate buffer, pH7
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 280 nm
injection 3mg (crude) or 0.2mg (standard)
Application No. [713-0922](#)



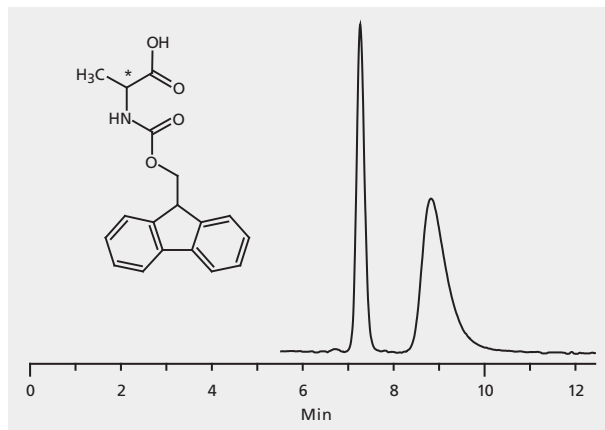
HPLC Analysis of Fluorinated Pyrimidine Nucleosides on Ascentis® RP-Amide

column Ascentis RP-Amide, 5 cm × 4.6 mm I.D., 5 µm particles (565323-U)
mobile phase (A) water with 0.1% ammonium formate
(pH 3.04 with formic acid), (B) acetonitrile
flow rate 1.0 mL/min
column temp. 30 °C
detector UV, 260 nm
injection 5 µL
sample as indicated in mobile phase A
Application No. **G003940**



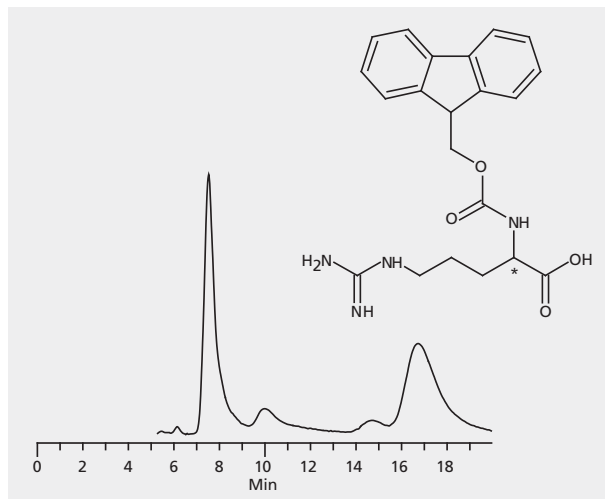
HPLC Analysis of FMOc-Alanine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 5.0; (B) methanol; (60:40, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 260 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004559**



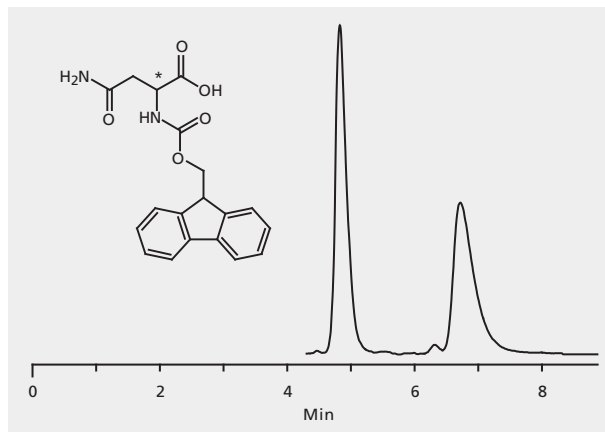
HPLC Analysis of Fmoc-Arginine Enantiomers on Astec® CHIROBIOTIC® R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
mobile phase 0.1% ammonium trifluoroacetic acid in methanol
flow rate 1 mL/min
column temp. 23 °C
detector UV, 260 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. **G004678**



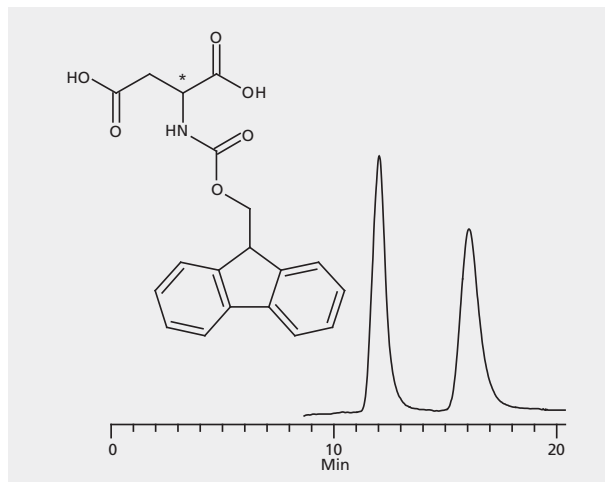
HPLC Analysis of Fmoc-Asparagine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (60:40, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 260 nm
injection 1 µL
sample 5 mg/mL in methanol
Application No. [G004562](#)



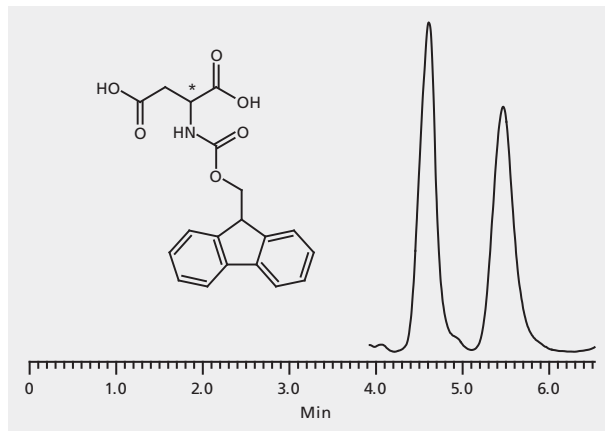
HPLC Analysis of FMOC-Aspartic Acid Enantiomers on Astec® CHIROBIOTIC® R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
mobile phase . . . (A) 10 mM ammonium acetate, pH 5.0; (B) methanol; (60:40, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 260 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004677**



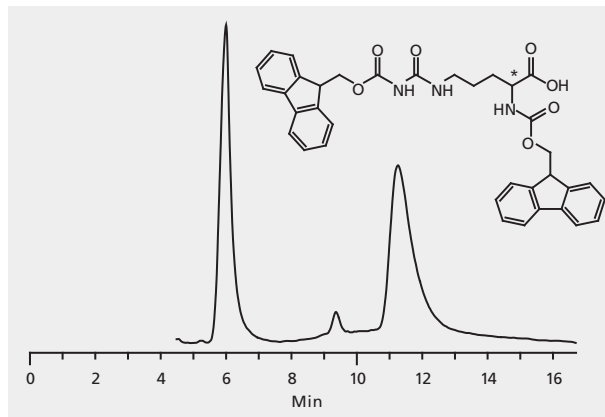
HPLC Analysis of FMOC-Aspartic Acid Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (60:40, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 280 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004560**



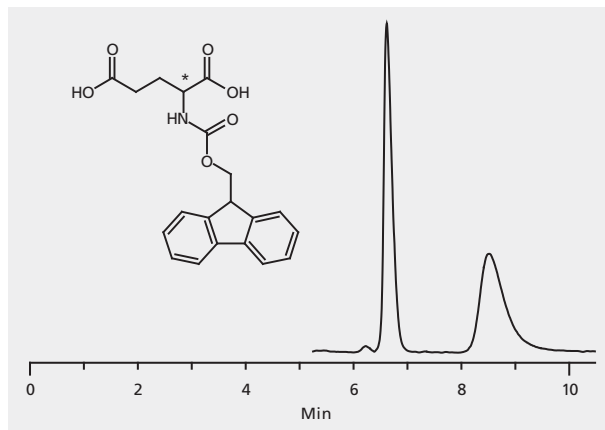
HPLC Analysis of FMOCCitrulline Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (60:40, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 260 nm
sample 1 mg/mL in methanol
injection 1 µL
Application No. [G004563](#)



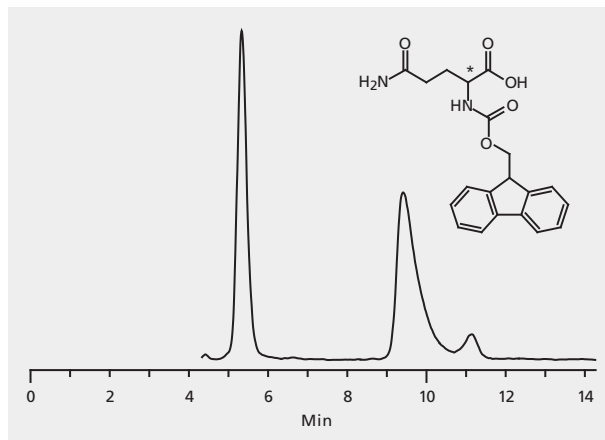
HPLC Analysis of FMOc-Glutamic Acid Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (60:40, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004561**



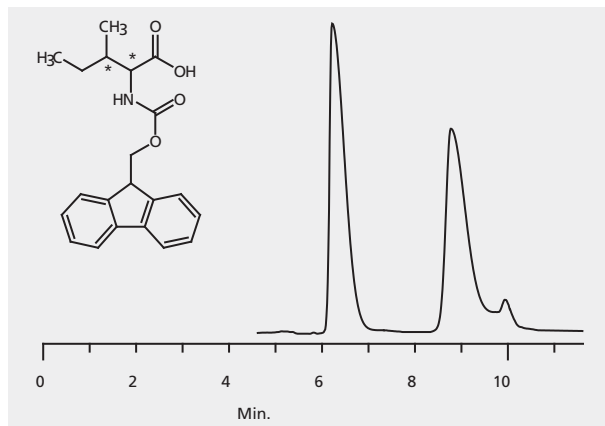
HPLC Analysis of Fmoc-Glutamine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (60:40, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 260 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004565](#)



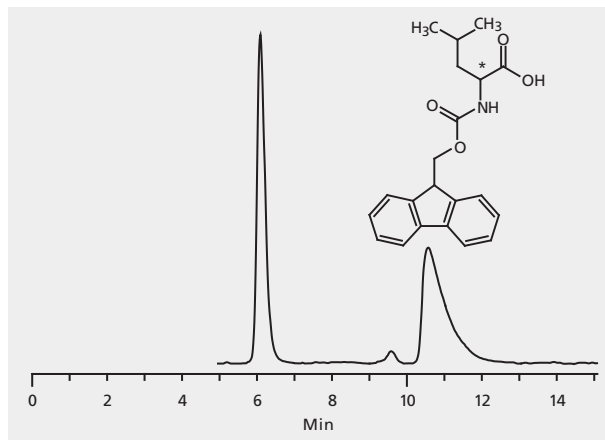
HPLC Analysis of FMOC-Isoleucine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (60:40, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 260 nm
injection 3 µL
sample 1 mg/mL in methanol
Application No. [G004575](#)



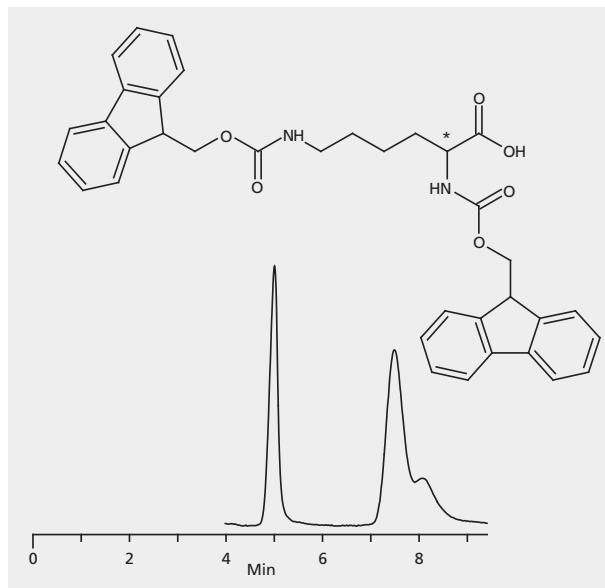
HPLC Analysis of FMOc-Leucine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (60:40, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 260 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004564**



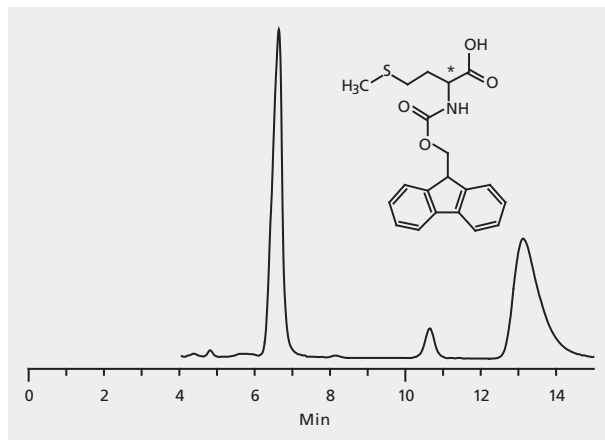
HPLC Analysis of Fmoc-Lysine Enantiomers on Astec® CHIROBIOTIC® R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
mobile phase 0.1% ammonium trifluoroacetic acid in methanol
flow rate 1 mL/min
column temp. 23 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004679](#)



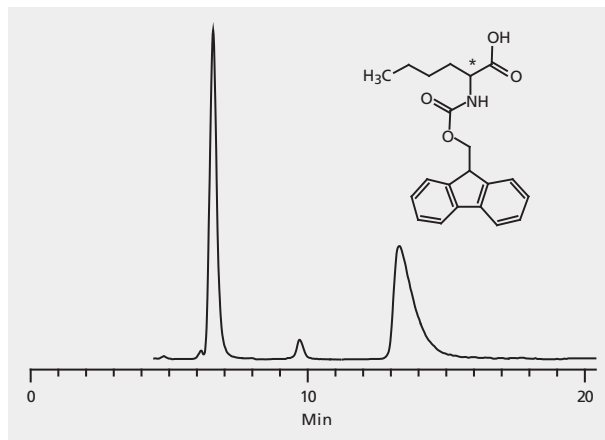
HPLC Analysis of Fmoc-Methionine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (60:40, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 260 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004566**



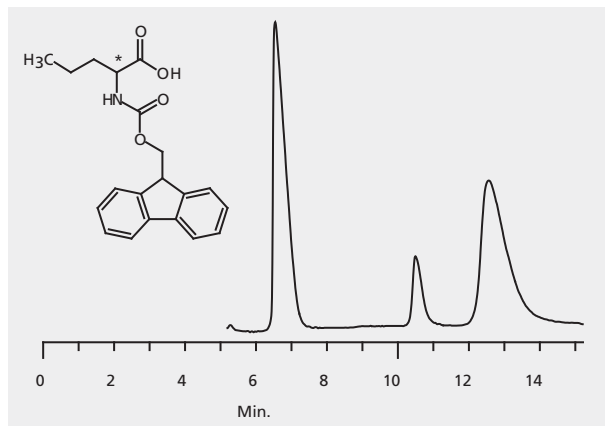
HPLC Analysis of FMOC-Norleucine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (60:40, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 260 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004567](#)



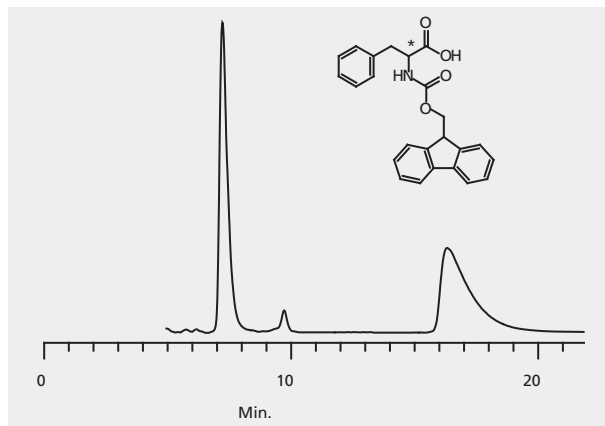
HPLC Analysis of FMOC-Norvaline Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (60:40, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 280 nm
injection 0.5 µL
sample 1 mg/mL in methanol
Application No. **G004568**



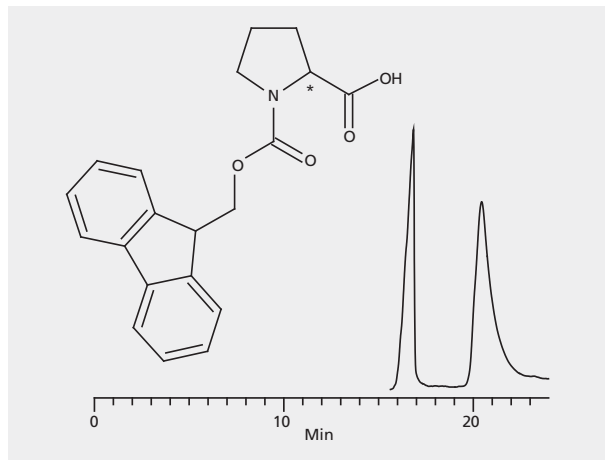
HPLC Analysis of FMOc-Phenylalanine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (60:40, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample 5 mg/mL in methanol
Application No. [G004569](#)



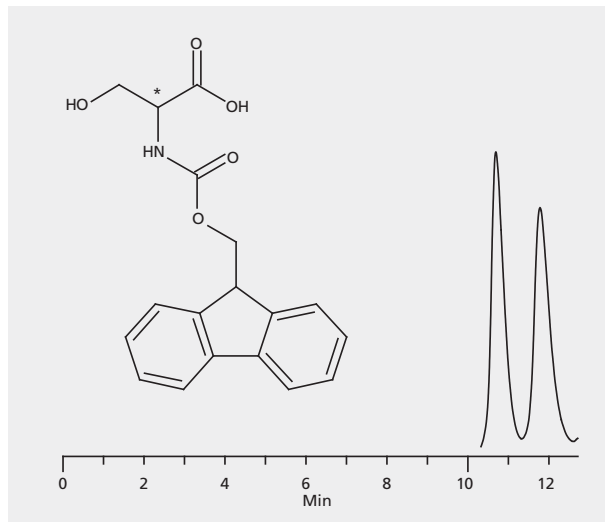
HPLC Analysis of Fmoc-Proline Enantiomers on Astec® CYCLOBOND® I 2000 SN

column . . . CYCLOBOND I 2000 SN, 25 cm x 4.6 mm I.D., 5 µm particles (20524AST)
mobile phase (A) acetonitrile; (B) methanol; (C) acetic acid;
(D) ammonium hydroxide; (85:15:0.4:0.1, A:B:C:D)
flow rate 0.9 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. **G004710**



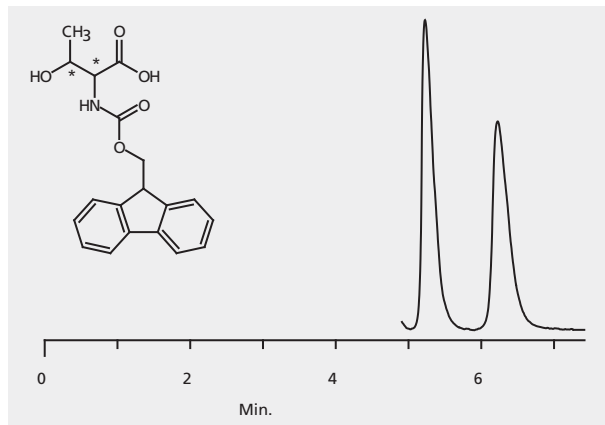
HPLC Analysis of Fmoc-Serine Enantiomers on Astec® (R,R) P-CAP™

column Astec (R,R) P-CAP, 25 cm x 4.6 mm I.D., 5 µm particles (31024AST)
mobile phase 20 mM ammonium acetate in: (A) acetonitrile;
(B) methanol; (70:30, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 0.5 µL
sample 1 mg/mL in methanol
Application No. **G004725**



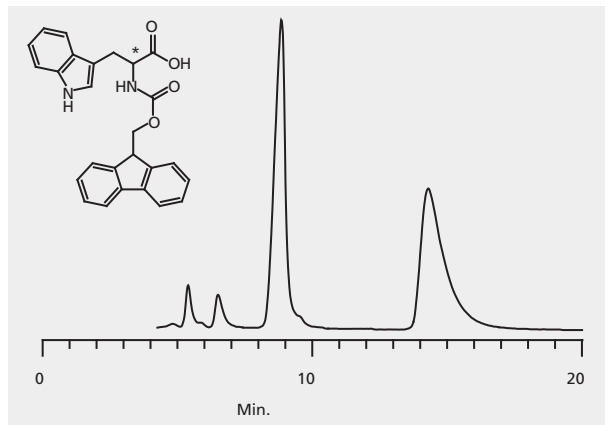
HPLC Analysis of FMOC-Threonine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (60:40, A:B)
flow rate 0.8 mL/min
column temp. 25 °C
detector UV, 260 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004571**



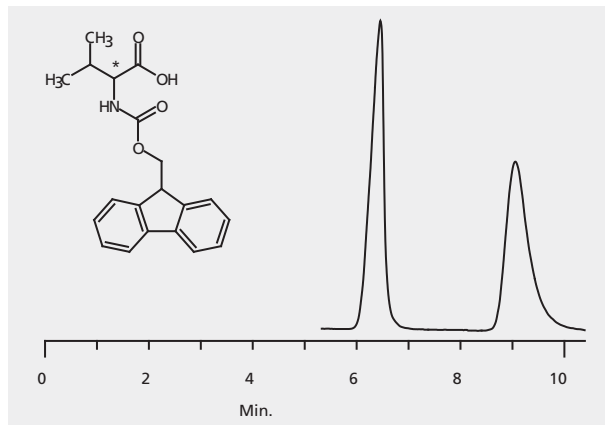
HPLC Analysis of Fmoc-Tryptophan Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (60:40, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 260 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004570**



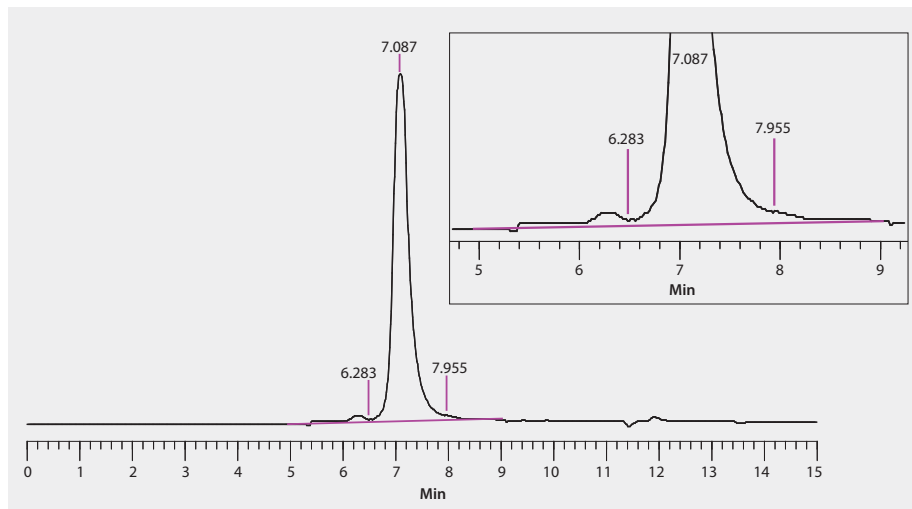
HPLC Analysis of Fmoc-Valine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (60:40, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 260 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004589**



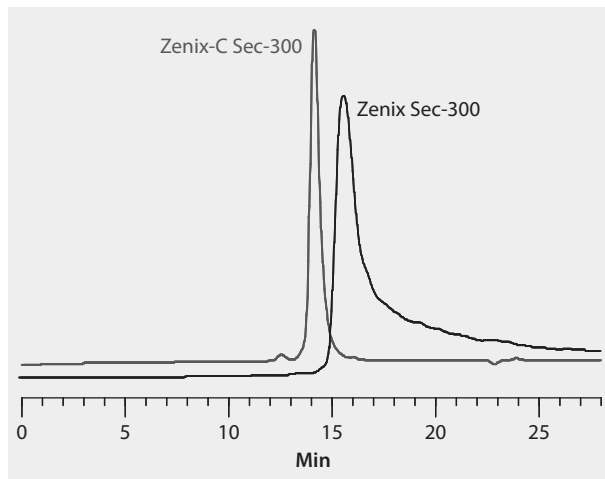
HPLC Analysis of Fusion Protein on Zenix®-C SEC-300

column Zenix-C SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777092)
mobile phase 150 mM sodium phosphate buffer, pH 7.0 + 200 mM NaCl
flow rate 1.0 mL/min
pressure 1102 psi (76 bar)
column 25 °C
detector UV, 214 nm
injection 10 µL
sample 1 mg/mL fusion protein
Application No. **G005953**



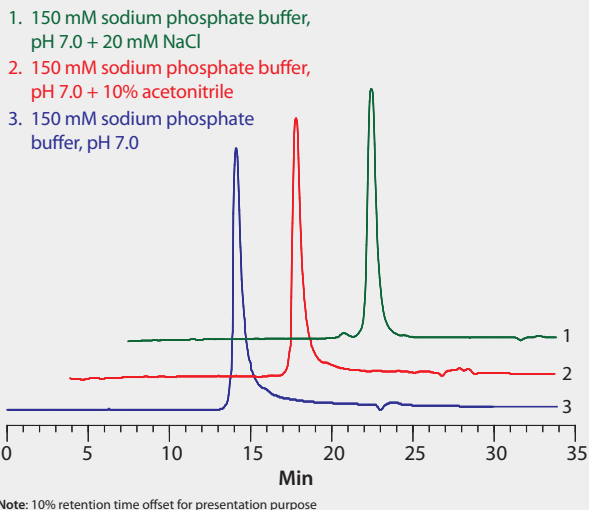
HPLC Analysis of Fusion Protein on Zenix®-C SEC-300 vs. Zenix® SEC-300

column Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777033)
column Zenix-C SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777092)
mobile phase 150 mM sodium phosphate buffer, pH 7.0 + 200 mM NaCl
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 214 nm
injection 10 µL
sample 1 mg/mL fusion protein, MW 170 kD, pI 6.8-7.0
Application No. **G005951**



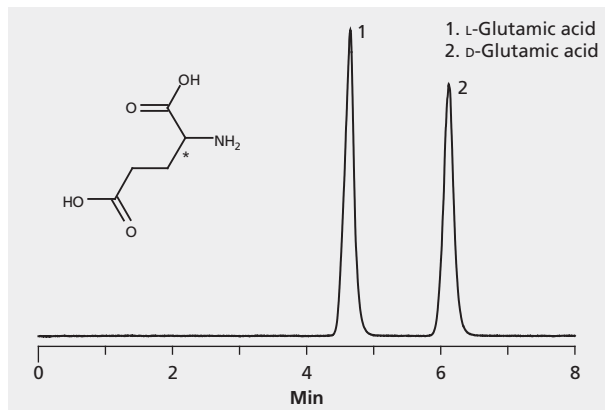
HPLC Analysis of Fusion Protein on Zenix®-C SEC-300, Effect of Mobile Phase Composition

column Zenix-C SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777092)
gradient (A) lower, 150 mM sodium phosphate buffer, pH 7.0
(B) middle, 150 mM sodium phosphate buffer, pH 7.0 + 10% acetonitrile
(C) top, 150 mM sodium phosphate buffer, pH 7.0 + 20 mM NaCl
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 214 nm
injection 10 µL
sample 1 mg/mL fusion protein, MW 170 kD, pI 6.8-7.0
Application No. **G005952**



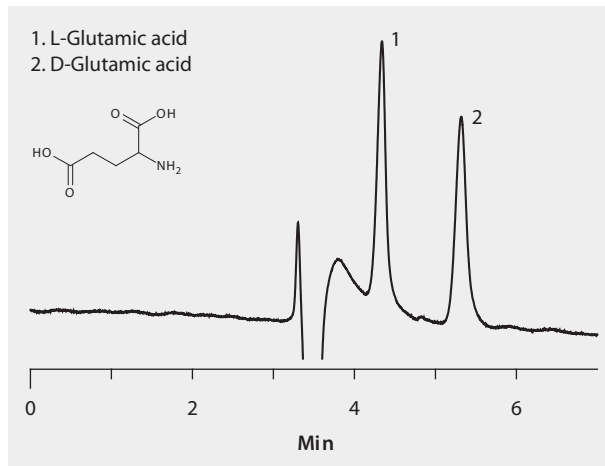
HPLC Analysis of Glutamic Acid Enantiomers on Astec® CHIROBIOTIC® T (23 °C)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (20:80:0.02, A:B:C)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 205 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004496](#)



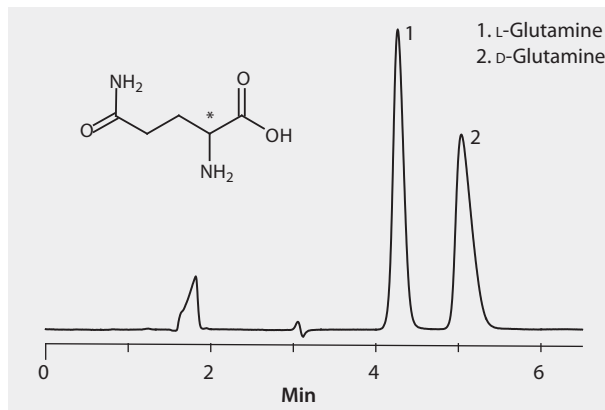
HPLC Analysis of Glutamic Acid Enantiomers on Astec® CHIROBIOTIC® T (25 °C)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (30:70:0.02, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 300 µg /mL in 30:70 water:methanol
Application No. [G005335](#)



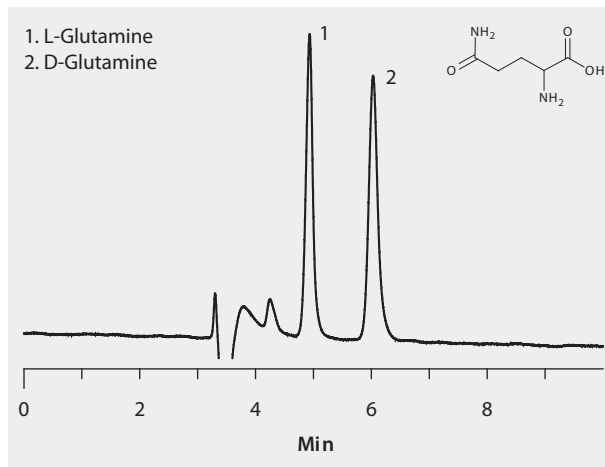
HPLC Analysis of Glutamine Enantiomers on Astec® CHIROBIOTIC® T (23 °C)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (50:50, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 205 nm
injection 5 µL
sample gas 1 mg/mL in methanol
Application No. **G004497**



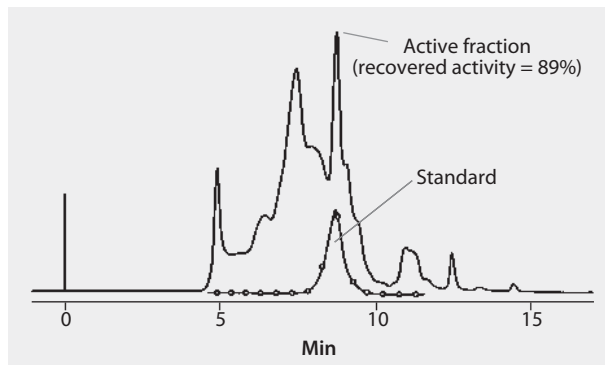
HPLC Analysis of Glutamine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (30:70:0.02, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 300 µg /mL in 30:70 water:methanol
Application No. [G005336](#)



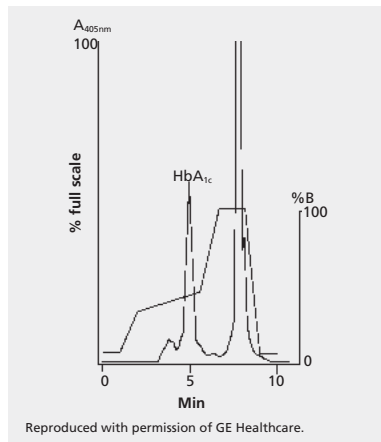
HPLC Analysis of Glutathione S-Transferase on TSKgel® G3000SW_{XL}

column TSKgel G3000SW_{XL}, 30 cm × 7.8 mm I.D., 5 μm particles (808541)
mobile phase 0.3M sodium chloride/0.05M sodium dihydrogen phosphate, pH 7.0
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220nm and enzyme assay
injection 100μL crude glutathione S-transferase preparation from guinea pig liver (0.7mg)
Application No. [713-0939](#)



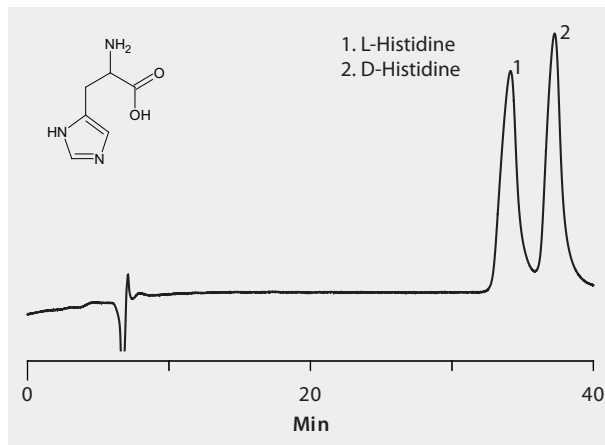
HPLC Analysis of Hemoglobin HbA_{1c} on Mono S[®] HR5/5

column Mono S HR5/5, 5 cm x 5 mm I.D., 10 µm (54808)
mobile phase . . (A) 0.01M malonate-NaOH, pH 5.7; (B) 0.3M LiCl in mobile phase A
flow rate 2.0 mL/min
detector VIS, 405 nm
injection 50 µL hemolysate, diluted 1:5
Application No. [794-0412](#)



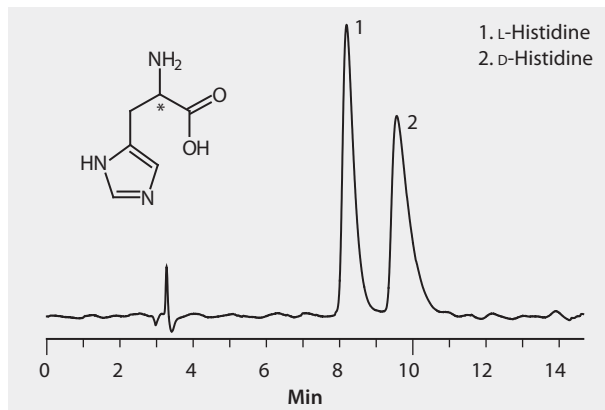
HPLC Analysis of Histidine Enantiomers on Astec® CHIROBIOTIC® T (15 °C)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (30:70:0.006, A:B:C)
flow rate 0.5 mL/min
column temp. 15 °C
detector UV, 205 nm
injection 10 µL
sample 200 µg /mL in 50:50 water:methanol
Application No. [G005337](#)



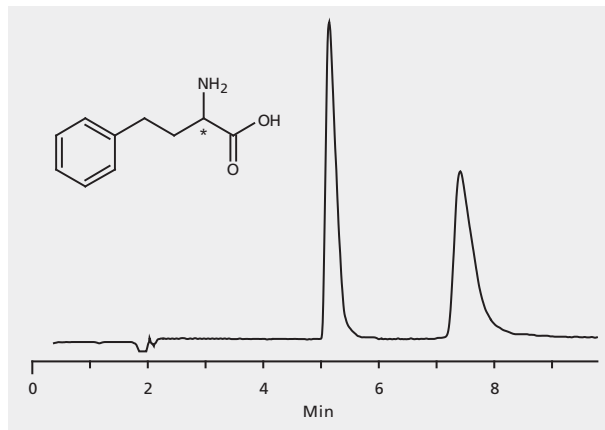
HPLC Analysis of Histidine Enantiomers on Astec® CHIROBIOTIC® T (23 °C)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 160 mM sodium phosphate, pH 4.5; (B) ethanol; (40:60, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 205 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004498**



HPLC Analysis of Homophenylalanine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (90:10, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 210 nm
injection 5 µL
sample 10 mg/mL in methanol
Application No. [G004533](#)



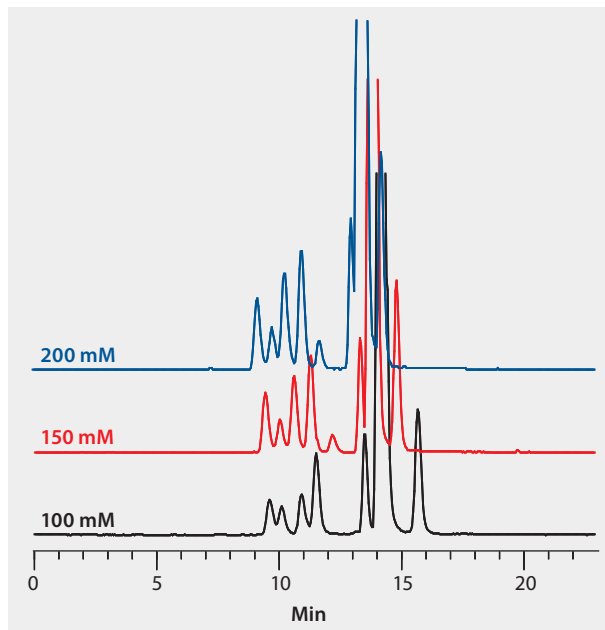
HPLC Analysis of Horse Serum Proteins in Acetonitrile as a Function of Ammonium Formate Concentration

Although horse serum proteins can be analyzed under standard SEC conditions, the resolution is poor. However, very high efficiency separations can be achieved when using pure acetonitrile to which ammonium formate has been added. About 200 mM ammonium formate is required for all proteins to elute within the pore volume of SRT SEC-150 column. The position of the components can be modulated by decreasing the ammonium formate concentration.

Ref: V. McKay; X. Huang, LC-GC North America; Sep2006 Supplement, Vol. 24, p25, 2D Chromatography of Proteins: Horse Serum Analysis

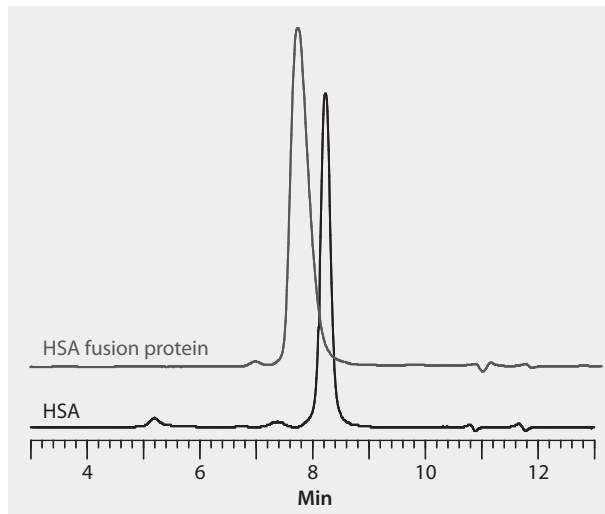
Courtesy of Miyako Kawakatsu, M&S Instruments Inc.

column . . . SRT SEC-150, 30 cm x 4.6 mm I.D., 5 μ m particles, 150 Å (Z777043)
 mobile phase 100–200 mM CH₃COONH₄/CH₃CN, pH 6.3
 flow rate 0.25 mL/min
 detector SofTA ELSD
 sample Molecular weight marker proteins, horse serum
 Application No. G006212



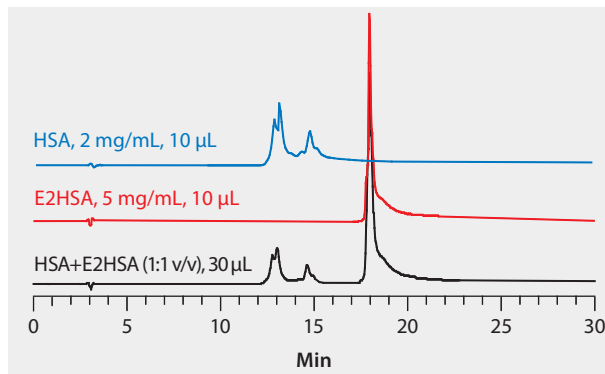
HPLC Analysis of HSA and HSA Fusion Protein on Zenix®-C SEC-300

column Zenix-C SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777092)
mobile phase (A) 150 mM sodium phosphate buffer, pH 7.0;
(B) IPA; (95:5, v/v, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 280 nm
injection 10 µL
sample HSA fusion peptide 5 mg/mL (MW 75 kD, pI 5.0,
HSA conjugated peptide in diabetes treatment)
Application No. **G005956**



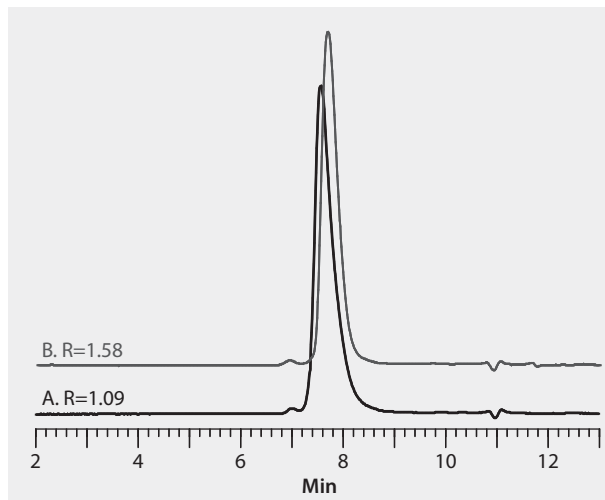
HPLC Analysis of HSA Fusion Protein on Proteomix® SAX-NP5

column Proteomix SAX-NP5 25 cm x 4.6mm I.D., 5 µm particles (Z777229)
detector UV, 280 nm
flow rate 0.5 mL/min
column temp. 30 °C
mobile phase . . Piperazine, Triethanolamine, bis-tris propane and N-methylpiperazine,
20 mM each,(A) pH 9.7; (B) pH 3.0 (adjust by HCl)
sample HSA fusion peptide 5 mg/mL, 10 µL (MW 75 kD,
pl 5.0, HSA conjugated peptide in diabetes treatment)
pressure 2016 psi (139 bar)
Application No. **G006133**



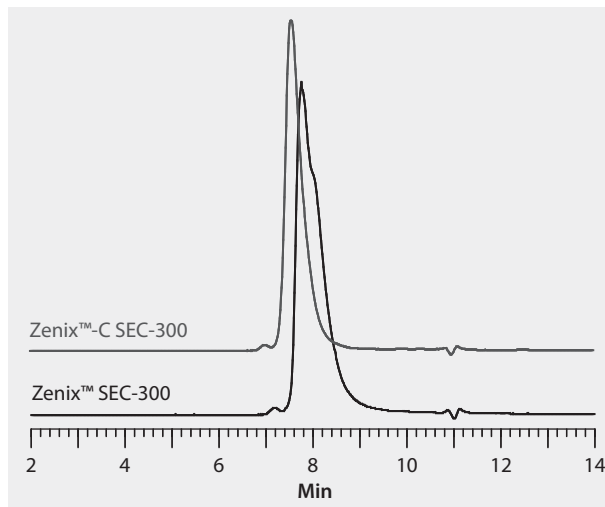
HPLC Analysis of HSA Fusion Protein on Zenix®-C SEC-300, Effect of Mobile Phase Composition

column Zenix-C SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777092)
mobile phase . . . 150 mM sodium phosphate buffer, pH 7.0 or (A) 150 mM sodium phosphate buffer, pH 7.0; (B) IPA; (95:5, A:B)
flow rate 1.0 mL/min
column temp. 25 °C
detector UV, 280 nm
injection 10 µL
sample HSA fusion peptide 5 mg/mL (MW 75 kD, pI 5.0, HSA conjugated peptide in diabetes treatment)
Application No. **G005955**



HPLC Analysis of HSA Fusion Protein on Zenix®-C SEC-300 vs. Zenix® SEC-300

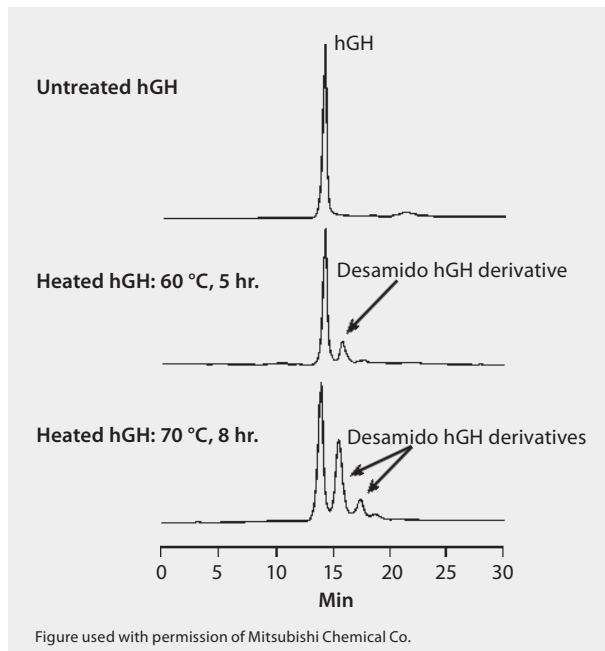
column Zenix-C SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777092)
column Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777033)
mobile phase 150 mM sodium phosphate buffer, pH 7.0
flow rate 1 mL/min
column temp. 25 °C
detector UV, 280 nm
injection 10 µL
sample HSA fusion peptide 5 mg/mL (MW 75 kD, pI 5.0,
HSA conjugated peptide in diabetes treatment)
Application No. **G005957**



HPLC Analysis of Human Growth Hormone (hGH) on Discovery® BIO PolyMA-WAX

This Figure shows the degradation products of human growth hormone (hGH) well-separated on a Discovery BIO PolyMA-WAX anion-exchange column. The difference between the resolved compounds is the conversion of protein amide(s) to carboxylate(s), demonstrating both the power of the ion-exchange technique, and the efficiency of the Discovery BIO PolyMA-WAX column.

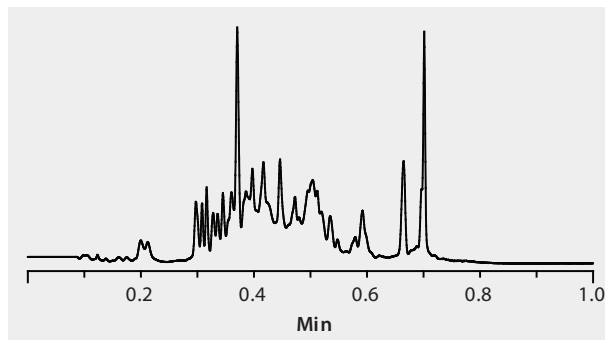
column . . . Discovery BIO PolyMA-WAX, 5 cm × 4.6 mm I.D., 5 μm particles (59602-U)
 mobile phase . . . (A) 20 mM Tris-HCl, pH 8.0; (B) 20 mM Tris-HCl, 0.5 M NaCl, pH 8.0
 gradient 5 to 70% B in 30 min. (linear)
 flow rate 0.5 mL/min
 column temp. 25 °C
 detector UV, 210 nm
 injection 10 mg hGH
 Application No. [796-0659](#)



HPLC Analysis of Human Serum Albumin Tryptic Digest on Ascentis® Express C18

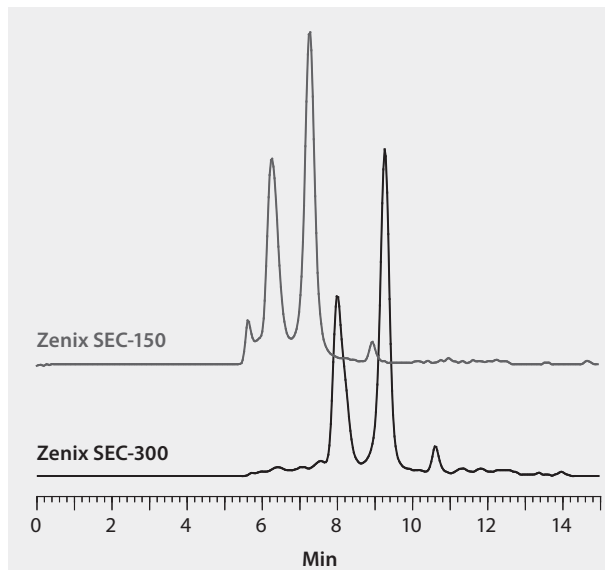
Sample Prep: 0.1 gram of albumin was dissolved in 10 mL of 0.01 M ammonium formate buffer, and the pH was adjusted to 8.0 with ammonium hydroxide; the solution was heated in a boiling water bath for 6 min. After the solution cooled, 2.0 mg of trypsin from bovine pancreas was added, and the mixture was allowed to react for 4 h at 37 °C; the reaction was quenched by adding 0.1% trifluoroacetic acid to pH 2. The digest was stored at 4 °C and filtered prior to injection through a 0.45 µm nylon membrane

sample/matrix human serum albumin, tryptic digest
 column Ascentis Express C18, 3 cm x 4.6 mm I.D., 2.7 µm particles (53818-U)
 mobile phase (A) 10 mM ammonium acetate in water, pH 9;
 (B) 10 mM ammonium acetate in methanol/water, pH 9; (90:10, A:B)
 gradient 0% B in 0.50 min; 55% B in 0.25 min; 90% B for 0.50-0.69 min;
 0% B for 0.70-1.00 min
 flow rate 4.0 mL/min
 column temp. 45 °C
 detector UV, 254 nm
 injection 20 µL
 Application No. **G005598**



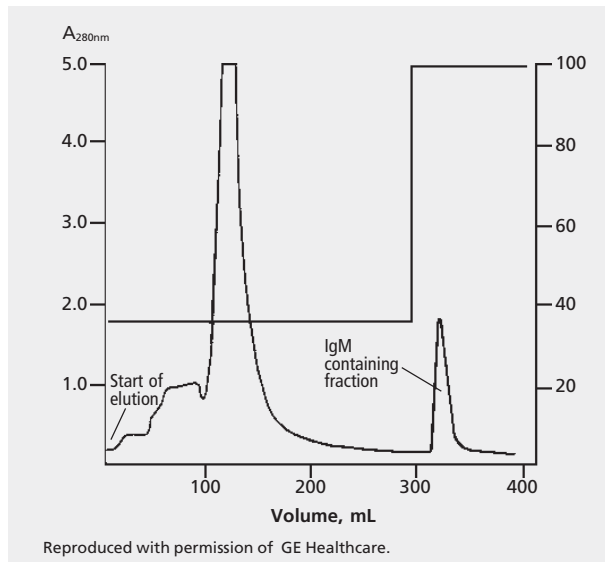
HPLC Analysis of Immunoglobulin G (IgG) on Zenix® SEC-150 versus Zenix® SEC-300, Effect of Pore Size on Resolution

column . . . Zenix SEC-150, 30 cm x 4.6 mm I.D., 3 μ m, 150 Å particles (Z777016)
column . . . Zenix SEC-300, 30 cm x 4.6 mm I.D., 3 μ m, 300 Å particles (Z777028)
mobile phase 150 mM sodium phosphate, pH 7.0
flow rate 1 mL/min
detector UV, 214 nm
injection 10 μ L
sample 1 mg/mL, IgG
Application No. **G006120**



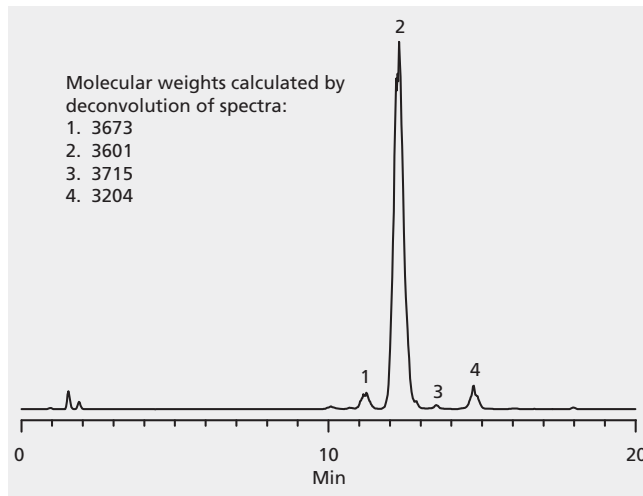
HPLC Analysis of Immunoglobulins (IgM) on Q Sepharose® Fast Flow

media Q Sepharose Fast Flow (Q1126-100ML)
 column 30 cm × 50 mm I.D. (Q1126-100ML)
 mobile phase (A) 0.02 M NaH₂PO₄, pH 6.5; (B) A + 0.5 M NaCl, pH 6.5
 flow rate 25 cm/hr
 detector UV, 280 nm
 injection cell culture supernatant
 Application No. [794-0370](#)



HPLC Analysis of Inhibin α -Subunit Fragment 1-32 on Discovery[®] HS C18

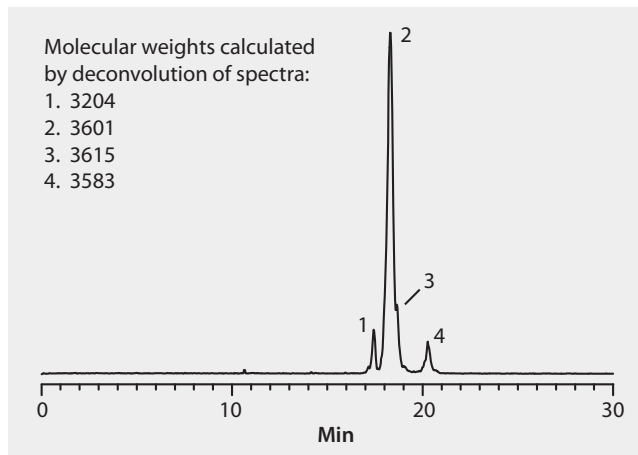
column Discovery HS C18, 10 cm \times 2.1 mm ID, 5 μ m particles (568501-U)
mobile phase . . . (A) 20 mM formic acid in water; (B) (20 mM formic acid in water):
(20 mM formic acid in acetonitrile), 50:50
flow rate 0.2 mL/min
injection 2 μ L
column temp. 22 $^{\circ}$ C
detector ESI (+), full scan
sample 20 mg/L in 0.1 % formic acid
Application No. **G002581**



HPLC Analysis of Inhibin α -Subunit Fragment 1-32 on Discovery® HS F5

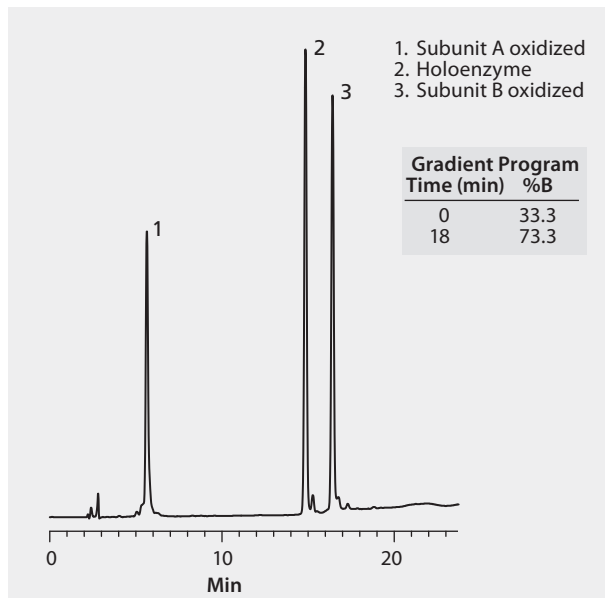
column Discovery HS F5, 10 cm \times 2.1 mm ID, 5 μ m particles (567510-U)
mobile phase . . . (A) 80 mM formic acid, 40 mM ammonium hydrate (pH \sim 3.5) in water; (B) 80 mM formic acid, 40 mM ammonium hydrate in 80% acetonitrile

flow rate 0.2 mL/min
column temp. 22 $^{\circ}$ C
detector ESI (+), full scan
injection 2 μ L
sample 50 mg/L in 0.1 % formic acid
Application No. **G002580**



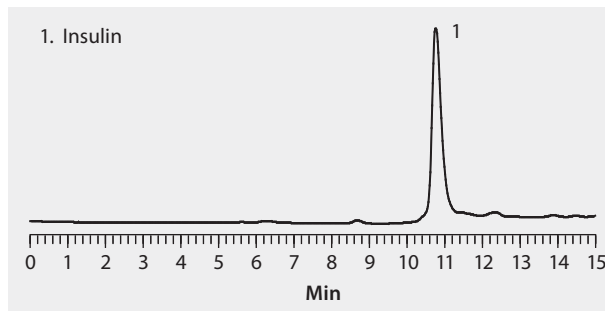
HPLC Analysis of Insulin, Bovine on Discovery® C8

column Discovery C8, 5 cm × 4.6 mm I.D., 5 µm particles (59353-U)
mobile phase 50 mM sodium phosphate, monobasic, 50 mM sodium sulfate,
pH 3.0 (w/phosphoric acid), (A) +5% acetonitrile,
(B) +50% acetonitrile
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
Application No. **G000765**



HPLC Analysis of Insulin on SRT®-C SEC-300

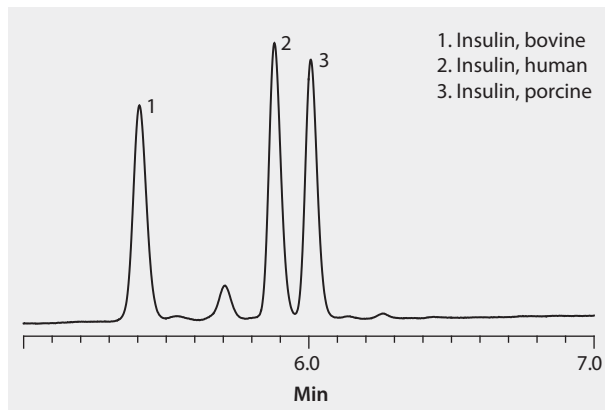
column SRT-C SEC-300, 30 cm x 7.8 mm I.D., 5 µm particles (Z777110)
mobile phase 150 mM sodium phosphate, pH 7
flow rate 1.0 mL/min
column temp. ambient
detector UV, 214 nm
injection 10 µL
sample insulin
Application No. **G006167**



HPLC Analysis of Insulin (Species Variants) on Ascentis® Express Peptide ES C18

These three insulins have more than 76% identical positions in a primary structure alignment. The human and porcine proteins are most similar with 85% identity. Baseline resolution of these insulins is achieved on Ascentis Express Peptide ES-C18, with relative band spacing of these three peaks approximating their relative sequence similarities. Ascentis Express Peptide ES-C18 is ideally suited for RP chromatography of small proteins or large peptides.

column Ascentis Express Peptide ES C18, 15 cm x 2.1 mm I.D.,
2.7 µm particles (53307-U)
mobile phase (A) 70:30, water with 0.1% TFA:acetonitrile with 0.09% TFA;
(B) 55:45, water with 0.1% TFA:acetonitrile with 0.09% TFA
gradient 0 to 100% B in 7.5 min
flow rate 0.3 mL/min
pressure 4040 psi (278 bar)
column temp. 30 °C
detector UV, 215 nm
injection 0.5 µL
sample 200 µg/mL insulin (bovine, human, porcine) in 0.1% formic acid
Application No. **G005794**



HPLC Analysis of Insulin (Species Variants) on Discovery® BIO Wide Pore C5

column Discovery BIO Wide Pore C5, 15 cm × 4.6 mm I.D.,
5 μm particles (568422-U)

mobile phase (A): 71:29, (0.1% TFA in water):(0.1% TFA in acetonitrile);
(B): 68:32, (0.1% TFA in water):(0.1% TFA in acetonitrile)

gradient 0–100% B in 30 min

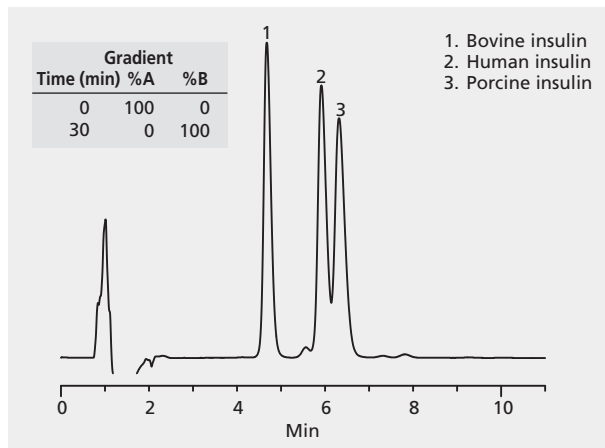
flow rate 1 mL/min

column temp. ambient

detector UV, 215 nm

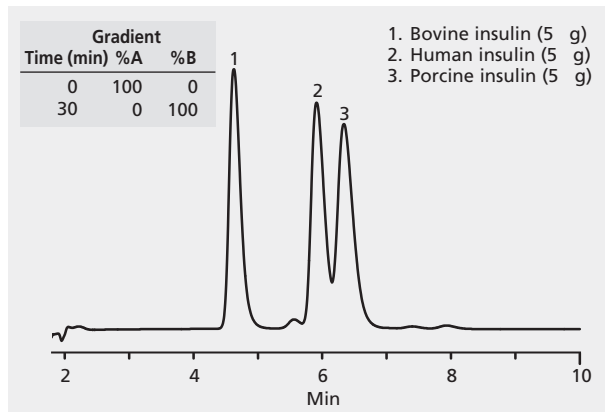
injection 5 μL 5 μL in 0.1% TFA containing 5ug each of three insulin variants

Application No. **G001580**



HPLC Analysis of Insulin (Species Variants) on Discovery® BIO Wide Pore C8

column Discovery BIO Wide Pore C8, 15 cm × 4.6 mm I.D.,
5 µm particles (568322-U)
mobile phase (A) (0.1% TFA in water):(0.1% TFA in acetonitrile),
71:29 (B): (0.1% TFA in water):(0.1% TFA in acetonitrile), 68:32,
gradient 0-100% B in 30 min
flow rate 1 mL/min
column temp. 30 °C
detector UV, 215 nm
injection 5 µL in 0.1% TFA containing 5µg each of three insulin variants
Application No. **G001507**



HPLC Analysis of Insulin (Specirs Variants) on Ascentis® Express Phenyl-Hexyl

These three insulins have more than 76% identical positions in a primary structure alignment. The human and porcine proteins are most similar with 85% identity. The Phenyl-Hexyl phase provides an alternate retention and selectivity to a C18 phase, particularly the C18 phase on a larger pore silica, Ascentis Express ES-C18

column Ascentis Express Phenyl-Hexyl, 15 cm x 2.1 mm,
2.7 µm particles (53338-U)

mobile phase (A) 70:30, water with 0.1% TFA:acetonitrile with 0.09% TFA;
(B) 55:45, water with 0.1% TFA:acetonitrile with 0.09% TFA

gradient 0 to 100% B in 7.5 min

flow rate 0.3 mL/min

pressure 3960 psi (273 bar)

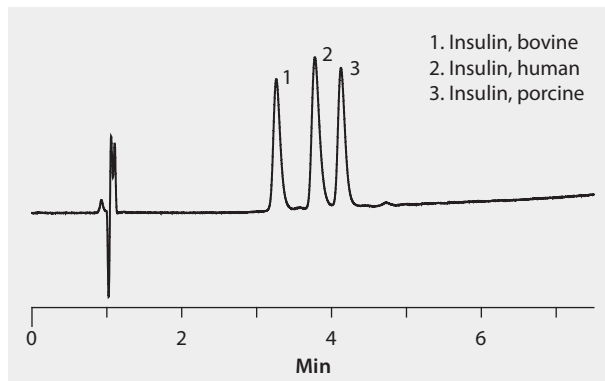
column temp. 30 °C

detector UV, 215 nm

injection 0.5 µL

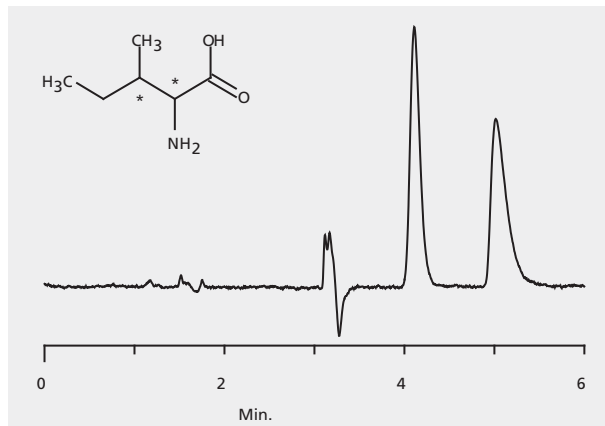
sample 200 µg/mL in 0.1% formic acid

Application No. **G005795**



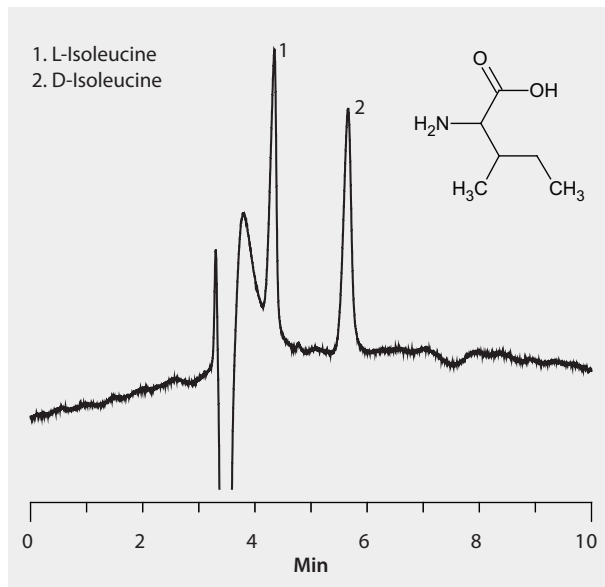
HPLC Analysis of Isoleucine Enantiomers on Astec® CHIROBIOTIC® T (23 °C)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (70:30, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 205 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004500](#)



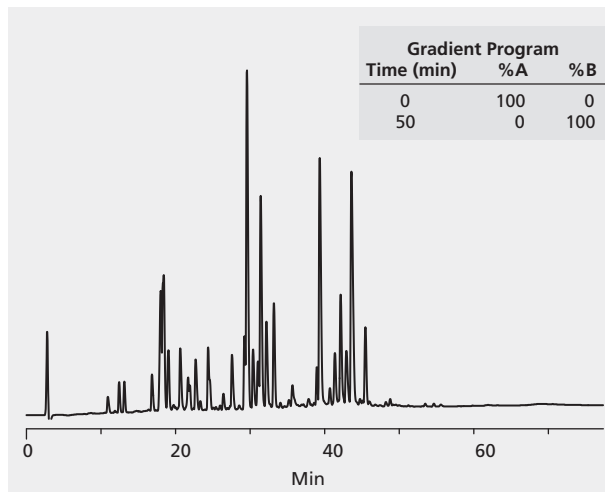
HPLC Analysis of Isoleucine Enantiomers on Astec® CHIROBIOTIC® T (25 °C)

column . . . Astec CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (30:70:0.02, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 300 µg /mL in 30:70 water:methanol
Application No. [G005338](#)



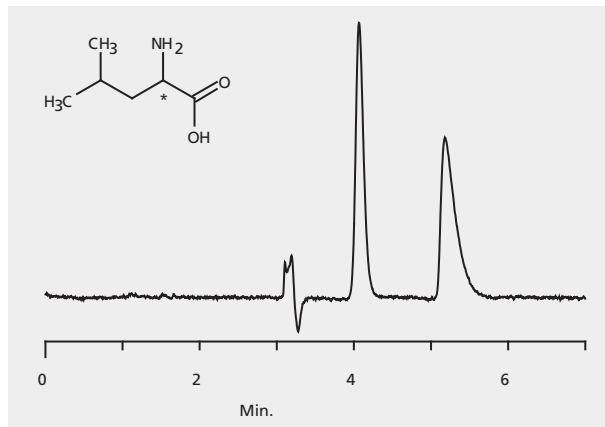
HPLC Analysis of β -Lactoglobulin, Carboxymethylated, Tryptic Digest on Discovery® BIO Wide Pore C18

column Discovery BIO Wide Pore C18, 15 cm \times 2.1 mm I.D.,
3 μ m particles (567202-U)
mobile phase (A) water/0.1% TFA;
(B) (water/0.1% TFA):(acetonitrile/0.1% TFA), 50:50
flow rate 0.20 mL/min
column temp. 35 $^{\circ}$ C
detector UV, 215 nm
injection 5 μ L
Application No. **G001720**



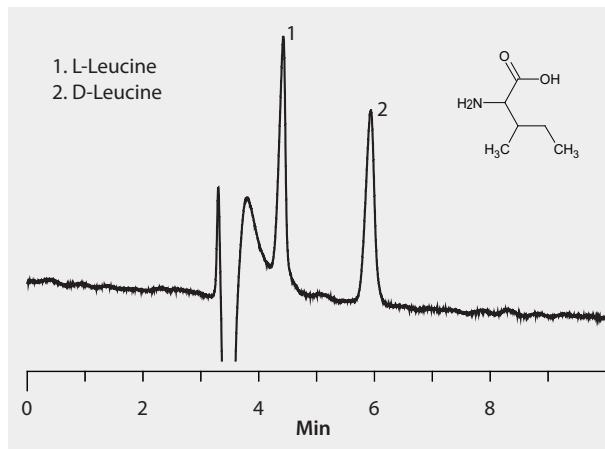
HPLC Analysis of Leucine Enantiomers on Astec® CHIROBIOTIC® T (23 °C)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (80:20, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 205 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004501**



HPLC Analysis of Leucine Enantiomers on Astec® CHIROBIOTIC® T (25 °C)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (30:70:0.02, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 300 µg /mL in 30:70 water:methanol
Application No. [G005339](#)

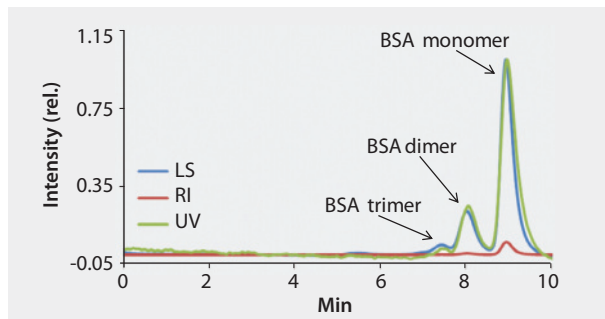


HPLC Analysis of Light Scattering Detection of BSA on Zenix® SEC-300

The chromatogram shows an overlay of the ultraviolet (UV), differential refractive index (RI) and multi angle light scattering data (MALS) for a sample of bovine serum albumin; showing the presence of dimer and trimer as well as the monomer. The chromatogram illustrates the power of light scattering used with Sepax's Zenix® SEC in protein characterization. The light scattering data makes it possible to determine the molecular mass for the monomer, dimer and trimer.

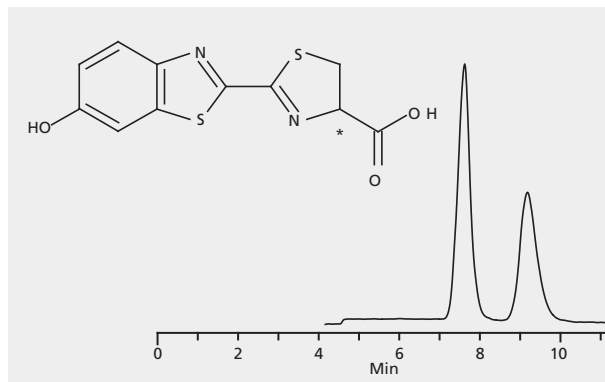
Acknowledgements and thanks to Matthew Thompson for this data.
Postdoctoral Researcher - Gianneschi Lab, Department of Chemistry & Biochemistry University of California, San Diego

column . . . Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles, 300 Å (Z777033)
mobile phase 0.1M phosphate buffer
flow rate 1.0 mL/min
column temp. 25 °C
detector Hitachi-Elite LaChromL-2130 pump equipped with a multi-angle light scattering detector (DAWN-HELIOS: Wyatt Technology),
a refractive index detector (Hitachi L-2490) and a UV-Vis detector (Hitachi 2420)
injection 20 µL
sample BSA (20mg/mL)
Application No. **G006198**



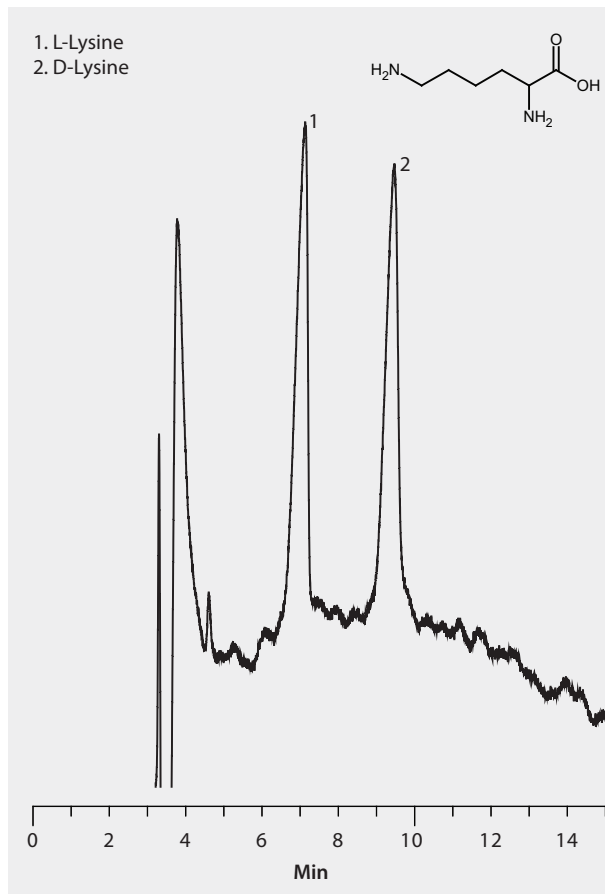
HPLC Analysis of Luciferin Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 20 mM ammonium nitrate, pH 5.5; (B) THF; (90:10, A:B)
flow rate 1 mL/min
column temp. ambient
detector UV, 254 nm
injection 6 µL
sample 0.5 mg/mL in methanol
Application No. **G004641**



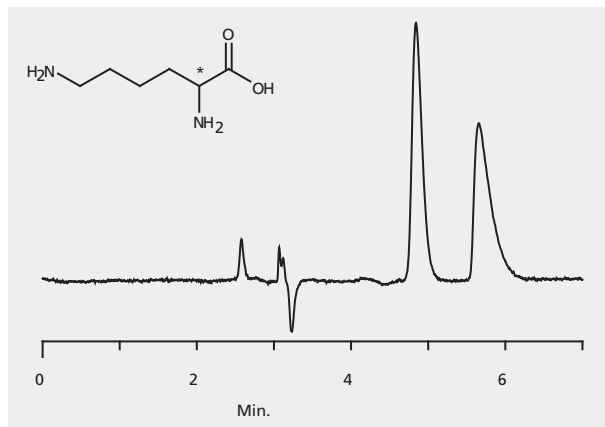
HPLC Analysis of Lysine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (30:70:0.02, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 300 µg /mL in 30:70 water:methanol
Application No. [G005340](#)



HPLC Analysis of Lysine Enantiomers on Astec® CHIROBIOTIC® T (Ethanol Mobile Phase)

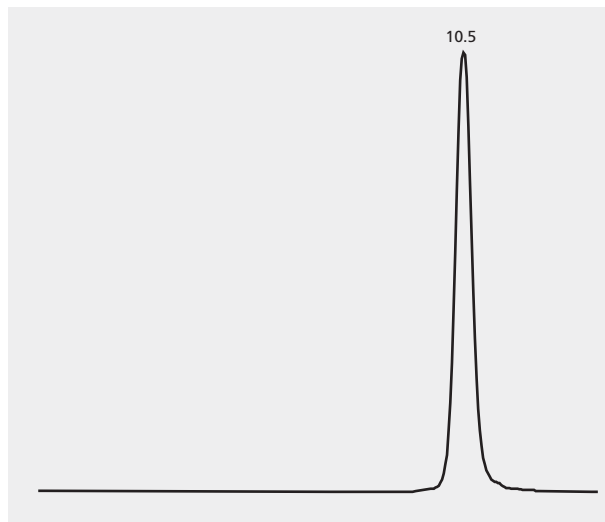
column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 100 mM sodium phosphate, pH 4.5; (B) ethanol; (70:30, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 205 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004502](#)



HPLC Analysis of Lysozyme on SRT® SEC-300, 30 cm x 7.8 mm I.D., 5 µm particles

The positively-charged protein, lysozyme (pI=11), exhibits excellent peak shape and recovery on Discovery BIO GFC columns due to its highly-inert surface. Low protein recovery is usually attributed to 1) hydrophobic interactions with the stationary phase and 2) electrostatic interactions with the silica surface. Discovery BIO GFC surface is hydrophilic and densely bonded to silica, therefore providing high mass recovery and good peak shape.

column SRT SEC-300, 30 cm x 7.8 mm I.D., 5 µm particles (Z777051)
mobile phase 50 mM phosphate buffered saline, 200 mM Na₂SO₄, pH 7.0
flow rate 1 mL/min
column temp. ambient
detector UV, 214 nm
injection 5 µL
sample 1 mg/mL in 50 mM phosphate buffered saline
Application No. **G004736**

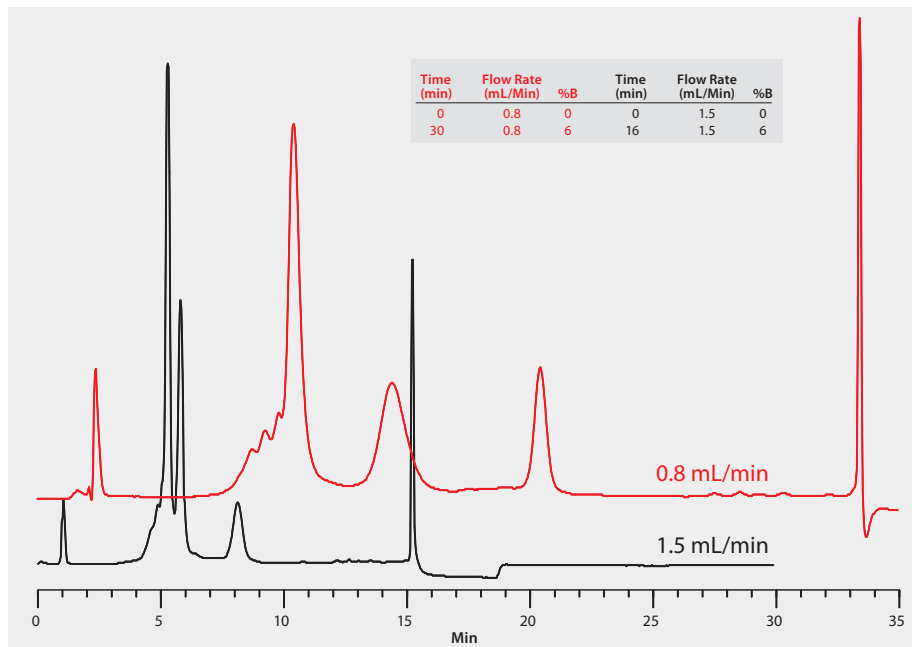


HPLC Analysis of mAb 016 on Proteomix® SCX-NP5 Column at Different Flow Rates

This figure shows how flow rate (F) affects analysis time and resolution during gradient analysis. When comparing the performance of different column formats or flow rates or gradient times, the rule of thumb is to keep the gradient volume, i.e. the product of gradient time and flow rate, constant. When gradient volume is kept constant, the compounds elute from the column in the same eluent composition.

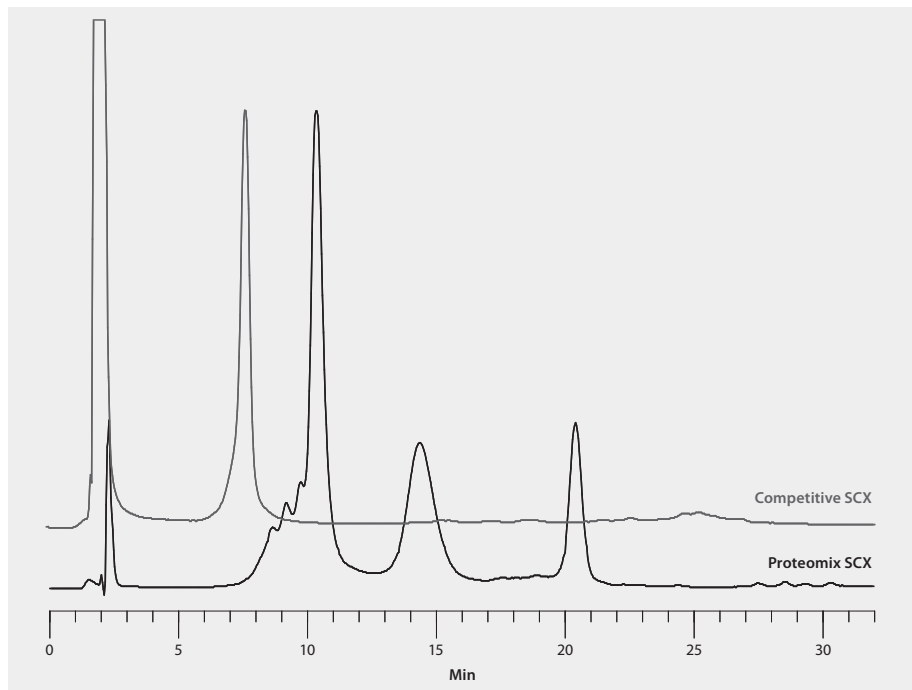
Note that in this example the gradient time (tg) was reduced by the same factor as the increase in flow rate, thereby proportionally increasing the gradient steepness, since gradient steepness is equal to the change in composition per unit time; in this case 6%B/16 vs. 6%B/30. It is now easy to see that the gradient volume was kept constant, since $30 \text{ min} \times 0.8 \text{ mL/min} = 15 \text{ min} \times 1.6 \text{ mL/min} = 24 \text{ mL}$. Clearly, the separation deteriorated substantially at the higher flow rate.

column . . . Proteomix SCX-NP5, 25 cm x 4.6mm I.D., 5 μm particles, PEEK (Z777164)
 mobile phase (A) 20 mM phosphate buffer, pH 7.5 and (B) A + 1 M NaCl
 flow rate 0.8 mL/min
 flow rate 1.5 mL/min
 detector UV, 280 nm
 sample mAb 016 (11.8 mg/mL) 4 μL
 Application No. [G006173](#)



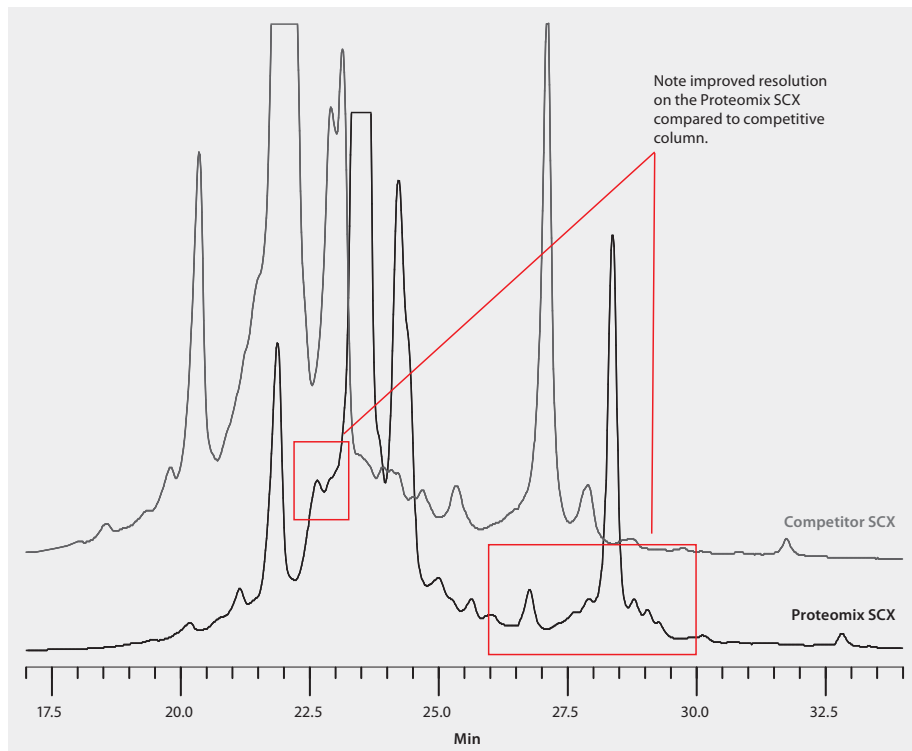
HPLC Analysis of MAb 016 on Proteomix® SCX NP5 versus Competitive SCX using a Salt Gradient

column Proteomix SCX-NP5, 25 cm x 4.6 mm I.D. (PEEK hardware),
5 µm particles (Z777164)
mobile phase (A) 20 mM phosphate buffer, pH 7.5; (B) A + 1 M NaCl
gradient 0 to 6% B in 30 min
flow rate 0.8 mL/min
detector UV, 280 nm
injection 4 µL
sample MAb 016 (11.8 mg/mL)
Application No. **G006107**



HPLC Analysis of MAb 321 on Proteomix® SCX NP5 versus Competitive SCX using pH and Salt Gradients

column Proteomix SCX-NP5, 25 cm x 4.6 mm I.D. (PEEK hardware),
5 µm particles (Z777164)
mobile phase (A) 2.4 mM Tris, 1.5 mM imidazole,
11.6 mM piperazine, pH 6.0; (B) A + 0.5 M NaCl, pH 10.5
flow rate 0.8 mL/min
detector UV, 280 nm
injection 20 µL
sample MAb 321 (5 mg/mL)
Application No. **G006098**



HPLC Analysis of mAb Charge Variants on TSKgel® CM-STAT

A TSKgel CM-STAT weak cation exchange (WCX) column was applied to separate charge variants of several monoclonal antibodies. The typical analysis time on conventional 25 cm long WCX columns of about eighty minutes could be significantly reduced when separation was performed on a 10 cm TSKgel CM-STAT column, filled with 7 μ m particles. The analysis profiles for five antibodies show that high resolution analysis can be obtained in about 20 minutes analysis time.

From "Ion Exchange Chromatography for the Characterization of Biotherapeutics" in The Supelco Reporter, Vol. 29.3, page 20.

column TSKgel CM-STAT, 10 cm x 4.6 mm I.D., 7 μ m particles (821966)

mobile phase . . . (A) 20 mM MES buffer, pH 6.0; (B) 0.5 M NaCl in buffer A, pH 6.0

gradient 0% B (0 min), 30% B (15 min), 100% B (15 min),
0% B (17 min), 10% B (17 min), 10% B (21 min)

flow rate 1 mL/min

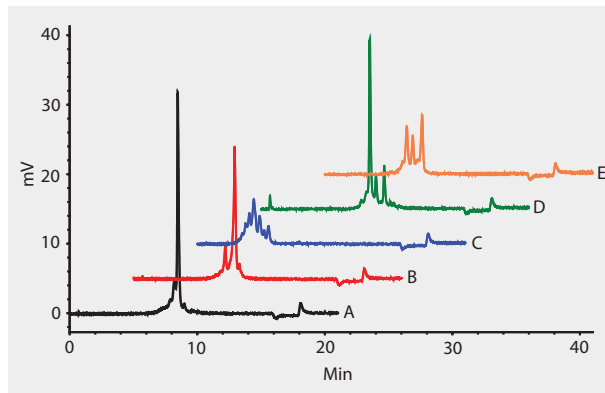
column temp. ambient

detector UV, 280 nm

injection 20 μ L

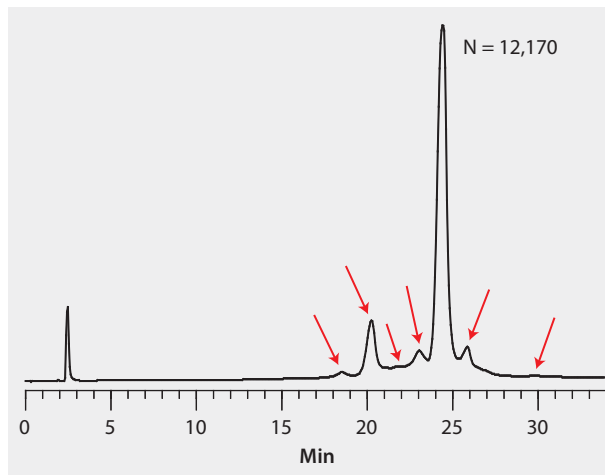
sample monoclonal antibodies (mAb A through E)

Application No. [G005458](#)



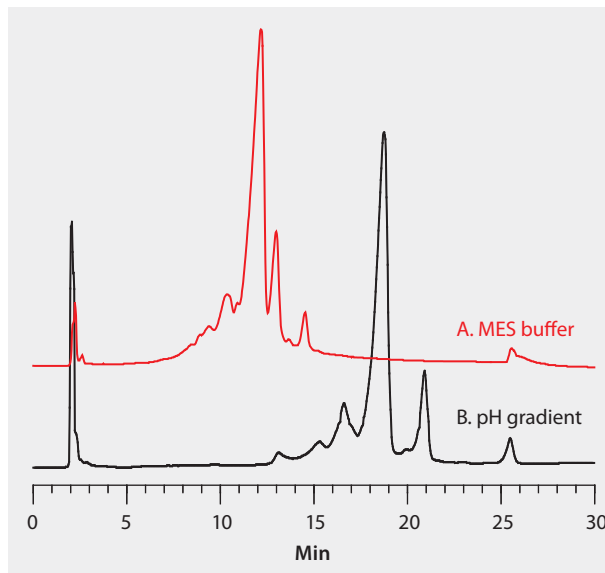
HPLC Analysis of mAb on Antibodix® WCX-NP5, 25 cm Columns

column Antibodix WCX-NP5, 25 cm x 4.6 mm I.D., 5 µm particles (Z777294)
mobile phase . . . (A) 10 mM sodium phosphate buffer, pH 7.5; (B) A + 100 mM NaCl
gradient 15 to 55% B in 30 min
flow rate 0.8 mL/min
column temp. ambient
detector UV, 214 nm
injection 10 µL
sample monoclonal antibody
Application No. **G005942**



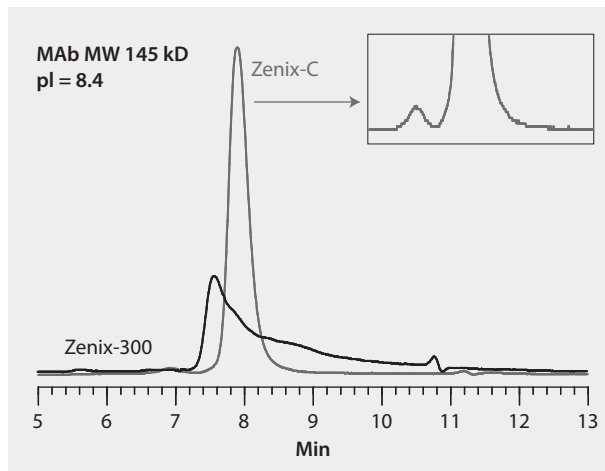
HPLC Analysis of MAb on Proteomix® SCX-NP5 Comparing Different Buffer Systems and pH Gradients

column Proteomix SCX-NP5, 25 cm x 4.6 mm I.D., 5 µm particles (Z777161)
mobile phase Mobile phase A: (A) 20 mM MES, pH 6.0;
(B) A + 1 M NaCl, pH 6.0 Mobile phase B: (A) 2.4 mM Tris,
1.5 mM imidazole, 11.6 mM piperazine, pH 6.0; (B) A, pH 10.5
gradient Gradient A: 7% B held for 2 min; to 14% B in 20 min,
Gradient B: 0 to 30% B in 2 min; to 55% B in 30 min
flow rate 0.8 mL/min
detector UV, 280 nm
injection 5 µL
sample 10 mg/mL
Application No. **G006141**



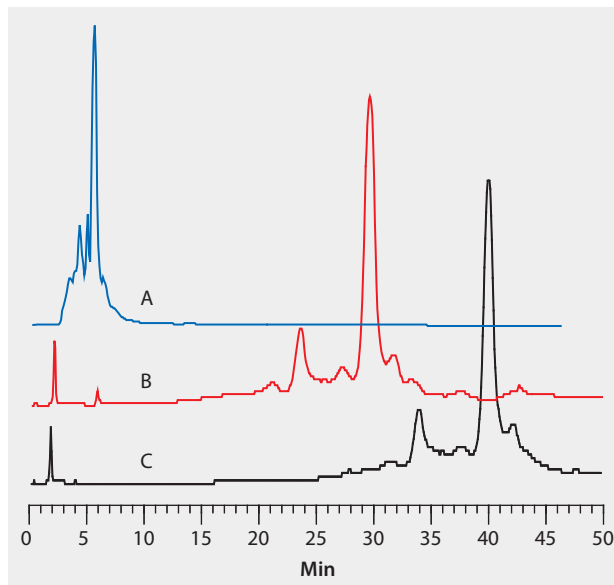
HPLC Analysis of mAb F on Zenix®-300 and Zenix®-C 300

column Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777033)
column Zenix-C SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777092)
mobile phase 150 mM sodium phosphate, pH 7.0
flow rate 1.0 mL/min
pressure 1073 psi (74 bar)
column temp. 25 °C
detector UV, 280 nm
injection 10 µL
sample 1.23 mg/mL mAb F in 10 mM sodium succinate, pH 5.0
Application No. **G005950**



HPLC Analysis of mAb-X22 on Antibodix® WCX-NP10, Impact of Initial Salt Concentration

column . . . Antibodix WCX-NP10, 25 cm x 4.6 mm I.D., 10 µm particles (Z777272)
mobile phase . . . (A) 10 mM sodium phosphate buffer, pH 7.5; (B), A + 100 mM NaCl
gradient 15 to 65% B in 60 min
flow rate 0.8 mL/min
column temp. 25 °C
detector UV, 214 nm
injection 10 µL
sample mAb-X22, 1.5 mg/mL
Application No. **G005944**

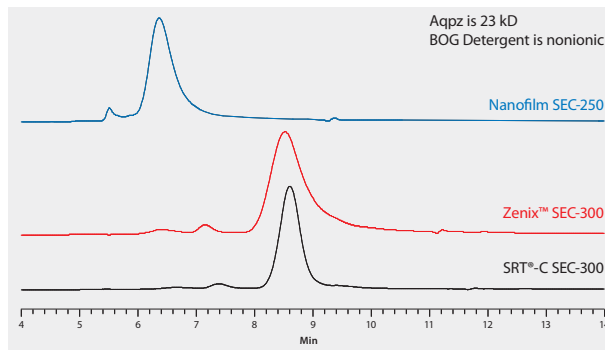


HPLC Analysis of Membrane Protein Aquaporin-Z (AqpZ) on SRT® SEC-300, Octyl Glucoside Mobile Phase Additive

SRT SEC-300 gave the best separation of the three columns tested. It exhibited fewer secondary interactions and provided baseline separation of the high molecular weight proteins.

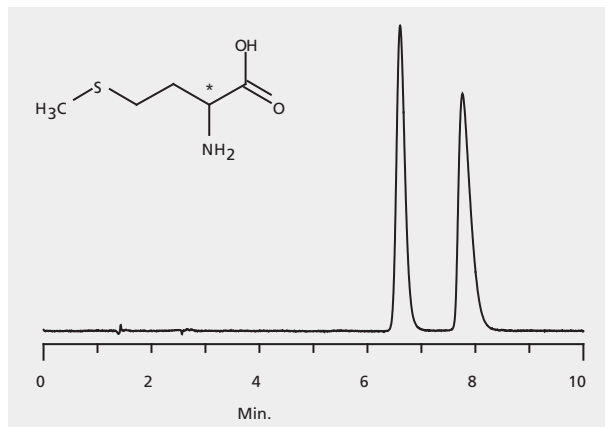
column SRT-SEC 300, 30 cm x 7.8mm I. D., 5 µm particles (Z777110)
mobile phase 20 mM tris-HCl pH 7.0, 190 mM NaCl,
10 mM KCl, 40 mM octyl glucoside

flow rate 1.0 mL/min
detector UV, 280 nm
injection 2 µL
sample aqpZ, 6 mg/mL
Application No. [G006169](#)



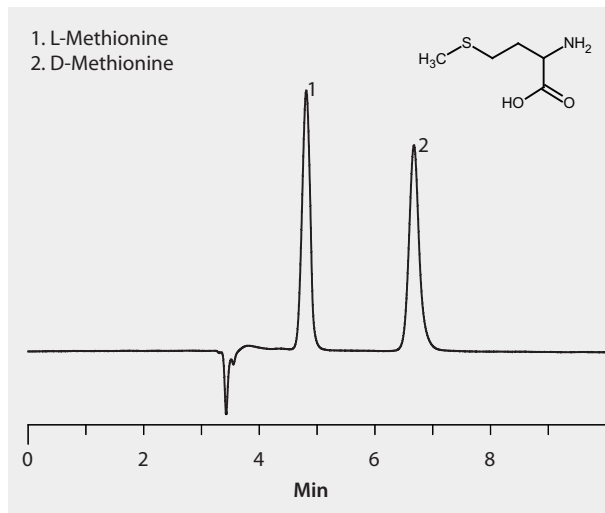
HPLC Analysis of Methionine Enantiomers on Astec® CHIROBIOTIC® T (No Additives)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) acetonitrile; (30:70, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004503**



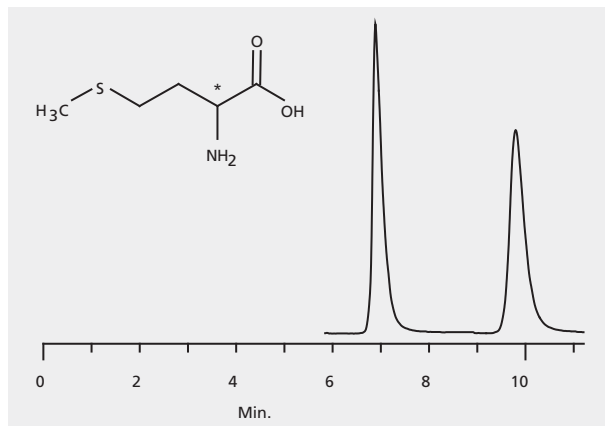
HPLC Analysis of Methionine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (30:70:0.02, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 300 µg /mL in 30:70 water:methanol
Application No. **G005341**



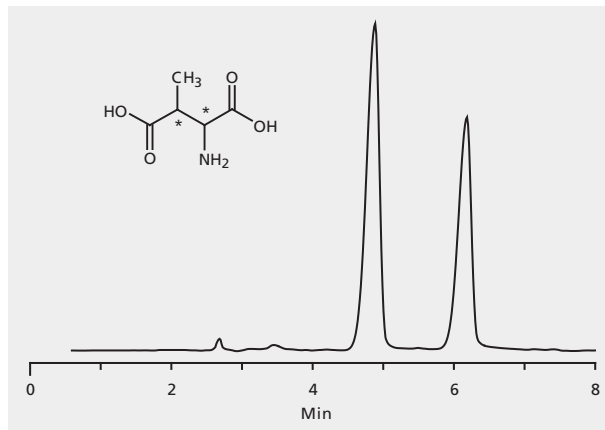
HPLC Analysis of Methionine Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase (A) water; (B) acetonitrile; (25:75, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004598**



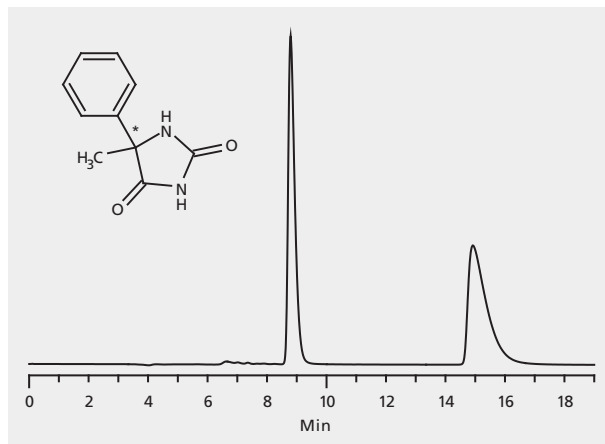
HPLC Analysis of 3-Methylaspartic Acid Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) methanol; (B) water; (C) formic acid; (80:20:0.02, A:B:C)
flow rate 0.9 mL/min
column temp. 25 °C
detector ELSD
injection 4 µL
sample 5 mg/mL in methanol
Application No. [G004553](#)



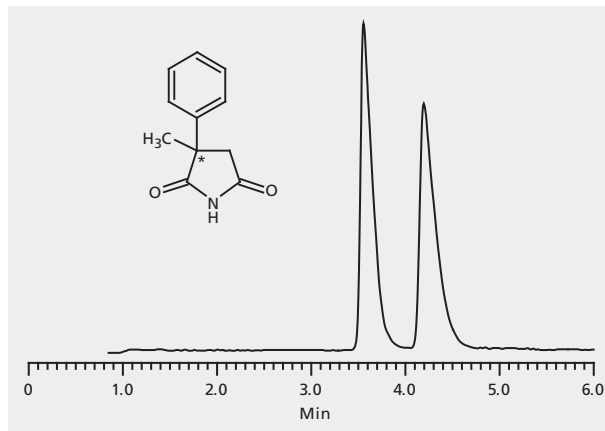
HPLC Analysis of 5-Methyl-5-Phenylhydantoin Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase methanol
flow rate 0.48 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. **G004525**



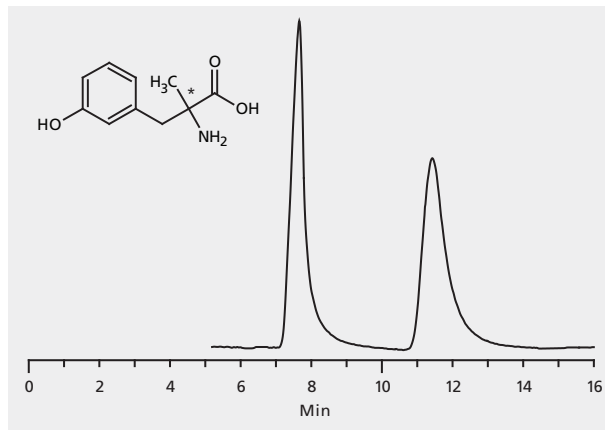
HPLC Analysis of α -Methyl- α -Phenylsuccinimide Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 μ m particles (12024AST)
mobile phase (A) ethanol; (B) hexane; (20:80, A:B)
flow rate 3 mL/min
column temp. 23 $^{\circ}$ C
detector UV, 210 nm
injection 5 μ L
sample 5 mg/mL in methanol
Application No. [G004544](#)



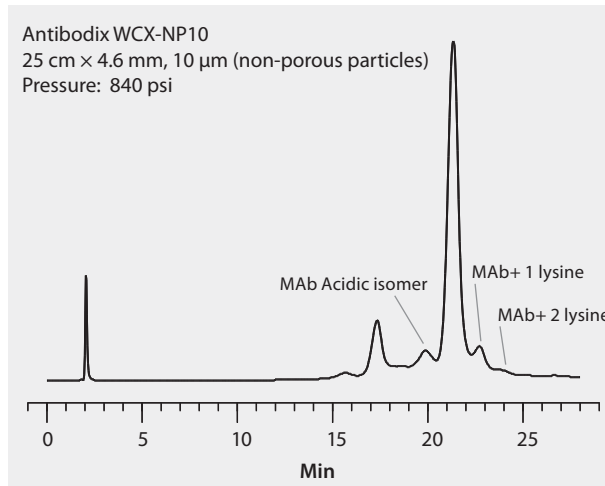
HPLC Analysis of α -Methyl-m-Tyrosine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 μ m particles (12024AST)
mobile phase methanol
extraction tube 1 mL/min
column temp. 25 $^{\circ}$ C
detector UV, 220 nm
injection 1 μ L
sample 2 mg/mL in methanol
Application No. [G004557](#)



HPLC Analysis of Monoclonal Antibodies (mAb) with Charge Variance on Antiodix® WCX-NP10

column . . . Antiodix WCX-NP10, 25 cm x 4.6 mm I.D., 10 µm particles (Z777272)
mobile phase . . . (A) 10 mM sodium phosphate buffer, pH 7.5; (B) A + 100 mM NaCl
gradient 15 to 55% B in 30 min
flow rate 0.8 mL/min
pressure 840 psi (58 bar)
column temp. ambient
detector UV, 214 nm
injection 5 µL
sample monoclonal antibody
Application No. **G005940**



HPLC Analysis of Monoclonal Antibody Fragments on BIOshell™ A400 Protein C4

Digesting an antibody into a few large fragments facilitates a middle-down approach for subsequent structural characterization. The IdeS is a Streptococcal protease (commercialized as FabRICATOR) that cleaves IgG in the hinge region resulting in two fragments: F(ab')₂ and scFc.

Monoclonal antibody SO57 (0.5 mg) was digested by IdeS protease according to Genovis (www.genovis.com) FragIT kit protocol. The digest was then diluted 1:5 with mobile phase A, before injection; final protein conc. <0.3 g/L.

Genovis FragIT kit is available from Sigma, outside the USA.

column BIOshell A400 Protein C4, 10 cm x 2.1 mm I.D.,
3.4 µm particles (66825-U)

mobile phase (A) 80:20, [0.1% TFA in water]:[0.1% TFA in acetonitrile] ;
(B) 50:50, [0.1% TFA in water]:[0.1% TFA in acetonitrile]

gradient 30 to 70% B in 12 min

flow rate 0.3 mL/min

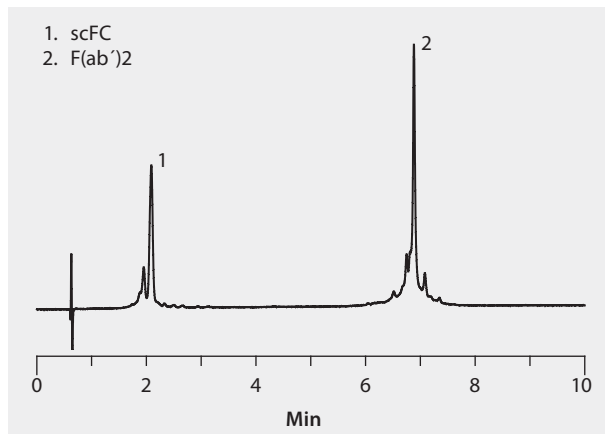
pressure 1000 psi initial (69 bar initial)

column temp. 90 °C

detector UV, 215 nm

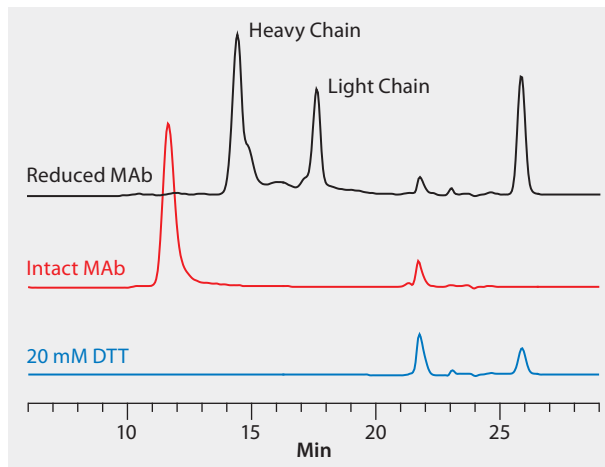
injection 1.0 µL

Application No. **G006204**



HPLC Analysis of Monoclonal Antibody Heavy and Light Chains on Zenix® SEC-300

column Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777033)
mobile phase 0.1% TFA, 0.1% formic acid, 20% acetonitrile
flow rate 0.5 mL/min
detector UV, 280nm
injection 20 µL
sample Monoclonal antibody (1 mg/mL) reduced with 20 mM DTT
Application No. G006171



HPLC Analysis of a Monoclonal Antibody on Discovery® BIO GFC 150 after Partial Proteolysis with IdeS Protease

Proteolysis of antibodies can be useful for simplifying further analysis. This application demonstrates separation of the two fragments, F(ab')₂ and scFc from the intact IgG, after partial digestion with IdeS protease.

column . . . Discovery® BIO GFC 150, 30 cm X 4.6 mm I.D., 3 µm particles (567329-U)

mobile phase 0.15 M potassium phosphate monobasic,
pH 7.0 with potassium hydroxide (567329-U)

flow rate 0.35 mL/min

pressure 1450 psi (100 bar)

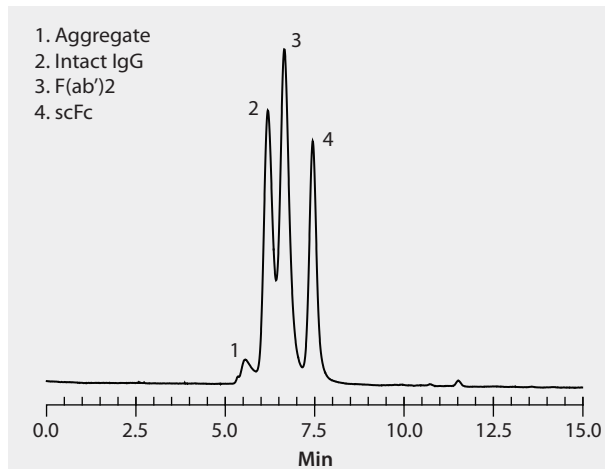
column temp. ambient

detector UV, 215 nm

injection 1 µL

sample digested S057 mAb, ~0.5 g/L

Application No. **G005896**



HPLC Analysis of a Monoclonal Antibody on Discovery® BIO GFC 300 after Partial Proteolysis with IdeS Protease

Proteolysis of antibodies can be useful for simplifying further analysis. This application demonstrates separation of the two fragments, F(ab')₂ and scFc from the intact IgG, after partial digestion with IdeS protease.

column . . . Discovery® BIO GFC 300, 30 cm X 4.6 mm I.D., 3 µm particles (567335-U)
mobile phase 0.15 M potassium phosphate monobasic,
pH 7.0 with potassium hydroxide

flow rate 0.35 mL/min

pressure 1350 psi (93 bar)

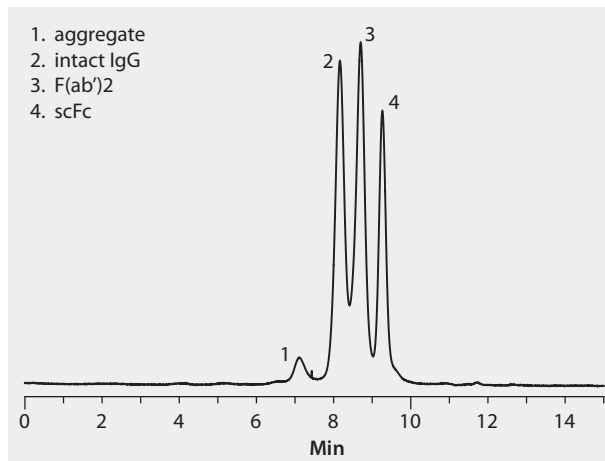
column temp. ambient

detector UV, 215 nm

injection 1 µL

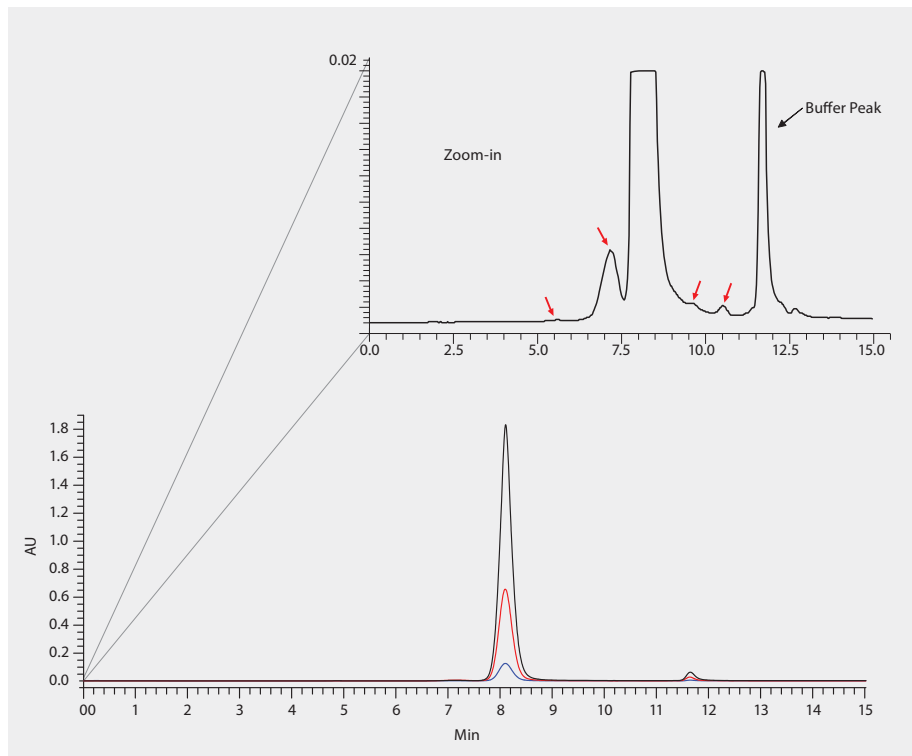
sample digested S057 mAb, ~0.5 g/L

Application No. [G005899](#)



HPLC Analysis of a Monoclonal Antibody on SRT® SEC-300

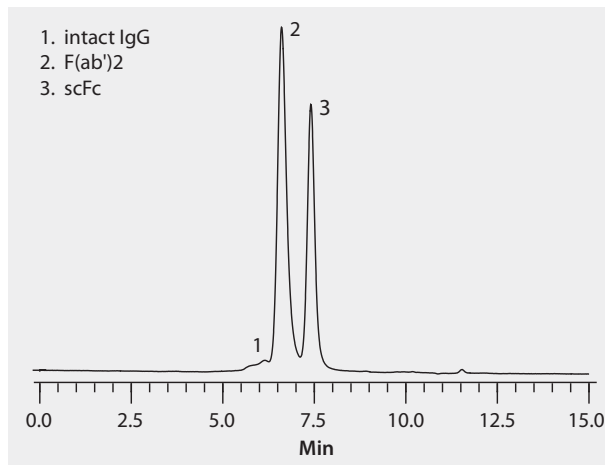
column SRT SEC-300, 30 cm x 7.8 mm I.D., 5 µm particles (Z777051)
mobile phase 150 mM sodium phosphate, pH 7
flow rate 1.0 mL/min
column temp. ambient
injection 10 µL
sample MAb 10, 2.5, 0.5 mg/mL
Application No. **G006170**



HPLC Analysis of a Monoclonal Antibody on Zenix® SEC-150, 30 cm X 4.6 mm I.D., 3 µm particles after Proteolysis with IdeS Protease

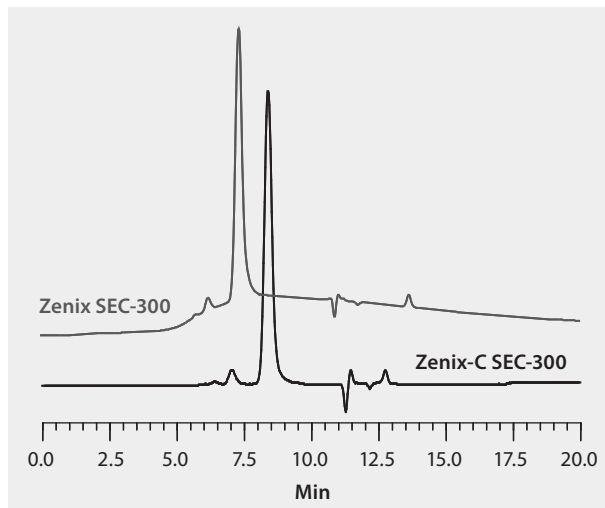
Proteolysis of antibodies can be useful for simplifying further analysis. This application demonstrates separation of the two fragments, F(ab')₂ and scFc, after digestion with IdeS protease

column Zenix® SEC-150, 30 cm X 4.6 mm I.D., 3 µm particles (Z777018)
mobile phase 0.15 M potassium phosphate monobasic,
pH 7.0 with potassium hydroxide
flow rate 0.35 mL/min
pressure 1450 psi (100 bar)
column temp. ambient
detector UV, 215 nm
injection 1 µL
sample digested S057 mAb, ~0.5 g/L
Application No. [G005889](#)



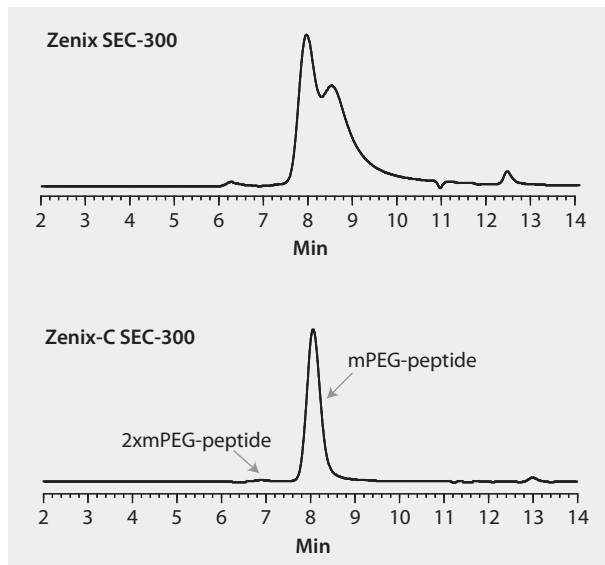
HPLC Analysis of mPEG and mPEG-Peptide (Methoxy-PEG-Maleimide) on Zenix® and Zenix®-C SEC

column Zenix-C SEC-300, 30 cm x 7.8 mm, I.D., 3 µm particles (Z777092)
column Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777033)
mobile phase 150 mM sodium phosphate buffer, pH 7.0
flow rate 1.0 mL/min
column temp. 25 °C
detector UV, 214 nm
injection 20 µL
sample 20kD peptide mPEG-MAL (methoxy-PEG-Maleimide), 1 mg/mL
Application No. [G005948](#)



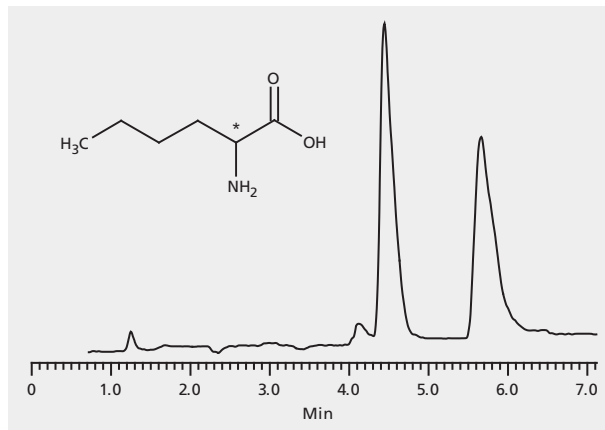
HPLC Analysis of mPEG and mPEG-Peptide on Zenix® and Zenix®-C SEC

column Zenix-C SEC-300, 30 cm x 7.8 mm, I.D., 3 µm particles (Z777092)
column Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777033)
mobile phase 150 mM sodium phosphate buffer, pH 7.0
flow rate 1.0 mL/min
column temp. 25 °C
detector UV, 214 nm
injection 20 µL
sample 4kD peptide and 20kD mPEG-MAL(methoxy-PEG-Maleimide) (6 mg/mL)
Application No. [G005947](#)



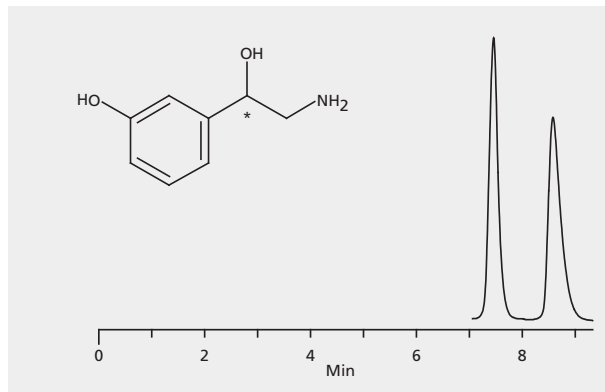
HPLC Analysis of Norleucine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (80:20, A:B)
flow velocity 1 mL/min
column temp. 25 °C
detector UV, 210 nm
injection 5 µL
sample 5 mg/mL in methanol
Application No. [G004534](#)



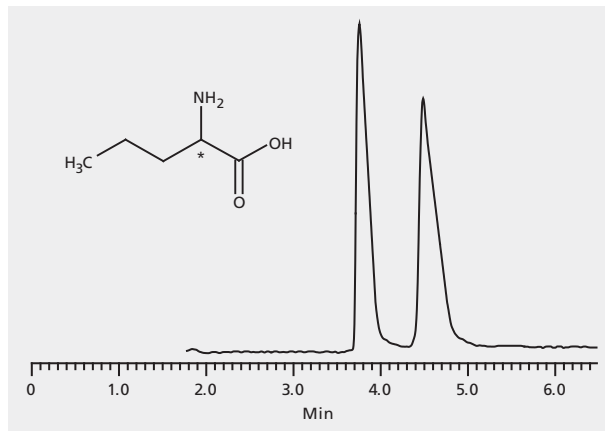
HPLC Analysis of Norphenylephrine Enantiomers on Astec® CYCLOBOND® I 2000 AC (pH 4.1)

column . . . CYCLOBOND I 2000 AC, 25 cm x 4.6 mm I.D., 5 µm particles (20124AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (93:7, A:B)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004693**



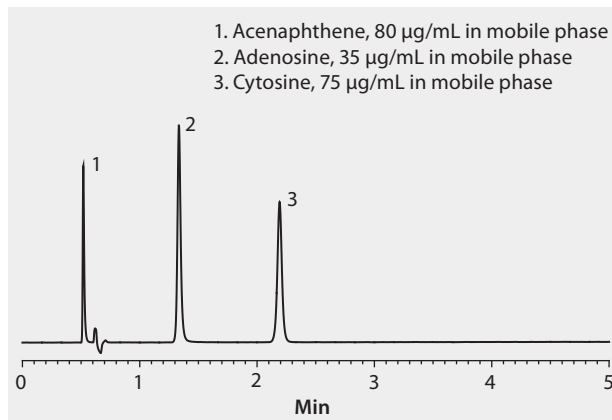
HPLC Analysis of Norvaline Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (90:10, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 210 nm
injection 5 µL
sample 5 mg/mL in methanol
Application No. **G004535**



HPLC Analysis of Nucleosides on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 10 cm × 2.1 mm I.D., 2.7 µm particles (53939-U)
mobile phase (A) 100 mM ammonium formate,
pH 3.0 with concentrated formic acid;
(B) acetonitrile; (10:90, A:B)
flow rate 0.4 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 1 µL
Application No. **G004183**



HPLC Analysis of Nucleosides on Ascentis® Express OH5 (HILIC Mode)

Nucleosides are involved in many aspects of metabolism. Analogs of nucleosides have medical application in antivirals or anticancer treatments. This application demonstrates the utility of hydrophilic interaction chromatography (HILIC) for the retention and resolution of nucleosides and analogs thereof. Elution is not solely explained by logD but by other ionic and solvophobic effects.

column . . . Ascentis Express OH5, 10 cm x 2.1 mm I.D., 2.7 µm particles (53757-U)

mobile phase (A) 5 mM ammonium acetate, pH 5.0 with acetic acid in 95:5, acetonitrile:water;

(B) 5 mM ammonium acetate, pH 5.0 with acetic acid in 80:20, acetonitrile:water

gradient . . . 0% B held for 1 min; to 100% B in 10 min; held at 100% B for 1 min

flow rate 0.3 mL/min

column temp. 25 °C

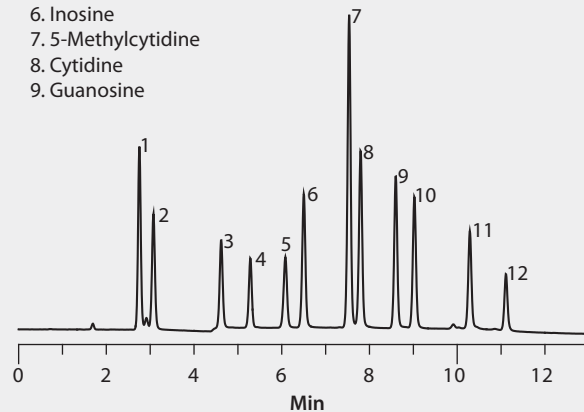
detector UV, 250 nm

injection 2 µL

sample . . . 10 - 100 µg/mL in 95:5, acetonitrile:water (pH of buffer stock (in water) was adjusted before further dilution with water and/or acetonitrile)

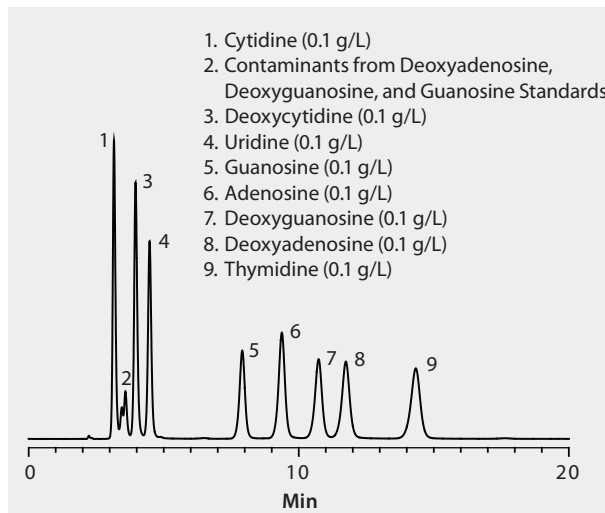
Application No. [G005644](#)

- | | |
|------------------------|-----------------------|
| 1. Ribothymidine | 10. 3-Methylcytidine |
| 2. Uridine | 11. 1-Methyladenosine |
| 3. 2-Thiocytidine | 12. 7-Methylguanosine |
| 4. 2'-O-Methylcytidine | |
| 5. Pseudouridine | |
| 6. Inosine | |
| 7. 5-Methylcytidine | |
| 8. Cytidine | |
| 9. Guanosine | |



HPLC Analysis of Nucleosides on Ascentis® Phenyl

column Ascentis Phenyl, 15 cm x 2.1 mm I.D., 5 µm particles (581613-U)
mobile phase 10 mM ammonium formate (pH 3.0 with formic acid)
flow rate 0.2 mL/min
column temp. 35 °C
detector UV, 270 nm; 750 psi back pressure regulator on outlet of flow cell
injection 1 µL
sample as indicated, in mobile phase
Application No. **G003710**

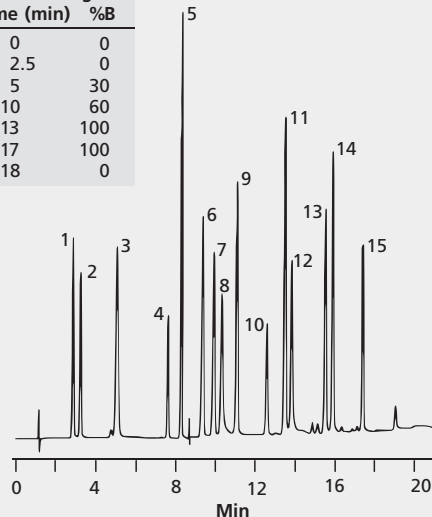


HPLC Analysis of Nucleotides on SUPELCO[™] LC-18-T

column . . . SUPELCO[™] LC-18-T, 15 cm × 4.6 mm I.D., 3 μm particles (58970-U)
 mobile phase . . . (A) 0.1M potassium phosphate buffer/4mM tetrabutylammonium
 hydrogen sulfate, pH6.0; (B) A:methanol (70:30), pH 7.2
 flow rate 1.5 mL/min
 detector UV, 254 nm
 injection 20 μL deionized water (25-530 μM each analyte)
 Application No. [713-0951](#)

Gradient Program
Time (min) **%B**

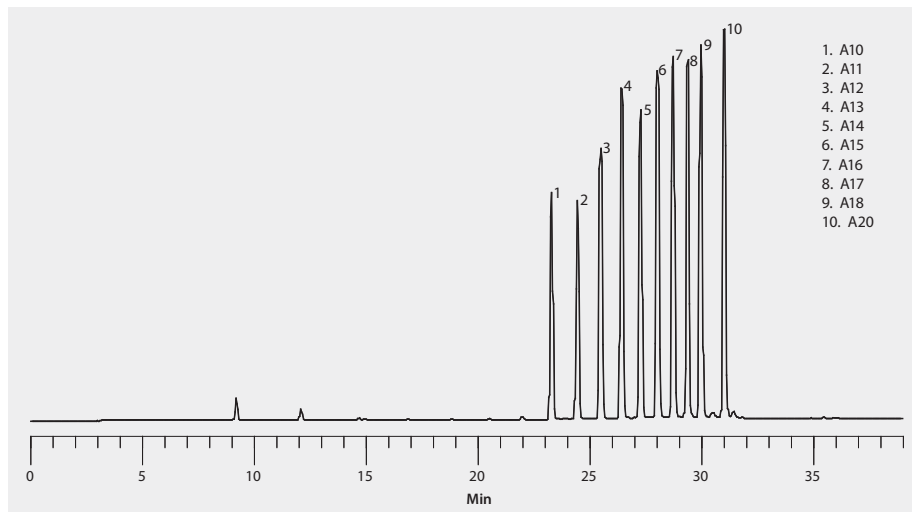
0	0
2.5	0
5	30
10	60
13	100
17	100
18	0



1. HX
2. XAN
3. INO
4. IMP
5. NAD⁺
6. ADO
7. AMP
8. GDP
9. NADP⁺
10. ADP-rib
11. GTP
12. ADP
13. NADH
14. ATP
15. NADPH

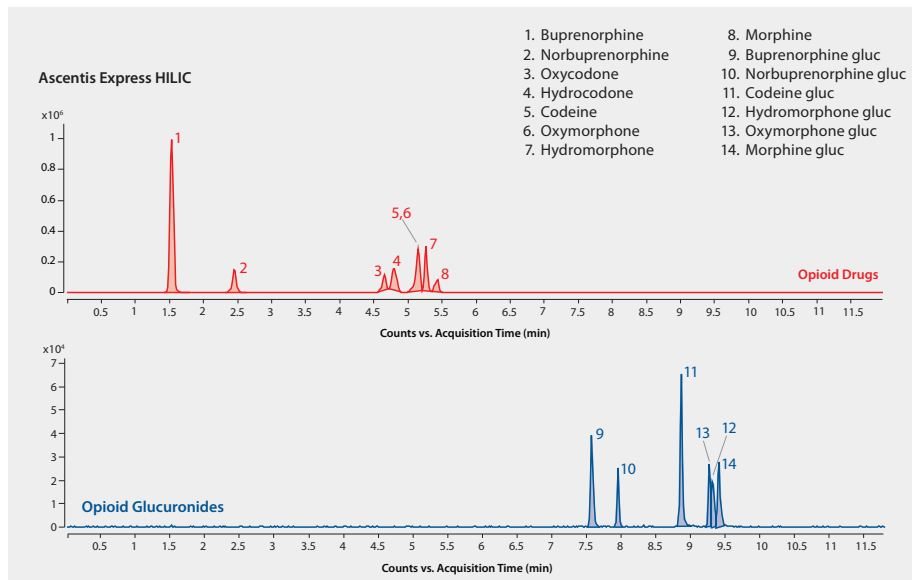
HPLC Analysis of Oligonucleotides on Proteomix® SAX

column Proteomix SAX-NP5, 25 cm x 4.6 mm I.D., 5 µm particles (Z777229)
mobile phase A: 20 mM Tris, pH 8.0 B: A + 0.5 M NaCl
gradient 0 - 100% B in 30 minutes
flow rate 0.5 mL/min
pressure 1073 psi (74 bar)
column temp. 25 °C
detector UV 260 nm
injection 5 µL
sample (10 mM each oligonucleotide in water)
Application No. **G005994**



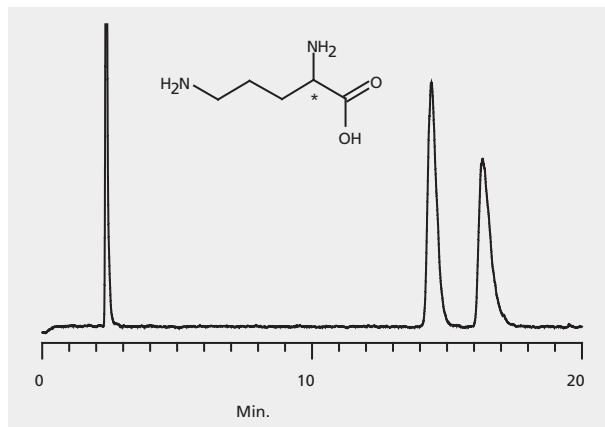
HPLC Analysis of Opioid Glucuronide Metabolites on Ascentis® Express HILIC

sample preparation	SPE (Solid Phase Extraction)
sample/matrix	urine
SPE well plate	Supel™-Select HLB 96-Well 60mg/Well (575662-U)
condition	1 mL methanol, 1 mL water
sample addition	1.0 mL urine
washing	1 mL water, 1 mL 25% methanol
elution	1 mL acetonitrile
column	Ascentis Express HILIC, 10 cm x 2.1 mm x 2.7 µm particles (53939-U)
mobile phase	(A): 5 mM ammonium formate pH 4.2 (B): 5 mM ammonium formate (95:5 acetonitrile:water) pH 5.2
gradient	100% B for 3 minutes, 80% B in 7 minutes, hold 80%B for 2 minutes
flow rate	0.6 mL/min
detector	55
detector	TOF MS
injection	3.0 µL
sample	300 ng/mL
Application No.	G006290



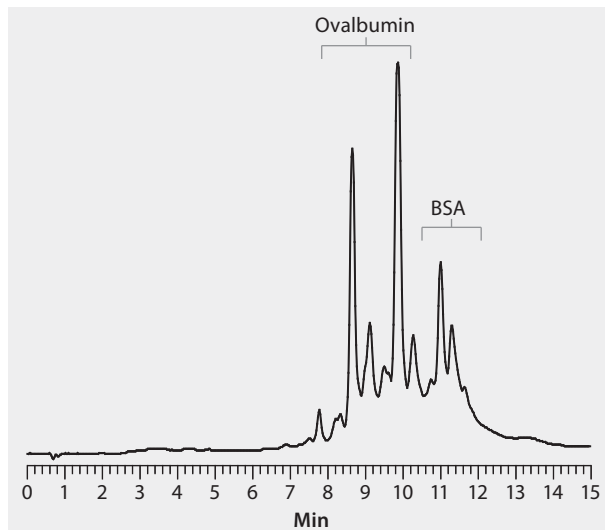
HPLC Analysis of Ornithine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (50:50, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 205 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004506**



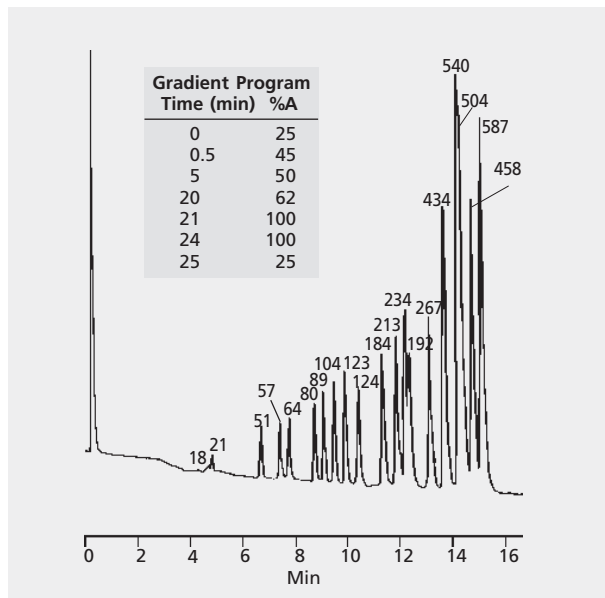
HPLC Analysis of Ovalbumin and BSA Charge Variants on Proteomix® SAX-NP3

column Proteomix SAX-NP3, 5 cm x 4.6 mm I.D., 3 µm particles (Z777219)
mobile phase 20 mM Tris buffer, pH 8.0
gradient 0 – 0.3 M NaCl in 15 min
flow rate 0.5 mL/min
pressure 1600 psi (110 bar)
detector UV, 214 nm
Application No. **G006132**



HPLC Analysis of pBr322 DNA-*Hae* III Digest on TSKgel® DEAE-NPR

column TSKgel DEAE-NPR, 3.5 cm × 4.6 mm I.D., 2.5 μm particles
 (with 5 mm DEAE-NPR guard column) (813075)
 mobile phase . . . (A) 1 M NaCl/25 mM Tris-HCl, pH 9.0; (B) 25 mM Tris-HCl, pH 9.0
 flow rate 1 mL/min
 column temp. ambient
 detector UV, 260 nm
 injection 20 μL of 50 μg/mL *Hae* III digest of pBR322 DNA
 Application No. 794-0036



Ref: 1. Elena D. Katz, Lawrence A. Haff, Roy Eksteen, Rapid separation, quantitation, and purification of products of polymerase chain reaction by liquid chromatography *J. Chromatogr. A.* 512, 433-444 (1990)

HPLC Analysis of PEG separation on two Zenix® SEC-300 columns in Tandem

Pegylation of biotherapeutic drugs improves solubility, increases half life in the blood stream and reduces immunogenicity. Size exclusion chromatography (SEC) is often applied to characterize protein-polyethylene glycol (PEG) conjugates and establish the number of attached PEG chains, since SEC is a precise and robust technique that combines ease of set up and straightforward method development.

This chromatogram shows the separation of four polyethyleneglycol polymers varying in molecular mass 8730 to 81,400 Da on two Zenix® SEC-300 columns in series.

column Zenix SEC-300 (2 ea), 30 cm x 7.8 mm I.D.,
3 µm particles, 300 Å, connected in tandem (Z777033)

mobile phase 150 mM Sodium Phosphate Buffer pH=7.0

flow rate 0.5 mL/min

column temp. 25 °C

detector Refractive Index at 30 °C

injection 10 µL

sample 1.PEG 81,400 Da (2mg/mL)

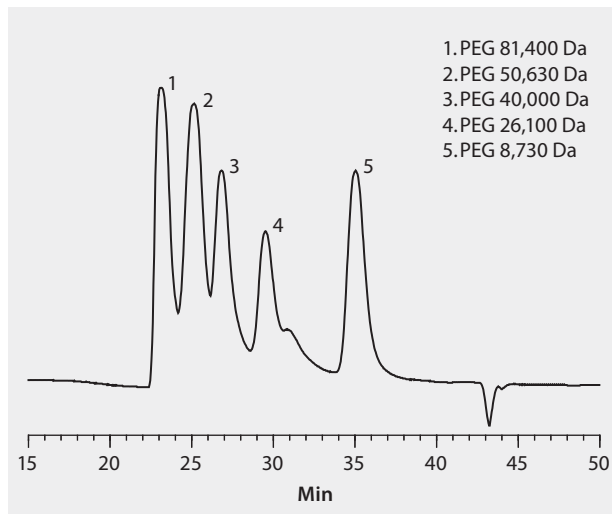
2.PEG 50,630 Da (2mg/mL)

3.PEG 40,000 Da (2mg/mL)

4.PEG 26,100 Da (2mg/mL)

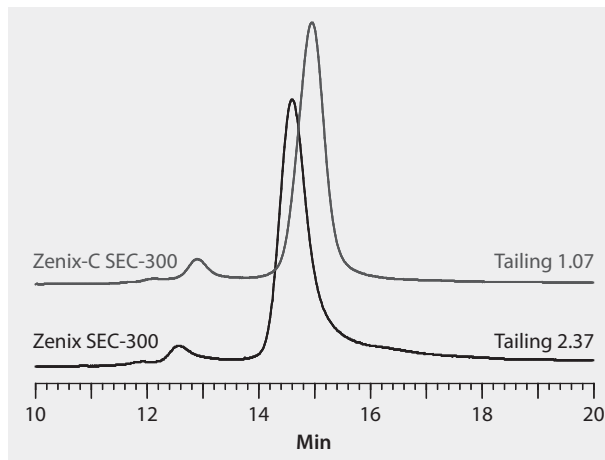
5.PEG 8,730 Da (2mg/mL)

Application No. **G006200**



HPLC Analysis of Pegylated Exenatide on Zenix® SEC-300 and Zenix®-C SEC-300

column Zenix-C SEC-300, 30 cm x 7.8 mm, I.D., 3 µm particles (Z777092)
column Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777033)
mobile phase . . . (A) 50 mM Ammonium acetate; (B) acetonitrile; (90:10, A:B, v/v)
flow rate 0.5 mL/min
pressure 609 psi (42 bar)
column temp. 25 °C
detector UV, 214 nm
injection 15 µL
sample 3.3 mg/ml PEG-Exenatide in water (PEG 23 kD)
Application No. **G005949**



HPLC Analysis of Peptides, Alberta Mix, on Discovery® BIO Wide Pore C18, No TFA

column Discovery BIO Wide Pore C18, 15 cm × 2.1 mm I.D.,
3 μm particles (567202-U)

mobile phase . . . (A) 25 mM formic acid in water, (B) (25 mM formic acid in water):
(20 mM formic acid in acetonitrile, (50:50))

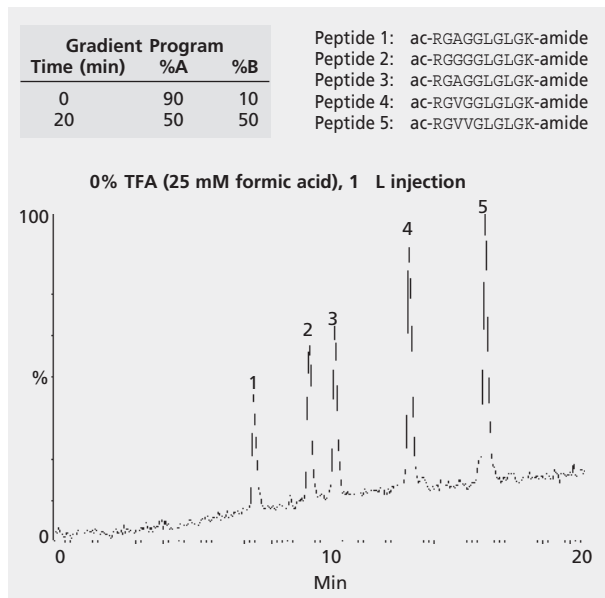
flow rate 0.20 mL/min

column temp. ambient

detector +ES

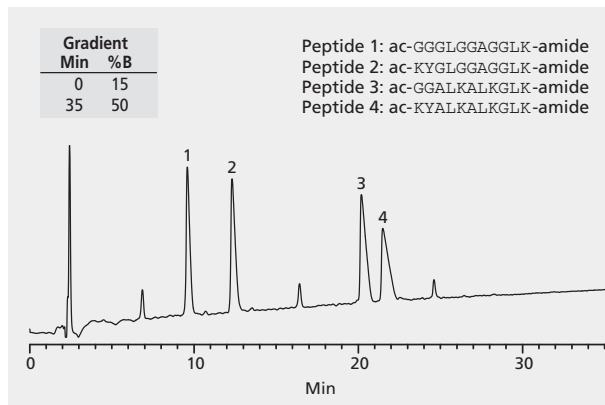
injection 1 μL

Application No. [G001638B](#)



HPLC Analysis of Peptides, Alberta Mix on Discovery® BIO Wide Pore C5

column Discovery BIO Wide Pore C5, 15cm × 2.1mm I.D.,
5 µm particles (568402-U)
mobile phase . . . (A) 25mM formic acid in water; (B) (50:50) 25mM formic acid in
water, 20mM formic acid in acetonitrile
flow rate 0.20 mL/min
injection 0.5 µL (~0.25 µg each peptide)
column temp. 35 °C
detector UV, 215 nm
sample RP Peptide Ionic Interactions Standard,
p/n RPS-10020 (Alberta Peptide Institute)
Application No. **G001882**

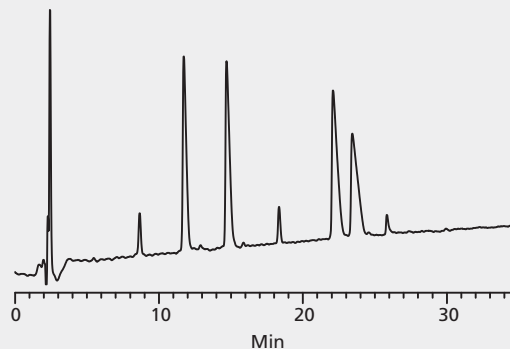


HPLC Analysis of Peptides, Synthetic, on Discovery® BIO Wide Pore C18

column Discovery BIO Wide Pore C18, 15 cm × 2.1 mm I.D.,
5 µm particles (568202-U)
mobile phase . . . (A) 25 mM formic acid in water; (B) (50:50) 25 mM formic acid in
water, 20 mM formic acid in acetonitrile
flow rate 0.20 mL/min
column temp. 35 °C
detector UV, 215 nm
injection 0.5 µL (~0.25 µg ea peptide)
sample RP Peptide Ionic Interactions Standard,
p/n RPS-10020 (Alberta Peptide Institute)
Application No. **G001642B**

Peptide 1: ac-GGGLGGAGGLK-amide
Peptide 2: ac-KYGLGGAGGLK-amide
Peptide 3: ac-GGALKALKGLK-amide
Peptide 4: ac-KYALKALKGLK-amide

Gradient Program	
Time (min)	%B
0	15
45	60



HPLC Analysis of Peptide Mix, Complex, on Ascentis® C18

column Ascentis C18, 15 cm x 2.1 mm I.D., 5 µm particles (581304-U)
mobile phase . . . (A) 25 mM formic acid in water; (B): 50:50, 25 mM formic acid in
water:25 mM formic acid in acetonitrile

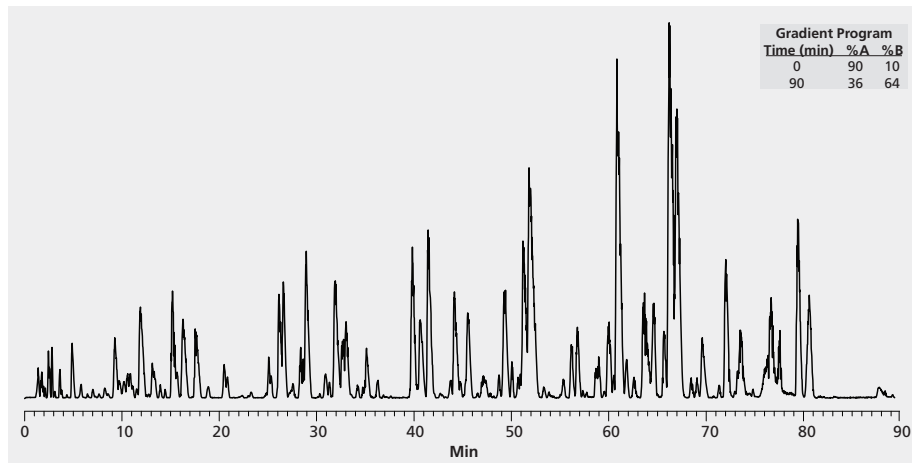
flow rate 0.2 mL/min
column temp. 35 °C

detector ESI (+), full scan

injection 10 µL

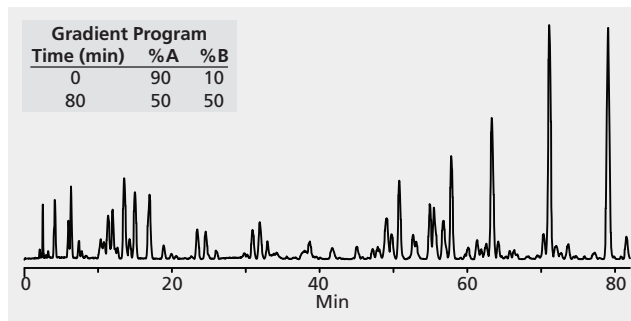
sample tryptic digest of carboxymethylated protein
mixture 2.4 g/L in 0.1% formic acid

Application No. **G002441**



HPLC Analysis of Peptide Mix, Complex on Ascentis® C18

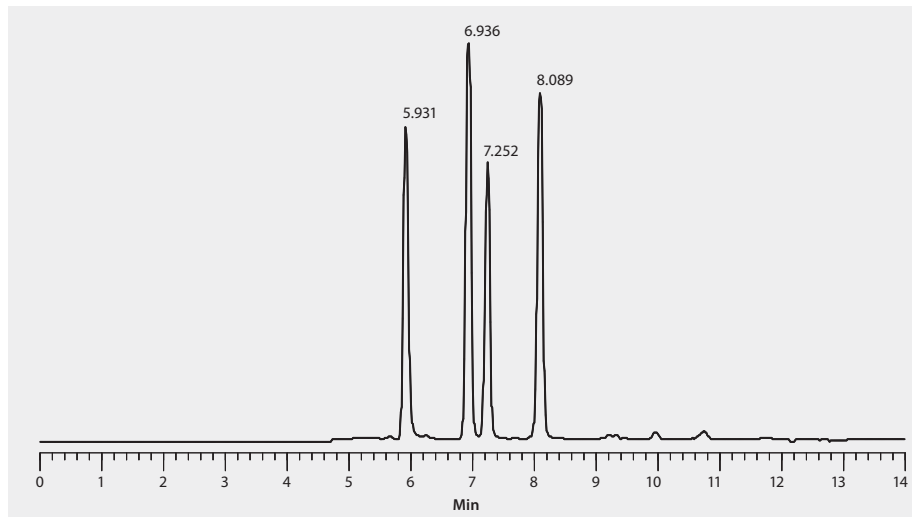
column Ascentis C18, 25 cm x 2.1 mm I.D., 5 µm particles (581305-U)
 mobile phase . . . (A) (50:50), 50 mM formic acid titrated with acetate (pH 3.0):water;
 (B) (50:50), 50 mM formic acid titrated with acetate (pH 3.0): acetonitrile
 flow rate 0.2 mL/min
 column temp. ambient
 detector ESI (+)
 injection 4 µL
 sample tryptic digest of carboxymethylated
 protein mixture 1.5 g/L in 50 mM formic acid
 Application No. **G002669**



HPLC Analysis of Peptide Mixture on Zenix® SEC-100

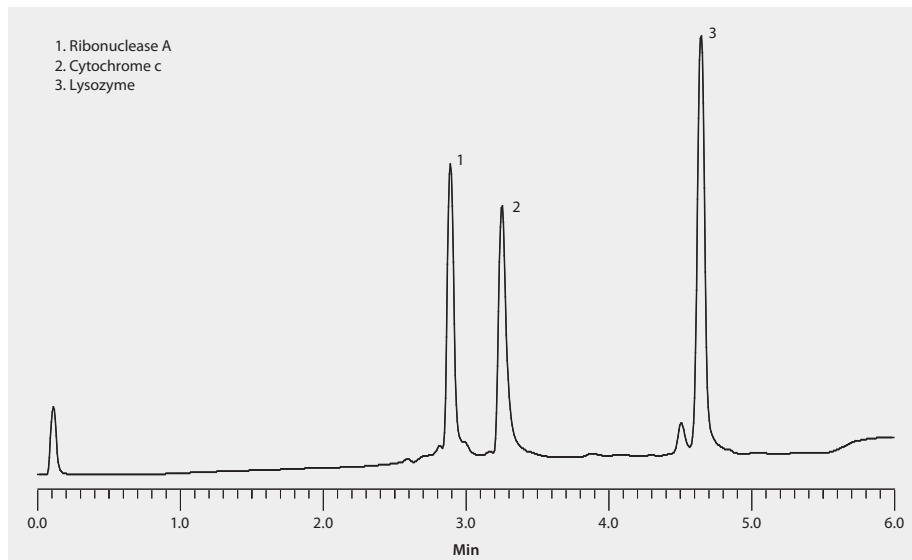
Zenix® SEC columns can be operated in aqueous-organic mobile phases, as is shown in this example where hydrophobic peptides and proteins are eluted with excellent peak shape in 65% acetonitrile 35% water containing 0.1% TFA.

column Zenix-100, 30 cm x 7.8 mm I.D., 3 µm particles, 100 Å (Z777008)
mobile phase ACN:H₂O:TFA=65:35:0.1(v/v)
flow rate 1.0 mL/min
column temp. Ambient
detector UV, 214 nm
injection 10 µL
sample ribonuclease A (5.931 min), human insulin (6.936 min),
thymosin α1 (7.252 min), somatostatin (8.089 min)
Application No. **G006196**



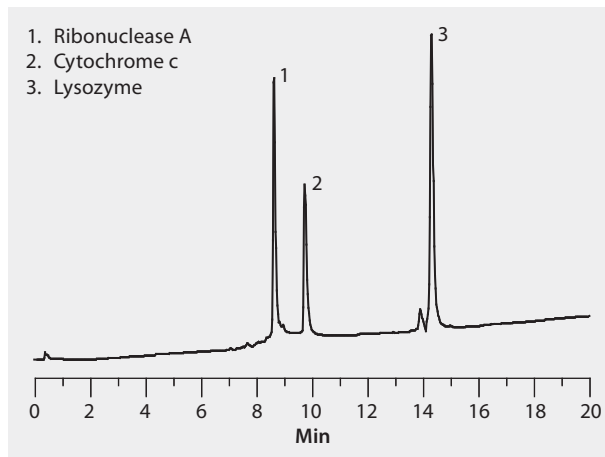
HPLC Analysis of Peptides and Proteins on Proteomix® SCX-NP1.7, 3 cm x 4.6 mm I.D. Column

column . . . Proteomix SCX-NP1.7, 3 cm x 4.6 mm I.D., 1.7 µm particles (Z777145)
mobile phase (A) 20 mM sodium phosphate, pH 6.0; (B) A + 1.0 M NaCl
gradient 0 to 50% B in 5 min; 15 min prewash
flow rate 2 mL/min
column temp. ambient
detector UV, 214 nm
injection 5 µL
sample 1 mg/mL
Application No. **G006144**



HPLC Analysis of Peptides and Proteins on Proteomix® SCX-NP1.7, 5 cm x 4.6 mm I.D. Column

column . . . Proteomix SCX-NP1.7, 5 cm x 4.6 mm I.D., 1.7 µm particles (Z777146)
mobile phase (A) 20 mM sodium phosphate, pH 6.0; (B) A + 1.0 M NaCl
gradient 0 to 75% B in 25 min; 15 min prewash
flow rate 0.75 mL/min
column temp. ambient
detector UV, 214 nm
injection 5 µL
sample 1 mg/mL
Application No. **G006145**



HPLC Analysis of Peptides on Discovery® BIO PolyMA-SCX (Ion Exchange)

Polymer particles are frequently used in bioseparations. Their advantages over inorganic particles, however, are often offset by generally lower efficiency. Discovery BIO PolyMA-SCX and PolyMA-WAX particles offer the benefits of polymeric particles, but have higher efficiency and better resolution than competitive particles. An example of the high efficiency of Discovery BIO PolyMA-SCX is shown in this Figure. The Discovery BIO PolyMA-SCX column gives efficient, well-resolved separation of a four-component peptide mixture.

column . . . Discovery BIO PolyMA-SCX, 5 cm x 4.6 mm I.D., 5 µm particles (59601-U)
mobile phase . . . ((A) 5% acetonitrile in 20 mM ammonium carbonate, pH 3.5 with phosphoric acid; (B) 5% acetonitrile in 20 mM ammonium carbonate, 480 mM ammonium phosphate, pH 3.5 with phosphoric acid)

gradient 0 to 100% B in 24 min (linear)

flow rate 0.2 mL/min

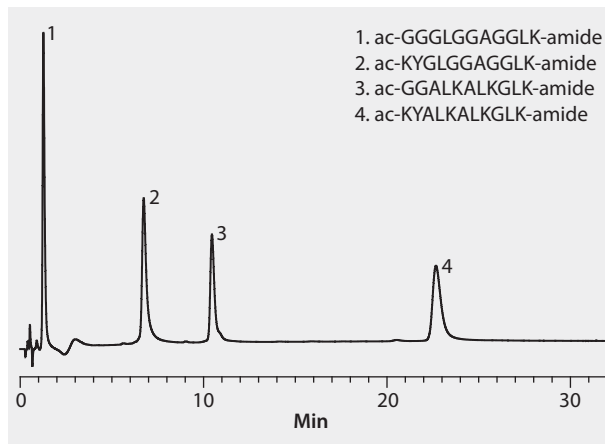
column temp. 35 °C

detector UV, 210 nm

injection 10 µL

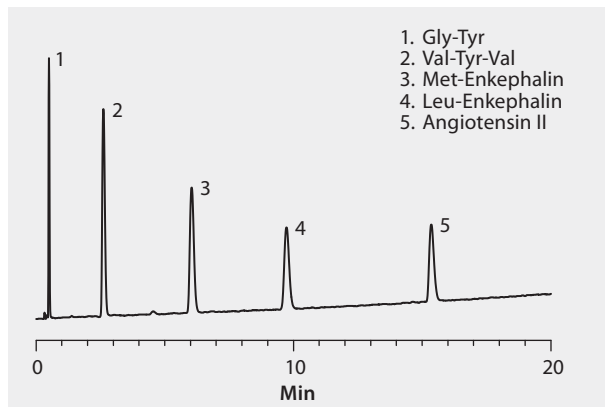
sample RP Peptide Ionic Interactions Standard,
p/n RPS-10020 (Alberta Peptide Institute)

Application No. **G001824**



HPLC Analysis of Peptides on Discovery® BIO Wide Pore C18 (5 cm Column)

column Discovery BIO Wide Pore C18, 5 cm × 4.6 mm I.D.,
5 µm particles (568220-U)
mobile phase ... (A) (5:95), 0.5% TFA in water:0.5% TFA in acetonitrile; (B) (25:75),
0.5% TFA in water:0.5% TFA in acetonitrile
gradient 2-24% B in 22 min, 8 min. at 100%A
flow rate 2 mL/min
column temp. 70 °C
detector UV, 220 nm
Application No. **G001562**



HPLC Analysis of Peptides on Discovery® BIO Wide Pore C18 (Gradient #1)

column Discovery BIO Wide Pore C18, 15cm × 4.6mm I.D.,
5µm particles (568222-U)

mobile phase (A) (80:20), 0.1% TFA in water:0.1% TFA in acetonitrile;
(B) (66:34), 0.1% TFA in water:0.1% TFA in acetonitrile

gradient 0-100% B in 14 min after 1 minute delay

flow rate 1 mL/min

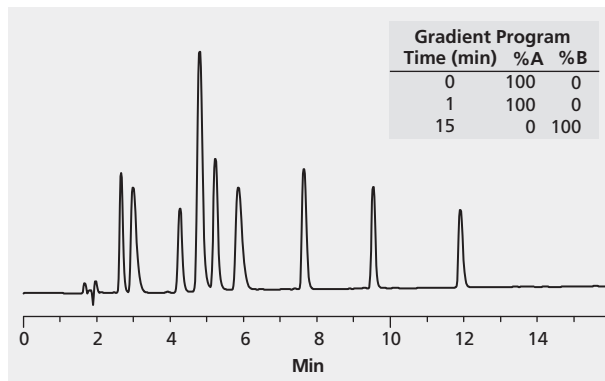
column temp. 30 °C

detector UV, 220 nm

injection 10 µL

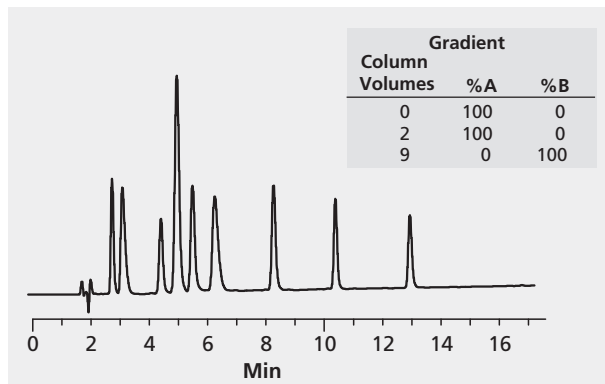
sample Sigma Peptide Mix (Cat. No. P2693)

Application No. **G001512**



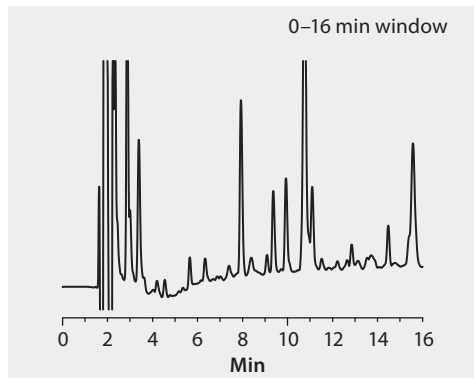
HPLC Analysis of Peptides on Discovery® BIO Wide Pore C18 (Gradient #2)

column Discovery BIO Wide Pore C18, 15 cm × 4.6 mm I.D.,
5 μm particles (568222-U)
mobile phase (A) (80:20), 0.1%TFA in water:0.1% TFA in acetonitrile;
(B) (66:34), 0.1% TFA in water:0.1% TFA in acetonitrile
flow rate 1 mL/min
column temp. 30 °C
detector UV, 215 nm
injection 5 μL Sigma Peptide Mix P2693 (~25 μg ea. Peptide) (~25 μg ea. peptide)
sample Sigma Peptide Mix (Cat. No. P2693)
Application No. **G001593**



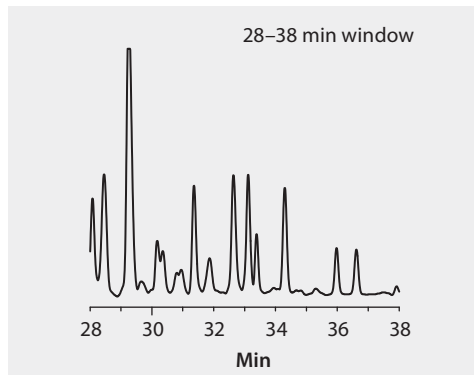
HPLC Analysis of Peptides on Discovery® BIO Wide Pore C18, 0-16 Min. Window

column Discovery BIO Wide Pore C18, 15 cm × 4.6 mm I.D.,
5 µm particles (568222-U)
mobile phase ... (A) (95:5), 0.1% TFA in water:0.1% TFA in acetonitrile; (B) (50:50),
0.1%TFA in water:0.1% TFA in acetonitrile
gradient 0-100% B in 65 min
flow rate 1 mL/min
column temp. 30 °C
detector UV, 215 nm
injection 50µL carboxymethylated apohemoglobin
tryptic digest in 50 mM ammonium bicarbonate
Application No. **G001730**



HPLC Analysis of Peptides on Discovery® BIO Wide Pore C18, 28-38 Min. Window

column Discovery BIO Wide Pore C18, 15cm × 4.6mm I.D.,
5 µm particles (568222-U)
mobile phase ... (A) (95:5), 0.1% TFA in water:0.1% TFA in acetonitrile; (B) (50:50),
0.1% TFA in water:0.1% TFA in acetonitrile
gradient 0-100% B in 65 min
flow rate 1 mL/min
column temp. 30 °C
detector UV, 215 nm
injection 50µL carboxymethylated apohemoglobin
tryptic digest in 50 mM ammonium bicarbonate
Application No. **G001727**



HPLC Analysis of Peptides on Discovery® BIO Wide Pore C18 (PFPA Mobile Phase Additive)

Sigma peptide mix (5 µm)

column Discovery BIO Wide Pore C18, 15 cm × 4.6 mm I.D.,
5 µm particles (568222-U)

mobile phase (A) 81:19, (water/0.1% PFPA):(acetonitrile/0.1%PFPA);
(B) 62:38, (water/0.1%PFPA):(acetonitrile/0.1%PFPA)

flow rate 1.0 mL/min

injection 10 µL (~25 µg each peptide)

column temp. 30 °C

detector UV, 215 nm

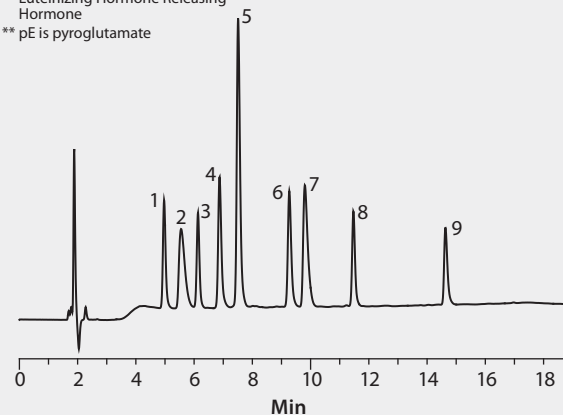
sample Sigma Peptide Mix (Cat. No. P2693)

Application No. **G001594**

Peptide	Amino Acid Sequence
1. Arg ⁸ -vassopressin	CYFQNCPRG-amide; disulfide
2. Bradykinin, fragment 1-5	RPPGF
3. Oxytocin	CYIQNCPLG-amide; disulfide
4. Met-Enkephalin	YGGFM
5. LHRH*	pEHWSYGLRPG-amide**
6. Leu-Enkephalin	YGGFL
7. Bradykinin	RPPGFSPFR
8. Bombesin	pEQRLGNQWAVGHLM-amide
9. Substance P	RPKPQQFFGLM-amide**

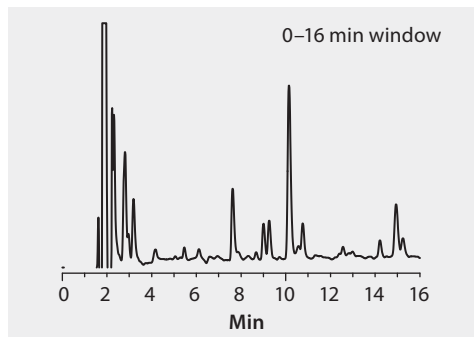
* Luteinizing Hormone Releasing Hormone

** pE is pyroglutamate



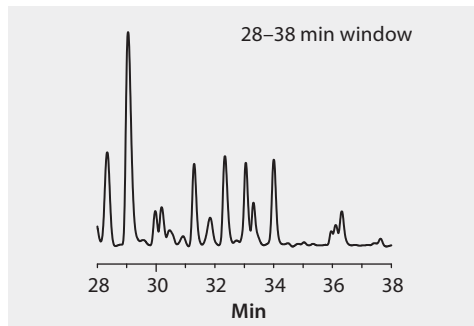
HPLC Analysis of Peptides on Discovery® BIO Wide Pore C5, 0-16 Min. Window

column Discovery BIO Wide Pore C5, 15 cm × 4.6 mm I.D.,
5 µm particles (568422-U)
mobile phase ... (A) (95:5), 0.1% TFA in water:0.1% TFA acetonitrile; (B) (50:50),
0.1% TFA in water:0.1% TFA in acetonitrile
gradient 0-100% B in 65 min
flow rate 1 mL/min
column temp. 30 °C
detector UV, 215 nm
injection 50µL carboxymethylated apohemoglobin tryptic digest in
50 mM ammonium bicarbonate (568422-U)
Application No. [G001732](#)



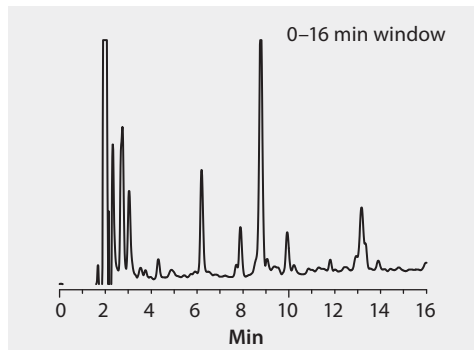
HPLC Analysis of Peptides on Discovery® BIO Wide Pore C5, 28-38 Min. Window

column Discovery BIO Wide Pore C5, 15 cm × 4.6 mm I.D.,
5 µm particles (568422-U)
mobile phase ... (A) (95:5), 0.1% TFA in water:0.1% TFA in acetonitrile; (B) (50:50),
0.1%TFA in water:0.1% TFA in acetonitrile
gradient 0-100% B in 65 min
flow rate 1 mL/min
column temp. 30 °C
detector UV, 215 nm
injection 50 µL carboxymethylated apohemoglobin
tryptic digest in 50 mM ammonium bicarbonate
Application No. **G001729**



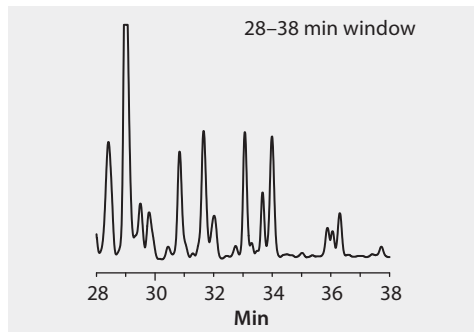
HPLC Analysis of Peptides on Discovery® BIO Wide Pore C8, 0-16 Min. Window

column Discovery BIO Wide Pore C8, 15 cm × 4.6 mm I.D.,
5 µm particles (568322-U)
mobile phase ... (A) (95:5), 0.1% TFA in water:0.1% TFA in acetonitrile; (B) (50:50),
0.1% TFA in water:0.1% TFA in acetonitrile
gradient 0-100% B in 65 min
flow rate 1ml/min
column temp. 30 °C
detector UV, 215 nm
injection 50µL carboxymethylated apohemoglobin
tryptic digest in 50 mM ammonium bicarbonate
Application No. **G001731**



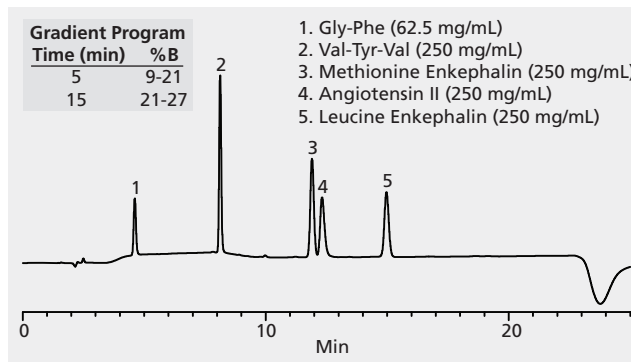
HPLC Analysis of Peptides on Discovery® BIO Wide Pore C8, 28-38 Min. Window

column Discovery BIO Wide Pore C8, 15 cm × 4.6 mm I.D.,
5 μm particles (568322-U)
mobile phase ... (A) (95:5), 0.1% TFA in water:0.1% TFA in acetonitrile; (B) (50:50),
0.1% TFA in water:0.1%TFA in acetonitrile
gradient 0-100% B in 65 min
flow rate 1 mL/min
column temp. 30 °C
detector UV, 215 nm
injection 50μL carboxymethylated apohemoglobin
tryptic digest in 50 mM ammonium bicarbonate
Application No. **G001728**



HPLC Analysis of Peptides on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 0.1% TFA in water; (B) 0.1% TFA in acetonitrile
flow rate 1.0 mL/min
column temp. 30 °C
detector UV, 220 nm
injection 5 µL
sample as indicated in mobile phase A
Application No. **G002613**



HPLC Analysis of Peptides on Discovery® BIO Wide Pore C18, Preparative Scale

column Discovery BIO Wide Pore C18, 15 cm × 10 mm I.D.,
10 µm particles (567208-U)

mobile phase (A) (80:20), 0.1% TFA in water:0.1% TFA in acetonitrile;
(B) (66:34), 0.1% TFA in water:0.1% TFA in acetonitrile

flow rate 4.7 mL/min

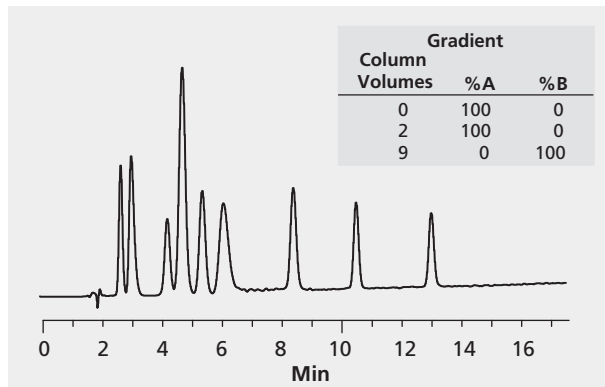
column temp. 30 °C

detector UV, 215 nm

injection 24.5 µL

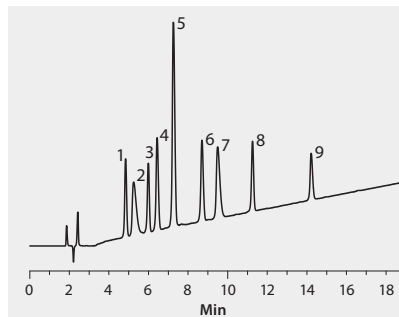
sample Cat. No. P2693

Application No. **G001511**



HPLC Analysis of Peptides on Discovery® BIO Wide Pore C5

column Discovery BIO Wide Pore C5, 15 cm × 4.6 mm I.D.,
5 µm particles (568422-U)
mobile phase (A): 0.1% PFPA (pentafluoropropionic acid) in water:acetonitrile
(81:19); (B): 0.1% PFPA in water:acetonitrile (62:38)
gradient 0-100% B in 19 min
flow rate 1 mL/min
column temp. 30 °C
detector UV, 215 nm
injection 10 µL ~0.25 µg each peptide
sample Cat. No. P2693
Application No. **G001492**



Peptide

1. Arg⁸-vasopressin
2. Bradykinin, fragment 1-5
3. Oxytocin
4. Met-enkephalin
5. Luteinizing hormone releasing hormone
6. Leu-enkephalin
7. Bradykinin
8. Bombesin
9. Substance P

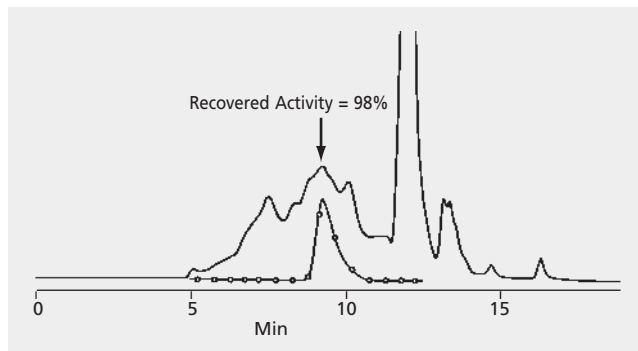
Sequence

CFQNCPRG-amide; disulfide
RPPGF
CYQNCPLG-amide; disulfide
YGGFM

PEHWSYGLRPG-amide
YGGFL
RPPGFSPFR
PEQLGNQWAVGHLM-amide
RPKPQQFFGLM-amide

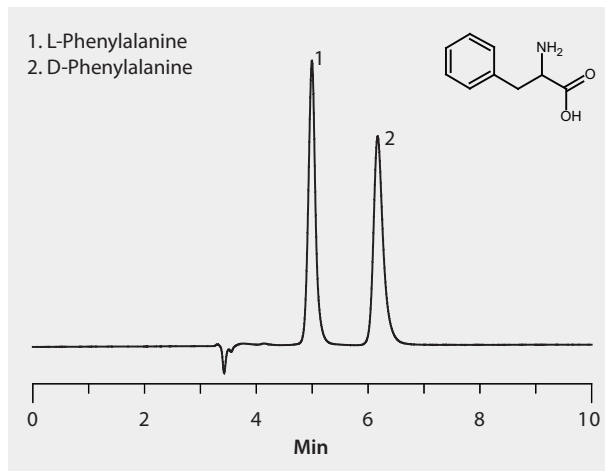
HPLC Analysis of Peroxidase on TSKgel® G3000SWXL

column TSKgel G3000SW_{XL}, 30 cm × 7.8 mm I.D., 5 μm particles (808541)
mobile phase 0.3M NaCl/0.05M phosphate buffer, pH 7.0
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection . . . 100 μL crude peroxidase preparation from Japanese horseradish (0.15mg)
Application No. [713-0940](#)



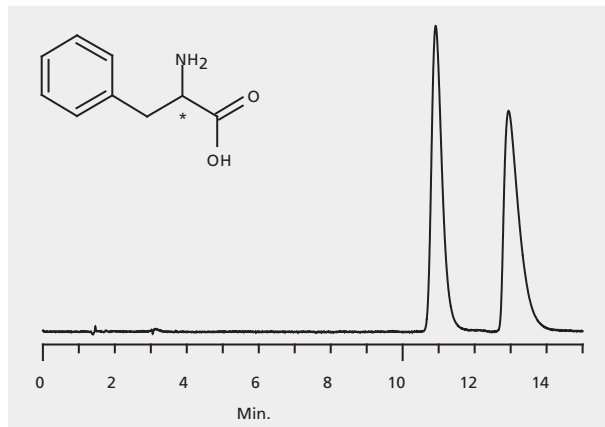
HPLC Analysis of Phenylalanine Enantiomers on Astec® CHIROBIOTIC® T (Formic Acid Mobile Phase Additive)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (30:70:0.02, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 300 µg /mL in 30:70 water:methanol
Application No. [G005342](#)



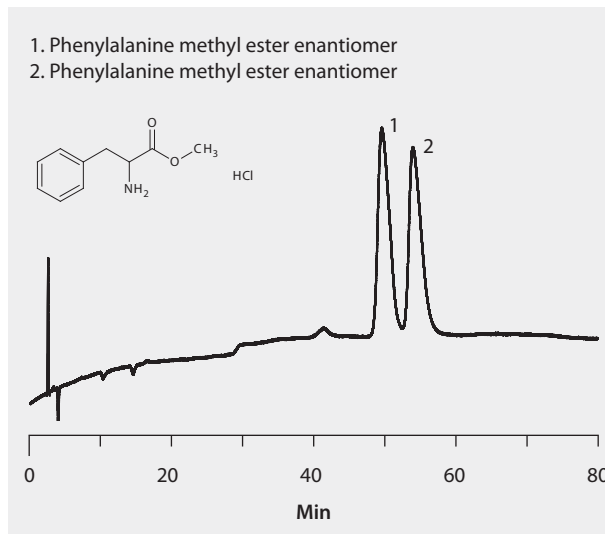
HPLC Analysis of Phenylalanine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) acetonitrile; (20:80, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004508**



HPLC Analysis of Phenylalanine Methyl Ester Enantiomers on LARIHC™ CF6-P

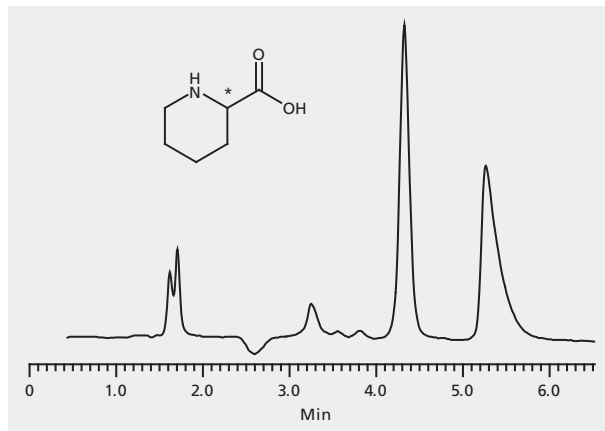
column . . . LARIHC CF6-P, 25 cm x 4.6 mm I.D., 5 µm particles (AZYP Part No.L1001, available from Supelco/Sigma-Aldrich as a custom item)
 mobile phase (A) methanol: (B) acetonitrile: (C) acetic acid: (D) triethylamine, (70:30:0.3:0.2. A:B:C:D)
 flow rate 1 mL/min
 column temp. 20 °C
 detector UV, 254 nm
 injection 5 µL
 sample Phenylalanine methyl ester, 0.3 mg/mL in ethanol
 Application No. G005259



Ref: 1. Ping Sun, Chunlei Wang, Zachary S. Breitbach, Ying Zhang, and Daniel W. Armstrong, Development of New HPLC Chiral Stationary Phases Based on Native and Derivatized Cyclofructans *Anal. Chem.* **81**, 10215 (2009)
 2. Ping Sun and Daniel W. Armstrong, Effective enantiomeric separations of racemic primary amines by the isopropyl carbamate-cyclofructan6 chiral stationary phase *J. Chromatogr. A.* **1217**, 4904 (2010)

HPLC Analysis of Pipecolic Acid Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) acetonitrile; (50:50, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 1 µL
sample 5 mg/mL in methanol
Application No. [G004554](#)



HPLC Analysis of Polar Neutral and Acidic Amino Acids on Ascentis® Si (Silica)

column Ascentis Si, 10 cm × 2.1 mm I.D., 5 µm particles (581508-U)
 mobile phase (A) 100 mM ammonium formate (pH 3.0, with formic acid),
 (B) water, (C) acetonitrile

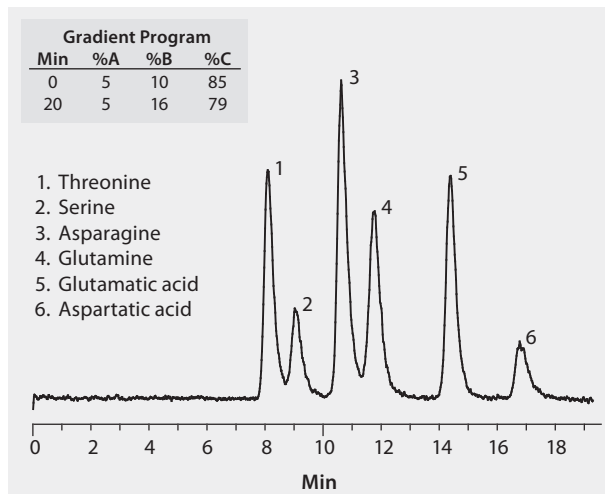
flow rate 0.3 mL/min
 column temp. 35 °C

detector ESI (+), full scan

injection 2 µL

sample 100 µg/mL in 10:90, (50 mM ammonium
 formate / formic acid, pH 3.0):acetonitrile

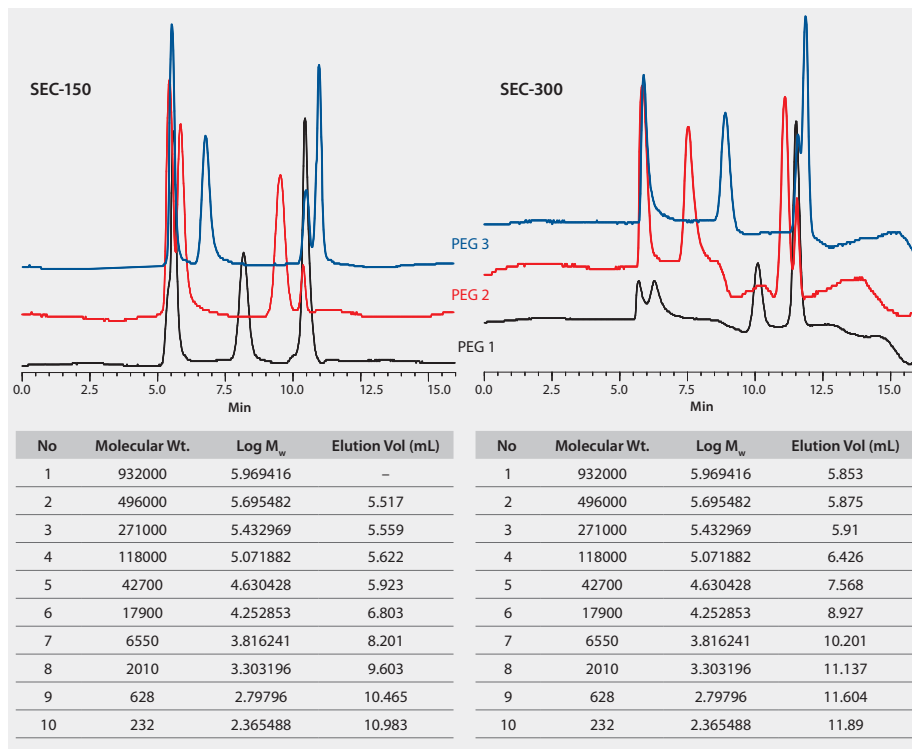
Application No. **G003688**



HPLC Analysis of Poly(ethyleneglycol) polymers on SRT® SEC-150 and SRT® SEC-300

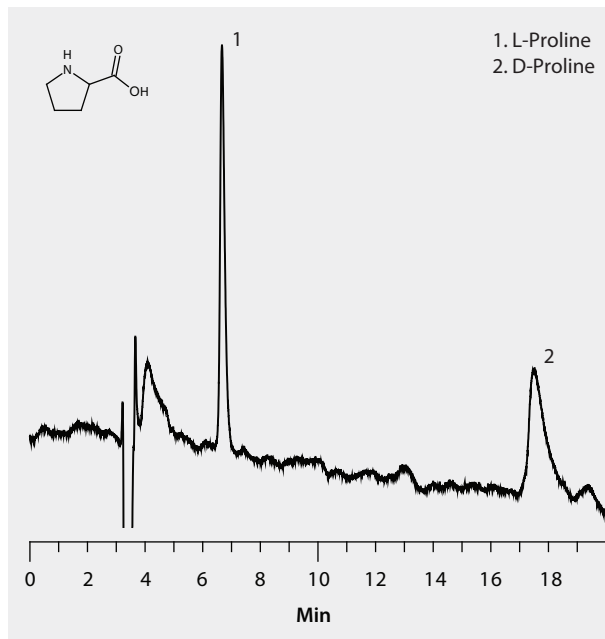
Although proteins are the most common applications of Sepax SRT and Zenix gel filtration columns, they can also be used to other water-soluble polymers such as the poly(ethyleneglycol) samples shown in these chromatograms. The conditions are very similar to those used for protein analysis, namely 150mM phosphate buffer at pH 7.0. Judging by the narrow peak widths all PEG polymers shown here have rather narrow size distributions.

column SRT-150, 30 cm x 7.8 mm I.D., 5 µm particles, 150 Å (Z777045)
 column SRT-300, 30 cm x 7.8 mm I.D., 5 µm particles, 150 Å (Z777051)
 mobile phase 150 mM phosphate Buffer, pH 7.0
 flow rate 1.0 mL/min
 pressure 720 psi (49.6 bar)
 detector RI(30 C°)
 injection 20 µL
 sample . . . 1.5 mg/mL in mobile phase PEG 1. MW 636, 6,550, 118,000, 932,000; PEG
 2. MW 2010, 42,700, 496,000 ; PEG 3. MW 232, 17,900, 271,000
 Application No. **G006206**



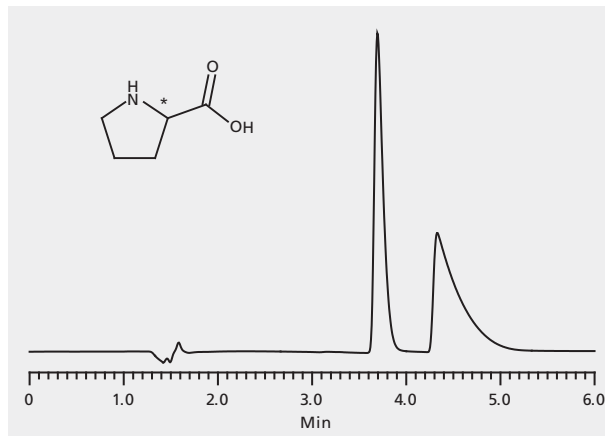
HPLC Analysis of Proline Enantiomers on Astec® CHIROBIOTIC® T (Formic Acid Mobile Phase Additive)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (40:60:0.02, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 200 µg /mL in 50:50 water:methanol
Application No. [G005343](#)



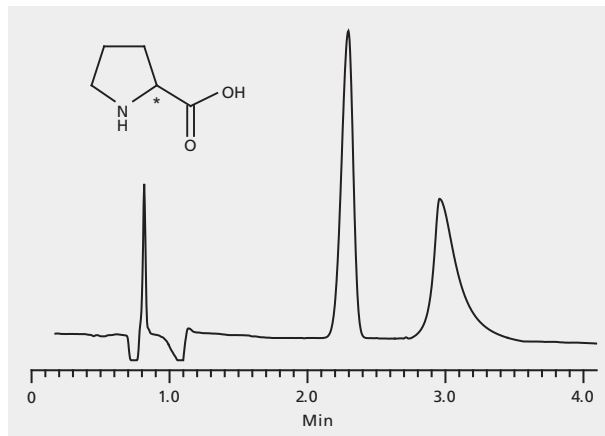
HPLC Analysis of Proline Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) acetonitrile; (95:5, A:B)
flow rate 1 mL/min
column temp. 30 °C
detector UV, 210 nm
injection 20 µL
sample 1 mg/mL in methanol
Application No. **G004526**



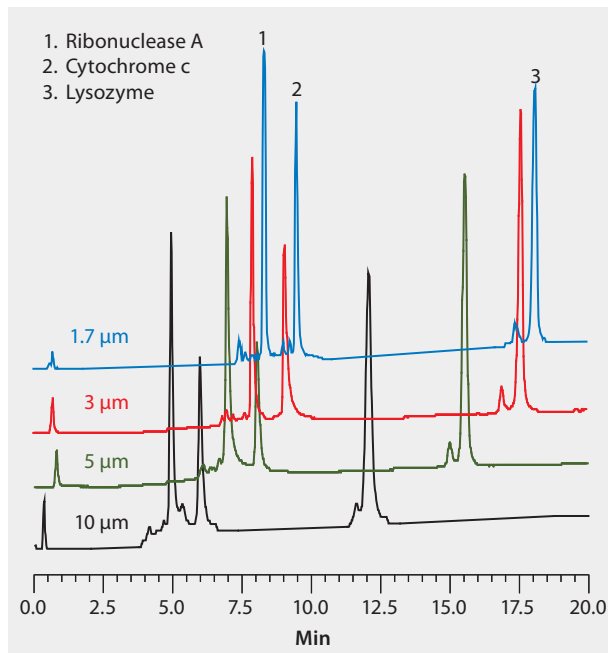
HPLC Analysis of Proline Enantiomers on Astec® CHIROBIOTIC® T, Fast Analysis

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase water
flow rate 0.65 mL/min
column temp. 25 °C
detector UV, 210 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. **G004527**



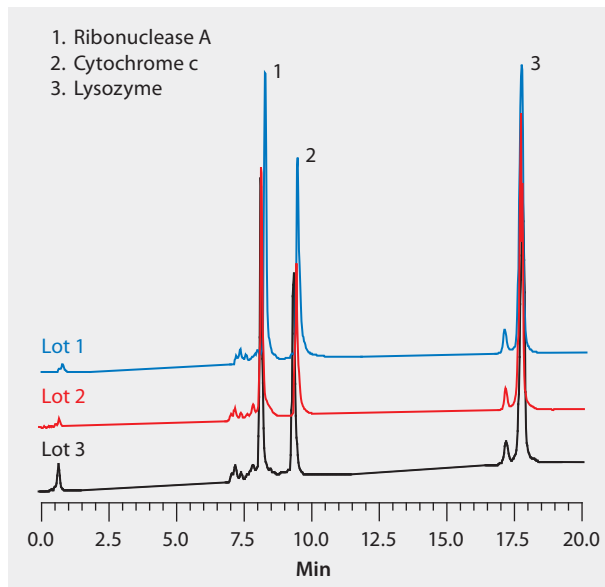
HPLC Analysis of Proteins and Peptides on Proteomix® WCX, Comparison of Different Particle Sizes

column Proteomix WCX-NP10, 5 cm x 4.6 mm, 10 μm particles (Z777169)
 column Proteomix WCX-NP5, 5 cm x 4.6 mm x 5 μm particles (Z777193)
 column . . . Proteomix WCX-NP1.7, 5 cm x 4.6 mm I.D., 1.7 μm particles (Z777180)
 column Proteomix WCX NP3, 5 cm x 4.6 mm I.D., 3 μm particles (Z777185)
 mobile phase (A) 20 mM sodium phosphate, pH 6.5, (B) A + 1.0 M NaCl
 gradient 0 to 100% B in 25 min, 15 min prewash
 flow rate 0.5 mL/min
 column temp. ambient
 detector UV, 214 nm
 injection 5 μL
 sample Ribonuclease A, Cytochrome C and Lysozyme (1 mg/mL) min
 Application No. **G006143**



HPLC Analysis of Proteins and Peptides on Proteomix® WCX-NP1.7 Demonstrating Lot-to-Lot Reproducibility

column . . . Proteomix WCX-NP1.7, 5 cm x 4.6 mm I.D., 1.7 µm particles (Z777180)
mobile phase (A) 20 mM sodium phosphate, pH 6.5; (B) A + 1.0 M NaCl
gradient 0 to 100% B in 25 min, 15 min prewash
flow rate 0.5 mL/min
column temp. ambient
detector UV, 214 nm
injection 5 µL
sample 1 mg/mL
Application No. **G006142**



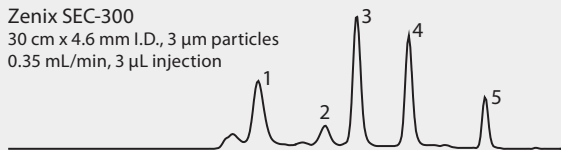
HPLC Analysis of Proteins by Size Exclusion on Zenix® and SRT® SEC-300, Comparison of Particle Size and Column I.D.

column Zenix 300, 30 cm x 4.6 mm I.D., 3 µm particles, 300 Å (Z777028)
 column Zenix 300, 30 cm x 7.8 mm I. D., 3 µm particles, 300 Å (Z777033)
 column SRT SEC-300, 30 cm x 7.8 mm 5 µm particles, 300 Å (Z777051)
 mobile phase 150 mM sodium phosphate, pH 7
 column temp. ambient
 detector UV, 214nm
 sample each compound 1 mg/mL except uracil, 2.5 µg/mL
 Application No. **G006179**

1. Thyroglobulin, 670 kDa
2. BSA dimer, 132 kDa
3. Bovine serum albumin (BSA), 66 kDa
4. Ribonuclease A, 13.7 kDa
5. Uracil, 120 Da

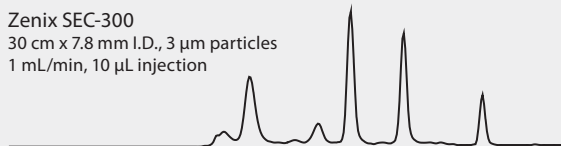
Zenix SEC-300

30 cm x 4.6 mm I.D., 3 µm particles
 0.35 mL/min, 3 µL injection



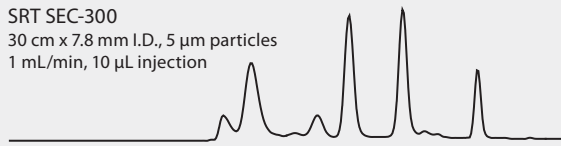
Zenix SEC-300

30 cm x 7.8 mm I.D., 3 µm particles
 1 mL/min, 10 µL injection



SRT SEC-300

30 cm x 7.8 mm I.D., 5 µm particles
 1 mL/min, 10 µL injection

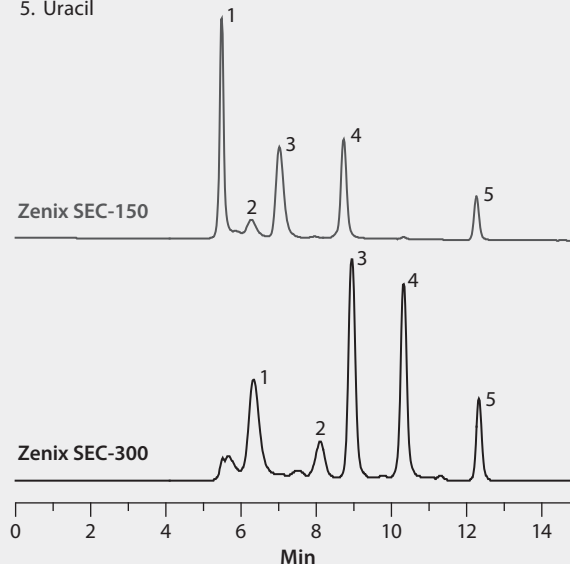


0 2 4 6 8 10 12 14
 Min

HPLC Analysis of Proteins by Size Exclusion on Zenix® Columns, Effect of Pore Size

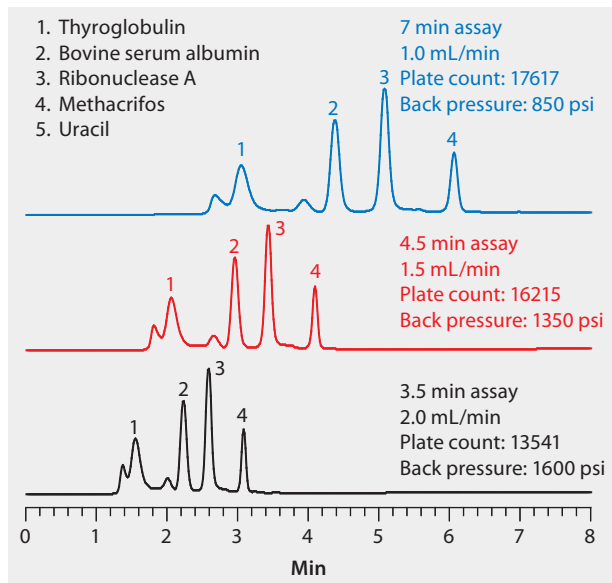
column . . . Zenix SEC-150, 30 cm x 7.8 mm I.D., 3 μ m, 150 Å particles (Z777018)
 column . . . Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 μ m, 300 Å particles (Z777033)
 mobile phase 150 mM sodium phosphate, pH 7
 flow rate 1 mL/min
 column temp. ambient
 detector UV, 214 nm
 injection 10 μ L
 sample each 1 mg/mL except uracil, 2.5 mg/mL
 Application No. [G006125](#)

1. Thyroglobulin
2. Bovine serum albumin (BSA) dimer
3. Bovine serum albumin (BSA)
4. Ribonuclease A
5. Uracil



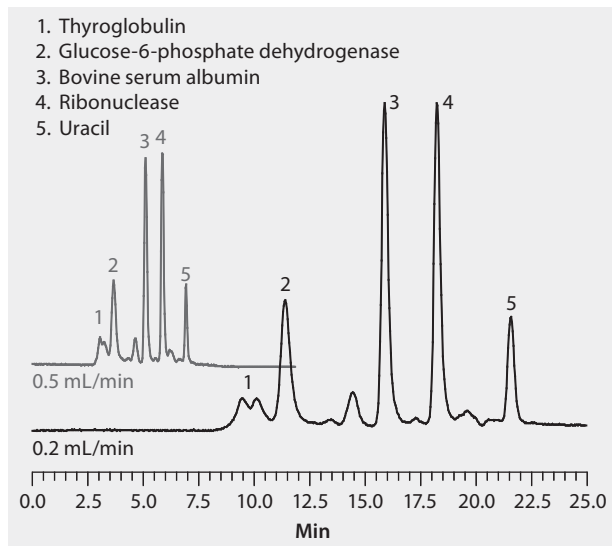
HPLC Analysis of Proteins by Size Exclusion on Zenix® SEC-300 Columns, Effect of Flow Rate (15 cm column)

column . . . Zenix SEC-300, 15 cm x 7.8 mm I.D., 3 µm, 300 Å particles (Z777030)
 mobile phase 150 mM sodium phosphate, pH 7
 flow rate as indicated on figure
 column temp. ambient
 detector UV, 214 nm
 injection 10 µL
 sample each 1 mg/mL except uracil, 2.5 mg/mL
 Application No. **G006127**



HPLC Analysis of Proteins by Size Exclusion on Zenix® SEC-300 Columns, Effect of Flow Rate (30 cm column)

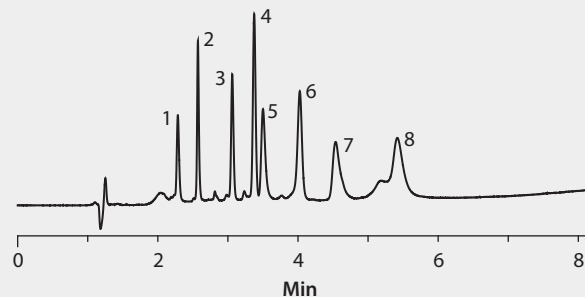
column . . . Zenix SEC-300, 30 cm x 4.6 mm I.D., 3 µm, 300 Å particles (Z777028)
mobile phase 150 mM potassium phosphate, pH 6.8
flow rate as indicated on figure
column temp. ambient
detector UV, 280 nm
injection 10 µL
sample each 1 mg/mL except uracil, 2.5 mg/mL
Application No. **G006128**



HPLC Analysis of Proteins on Ascentis® Express Peptide ES-C18

column Ascentis Express Peptide ES-C18, 15 cm x 2.1 mm I.D.,
2.7 µm particles (53307-U)
mobile phase (A) 75:25, 0.1% TFA in water: 0.08% TFA in acetonitrile;
(B) 25:75, 0.1% TFA in water: 0.08% TFA in acetonitrile
gradient held at 0% B for 0.5 min; 0 to 100% B in 7 min
flow rate 0.3 mL/min
pressure 4743 psi (327 bar)
column temp. 35 °C
detector UV, 220 nm
injection 1 µL
sample 0.2 - 0.6 g/L in mobile phase A
Application No. [G005724](#)

1. Ribonuclease, 13.7 kDa
2. Adrenomedullin, 5.73 kDa
3. Cytochrome c, 12.2 kDa
4. Lysozyme, 14.3 kDa
5. Superoxide dismutase, 32.5 kDa
6. Soybean trypsin inhibitor, 20.1 kDa
7. Carbonic anhydrase, 29.0 kDa
8. Ovalbumin, 44.3 kDa

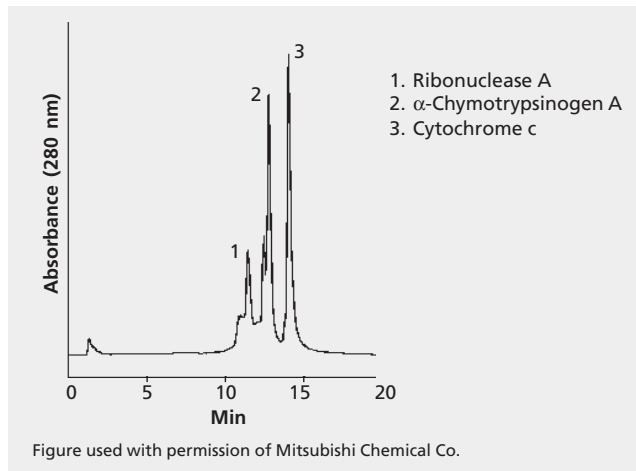


HPLC Analysis of Proteins on Discovery® BIO PolyMA-SCX (Analyte Set #2)

Proteins, mixture

The large pore diameter of Discovery BIO PolyMA-SCX and PolyMA-WAX particles allows full access to small peptides and very large proteins and protein aggregates. This Figure shows the power of ion-exchange to resolve proteins with very little difference in molecular weight, an advantage over size-exclusion separations.

column . . . Discovery BIO PolyMA-SCX, 5 cm x 4.6 mm, 5 µm particles (59601-U)
 mobile phase (A) 20 mM sodium phosphate, pH 7.0;
 (B) 20 mM sodium phosphate, 0.5 M NaCl, pH 7.0;
 5 to 100% B in 15 min. (linear)
 flow rate 0.5 mL/min
 injection 10 µg trypsin inhibitor, 5 µg conalbumin, myoglobin or
 10 µg ribonuclease A, 5 µg cytochrome c, a-chymotrypsinogen A
 detector UV, 280 nm
 Application No. [796-0658](#)



HPLC Analysis of Proteins on Discovery® BIO PolyMA-WAX (Analyte Set #1)

The large pore diameter of Discovery BIO PolyMA-SCX and PolyMA-WAX particles allows full access to small peptides and very large proteins and protein aggregates. This Figure shows the separation of proteins that vary from 18 to 80 kDA.

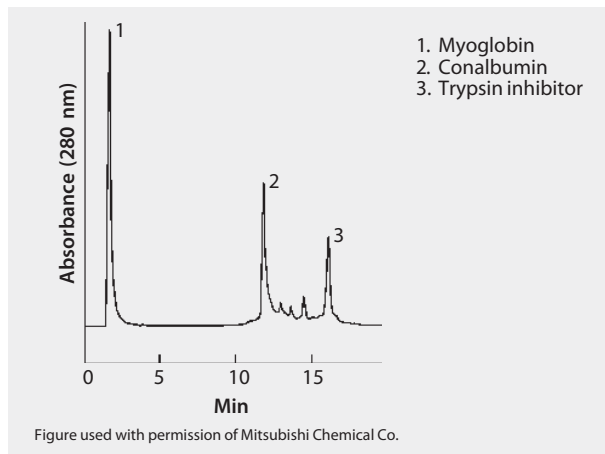
column . . . Discovery BIO PolyMA-WAX, 5 cm x 4.6 mm, 5 µm particles (59602-U)
mobile phase (A) 10 mM Tris, pH 8.0 with HCl; (B) 10 mM Tris,
0.5 M NaCl, pH 8.0 with HCl; 5 to 100% B in 15 min. (linear)

flow rate 0.5 mL/min

detector UV, 280 nm

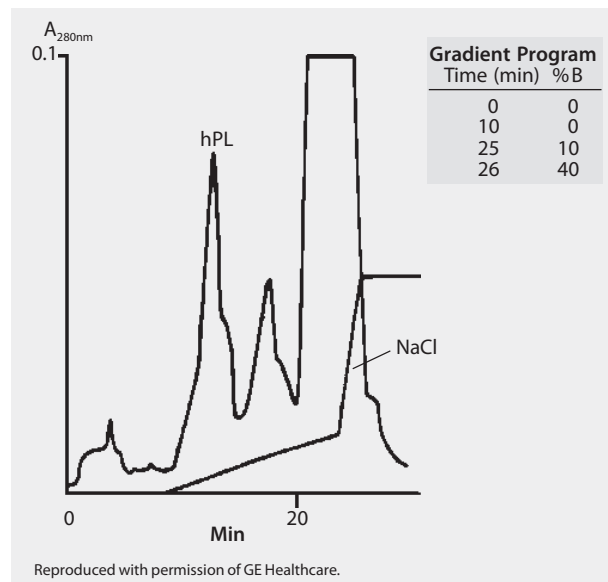
injection 10 µg trypsin inhibitor, 5 µg conalbumin, myoglobin or
10 µg ribonuclease A, 5 µg cytochrome c, a-chymotrypsinogen A

Application No. [796-0657](#)



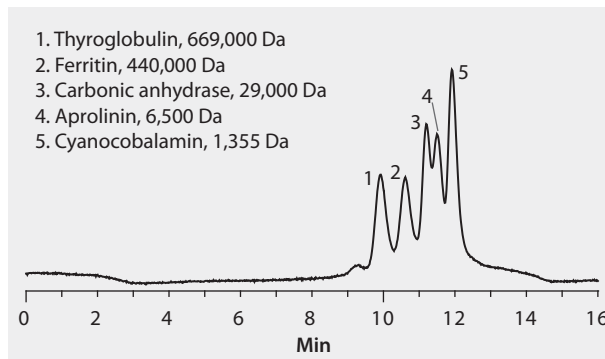
HPLC Analysis of Proteins on Mono Q HR 5/5

column Mono Q HR 5/5, 10 μm particles (54807)
mobile phase (A): 20 mM bis-Tris, pH 6.0; (B): A + 1M NaCl
flow rate 1.0 mL/min
detector UV, 280 nm
injection 2.5 mL
sample human placental lactogen fraction from size exclusion medium
Application No. [794-0421](#)



HPLC Analysis of Proteins on SRT® SEC-1000, 30 cm x 7.8 mm I.D., 5 µm particles

column SRT® SEC-1000, 30 cm x 7.8 mm I.D., 5 µm particles (Z777063)
mobile phase 150 mM potassium phosphate monobasic, pH 7.0
flow rate 1.0 mL/min
column temp. 25 °C
detector UV, 280 nm
injection 10 µL
sample 1-10 g/L in buffer
Application No. **G005726**



HPLC Analysis of Proteins on Antibodix® WCX-NP10, Comparison of WCX Columns

column . . . Antibodix WCX-NP10, 25 cm x 4.6 mm I.D., 10 µm particles (Z777272)
mobile phase . . . (A) 10 mM sodium phosphate buffer, pH 6.0; (B) A + 1.0 M NaCl
gradient 0 to 100% B in 42 min
flow rate 1.0 mL/min
column temp. ambient
detector UV, 214 nm
injection 5 µL
sample 1 mg/mL each
Application No. **G005946**

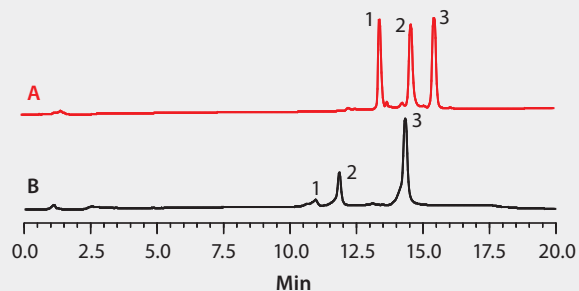
A. Antibodix WCX-NP10

25 cm × 4.6 mm I.D., 10 µm (non-porous)

B. Vendor D WCX

25 cm × 4.0 mm I.D., 10 µm (non-porous)

1. Cytochrome c (12.2 kDa)
2. Lysozyme (14.3 kDa)
3. Ribonuclease A (13.7 kDa)



HPLC Analysis of Proteins (2) on BIOshell™ A400 Protein C4

This application demonstrates the utility of the BIOshell A400 Protein C4 column for the reversed-phase chromatography of proteins from a variety of sources and of different molecular weights.

sample protein mixture, g/L ea: superoxide dismutase, 0.3; bovine serum albumin, 0.3; alpha-lactalbumin, 0.2; beta-lactoglobulin A, 0.3; catalase, 0.3; (carbonic anhydrase, 0.3; beta-Amylase, 1.0; glucose-6-phosphate dehydrogenase, 1.0; thioredoxin, 0.3; phosphorylase b, 2.5.)

column . . . BIOshell A400 Protein C4, 10 cm X 2.1 mm I.D., 3.4 µm particles (66825-U)

mobile phase (A) 75:25, [0.1% TFA in water]:[0.1% TFA in acetonitrile] ;
(B) 25:75, [0.1% TFA in water]:[0.1% TFA in acetonitrile]

gradient 15 to 75% B in 10 min

flow rate 0.3 mL/min

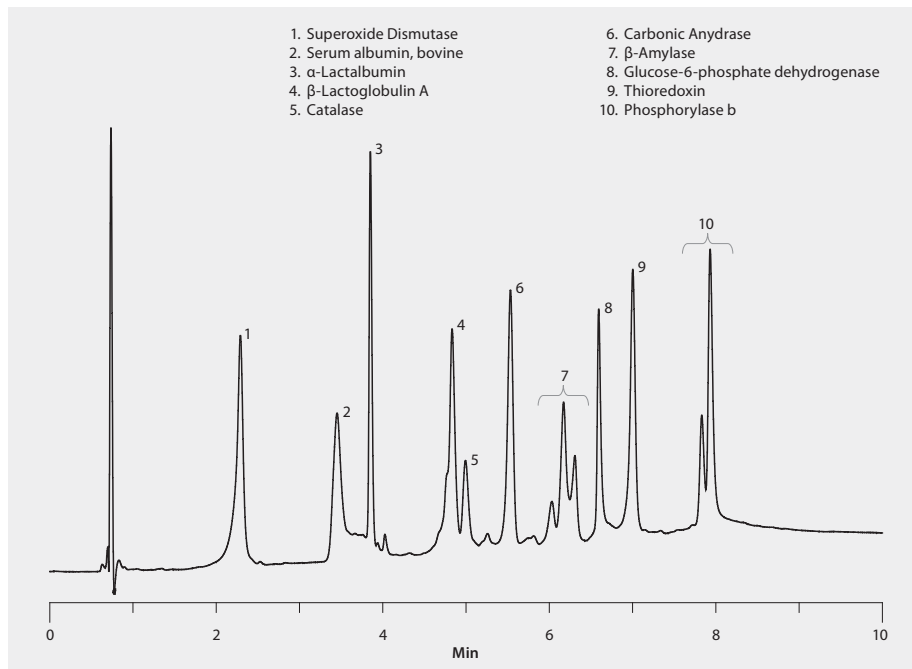
pressure 2410 psi (166 bar)

column temp. 30 °C

detector UV, 215 nm

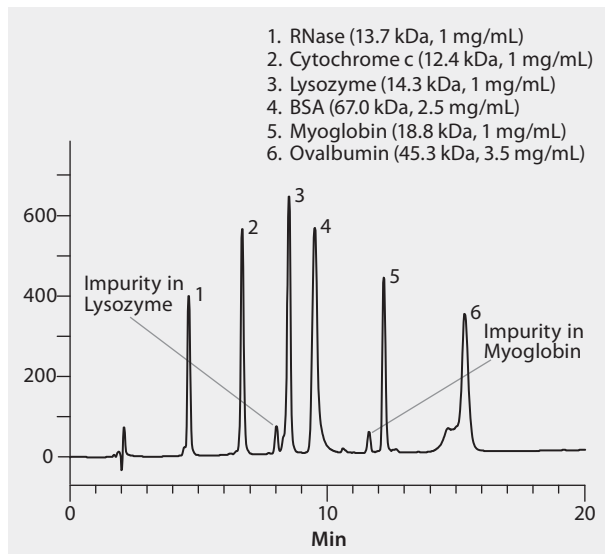
injection 1.0 µL

Application No. **G006236**



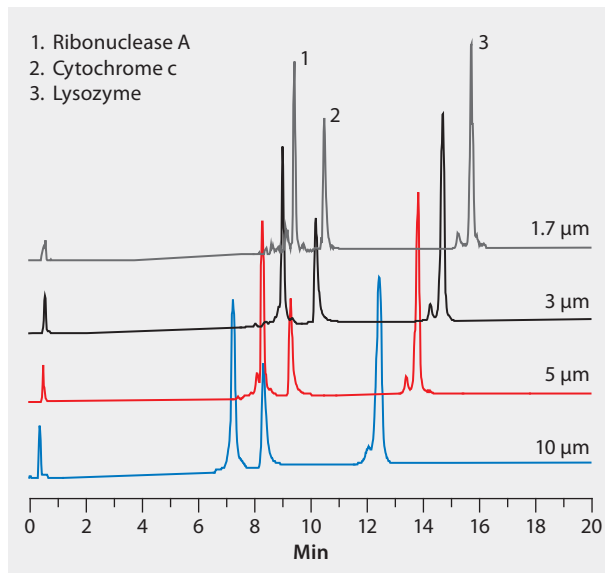
HPLC Analysis of Proteins on Discovery® BIO Wide Pore C5

column Discovery BIO Wide Pore C5, 15 cm × 4.6 mm I.D.,
5 μm particles (568422-U)
mobile phase . . . (A) (0.1% TFA in water): (B) (0.1% TFA in CH₃CN); (75:25, A:B)
gradient 0-100% B in 25 min
flow rate 1 mL/min
column temp. ambient
detector UV, 220 nm
injection 12 μL in 0.1% TFA
Application No. **G001488B**



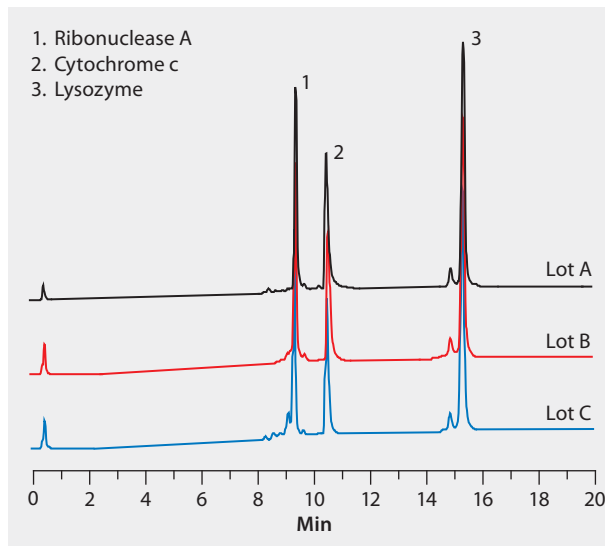
HPLC Analysis of Proteins on Proteomix® SCX Columns, Effect of Particle Size of Resolution

column . . . Proteomix SCX-NP1.7, 5 cm x 4.6 mm I.D., 1.7 μm particles (Z777146)
column Proteomix SCX-NP3, 5 cm x 4.6 mm I.D., 3 μm particles (Z777151)
mobile phase . . . (A) 20 mM sodium phosphate buffer, pH 6.0, (B) A + 1.0 M NaCl
gradient 0–25 min from 0–75% B, 15 min prewash
flow rate 0.75 mL/min
column temp. Ambient
detector 214 nm
injection 5 μL
sample each 1 mg/mL
Application No. **G006134**



HPLC Analysis of Proteins on Proteomix® SCX-NP1.7, Demonstration of Lot-to-Lot Reproducibility

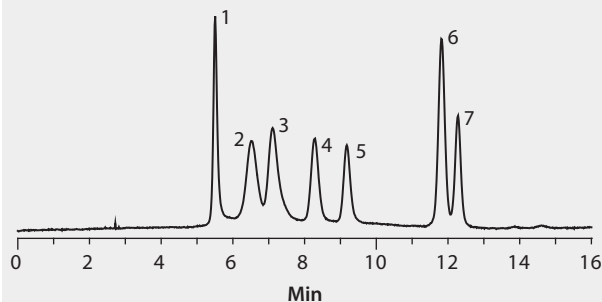
column . . . Proteomix SCX-NP1.7, 5 cm x 4.6 mm I.D., 1.7 µm particles (Z777146)
mobile phase . . . (A) 20 mM sodium phosphate buffer, pH 6.0, (B) A + 1.0 M NaCl
gradient 0 - 75% B in 25 min, 15 min prewash
flow rate 0.75 mL/min
column temp. ambient
detector UV, 214 nm
injection 5 µL
sample 1 mg/mL each compound
Application No. **G006136**



HPLC Analysis of Proteins on SRT® SEC-150, 30 cm x 7.8 mm I.D., 5 µm particles

column SRT® SEC-150, 30 cm x 7.8 mm I.D., 5 µm particles (Z777045)
mobile phase 150 mM potassium phosphate, pH 7.0
flow rate 1.0 mL/min
column temp. 25 °C
detector UV, 280 nm
injection 10 µL
sample 1-10 g/L in buffer
Application No. **G005728**

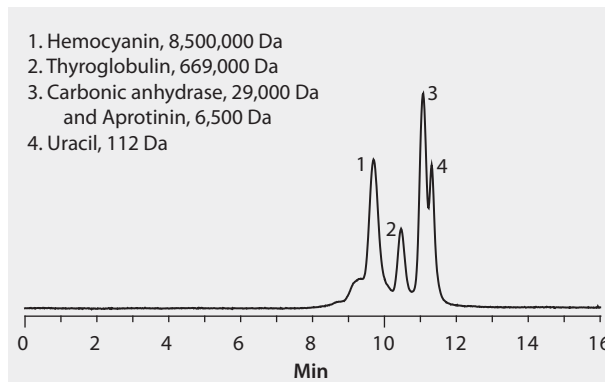
1. Thyroglobulin, 669,000 Da
2. Alcohol dehydrogenase, 150,000 Da
3. Albumin, 66,000 Da
4. Carbonic anhydrase, 29,000 Da
5. Aprotinin, 6,500 Da
6. Cyanocobalamin, 1,355 Da
7. p-Aminobenzoic acid, 137 Da



HPLC Analysis of Proteins on SRT® SEC-2000, 30 cm x 7.8 mm I.D.

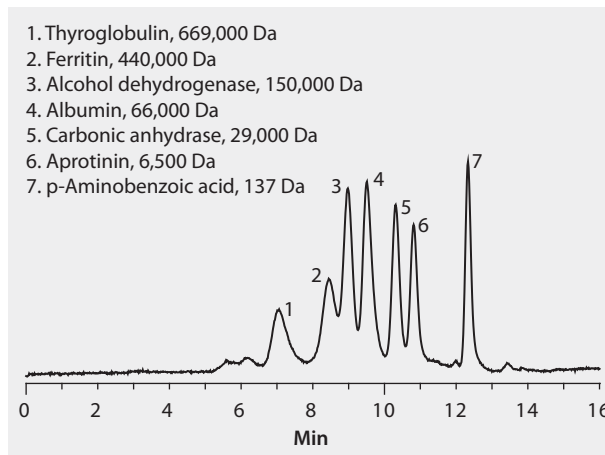
This application demonstrates the suitability of Discovery BIO GFC100 for the separation of proteins. Separation is by inclusion into the pore volume with larger molecules being excluded and therefore eluting earlier.

column SRT® SEC-2000, 30 cm x 7.8 mm I.D., 5 µm particles (Z777069)
mobile phase 150 mM potassium phosphate monobasic, pH 7.0
flow rate 1.0 mL/min
column temp. 25 °C
detector UV, 280 nm
injection 10 µL
sample 1- 10 g/L in buffer
Application No. [G005729](#)



HPLC Analysis of Proteins on SRT® SEC-300, 30 cm x 7.8 mm I.D., 5 µm

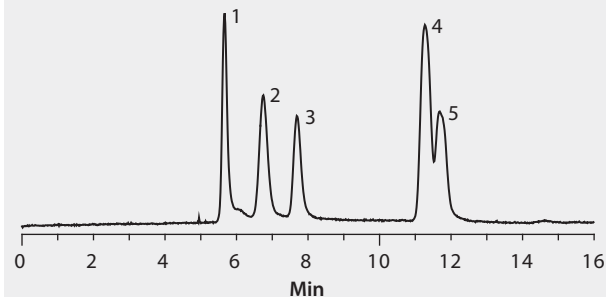
column SRT® SEC-300, 30 cm x 7.8 mm I.D., 5 µm particles (Z777059)
mobile phase 150 mM potassium phosphate monobasic, pH 7.0
flow rate 1.0 mL/min
column temp. 25 °C
detector UV, 280 nm
injection 10 µL
sample 1-10 g/L in buffer
Application No. **G005730**



HPLC Analysis of Proteins on SRT® SEC-300, 30 cm x 7.8 mm I.D., 5 µm particles

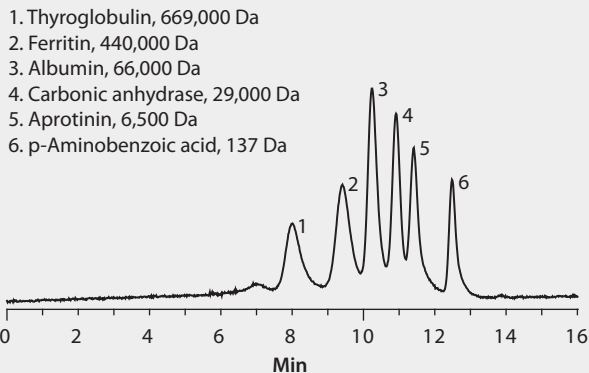
column SRT® SEC-300, 30 cm x 7.8 mm I.D., 5 µm particles (Z777051)
mobile phase 150 mM potassium phosphate, pH 7.0
flow rate 1.0 mL/min
column temp. 25 °C
detector UV, 280 nm
injection 10 µL
sample 1-10 g/L in buffer
Application No. [G005725](#)

1. Thyroglobulin, 669,000 Da
2. Carbonic anhydrase, 29,000 Da
3. Aprotinin, 6,500 Da
4. Cyanocobalamin, 1,355 Da
5. p-Aminobenzoic acid, 137 Da



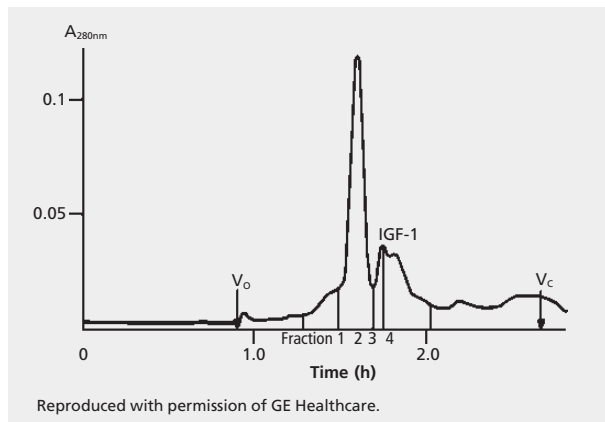
HPLC Analysis of Proteins on SRT® SEC-500, 30 cm x 7.8 mm I.D.

column SRT® SEC-500, 30 cm x 7.8 mm I.D., 5 µm particles (Z777057)
mobile phase 150 mM potassium phosphate monobasic, pH 7.0
flow rate 1.0 mL/min
column temp. 25 °C
detector UV, 280 nm
injection 10 µL
sample 1-10 g/L in buffer
Application No. **G005733**



HPLC Analysis of Proteins on Superdex® Gel Filtration column

column HiLoad 16/60 Superdex® 75 prep grade (54802-U)
mobile phase 0.15M ammonium acetate, pH 6.0
flow rate 0.75 mL/min
detector UV, 280 nm
sample IGF-1, ZZ fusion protein and impurities
Application No. [794-0420](#)



HPLC Analysis of Proteins on TSKgel® Butyl-NPR

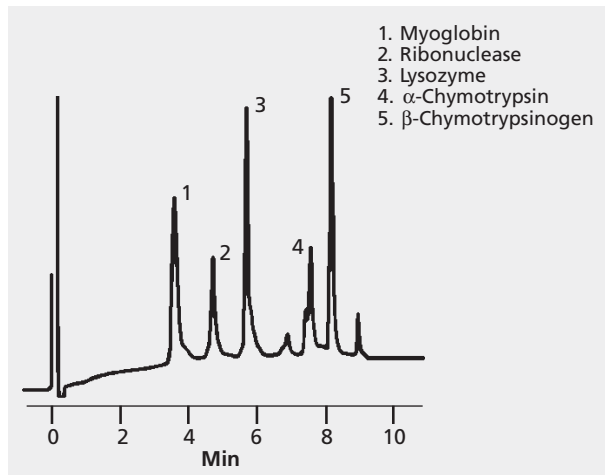
column TSKgel Butyl-NPR, 3.5 cm × 4.6 mm I.D., 2.5 μm particles (814947)

mobile phase (A) 0.1 M phosphate buffer, pH 7.0 plus ammonium sulfate,
2.3 M to 0 M in 12 min (B & C) = 0.1 M phosphate buffer,
pH 7.0 plus ammonium sulfate, 1.8 M to 0 M in 60 min

flow rate 1 mL/min

detector UV, 280 nm

Application No. 713-1025



HPLC Analysis of Proteins on TSKgel® Ether-5PW

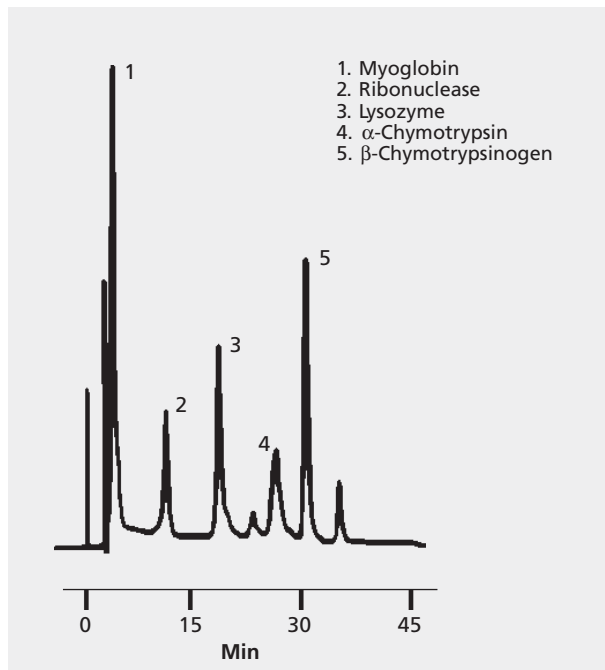
Proteins, mixture

column TSKgel Ether-5PW, 7.5 cm × 7.5 mm I.D., 10 μm particles (808641)
mobile phase 0.1 M phosphate buffer, pH 7.0 plus ammonium sulfate,
1.8 M to 0 M in 60 min

flow rate 1 mL/min

detector UV, 280 nm

Application No. **713-1027**



HPLC Analysis of Proteins on TSKgel® Phenyl-5PW

Proteins, mixture

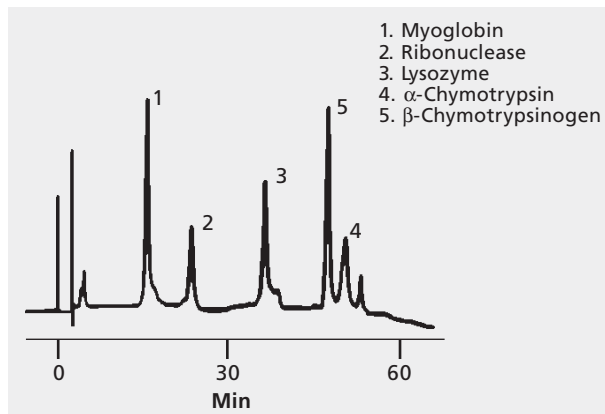
column TSKgel Phenyl-5PW, 7.5 cm × 7.5 mm I.D., 10 μm particles (807573)

mobile phase 0.1 M phosphate buffer, pH 7.0 plus ammonium sulfate,
1.8 M to 0 M in 60 min

flow rate 1 mL/min

detector UV, 280 nm

Application No. 713-1026



HPLC Analysis of Proteins on Zenix® SEC-300, 30 cm x 4.6 mm I.D., 3 µm

This application demonstrates the suitability of Discovery BIO GFC300 for the separation of proteins. Separation is by inclusion into the pore volume with larger molecules being excluded and therefore eluting earlier.

column Zenix® SEC-300, 30 cm x 4.6 mm I.D., 3 µm particles (Z777033)

mobile phase 150 mM potassium phosphate monobasic,
pH 7.0 (adjusted with potassium hydroxide)

flow rate 0.25 mL/min

pressure 652 psi (45 bar)

column temp. 25 °C

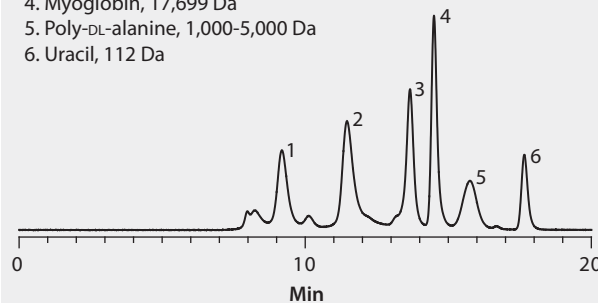
detector UV, 214 nm

injection 1 µL

sample 1 g/L each (except uracil, 0.1 g/L) in mobile phase

Application No. [G005732](#)

1. Thyroglobulin, 669,000 Da
2. γ-Globulins, ~300,000 Da
3. Ovalbumin, 44,281 Da
4. Myoglobin, 17,699 Da
5. Poly-DL-alanine, 1,000-5,000 Da
6. Uracil, 112 Da



HPLC Analysis of Proteins on Zenix® SEC-300, 30 cm x 7.8 mm I.D., 3 µm

This application demonstrates the suitability of Discovery BIO GFC300 for the separation of proteins. Separation is by inclusion into the pore volume with larger molecules being excluded and therefore eluting earlier.

column Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777033)

mobile phase 150 mM potassium phosphate monobasic,
pH 7.0 (adjusted with potassium hydroxide)

flow rate 0.7 mL/min

pressure 812 psi (56 bar)

column temp. 25 °C

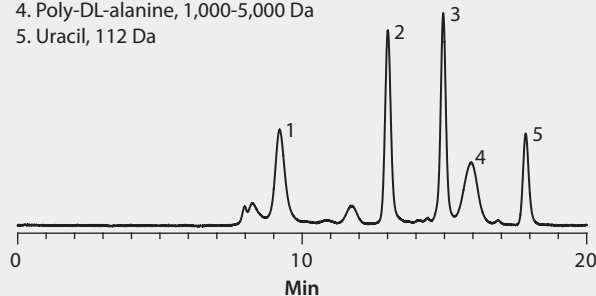
detector UV, 214 nm

injection 1 µL

sample 1 g/L each (except uracil, 0.1 g/L) in mobile phase

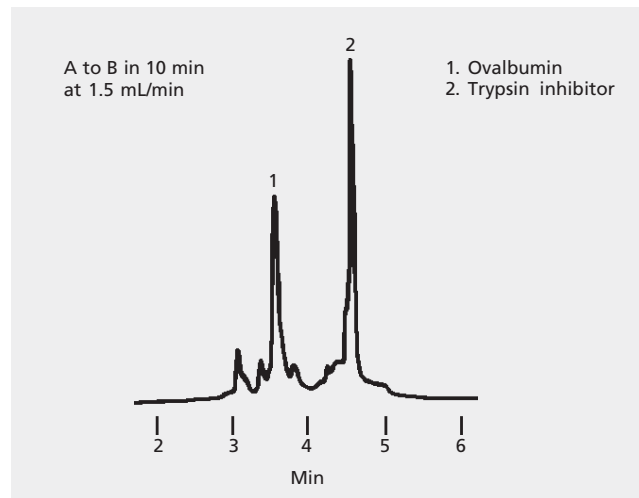
Application No. **G005731**

1. Thyroglobulin, 669,000 Da
2. BSA (bovine serum albumin), 66,463 Da
3. Ribonuclease A, 13,700 Da
4. Poly-DL-alanine, 1,000-5,000 Da
5. Uracil, 112 Da



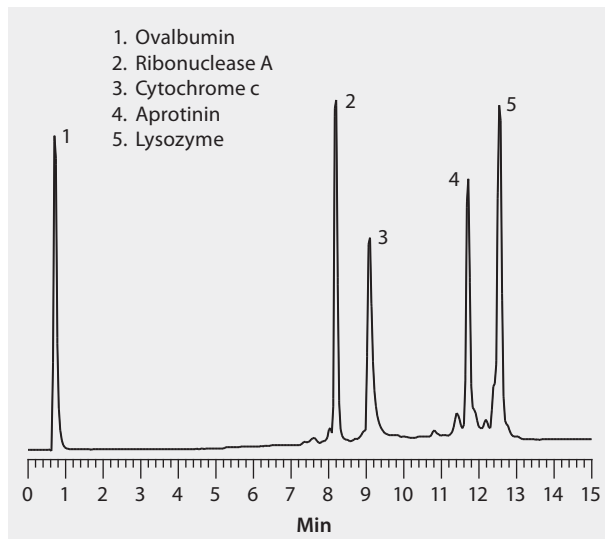
HPLC Analysis of Proteins on TSKgel® DEAE-NP

column TSKgel DEAE-NPR, 3.5 cm × 4.6 mm I.D., 2.5 µm particles (813075)
mobile phase . . . (A) 20 mM Tris-HCl buffer, pH 8.0; (B) 0.5 M sodium chloride in A
detector UV, 280 nm
Application No. [713-1020](#)



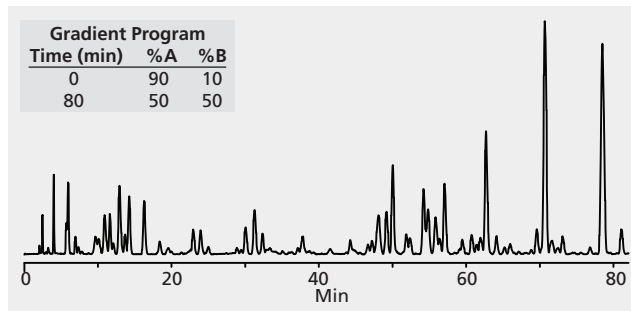
HPLC Analysis of Proteins with Different pI Values on Proteomix® SCX-NP3

column Proteomix SCX-NP3, 5 cm x 4.6 mm I.D., 3 µm particles (Z777151)
mobile phase (A) 10 mM sodium phosphate, pH 6.0; (B) A + 1 M NaCl
gradient 0 to 100% B in 15 min
flow rate 0.5 mL/min
detector UV, 280 nm
Application No. **G006146**



HPLC Analysis of Protein Tryptic Digest on Ascentis® RP-Amide

column . . . Ascentis RP-Amide, 25 cm x 2.1 mm I.D., 5 µm particles (565306-U)
 mobile phase . . . (A) (50:50) 50 mM formic acid titrated with acetate (pH 3.0):water;
 (B) (50:50) 50 mM formic acid titrated with acetate (pH 3.0):acetonitrile
 flow rate 0.2 mL/min
 column temp. ambient
 detector ESI (+)
 injection 4 µL
 sample tryptic digest of carboxymethylated protein
 mixture 1.5 g/L in 50 mM formic acid
 Application No. **G002670**



HPLC Analysis of Pullulan on an SRT® SEC-300 Gel Filtration Column

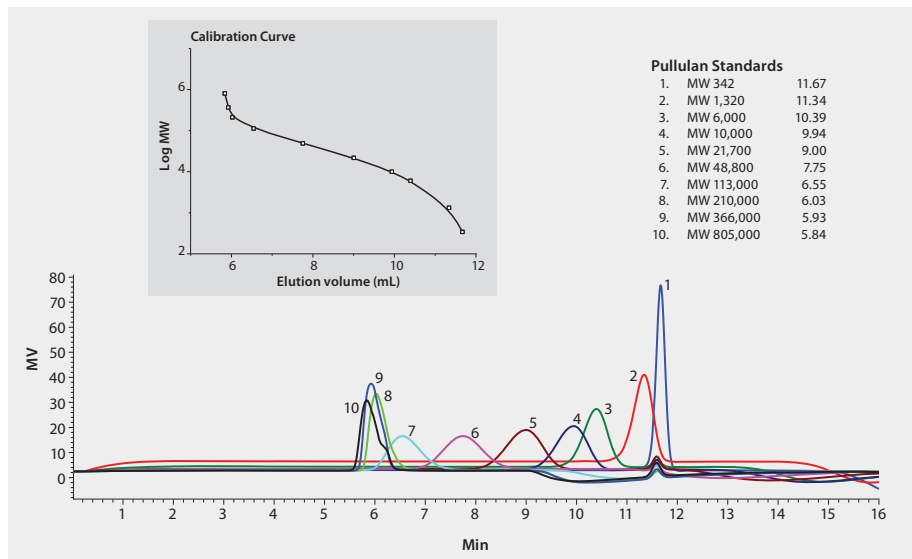
Pullulan is a water-soluble polysaccharide polymer consisting of glucan units. Pullulan is used in the manufacture of edible films that are used in breath fresheners and mints and is also used as a food additive. Another use of pullulan is as calibration standards in gel filtration chromatography.

Gel filtration chromatography (GFC) is used to determine the molecular mass composition of pullulan and many other water-soluble polymers using silica- or polymer-based particles that have been modified with a chemically bonded hydrophilic coating.

In this particular example, a SRT SEC-300 column from Sepax Technologies was used to analyze several pullulan standards. In the accompanying table shows retention volumes for the pullulan standards and the molecular mass of each; this data was then used to construct the calibration curve which allows the calculation of the molecular mass and distribution of an unknown pullulan polymer or other polymers of similar geometrical shape.

column SRT SEC-300, 30 cm x 7.8 mm I.D., 5 μ m, 300 Å (Z777051)
 mobile phase 150 mM phosphate Buffer, pH 7.0
 flow rate 1.0 mL/min
 pressure 600 psi (41.4 bar)
 column temp. 25 °C
 detector RI (30° C)
 injection 20 μ L
 sample 10 mg/mL in mobile phase 0.342 kD, 1.32 kD, 6 kD, 10 kD, 21.7 kD,
 48.8 kD 113 kD, 210 kD, 366 kD and 805 kD

Application No. **G006202**



HPLC Analysis of Recombinant Tumor Necrosis Factor Receptor-Fc Fusion Protein (rhTNFR-Fc) on Zenix® SEC-300 versus SRT® SEC-300, Effect of Particle Size on Resolution

column Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm,
300 Å particles (Z777051)

column SRT SEC-300, 30 cm x 7.8 mm I.D., 5 µm,
300 Å particles (Z777051) (Z777033)

mobile phase 150 mM sodium phosphate, pH 7.0

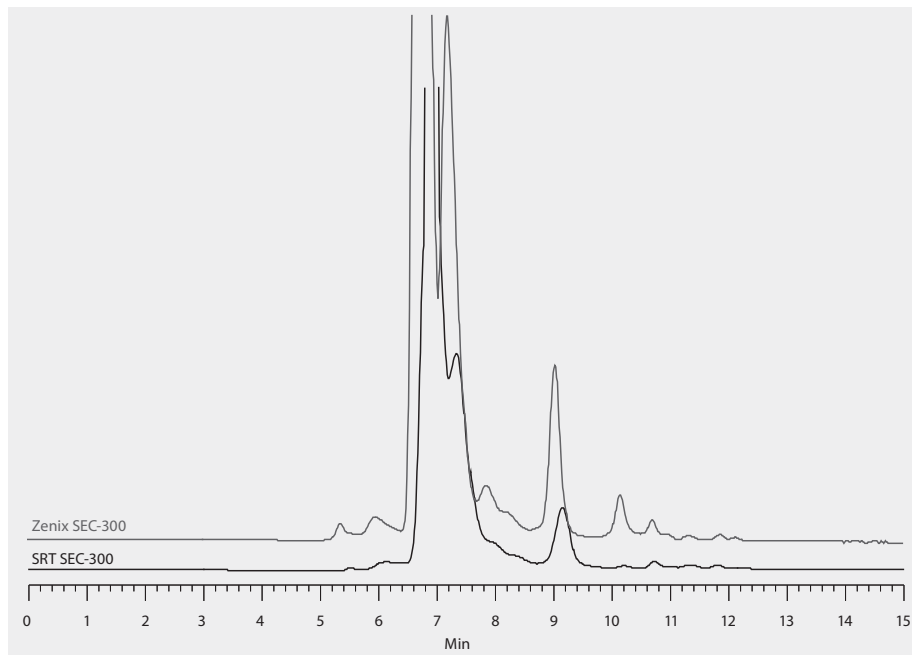
flow rate 1 mL/min

detector UV, 214 nm

injection 20 µL

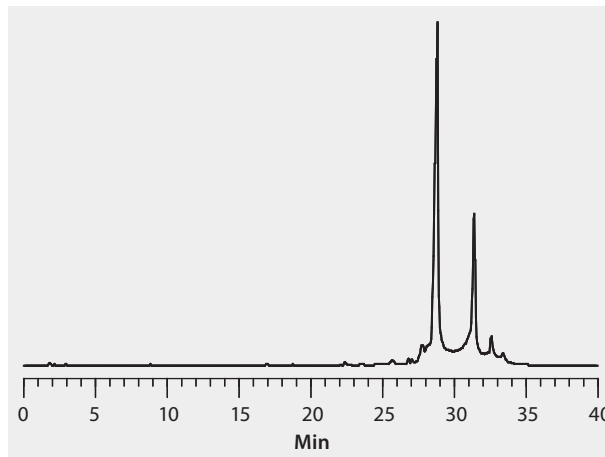
sample Recombinant tumor necrosis factor receptor-Fc fusion
protein (rhTNFR-Fc), including oligomers (440 kD and 360 kD),
monomer (150 kD), and impurity (120 kD)

Application No. **G006121**



HPLC Analysis of RNA on Proteomix® WAX-NP5

column . . . Proteomix WAX-NP5, 15 cm x 4.6 mm I.D., 5 µm particles (Z777262)
mobile phase (A) 20 mmol Tris, pH 6.0; (B): A + 1.0 M NaCl
gradient 20%-100%B (40 min)
flow rate 0.6 mL/min
pressure 1015 psi (70 bar)
column temp. Ambient
detector UV, 260 nm
injection 5 µL
sample RNA
Application No. [G005967](#)



HPLC Analysis of RP Peptide Performance Standard on Discovery® BIO Wide Pore C18, No TFA

column Discovery BIO Wide Pore C18, 15 cm × 2.1 mm I.D.,
3 μm particles (567202-U)

mobile phase . . . (A) 25 mM formic acid in water; (B) (50:50) 25 mM formic acid in
water:20 mM formic acid in acetonitrile

flow rate 0.20 mL/min

column temp. ambient

detector +ESI

injection 1 μL

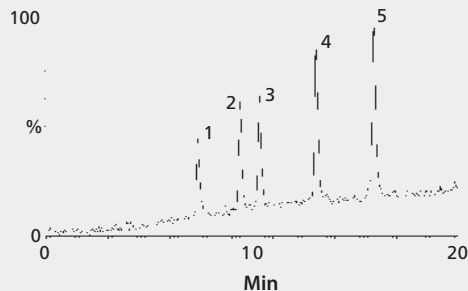
sample RP Peptide Performance Standard,
p/n RPS-P0010 (Alberta Peptide Institute)

Application No. [G001638A](#)

Peptide 1: RGAGGLGLGK-amide
Peptide 2: ac-RGGGGLGLGK-amide
Peptide 3: ac-RGAGGLGLGK-amide
Peptide 4: ac-RGVGGLGLGK-amide
Peptide 5: ac-RGVVGLGLGK-amide

Min	Gradient	
	%A	%B
0	90	10
20	50	50

0% TFA (25 mM formic acid), 1 μL injection



HPLC Analysis of Separation of Low MW Polysaccharides on SRT®

Achyranthes bidentata polysaccharides (ABPS) is extracted from the root of a Chinese medicinal herb. ABPS acts as an immune modulator. It is tested for use as a replacement of antibiotics added to feedstock to protect piglets from microorganisms. ABPS contains mainly fructose and glucose units. The chromatograms show that the smallest pore size column, SRT SEC-100, provides the largest number of peaks, which is not unexpected given the low molecular mass (< 10,000 Da) of the sample.

Note that since ABPS does not carry an electrical charge, a 15 mM buffer concentration is sufficient to prevent interaction of the sample with the underlying silica surface.

column SRT SEC-100 30 cm x 4.6 mm I.D., 5 µm particles, 100 Å (Z777037)

column SRT SEC-150 30 cm x 4.6 mm I.D., 5 µm particles, 150 Å (Z777043)

mobile phase 0.15 M phosphate buffer, pH 7

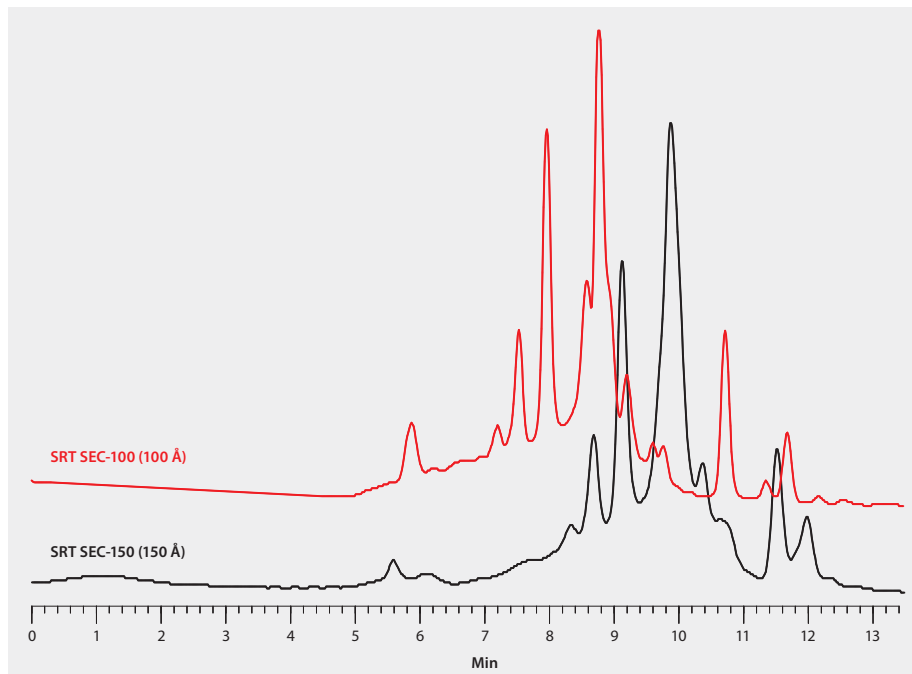
flow rate 0.35 mL/min

detector UV, 214 nm

injection 10 µL

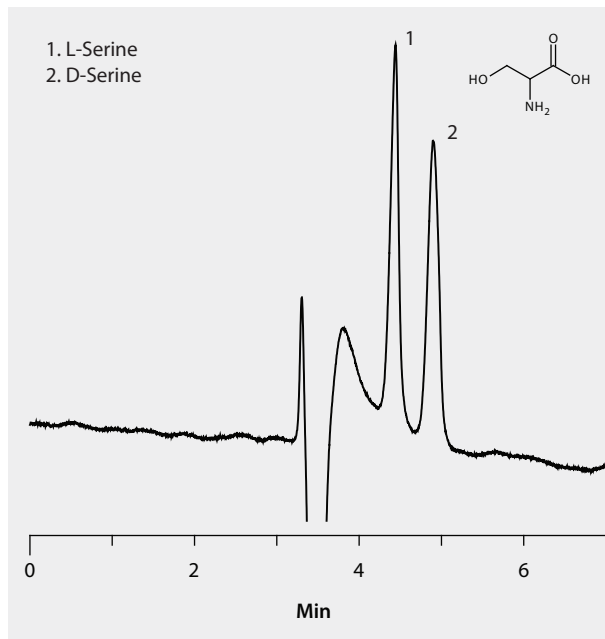
sample *Achyranthes bidentata* polysaccharides (ABPS)
from plant root extract (MW < 10,000)

Application No. **G006207**



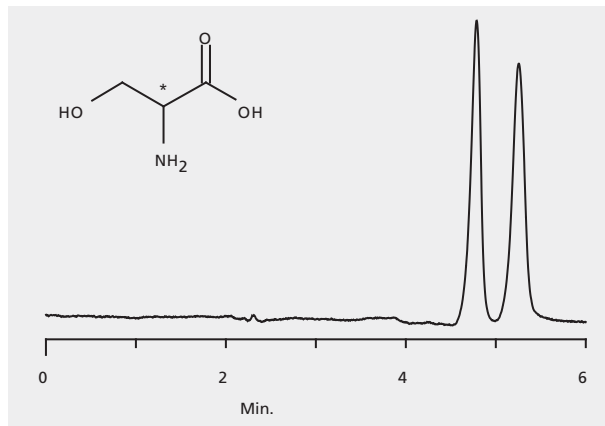
HPLC Analysis of Serine Enantiomers on Astec® CHIROBIOTIC® T (Formic Acid Mobile Phase Additive)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (30:70:0.02, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 300 µg /mL in 30:70 water:methanol
Application No. [G005344](#)



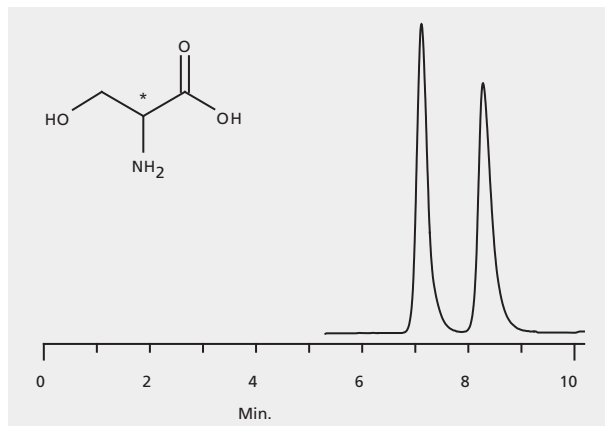
HPLC Analysis of Serine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (50:50, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 205 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004513**



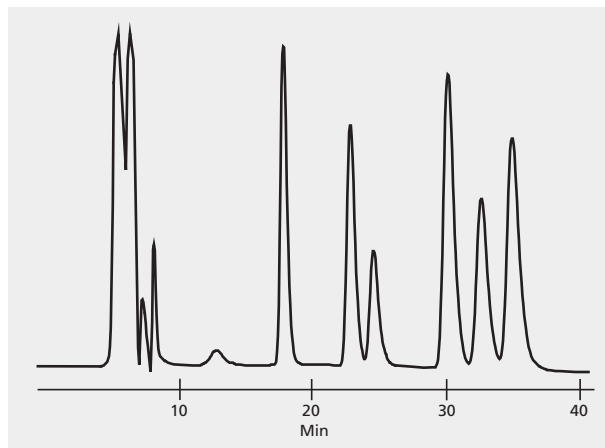
HPLC Analysis of Serine Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase (A) water; (B) acetonitrile; (70:30, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 210 nm
injection 5 µL
sample 10 mg/mL in methanol
Application No. [G004614](#)



HPLC Analysis of Six Enkephalin Peptides (Chiral and Achiral) on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase . . . (A) 5 mM ammonium formate, pH 3.3; (B) acetonitrile; (25:75, A:B)
flow rate 0.5 mL/min
detector UV, 230 nm
Application No. **G004738**



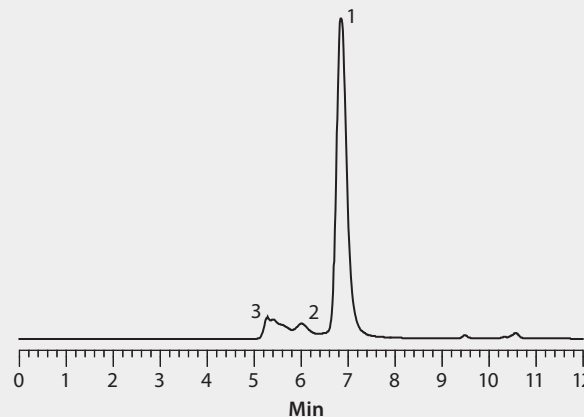
HPLC Analysis of Size Exclusion Separation of Proteins and PEGylated Proteins

Pegylation of biotherapeutic drugs improves solubility, increases half life in the blood stream and reduces immunogenicity. Size exclusion chromatography (SEC) is often applied to characterize protein-polyethylene glycol (PEG) conjugates and establish the number of attached PEG chains, since SEC is a precise and robust technique that combines ease of set up and straightforward method development.

column . . . Zenix SEC-150, 30 cm x 7.8 mm I.D., 3 μ m particles, 150 \AA , (Z777018)
 mobile phase 150 mM phosphate buffer, pH 7.0
 flow rate 1.0 mL/min
 column temp. Ambient
 detector UV, 214 nm
 injection 20 μ L, 2.0 mg/mL
 sample 1. Protein with MW 70KD (from an undisclosed drug development company) 2. Protein 1 attached with 1 PEG (MW 40KD) molecule 3. Protein 1 attached with 2 PEG (MW 40KD) molecules

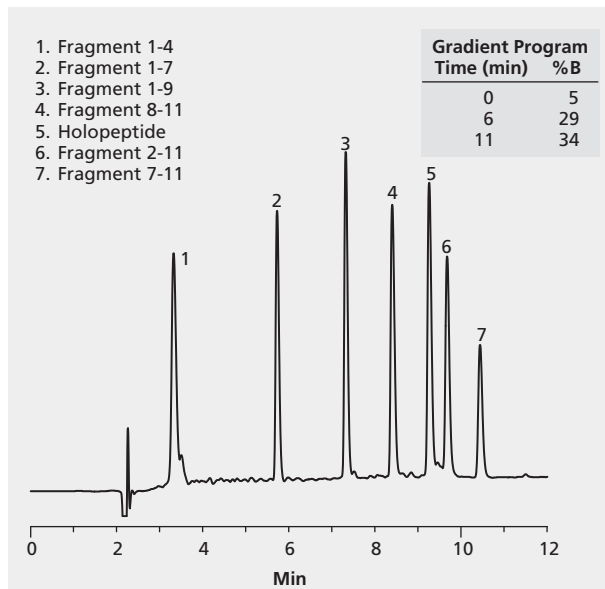
Application No. **G006197**

1. 70 kDa protein (undisclosed drug candidate)
2. 40 kDa PEG molecule attached to protein identified as peak 1
3. Two PEG molecules attached to protein identified as peak 1



HPLC Analysis of Substance P and Its Fragments on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase (A) water + 0.1% TFA; (B) acetonitrile + 0.1% TFA
gradient linear; 5-29%B (6 min); 29-34B (5 min)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
sample Substance P in initial mobile phase
Application No. [G000322](#)



HPLC Analysis of Superoxide Dismutase on Discovery® BIO PolyMA-WAX

Discovery BIO PolyMA-SCX and PolyMA-WAX columns give sharp, efficient peaks for a wide variety of proteins.

column . . . Discovery BIO PolyMA-WAX, 5 cm × 4.6 mm, 5 µm particles (59602-U)

mobile phase ((A) 20 mM Tris, pH 8.0 with hydrochloric acid;

(B) 20 mM Tris, 0.5 M sodium chloride,
pH 8.0 with hydrochloric acid)

gradient 0 to 10% B in 30 min. (linear)

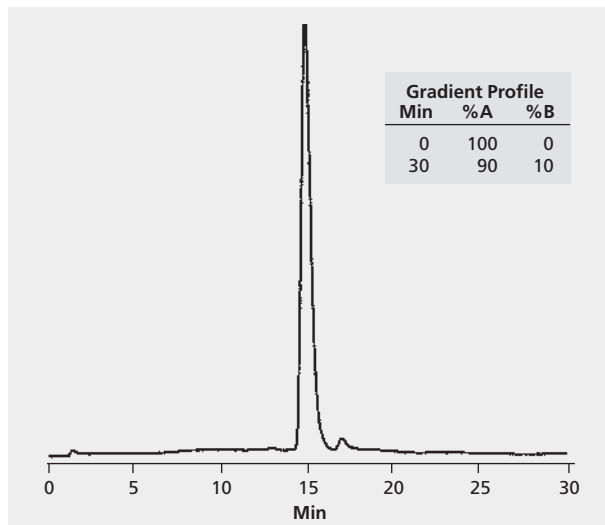
flow rate 0.5 mL/min

column temp. 25 °C

detector UV, 280 nm

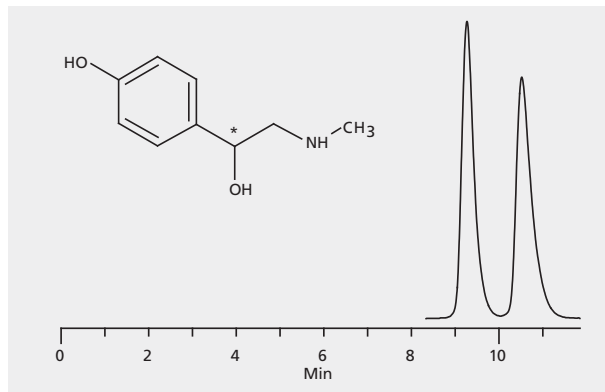
injection 10 µL

Application No. **G001835**



HPLC Analysis of Synephrine Enantiomers on Astec® CYCLOBOND® I 2000 AC

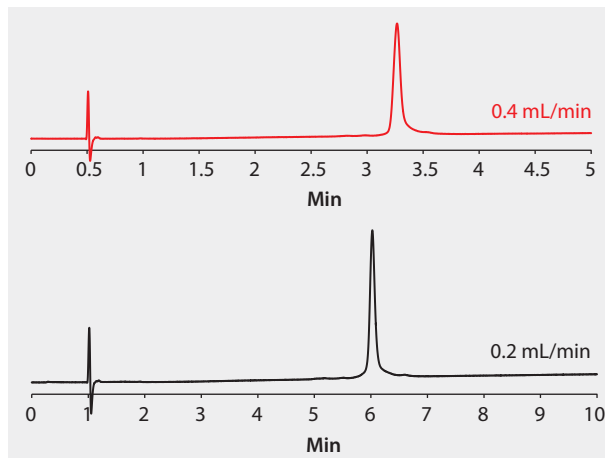
column . . . CYCLOBOND I 2000 AC, 25 cm x 4.6 mm I.D., 5 µm particles (20124AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (95:5, A:B)
flow rate 0.5 mL/min
column temp. 10 °C
detector UV, 254 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004695](#)



HPLC Analysis of the Monoclonal Antibody (mAb) Erbitux (Cetuximab) on BIOshell™ A400 Protein C4

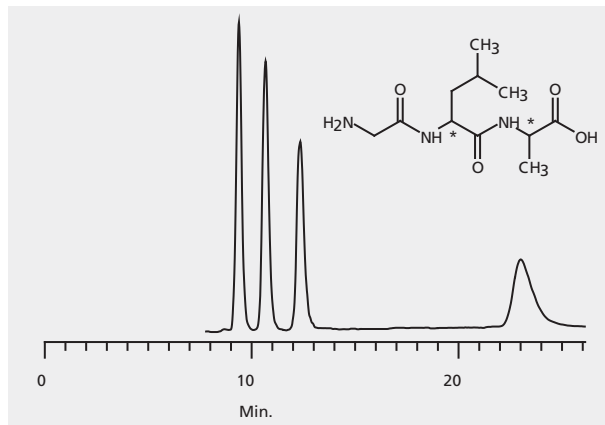
Antibodies can exhibit considerable hydrophobicity, and so efficient reversed-phase elution of this intact mAb requires the use of high temperature. The top chromatogram illustrates that BIOshell™ Fused-Core® columns can be operated at high flow rate while maintaining good peak shape at a reasonable back pressure.

column BIOshell™ A400 Protein C4, 10 cm X 2.1 mm I.D.,
3.4 µm particles (66825-U)
mobile phase (A) 80:20, 0.1% TFA in water: 0.1% TFA in acetonitrile;
(B) 20:80, 0.1% TFA in water: 0.1% TFA in acetonitrile
gradient 20 to 35%B in 10 min (or 5 min)
flow rate 0.2 mL/min
pressure 470 psi (or 940 psi)
column temp. 90 °C
detector UV, 215 nm
injection 0.4 µL
sample 1 g/L mAb in 20 mM Tricine/KOH, pH 7
Application No. [G006254](#)



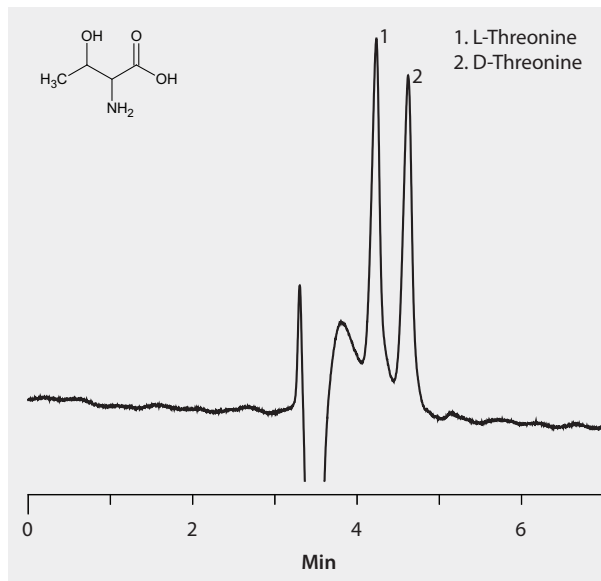
HPLC Analysis of the Peptide Glycine-Leucine-Alanine Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase . . . (A) 5 mM ammonium acetate, pH 4.1; (B) acetonitrile; (35:65, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. **G004617**



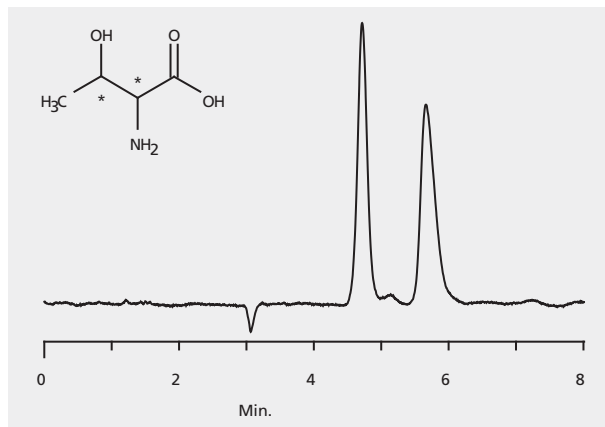
HPLC Analysis of Threonine Enantiomers on Astec® CHIROBIOTIC® T (Formic Acid Mobile Phase Additive)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A); water; (B) methanol; (C) formic acid; (30:70:0.02, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 300 µg /mL in 30:70 water:methanol
Application No. [G005345](#)



HPLC Analysis of Threonine Enantiomers on Astec® CHIROBIOTIC® T

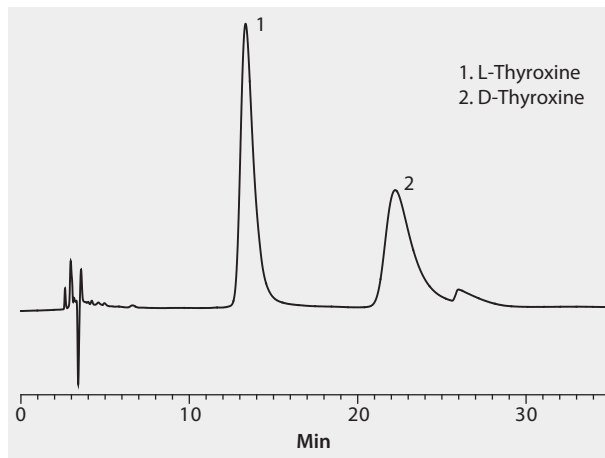
column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (30:70, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 205 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004517**



HPLC Analysis of Thyroxine Enantiomers on Astec® CHIROBIOTIC® TAG

Baseline resolution of the chiral enantiomers of DL-Thyroxine is achieved by polar ionic mode on the Astec CHIROBIOTIC TAG with the use of an LC/MS-compatible mobile phase.

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase 1% ammonium formate in methanol
flow rate 1 mL/min
pressure 826 psi (57 bar)
column temp. 25 °C
detector UV, 220 nm
injection 10 µL
sample each enantiomer 0.1 mg/L in methanol
Application No. **G005515**



HPLC Analysis of BIOshell™ A160 Peptide C18 and CN 5 µm Columns, Comparison of Different Phases

The availability of two distinct chemistries (C18 alkyl vs. CN) is helpful to check changes in elution order as we see for peaks # 5 and # 6 on the C18 and CN columns. As expected, peptide retention is shorter on the CN column, while peak shape is symmetrical and efficiency very high on both column types.

column . . . BIOshell A160 Peptide C18, 15 cm x 4.6 mm I.D., 5 µm particles (67015-U)

column . . . BIOshell A160 Peptide CN, 15 cm x 4.6 mm I.D., 5 µm particles (67081-U)

mobile phase (A): water/0.1% TFA (B): acetonitrile/0.1% TFA

gradient 5-50%B in 30 minutes

flow rate 1.0 mL/min

pressure 126 bar, 250 bar

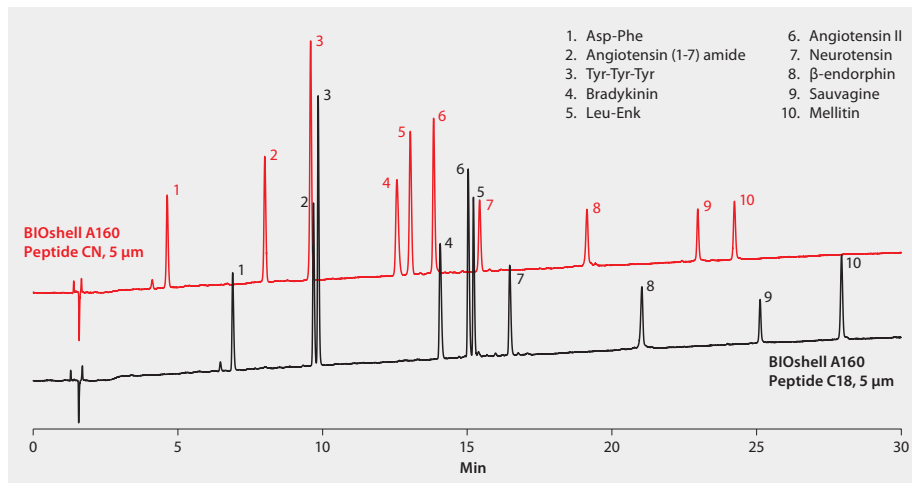
column temp. 40 °C

detector UV, 215 nm

injection 10 µL

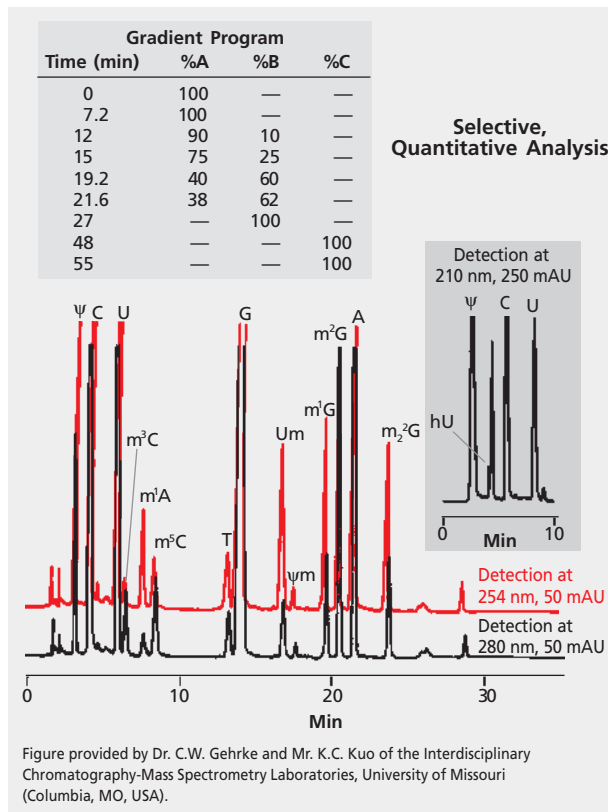
sample 0.01 mg/mL in water/0.1% TFA

Application No. **G006219**



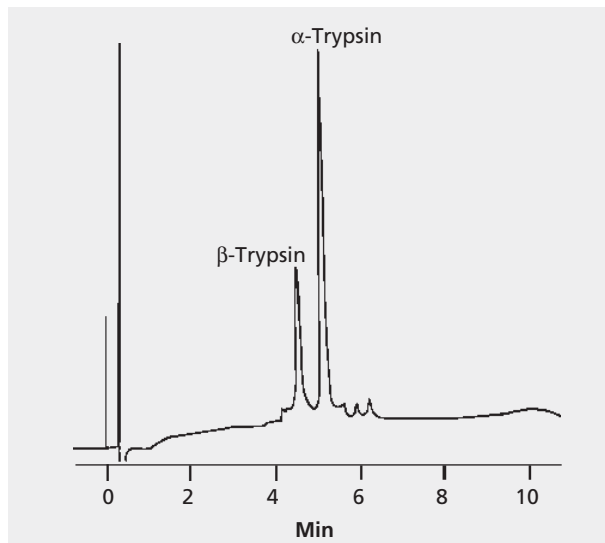
HPLC Analysis of tRNA Hydrolysate on SPELCOTM LC-18-S

column SPELCOTM LC-18-S, 15 cm × 4.6 mm I.D., 5 μm particles (58931)
 mobile phase . . . (A) 0.1M potassium phosphate, dibasic (pH 5.3):methanol, 97.5:2.5;
 (B) 0.01M potassium phosphate, dibasic (pH 5.1):methanol, 80:20; (C) 0.01M
 potassium phosphate, dibasic (pH 4.9):acetonitrile, 65:35
 flow rate 1 mL/min
 column temp. 26 °C
 detector UV, 210 nm, 254 nm, 280 nm
 injection 50 μL hydrolysate buffer (pH 7.8) containing
 5 μg bovine tRNA^{Leu} hydrolysate
 Application No. 713-0501



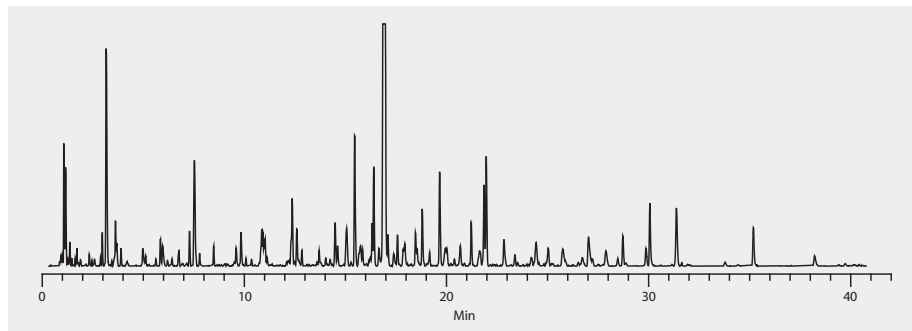
HPLC Analysis of Trypsin on TSKgel® Butyl-NPR

column TSKgel Butyl-NPR, 3.5 cm × 4.6 mm I.D., 2.5 μm particles (814947)
mobile phase 2 M to 0 M ammonium sulfate in 20 mM Tris-HCl buffer,
pH 7.5 in 10 min
flow rate 1 mL/min
detector UV, 280 nm
injection commercial trypsin sample
Application No. [713-1204](#)



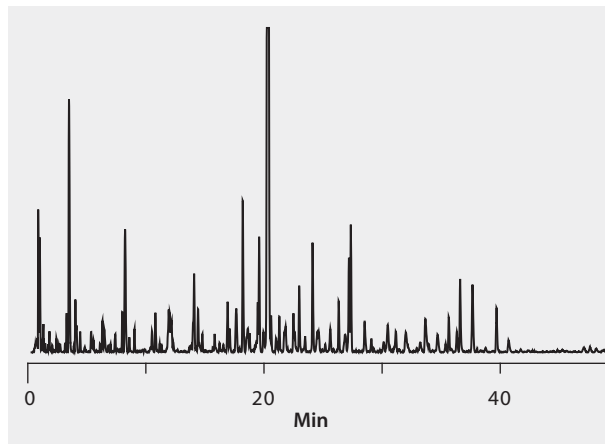
HPLC Analysis of Tryptic Digest on Ascentis® Express Peptide ES-C18

column Ascentis Express Peptide ES-C18, 15 cm x 2.1 mm I.D.,
2.7 µm particles (53307-U)
mobile phase (A) 0.1% formic acid in water;
(B) 25:75, (0.4% formic acid in water):acetonitrile
gradient 0 to 70% B in 40 min.
flow rate 0.3 mL/min
column temp. 35 °C
detector ESI(+), TOF
injection 2 µL
sample 10 pg/L in 0.1% formic acid
Application No. [G005381](#)



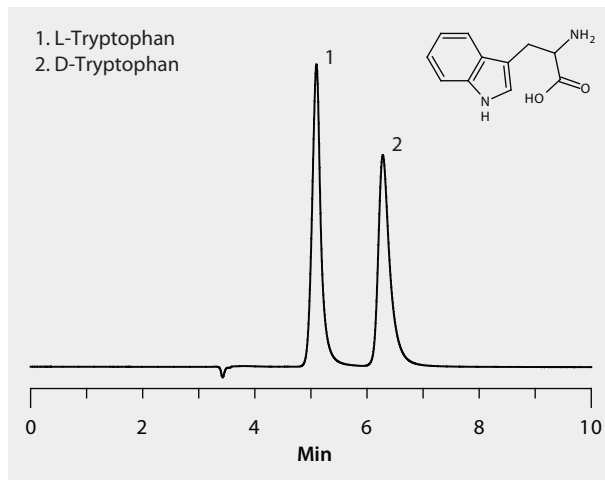
HPLC Analysis of Tryptic Digest of Protein Mixture on Ascentis® Express Peptide ES-C18

column Ascentis Express Peptide ES-C18, 15 cm x 21 mm I.D.,
2.7 µm particles (53307-U)
mobile phase (A) 0.1% formic acid in water;
(B) 0.4% formic acid in 25:75 (v/v) water:acetonitrile
gradient 6 to 70% B in 40 min
flow rate 0.3 mL/min
column temp. 35 °C
detector ESI(+), TOF
injection 2 µL
sample 10 pmol/L in 0.1% formic acid
Application No. **G005629**



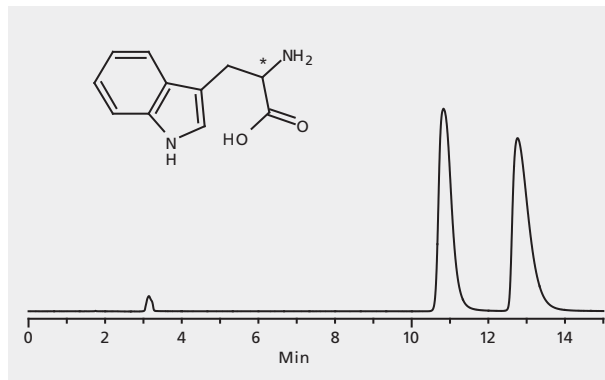
HPLC Analysis of Tryptophan Enantiomers on Astec® CHIROBIOTIC® T (Formic Acid Mobile Phase Additive)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (30:70:0.02, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 300 µg /mL in 30:70 water:methanol
Application No. [G005346](#)



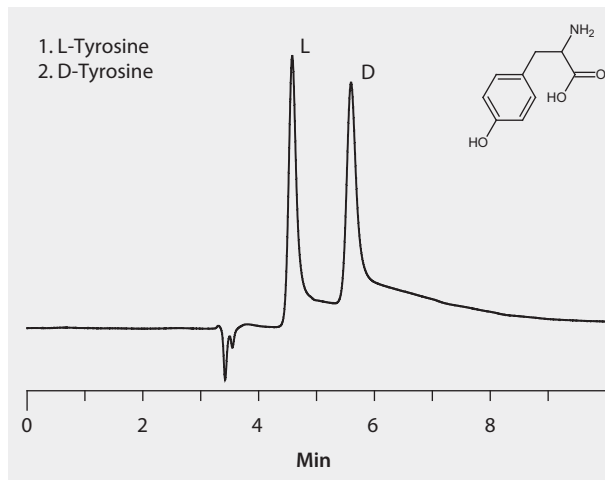
HPLC Analysis of Tryptophan Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) acetonitrile; (20:80, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004521**



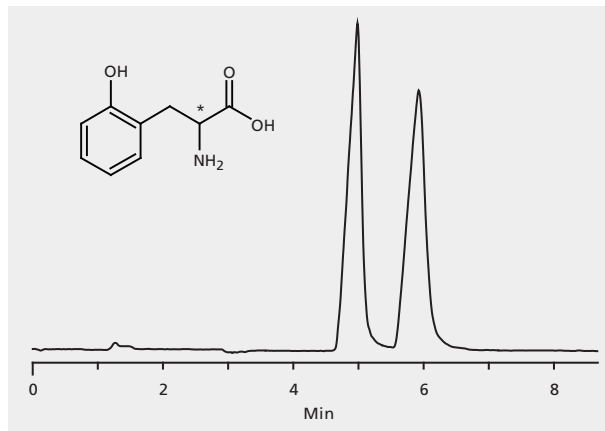
HPLC Analysis of Tyrosine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (30:70:0.02, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 300 µg /mL in 30:70 water:methanol
Application No. [G005347](#)



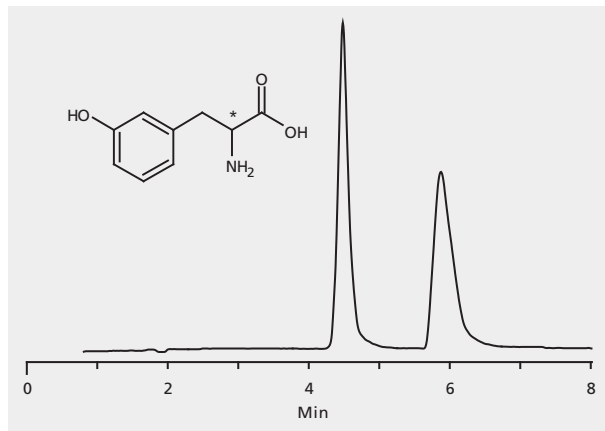
HPLC Analysis of o-Tyrosine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (50:50, A:B)
flow rate 1 mL/min
column temp. 24 °C
detector UV, 210 nm
injection 1 µL
sample 5 mg/mL in methanol
Application No. [G004537](#)



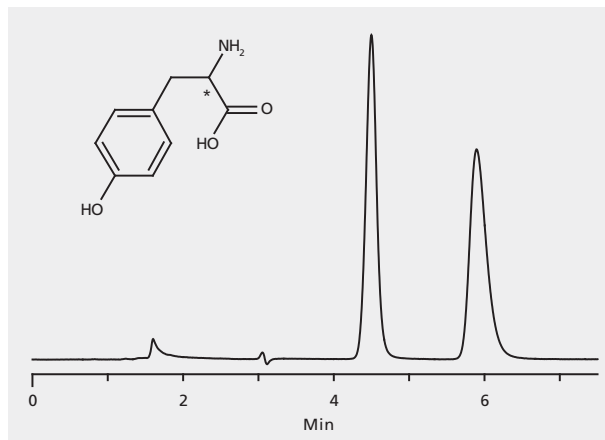
HPLC Analysis of m-Tyrosine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (90:10, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 210 nm
injection 1 µL
sample 5 mg/mL in methanol
Application No. **G004536**



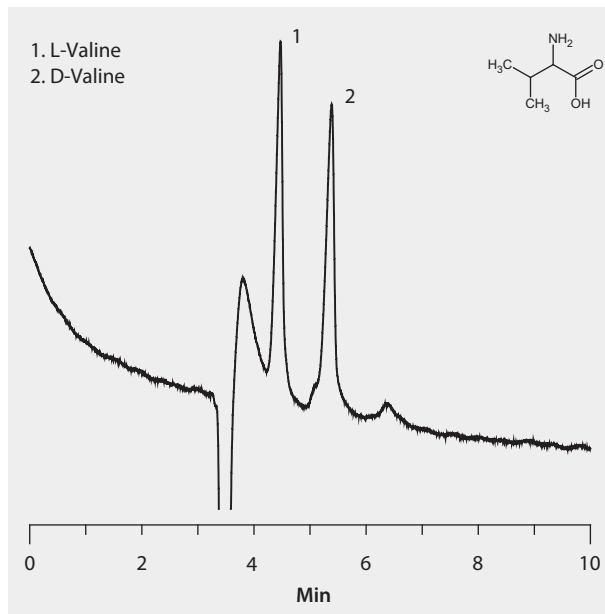
HPLC Analysis of p-Tyrosine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (50:50, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 205 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004522](#)



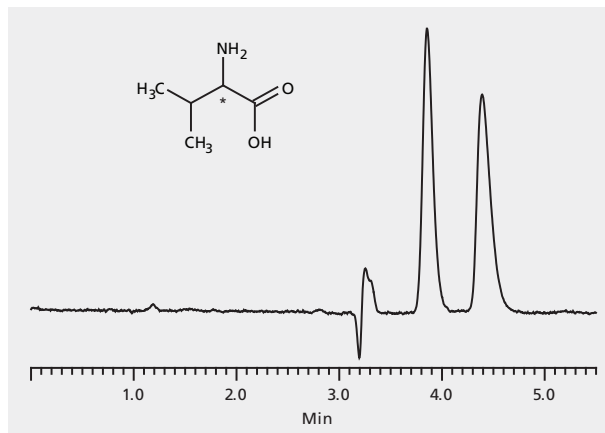
HPLC Analysis of Valine Enantiomers on Astec® CHIROBIOTIC® T (Formic Acid Mobile Phase Additive)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) methanol; (C) formic acid; (30:70:0.02, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 300 µg/mL in 30:70 water:methanol
Application No. [G005348](#)



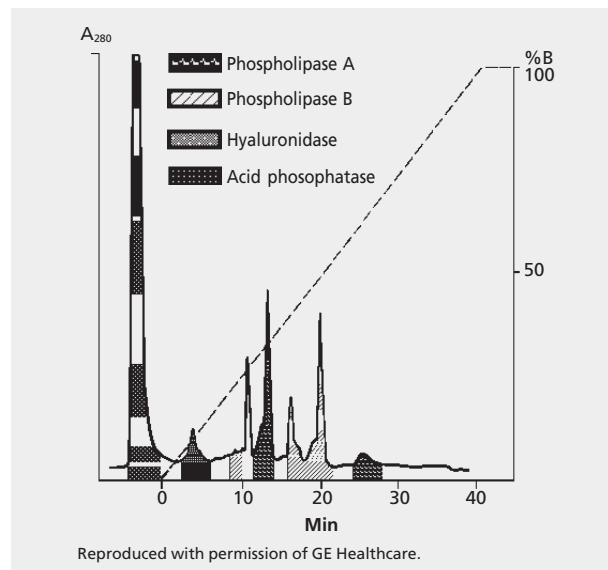
HPLC Analysis of Valine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (70:30, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 205 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004523](#)



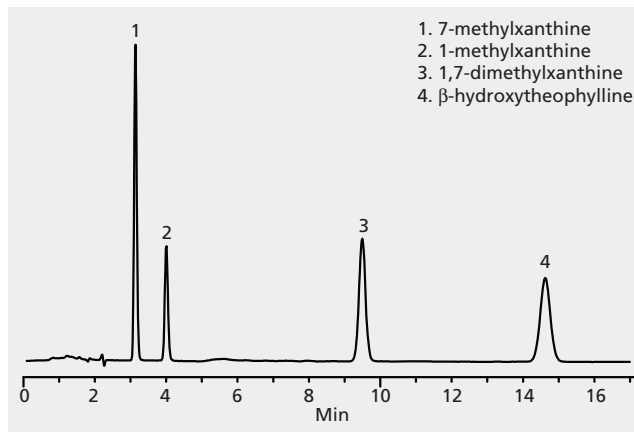
HPLC Analysis of White-Faced Hornet Venom on Mono S® HR5/5

column Mono S HR5/5, 10 µm particles (54808)
mobile phase (A) 50 mM BICINE, pH 8.4; (B) A + 0.35 M sodium chloride
flow rate 1 mL/min
detector UV, 280 nm
injection 7 mg venom in mobile phase A
Application No. [794-0411](#)



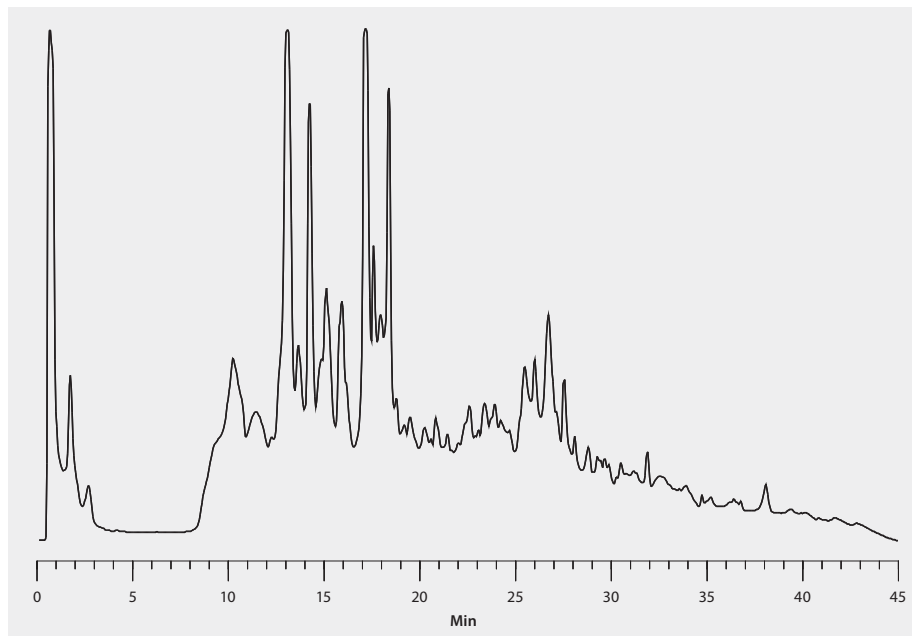
HPLC Analysis of Xanthines on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) methanol; (94:6, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. [G002465](#)



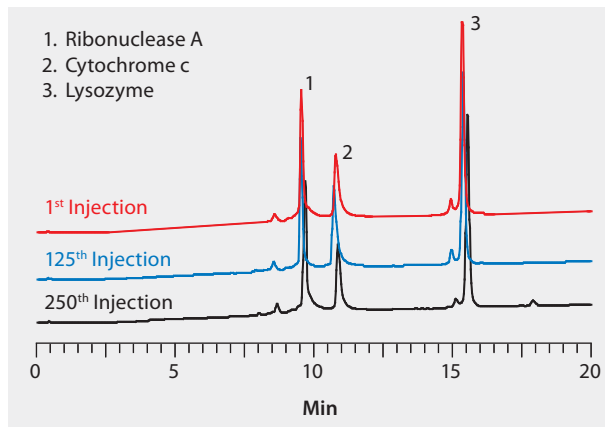
HPLC Analysis of Yeast Lysate on Proteomix® SAX-NP3 Demonstrating High Separation Efficiency

column temp. 25 °C
detector UV, 280 nm
column Proteomix SAX-NP3, 5 cm x 4.6 mm I.D., 3 µm particles (Z777219)
mobile phase (A) 20 mM Tris, pH 9.0; (B) A + 0.5 M NaCl
gradient 0 - 100% B in 30 min
flow rate 0.5 mL/min
injection 40 µL
sample 2.5 mg/mL
Application No. **G006131**



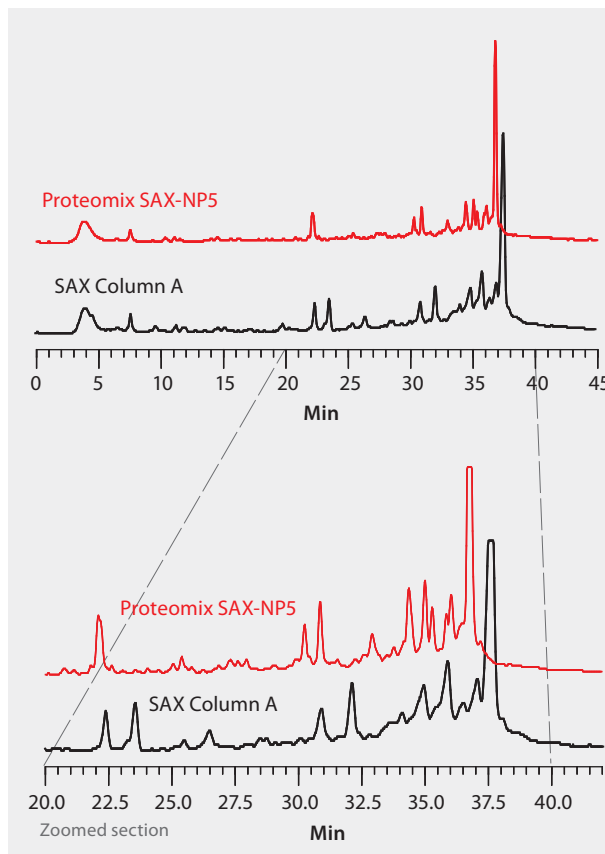
HPLC Analysis Proteins on Proteomix® SCX-NP1.7, Demonstration of Column Stability with Repeated Injections

column . . . Proteomix SCX-NP1.7, 5 cm x 4.6 mm I.D., 1.7 µm particles (Z777146)
 column Proteomix SCX-NP1.7 guard cartridge with holder,
 1 cm x 4 mm I.D. (Z777144)
 mobile phase . . . (A) 20 mM sodium phosphate buffer, pH 6.5, (B) A + 1.0 M NaCl
 gradient 0 - 100% B in 25 min, 15 min prewash
 flow rate 0.5 mL/min
 column temp. ambient
 detector UV, 214 nm
 injection 5 µL
 sample each compound 1 mg/mL
 Application No. **G006135**



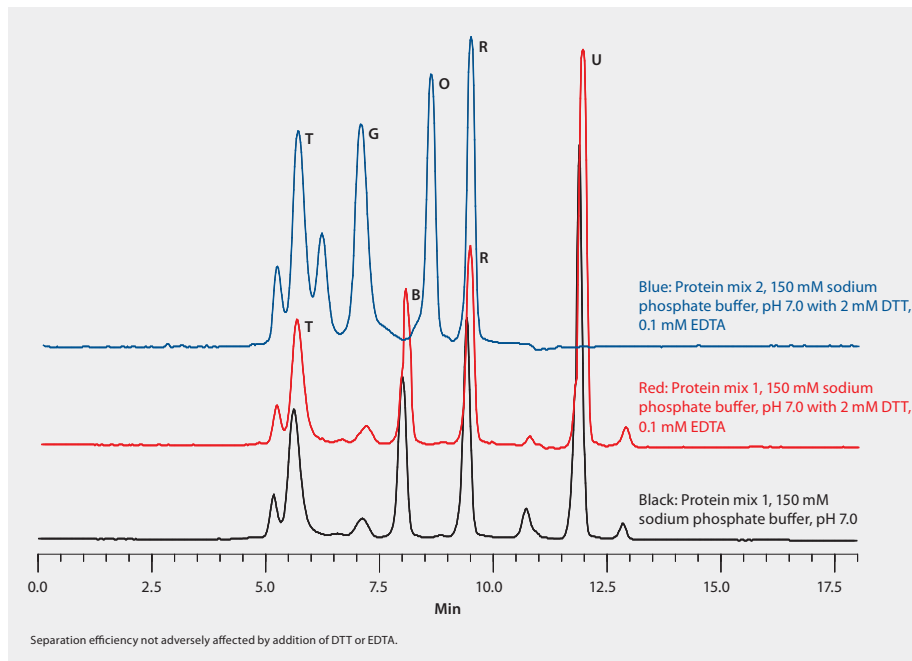
HPLC Separation of an Oligonucleotide and Impurities on Proteomix® SAX-NP5 versus Porous SAX

column Proteomix SAX-NP5, 15 cm x 4.6 mm I.D., 5 µm particles (Z777228)
mobile phase (A) 0.025 M Tris buffer pH9; (B) A + 1.0 M LiCl
gradient 30 to 75% B in 45 min
flow rate 1.0 mL/min
detector UV, 260 nm
injection 50 µL
sample 50-mer Oligo
Application No. **G005961**



HPLC (Size Exclusion) Analysis of Proteins on Zenix®-C SEC-300, Effect of DTT and EDTA

column Zenix-C SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777092)
 mobile phase . . . (A) 150 mM sodium phosphate buffer, pH 7.0 (B) 150 mM sodium phosphate buffer, pH 7.0 with 2 mM DTT, 0.1 mM EDTA
 (C) 150 mM sodium phosphate buffer, pH 7.0 with 2 mM DTT, 0.1 mM EDTA
 flow rate 1 mL/min
 column temp. 25 °C
 detector UV, 280 nm
 injection 10 µL
 sample proteins
 Application No. G005954



Improved HPLC Selectivity of Discovery® BIO Wide Pore RP Phases

column . . . Discovery BIO Wide Pore C18, 15 cm x 4.6 mm I.D., 5 µm particles vs. competitive wide pore C18 column of same dimensions (568222-U)

mobile phase (A) 0.1% TFA in 80:20 water:acetonitrile; (B) 0.1% TFA in 66:34 water:acetonitrile

gradient Gradient of 0 to 100% B in 14 min. after 1 min. delay

flow rate 1 mL/min

column temp. 30 °C

detector UV, 220 nm

injection 10 µL

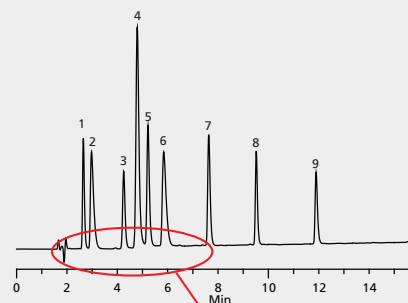
sample peptide mixture (Sigma P2693), ~0.25 µg each peptide in 0.1% TFA

Application No. **G004415**

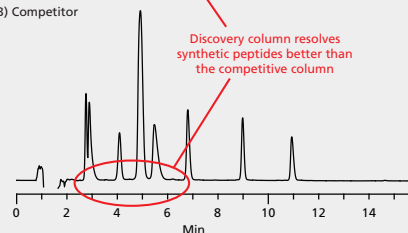
Peak Peptide	Amino Acid Sequence
1. Arg ¹ -vassopressin	CYFQNCPRG-amide; disulfide
2. Bradykinin, fragment 1-5	RPPGF
3. Oxytocin	CYIQNCPLG-amide; disulfide
4. LHRH**	pEHWSYGLRPG-Amide**
5. Met-enkephalin	YGGFM
6. Bradykinin	RPPGFSPFR
7. Leu-enkephalin	YGGFL
8. Bombesin	pEQRLGNQWAVGHLM-amide**
9. Substance P	RPKPKQFFGLM-amide

*Luteinizing Hormone Releasing Hormone
**pE is pyroglutamate

(A) Discovery Bio Wide Pore C18



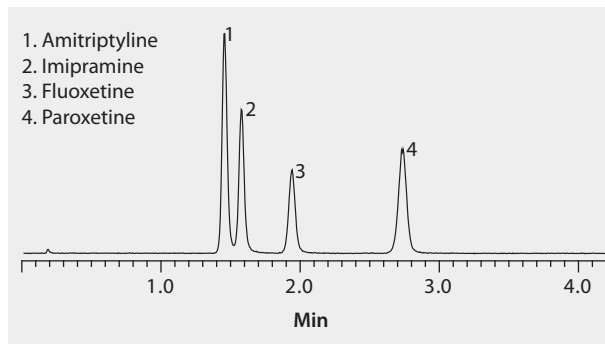
(B) Competitor



LC-MS Analysis of CYP2D6 Inhibitors on Ascentis® Express HILIC

This application demonstrates the suitability of the Ascentis Express HILIC for the analysis of CYP2D6 Inhibitors.

column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)
mobile phase 5 mM ammonium formate in 2:98 (v/v) water:acetonitrile
flow rate 1.2 mL/min
column temp. 50 °C
detector ESI(+), m/z 100-400
injection 0.5 µL
Application No. **G005691**

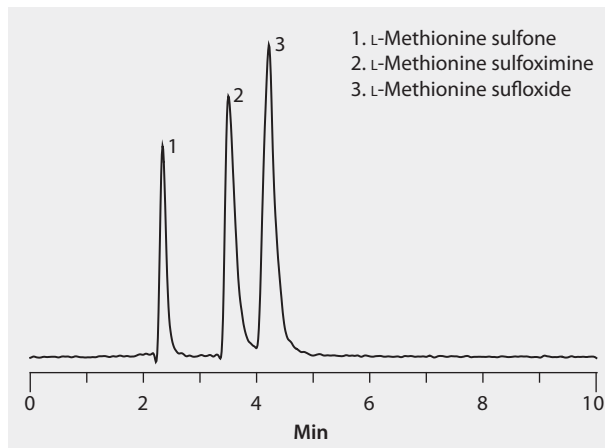


LC-MS Analysis of L-Methionine Sulfoximine, Sulfone and Sulfoxide on Ascentis® Express HILIC

L-methionine sulfoximine and L-buthionine sulfoximine are used in are used to prevent additional enzyme activity in Chinese hamster ovary (CHO) cell lines with supplemental Glutamine Synthase (GS). It is of interest to be able to monitor both purity of such molecules in order to control addition to cell media as well as for the assay of parent molecules during use. The analytes are highly polar and thus should be amenable to HILIC-LC-MS analysis. This first installment investigates the ability of Ascentis Express HILIC and Ascentis Express OH5 stationary phases for the separation of the methionine analog and related compounds as well as methionine and buthionine separations.

column . . . Ascentis Express HILIC, 10 cm x 3.0 mm I.D., 2.7 μ m particles (53970-U)
mobile phase (A) acetonitrile; (B) water with 0.1% formic acid,
pH 3.5 with ammonium formate; (75:25, A:B)

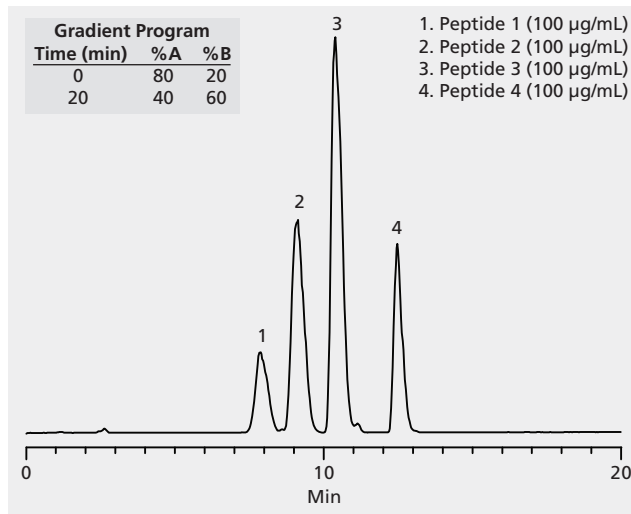
flow rate 0.4 mL/min
pressure 1350 psi 93 bar
temp. 25 °C
detector MS, ESI (+), TIC, m/z 150-300
injection 5 μ L
sample 10 μ g/mL in 90:10, methanol:water
Application No. **G005790**



LC-MS Analysis of Peptides, Basic, on Ascentis® C18

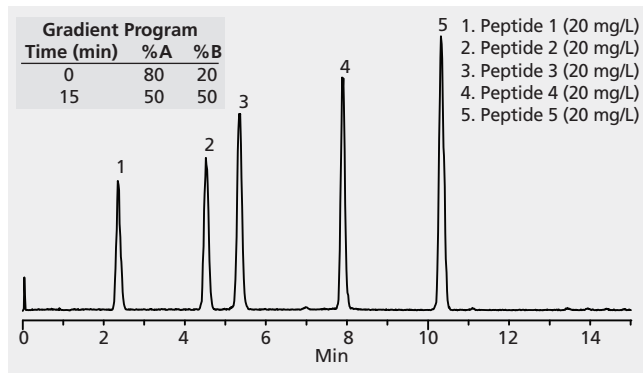
column Ascentis C18, 10 cm x 2.1 mm I.D., 5 µm particles (581326-U)
mobile phase (A) 20 mM formic acid in water; (B) (50:50), 20 mM formic acid in water:20 mM formic acid in acetonitrile

flow rate 0.2 mL/min
column temp. 22 °C
detector ESI (+), full scan
injection 2 µL
Application No. [G002444](#)



LC-MS Analysis of Peptides, Hydrophobic, on Ascentis® C18

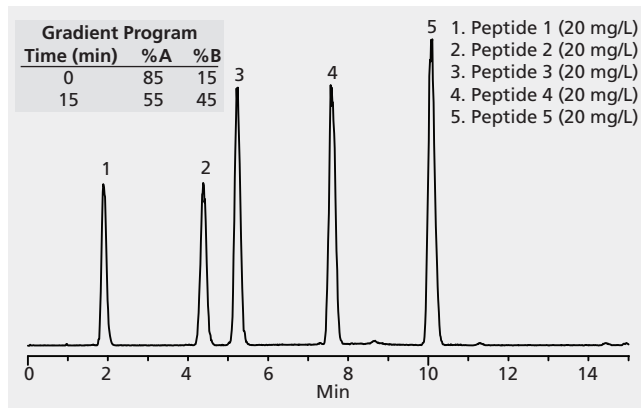
column Ascentis C18, 10 cm x 2.1 mm I.D., 5 µm particles (581326-U)
 mobile phase (A) (50:50), 50 mM formic acid titrated with acetate (pH 3.0):water; (B) (50:50), 50 mM formic acid titrated with acetate (pH 3.0):acetonitrile
 flow rate 0.2 mL/min
 column temp. ambient
 detector ESI (+)
 injection 4 µL
 sample as indicated in 10 mM formic acid
 Application No. **G002688**



LC-MS Analysis of Peptides, Hydrophobic, on Ascentis® RP-Amide

column Ascentis RP-Amide, 10 cm x 2.1 mm I.D., 5 µm particles (565304-U)
 mobile phase . . . (A) (50:50), 50 mM formic acid titrated with acetate (pH 3.0):water;
 (B) (50:50), 50 mM formic acid titrated with acetate (pH 3.0):acetonitrile

flow rate 0.2 mL/min
 column temp. ambient
 detector ESI (+)
 injection 4 µL
 sample as indicated in 10 mM formic acid
 Application No. **G002682**



LC-MS Analysis of Peptides on Discovery® BIO Wide Pore C18, Effect of TFA Concentration on MS Signal

column Discovery® BIO Wide Pore C18, 15 cm x 2.1 mm I.D.,
3 µm particles (567202-U)

mobile phase (A): aqueous component (25 mM formic acid, 0.01% TFA
or 0.1% TFA); (B) (50:50) water:acetonitrile containing
same ionic additives as aq. component

flow rate 0.20 mL/min

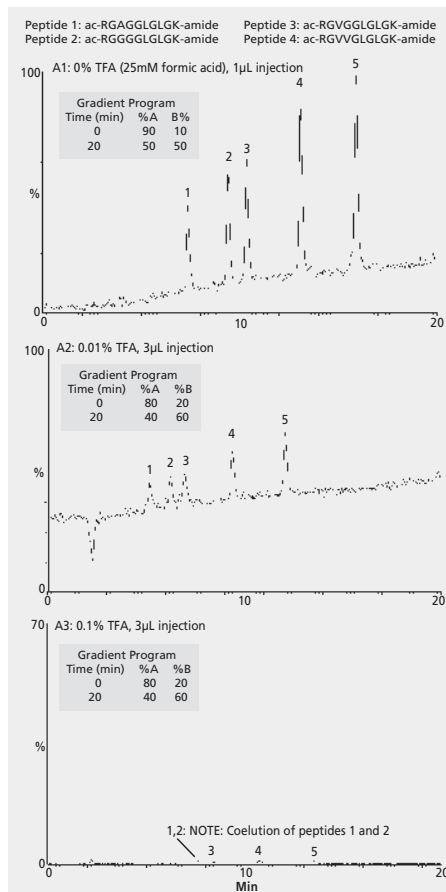
column temp. ambient

detector (+)ESI

injection 1-3 µL

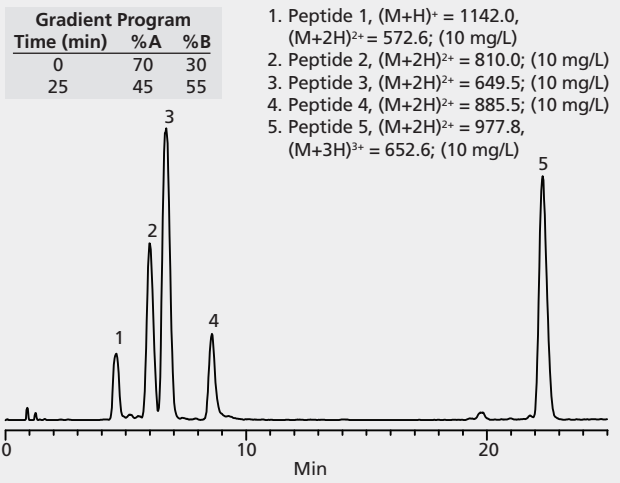
sample RP Peptide Performance Standard
(Alberta Peptide Inst., Cat. No. RPS-P0010)

Application No. **G004414**



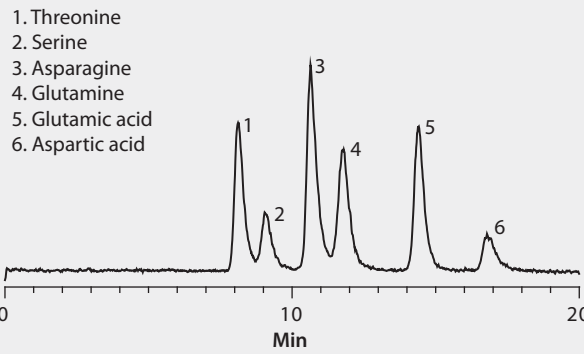
LC-MS Analysis of Peptides, Serum Derived, on Ascentis® RP-Amide

column . . . Ascentis RP-Amide, 10 cm x 2.1 mm I.D., 5 µm particles (565304-U)
 mobile phase . . . (A) (50:50), 50 mM formic acid titrated with acetate (pH 3.0):water;
 (B) (50:50), 50 mM formic acid titrated with acetate (pH 3.0):acetonitrile
 flow rate 0.2 mL/min
 column temp. ambient
 detector ESI (+)
 injection 4 µL
 sample as indicated in 10 mM formic acid
 Application No. **G002689**



LC-MS Analysis of Polar Amino Acids on Ascentis® Si (HILIC Mode)

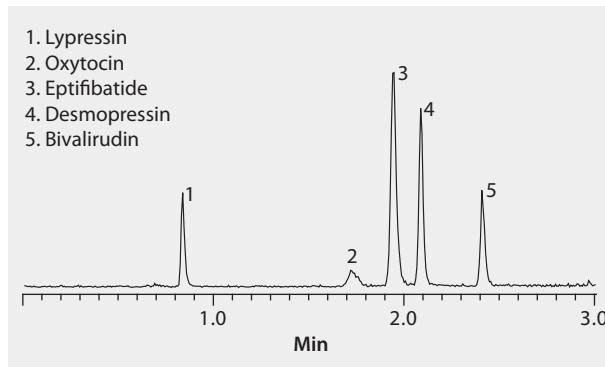
column Ascentis Si, 10 cm x 2.1 mm I.D., 5 µm particles (56403AST)
mobile phase (A) 100 mM ammonium formate, pH 3.0 with formic acid;
(B) water; (C) acetonitrile
gradient 5% A constant; 10 to 16% B, 85 to 79% C in 20 min
flow rate 0.3 mL/min
column temp. 35 °C
detector ESI(+)
injection 2 µL
sample 0.1 g/L each in mobile phase
Application No. [G005722](#)



LC-MS Analysis of Polypeptide Drugs on Ascentis® Express RP-Amide

This application demonstrates the suitability of the Ascentis Express RP Amide for the analysis of polypeptide drugs.

column Ascentis Express RP-Amide, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53913-U)
mobile phase (A) 10 mM ammonium acetate in water, pH 4.2; (B) 10 mM
ammonium acetate in 90:10 (v/v) acetonitrile:water, pH 4.7
gradient held at 20% B for 0.1 min; 20 to 80% B in 2.9 min;
80 to 20% B in 0.01 min; held at 20% B for 0.99 min
flow rate 0.3 mL/min
column temp. 35 °C
detector TOF, ESI(+), m/z 100-2500
injection 3 µL
sample 1 µL/mL in 10mM ammonium formate, 80:20, acetonitrile:water
Application No. [G005723](#)

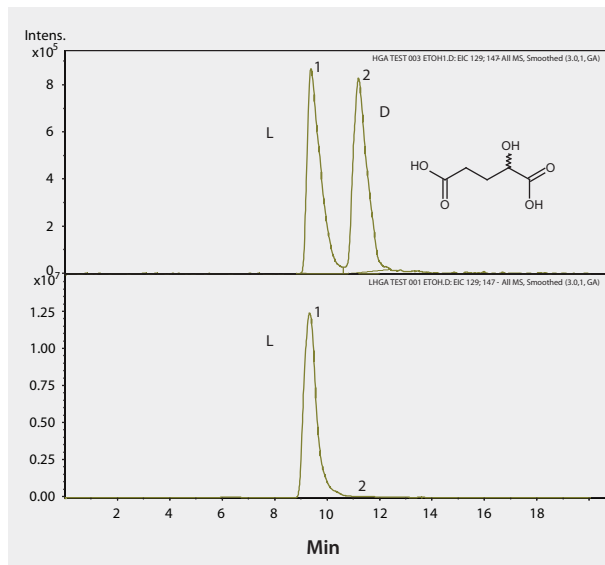


LC-MS/MS Analysis of 2-Hydroxyglutaric Acid Enantiomers on Astec® CHIROBIOTIC® R

Chiral 2-hydroxyglutarates (2-OHG) are important molecular signatures of both healthy and diseased biological cells, their specific biochemical pathways and inborn errors of metabolism. The chiral differentiation and quantification of D-2-OHG (R(-)-2-OHG) and L-2-OHG (S(+)-2-OHG) is key for characterizing neurometabolic disorders like the 2-hydroxyglutaric acidurias that cause neurological impairment early in life. The ability to distinguish and quantify the enantiomers of 2-OHG is therefore important to be able to track its disposition throughout the metabolic pathway of normal vs. mutated cells. We show here a rapid and sensitive method to separate and measure D-2-OHG and L-2-OHG using LC-MS/MS detection. An Astec® CHIROBIOTIC R (ristocetin chiral selector) column was run under polar ionic mobile phase conditions. Using tandem MS eliminated two fundamental analytical challenges with these compounds: the lack of a UV-absorbing chromophore in the 2-OHG molecule, and the abundance of competing low molecular weight acids in urine. The upper panel in the chromatogram shows the separation of D-2-OHG and L-2-OHG obtained during method development. The lower panel shows the pure L-2-hydroxyglutaric acid. Besides providing the necessary enantioselectivity, Astec® CHIROBIOTIC columns have the advantage of operating in aqueous and polar organic mobile phases that are amenable to polar drugs and metabolites. Their ionic interactions promote analyte ionization which enhances sensitivity in ESI detection. In addition to the CHIROBIOTIC columns, Sigma-Aldrich also provides the high purity mobile phase agents, racemic and pure chiral 2-OHG enantiomers and other compounds in the isocitrate dehydrogenase (IDH) pathway.

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
 mobile phase (A) ethanol:methanol (3:1, v/v); (B) 0.1% v/v TEA in water, adjusted to pH 4.5 with acetic acid; 75:25 (A:B)
 flow rate 0.4 mL/min
 column temp. 20 °C

detector MS, ESI(-), 100-1000 m/z
 injection 5 µL
 sample each enantiomer, 100 µg/mL in water
 Application No. G005848



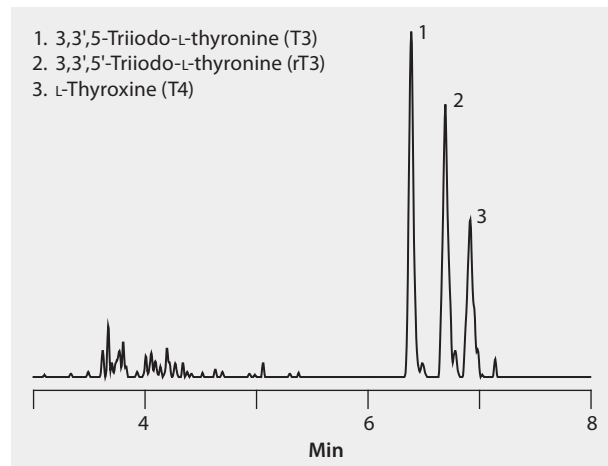
LC-MS with Online Solid Phase Extraction and (SPE/LC-MS) of Thyroid Hormones in Biological Fluids on Ascentis® Express Phenyl-Hexyl using RP-Amide Traps

An online SPE/LC/MS method was developed for the determination of thyroid hormones in biological fluids. The method exploits RP-Amide or C8 as the trapping column and Phenyl phase as the separation column, respectively. The preliminary experiments demonstrated that, under the optimized conditions, both RP-Amide and C8 effectively trapped the thyroid hormones extracted from spiked rabbit plasma sample which had been protein precipitated. However, the RP-Amide traps are advantageous over the commonly used C8 traps with higher signals and recoveries. Additionally, RP-Amide traps are more flexible with washing solvent as it is compatible with 100% aqueous mobile phases and can be used with up to 20% methanol with minimal sample loss.

The online SPE/LC-MS system comprises a trapping column, a switching valve and an LC-MS instrument. The program consists of three distinct steps. The valve switches between position 1 for loading/washing (Step 1) and equilibration (Step 3), and position 2 for LC-MS analysis (Step 2). In Step 1 samples are loaded onto the trap and washed with mobile phase containing low percent organic and high flow rate to remove salts and other interferences which are directed to the waste. In Step 2 the analytes are eluted from the trap, separated and detected by the LC-MS at optimum flow for both chromatographic separation and MS signals. In Step 3, the system returns back to valve position 1 for re-equilibration under the sample loading/washing conditions.

sample preparation SPE (Solid Phase Extraction)
 column Ascentis Express Phenyl-Hexyl, 5 cm x 2.1 mm I.D.,
 2.7 µm particles (53334-U)
 mobile phase (A) water; (B) methanol, both with 0.1% acetic acid
 gradient 5% B for 3 min; to 70% B in 2 min, hold 3 min
 pressure 1800 psi
 detector MS, ESI(+), MRM mode (777.7/731.8 for T4; 651.8/605.5 for T3 or rT3)

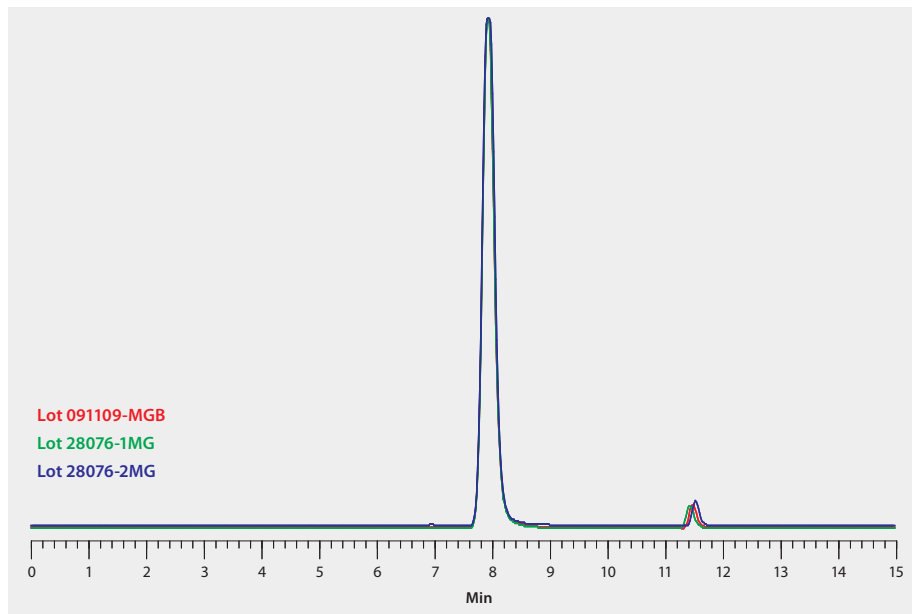
column temp. ambient
 injection 5 µl
 sample protein precipitated rabbit plasma spiked with desired amount of T4, T3 and rT3
 Application No. G006223



Lot-to-Lot Reproducibility of Monoclonal Antibody Analysis on Three Lots of Zenix® SEC-300 Columns

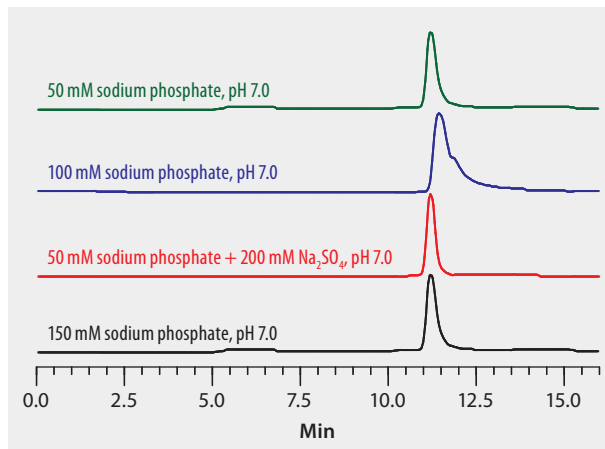
Exceptional lot-to-lot reproducibility is demonstrated for three lots of 3 micron Zenix SEC-300 columns for the release test of monoclonal antibody-based therapeutics. Monomer retention time, peak efficiency and peak height are shown to be virtually identical on the three lots.

column Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 μ m, 300 Å (Z777033)
mobile phase 150 mM Phosphate Buffer, pH 7
flow rate 1.0 mL/min
column temp. Ambient
detector UV, 214 nm
injection 10 μ L
sample 2.5 mg/ml MAb
Application No. **G006210**



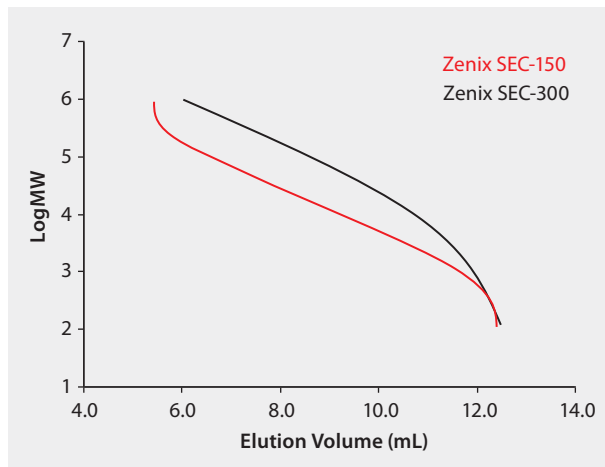
Mobile Phase Optimization in the Analysis of Lysozyme on Zenix® SEC-300

column Zenix SEC-300, 30 cm x 4.6 mm I.D., 3 μ m particles (Z777028)
mobile phase as indicated on figure
flow rate 0.35 mL/min
temp. 25 $^{\circ}$ C
detector UV, 214 nm
injection 5 μ L
sample lysozyme, 1 mg/mL
Application No. **G005972**



Protein Molecular Weight Calibration Curve on Zenix® Size Exclusion Columns, Effect of Pore Size

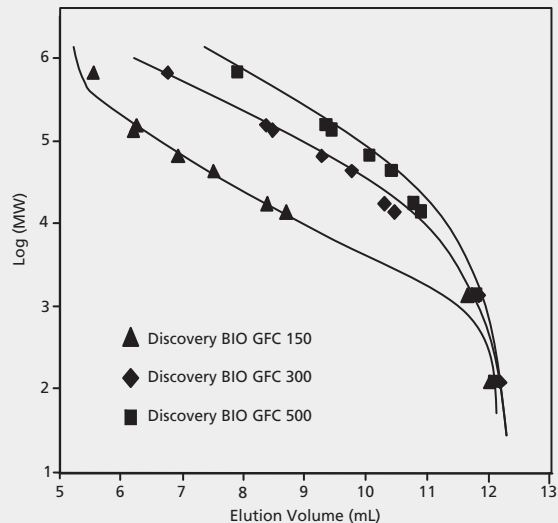
column . . . Zenix SEC-150, 30 cm x 7.8 mm I.D., 3 μ m, 150 Å particles (Z777018)
column . . . Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 μ m, 300 Å particles (Z777033)
mobile phase 150 mM sodium phosphate, pH 7
flow rate 1 mL/min
column temp. ambient
detector UV, 214 nm
injection 10 μ L
sample each 1 mg/mL except uracil, 2.5 mg/mL
Application No. [G006126](#)



Protein MW Calibration Curves on SRT® SEC-100, -150 and -300, 30 cm x 7.8 mm I.D., 5 µm particles

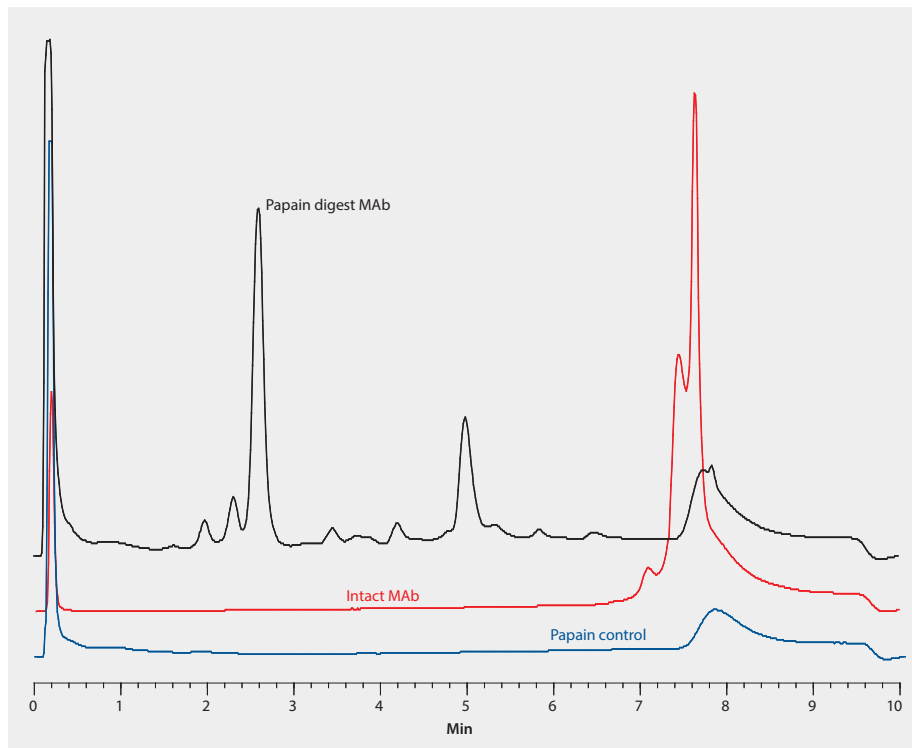
column SRT® SEC-100, -150 and -300, 30 cm x 7.8 mm I.D.,
5 µm particles (Z777039)
mobile phase 150 mM potassium phosphate, monobasic,
pH 7 (adjusted with potassium phosphate)
flow rate 1 mL/min
detector UV, 214 nm
injection 10 µL
Application No. **G004237**

1. Thyroglobulin, 670 kDa
2. γ -Globulin, 158 kDa
3. Bovine serum albumin dimer, 132 kDa
4. Bovine serum albumin, 66 kDa
5. Ovalbumin, 44 kDa
6. Myoglobin, 17.6 kDa
7. Ribonuclease A, 13.7 kDa
8. Vitamin B12, 1.35 kDa
9. Uracil, 120 Da



Proteomix WCX-NP1.7, 3 cm x 4.6 mm I.D., 1.7 μ m particles

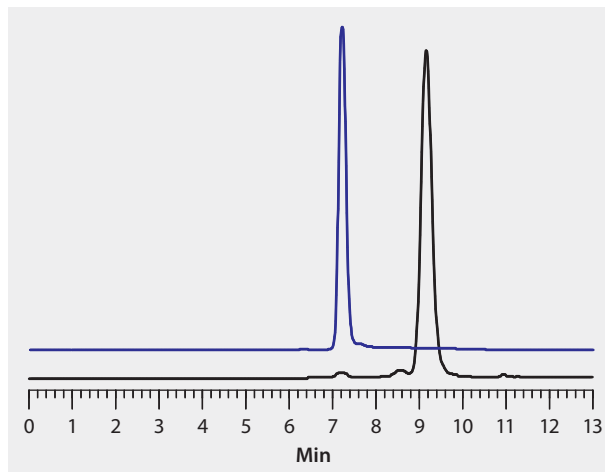
column . . . Proteomix WCX-NP1.7, 3 cm x 4.6 mm I.D., 1.7 μ m particles (Z777179)
mobile phase (A) 20 mM sodium acetate, pH 5.15; (B) A + 1 M LiCl
gradient 12% to 40% B in 6.7 min; to 100% B in 0.1 min; held for 2 min
flow rate (1.5 mL/min)
pressure 3335-3916 psi (230 - 270 bar)
detector UV 280 nm
injection 25 μ L
sample 1 mg/mL papain digested MAb 321
Application No. **G006023**



Size Exclusion Analysis of Avastin and Erbitux on Zenix® SEC-300

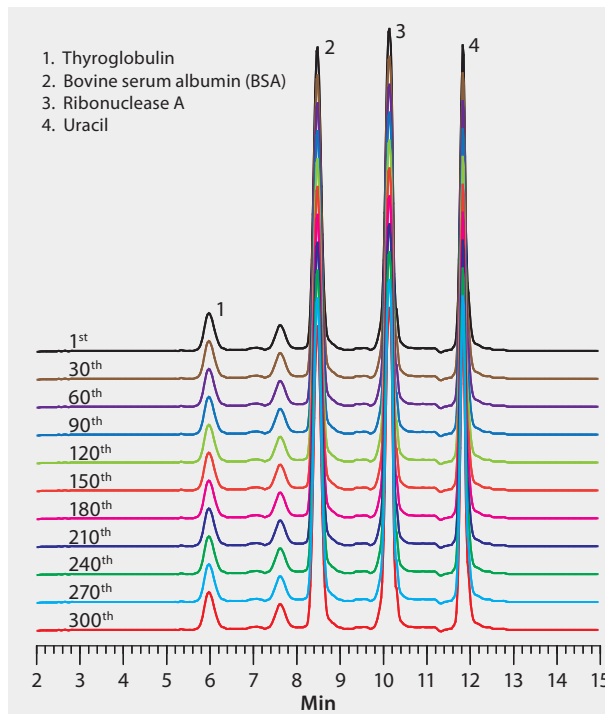
The quality control analysis of recombinant monoclonal antibody therapeutics by gel filtration chromatography is a standard release test to determine antibody purity and the level of aggregation. Bevacizumab, sold under the trade name Avastin, is a humanized monoclonal antibody used in the treatment of colorectal, breast and lung cancer. Similarly, cetuximab, sold under the trade name Erbitux, is a chimeric monoclonal antibody used in the treatment of metastatic colorectal cancer. Both mAbs have molecular masses of about 150 kD.

column . . . Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles, 300 Å (Z777033)
 mobile phase 150 mM phosphate buffer, pH 7.0
 flow rate 1.0 mL/min
 column temp. 25 °C
 detector UV, 280 nm
 injection 10 µL
 sample . . . (top) Bevacizumab (trade name Avastin), a humanized monoclonal antibody
 (bottom) Cetuximab (trade name Erbitux), a chimeric monoclonal antibody
 Application No. **G006208**



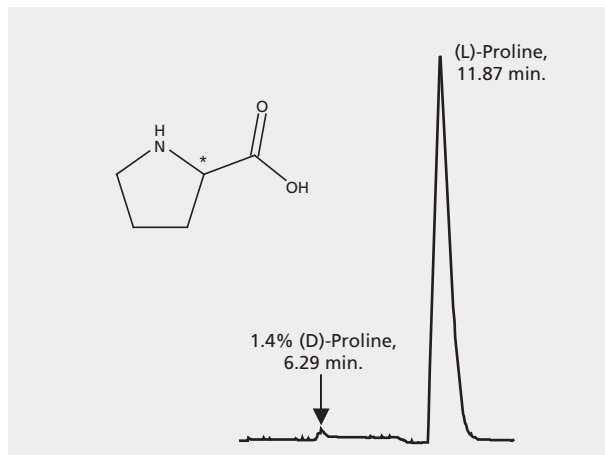
Stability and Reproducibility of Zenix® 300 under High Salt and High pH Mobile Phase Conditions

column Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777018)
mobile phase 50 mM sodium phosphate + 1 M NaCl, pH 8.5
flow rate 1.0 mL/min
pressure 1450 psi (100 bar)
column temp. 25 °C
detector UV, 214 nm
injection 5 µL
sample each compound 1 mg/mL except uracil, 0.1 mg/mL
Application No. **G005971**



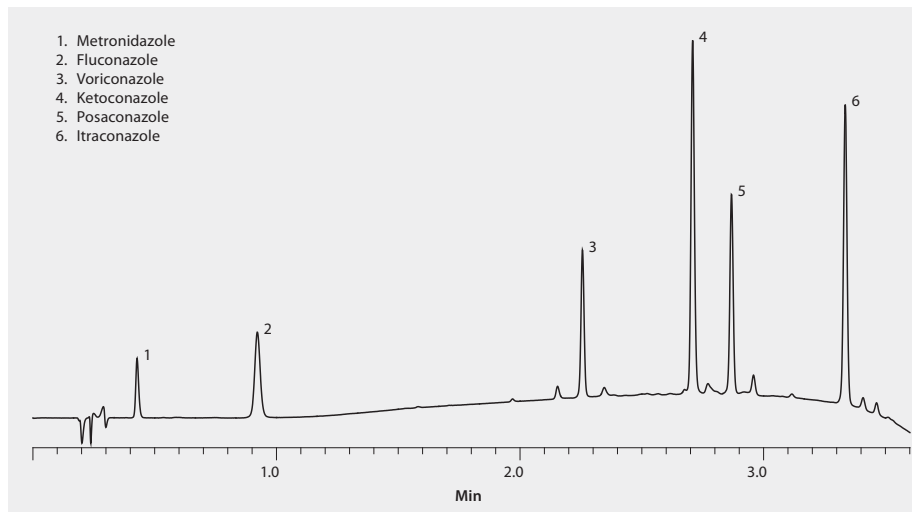
Trace HPLC Analysis of Proline Enantiomers on Astec® CLC-L

column Astec CLC-L, 15 cm x 4.6 mm I.D., 5 µm particles (53123AST)
mobile phase 5 mM copper sulfate
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
sample 1 mg/mL in water
Application No. **G004662**



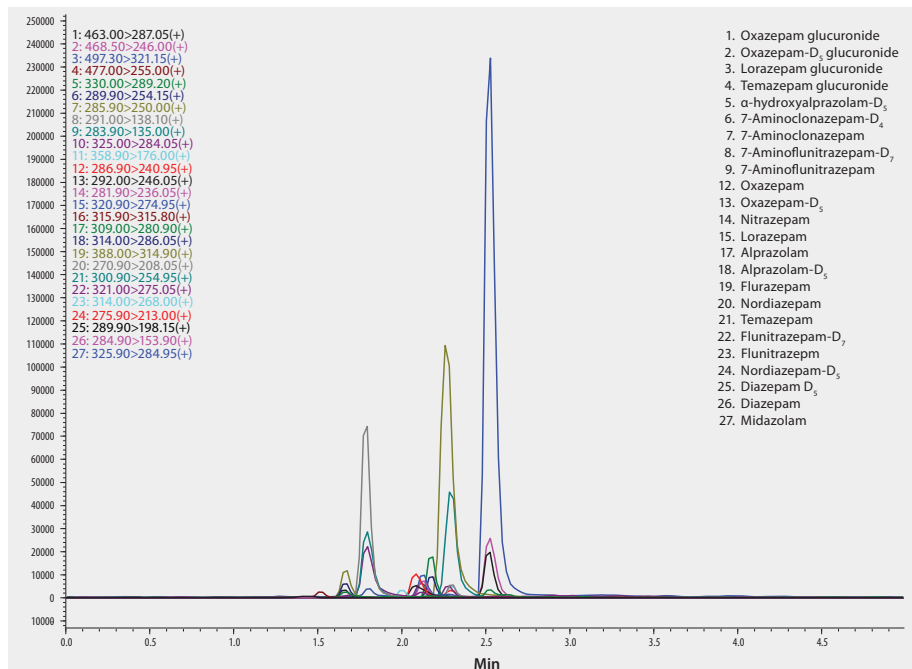
UHPLC Analysis of Antifungals on Titan™ C18

column Titan C18, 5 cm x 3.0 mm I.D., 1.9 µm particles (577126-U)
mobile phase (A) 5 mM ammonium acetate pH 6.8 unadjusted
in 80:20, water:acetonitrile;
(B) 5 mM ammonium acetate pH 6.8 unadjusted in 5:95, water:acetonitrile;
gradient 0% B; to 100% B in 3 min; 100% B held for 0.6 min
flow rate 1.0 mL/min
pressure 4350 psi (300 bar)
column temp. 35 °C
detector UV, 205 nm
injection 1.0 µL
sample 6 antifungal 50 µg/mL in 70:30, water:methanol
Application No. **G006255**



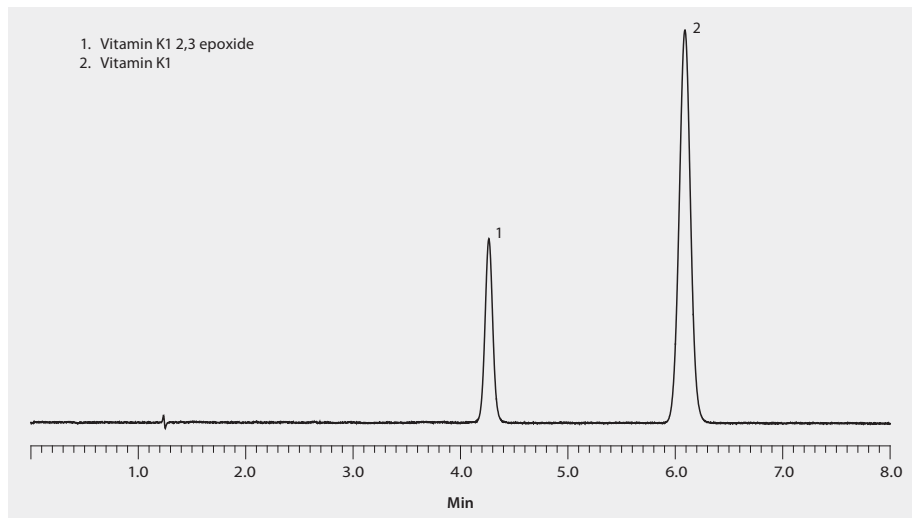
UHPLC Analysis of Benzodiazepines using Beta-Glucuronidase Enzymatic Digestion on Titan™ C18

sample preparation SPE (Solid Phase Extraction)
 SPE well plate Supel™-Select HLB 96-Well 60 mg/well (575662-U)
 condition 1 mL acetonitrile, 1 mL water
 sample addition 1.1 mL digested urine
 washing 1 mL water, 1 mL 25% methanol
 elution 1 mL acetonitrile
 column TITAN C18, 5 cm x 2.1 mm, 1.9 µm particles (577122-U)
 mobile phase (A): 5 mM ammonium formate
 (B): 5 mM ammonium formate (95:5 acetonitrile:water)
 gradient 10% B to 90% B in 2.5 minutes, hold 90% B for 0.5 minutes
 flow rate 0.3 mL/min
 column temp. 35 °C
 detector MS/MS
 injection 2.0 µL
 sample 300 ng/mL in water
 Application No. **G006291**



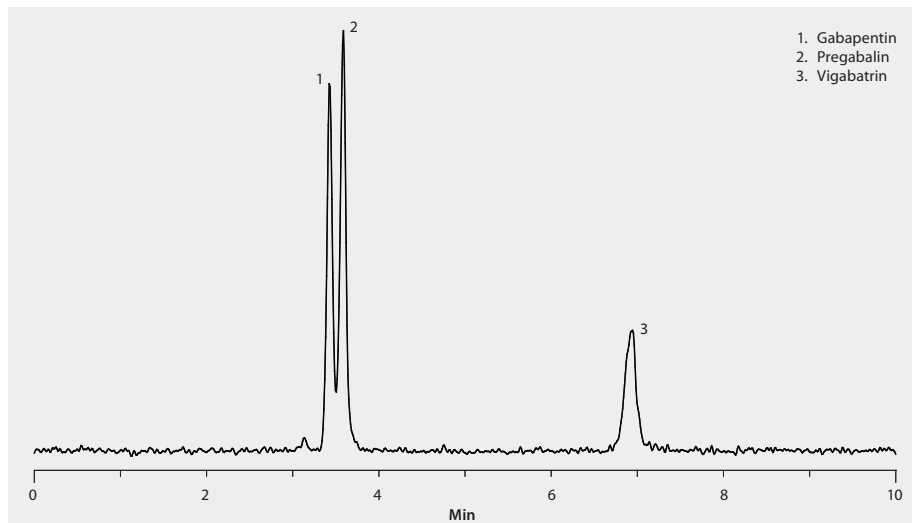
UHPLC Analysis of Vitamin K1 and Related Compound on Ascentis® Express 5 µm C18

column Ascentis Express C18 15 cm x 4.6 mm I.D., 5 µm particles (50537-U)
mobile phase (A) methanol; (B) 2-propanol; (90:10, A:B)
flow rate 1.0 mL/min
pressure 1035 psi (71 bar)
column temp. 35 °C
detector UV, 250 nm
injection 2.0 µL
sample Vitamin K1 and related, 50 µg/mL 90:10, methanol:2-propanol
Application No. **G006261**



UHPLC-MS Analysis of Anticonvulsants on Ascentis® Express 2.7µm HILIC

column . . . Ascentis Express HILIC, 10 cm x 3.0 mm I.D., 2.7 µm particles (53970-U)
mobile phase (A) 5 mM ammonium formate pH unadjusted
in 95:5, acetonitrile:water;
(B) 5 mM ammonium formate pH unadjusted
in 75:25, acetonitrile:water; (25:75, A:B)
flow rate 0.4 mL/min
pressure 1240 psi (85.5 bar)
column temp. 35 °C
detector MS-ESI-, full scan 100-500 m/z
detector 5.0 µL
sample 3 anticonvulsants 1 µg/mL in 99:1, acetonitrile:methanol
Application No. **G006302**

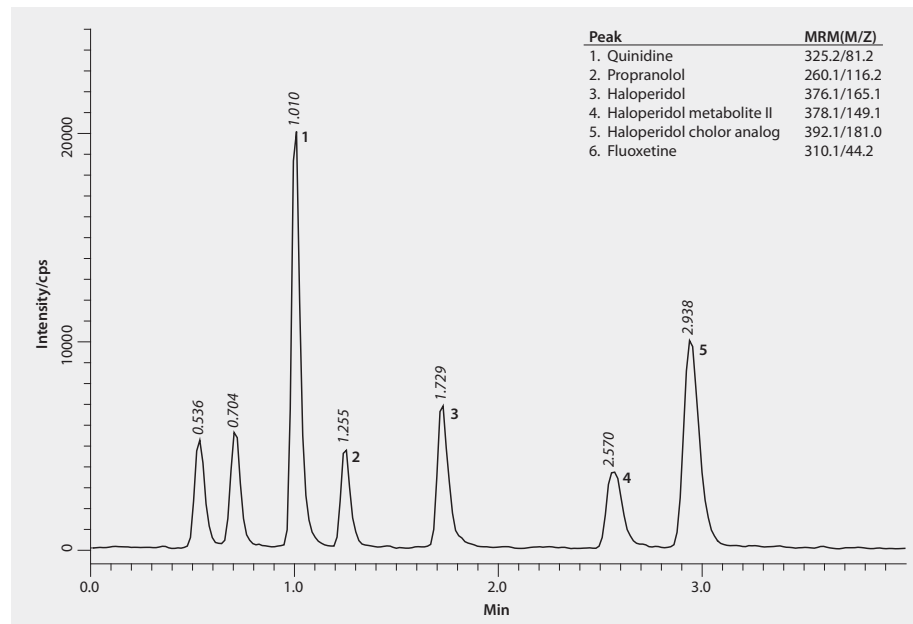


UHPLC-MS Analysis of Basic Drugs and Metabolites with Titan™ C18

MRM transitions

1. Quinidine 325.2/81.2
2. Propranolol 260.1/116.2
3. Haloperidol 376.1/165.1
4. Haloperidol metabolite II 378.1/149.1
5. Haloperidol cholor analog 392.1/181.0
6. Fluoxetine 310.1/44.2

column Titan C18 10 cm x 2.1 mm, 1.9 µm particles (577124-U)
 mobile phase (A) Water; (B) Acetonitrile, both with 0.1% Formic acid
 gradient 35%B Isocratic
 flow rate 0.4 mL/min
 pressure 484 psi (7120)
 column temp. 25 °C
 detector MS, ESI(+), MRM
 injection 1.0 µL
 sample 50 ng/mL in 50% methanol
 Application No. **G006280**

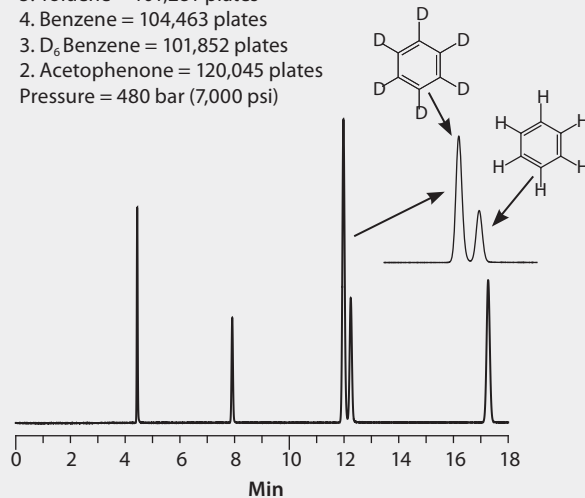


Petroleum

HPLC Analysis of Benzene and Deuterated Benzene on Ascentis® Express C18

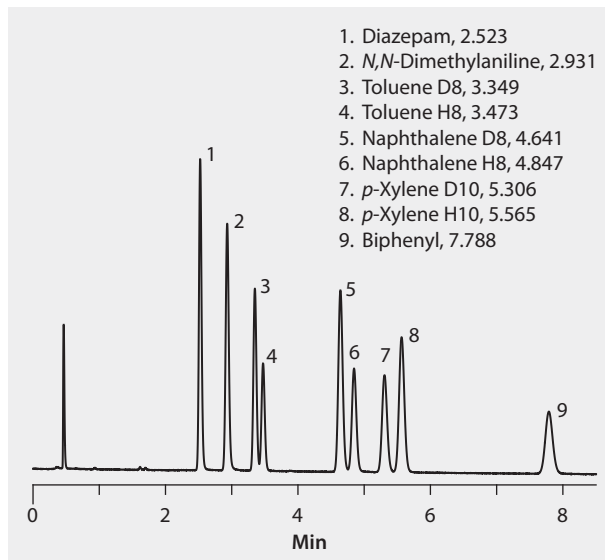
column Ascentis Express C18, 15 cm × 4.6 mm I.D., 2.7 μm particles
 mobile phase (A) acetonitrile; (B) water (55:45, A:B)
 flow rate 1.0 mL/min
 column temp. 50 °C
 detector UV, 254 nm
 injection 10 μL
 Application No. **G004046**

5. Toluene = 101,281 plates
 4. Benzene = 104,463 plates
 3. D₆ Benzene = 101,852 plates
 2. Acetophenone = 120,045 plates
- Pressure = 480 bar (7,000 psi)



UHPLC Analysis of Deuterated Isomers on Titan™ C18

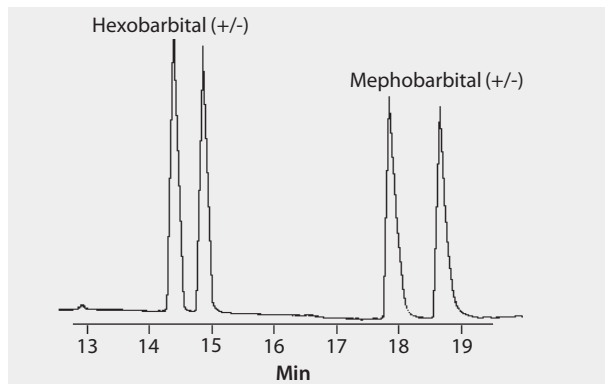
column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase (A) water; (B) acetonitrile; (50:50, A:B)
flow rate 0.4 mL/min
pressure 5650 psi (390 bar)
column temp. 35 °C
detector UV, 254 nm
injection 1 µL
Application No. **G006122**



Pharmaceutical (Small Molecule)

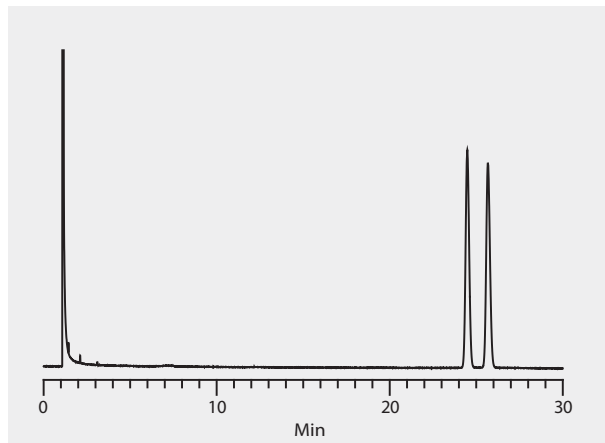
GC Analysis of Barbiturate Enantiomers on
 β -DEX™ 120

column β -DEX 120, 30 m \times 0.25 mm I.D., 0.25 μ m (24304)
oven 210 $^{\circ}$ C
inj. temp. 300 $^{\circ}$ C
detector FID, 300 $^{\circ}$ C
carrier gas helium, 20 cm/sec @ 275 $^{\circ}$ C
injection 100:1 split
Application No. [92-0342](#)



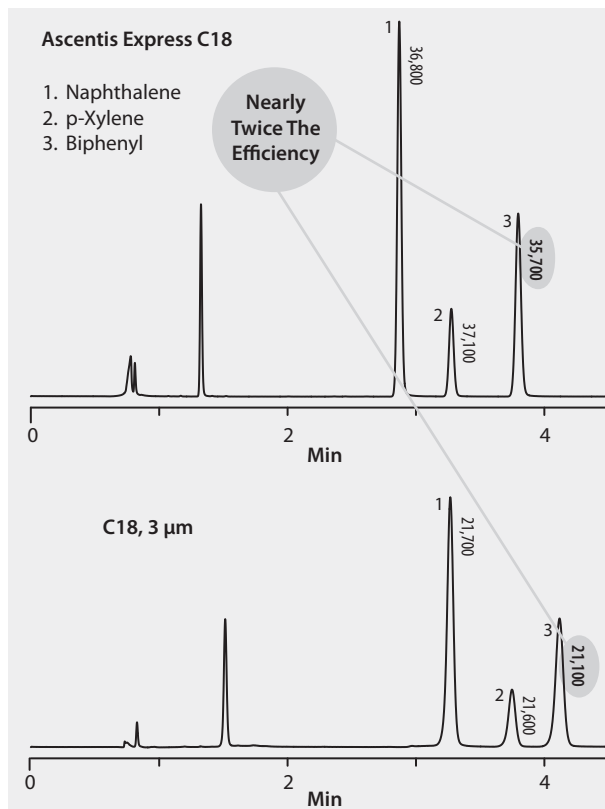
GC Analysis of Methylphenidate (Ritalin) Enantiomers (N-Trifluoroacetyl Derivatives) on Astec® CHIRALDEX® B-DA

column Astec CHIRALDEX B-DA, 30 m x 0.25 mm I.D., 0.12 µm (72023AST)
oven 170 °C
inj. temp. 250 °C
detector FID, 250 °C
carrier gas helium, 35 psi
sample peaks 1 & 2: methylphenidate enantiomers (N-TFA derivative)
Application No. **G005070**



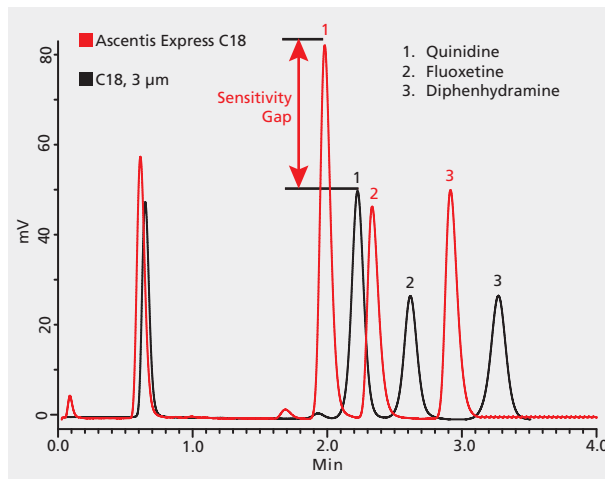
High Efficiency Resolution on Ascentis® Express Versus 3 μ m Particles

column Ascentis Express C18, 15 cm x 4.6 mm I.D., 2.7 μ m particles and C18, 15 cm x 4.6 mm I.D., 3 μ m particles (53829-U)
 mobile phase (A) water; (B) acetonitrile; (35:65 or 27.5:72.5, A:B)
 flow rate 1.5 mL/min
 column temp. ambient
 detector UV, 220 nm
 injection 2 μ L
 Application No. [G003979](#)



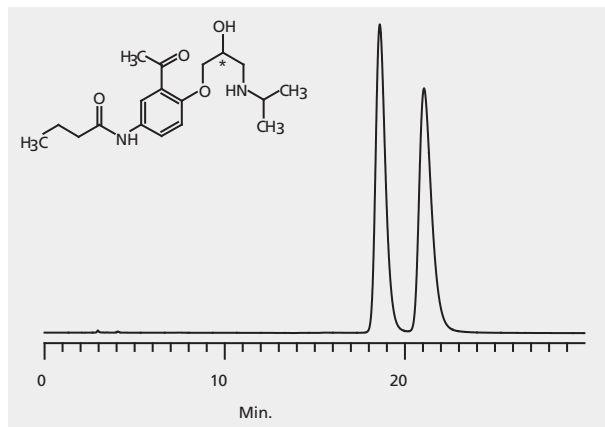
Higher Efficiency of Ascentis® Express Compared to 3 µm Particles Gives Better Sensitivity

column Ascentis Express C18, 5 cm x 2.1 mm I.D., 2.7 µm particles and C18, 5 cm x 2.1 mm I.D., 3 µm particles (53822-U)
mobile phase (A) 25 mM dibasic ammonium phosphate (pH 7.0):
(B) water: (C) acetonitrile; (35:0:65 or 35:4:61, A:B:C)
flow rate 0.2 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 1 µL
Application No. [G003977](#)



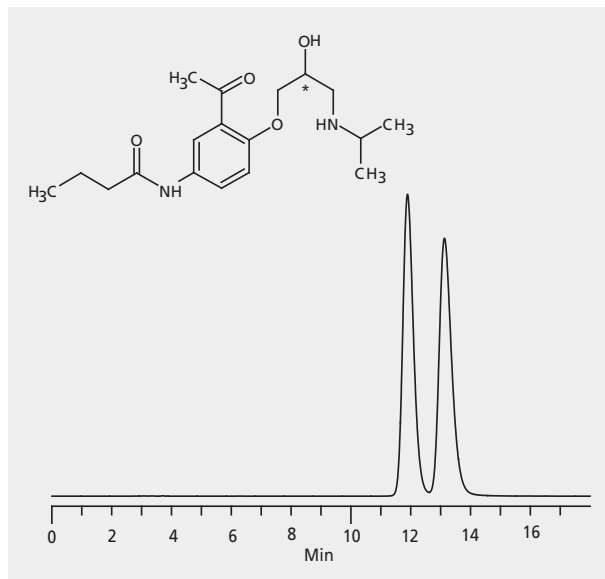
HPLC Analysis of Acebutolol Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase . . (A) methanol; (B) acetic acid; (C) triethylamine; (99.8:0.1:0.1, A:B:C)
flow rate 1 mL/min
column temp. 22 °C
detector UV, 254 nm
injection 12 µL
sample 1 mg/mL in methanol
Application No. [G004482](#)



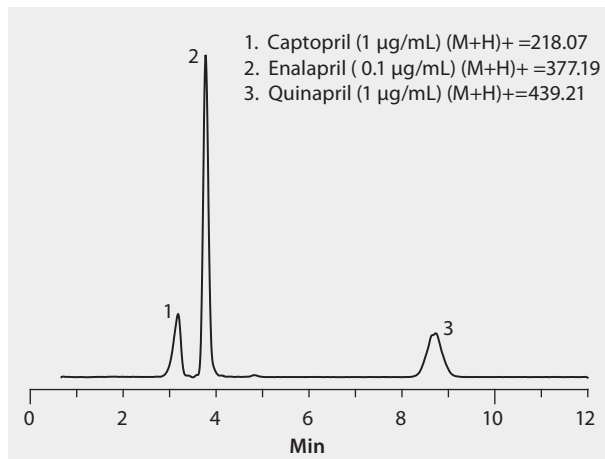
HPLC Analysis of Acebutolol Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase . . (A) methanol; (B) acetic acid; (C) triethylamine; (100:0.1:0.1, A:B:C)
flow rate 1 mL/min
column temp. 22 °C
detector UV, 254 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. [G004457](#)



HPLC Analysis of ACE Inhibitors on Ascentis® Phenyl

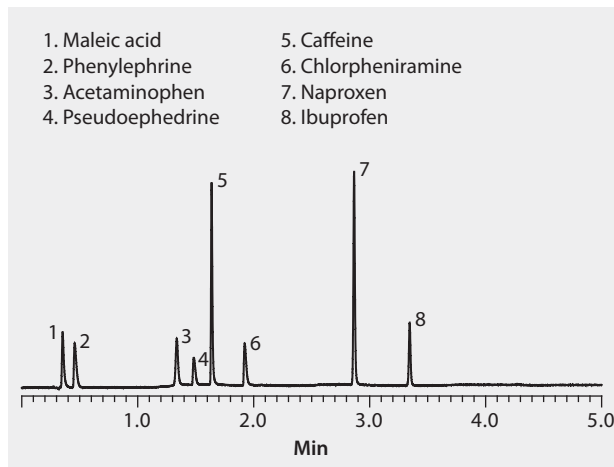
column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase (A) 13 mM ammonium formate (pH 2.0 with concentrated formic acid): (B) methanol; (40:60, A:B)
flow rate 1 mL/min, split to the MS
column temp. 35 °C
detector MS, ESI (+) in selected ion recording (SIR) mode
injection 5 µL
sample as indicated in 40:60, 13 mM ammonium formate (pH 2.0 with concentrated formic acid):methanol
Application No. [G003702](#)



HPLC Analysis of Acetaminophen, Caffeine, Chlorpheniramine, Ibuprofen, Naproxen, Phenylephrine, and Pseudoephedrine on Ascentis® Express C18

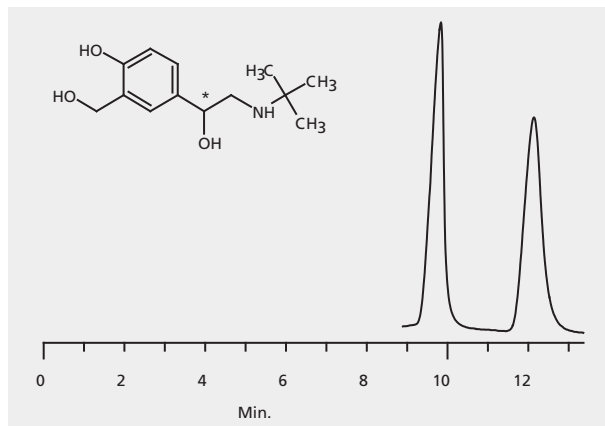
This application demonstrates the suitability of Ascentis Express C18 for the efficient separation of various over the counter drugs.

column . . . Ascentis Express C18, 5 cm x 2.1 mm I.D., 2.7 µm particles (53822-U)
mobile phase (A) 5 mM ammonium phosphate monobasic, pH 2.0 with phosphoric acid: acetonitrile (98:2); (B) acetonitrile;
gradient 0 to 68% B in 3 min; held at 68% B for 2 min
flow rate 0.4 mL/min
column temp. 35 °C
detector UV, 210 nm
injection 1 µL
sample 100 µg/mL in 95:5, water: methanol
Application No. [G005716](#)



HPLC Analysis of Albuterol Enantiomers on Astec® CHIROBIOTIC® T2

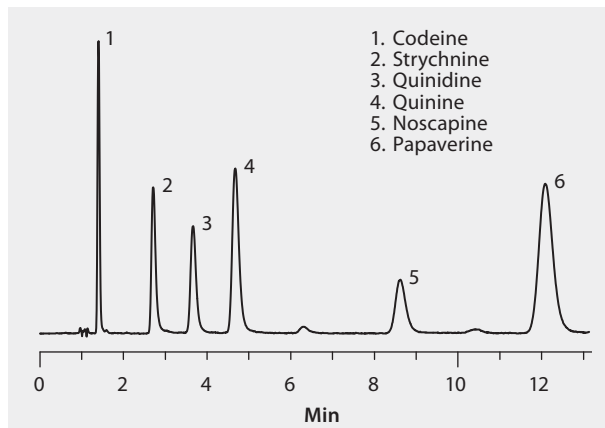
column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase 0.1 wt% ammonium trifluoroacetic acid in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004593](#)



HPLC Analysis of Alkaloids on Discovery® RP-AmideC16

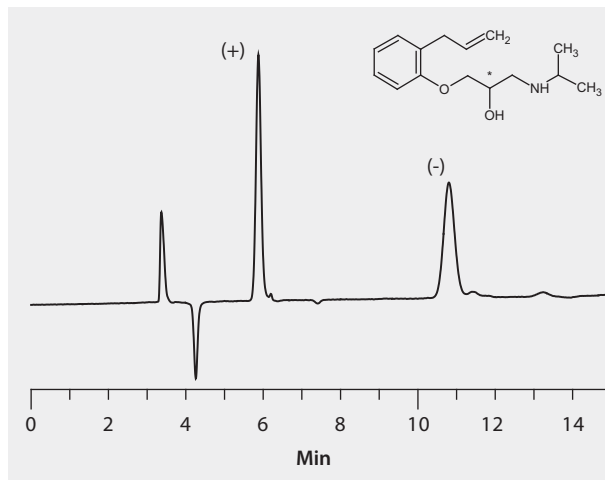
column . . . Discovery RP-AmideC16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase (A) methanol; (B) 25 mM potassium phosphate,
dibasic, pH 3.0; (20:80, A:B)

flow rate 2 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
Application No. **G000235**



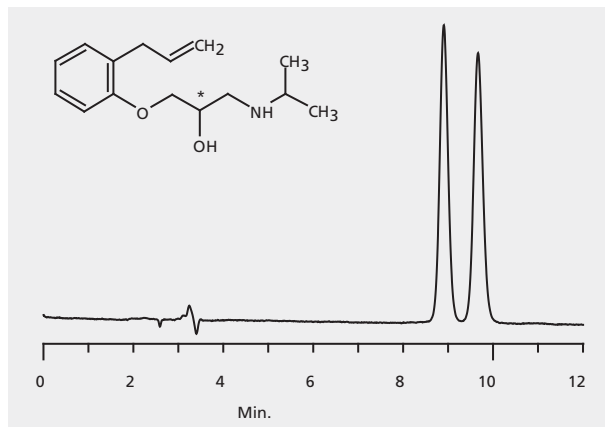
HPLC Analysis of Alprenolol Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) heptane; (B) IPA; (C) DEA; (90:10:0.1, A:B:C)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G004984](#)



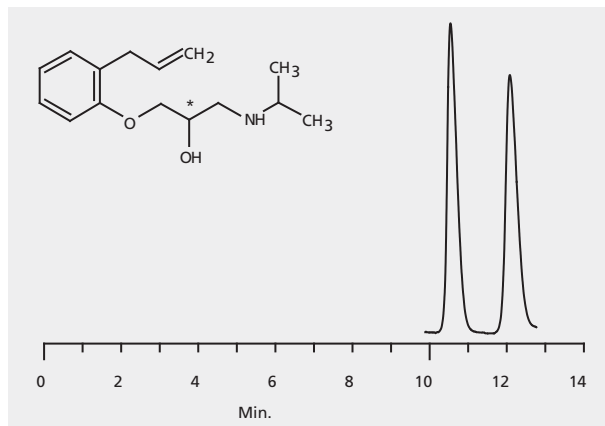
HPLC Analysis of Alprenolol Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase 15 mM ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 215 nm
injection 3 µL
sample 1 mg/mL in methanol
Application No. **G004486**



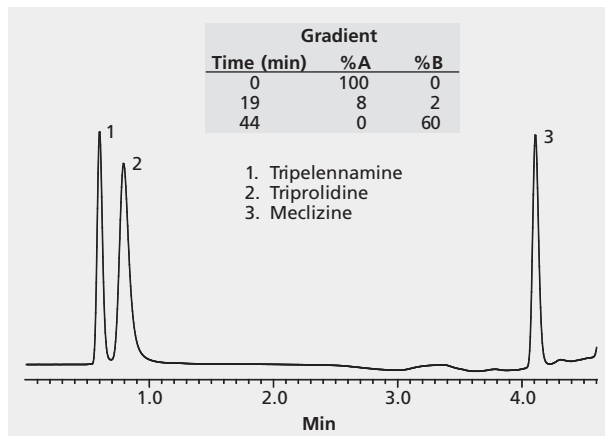
HPLC Analysis of Alprenolol Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase 0.1 wt% ammonium trifluoroacetic acid in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 0.5 µL
sample 1 mg/mL in methanol
Application No. [G004592](#)



HPLC Analysis of Amines on Discovery® Zr-PS

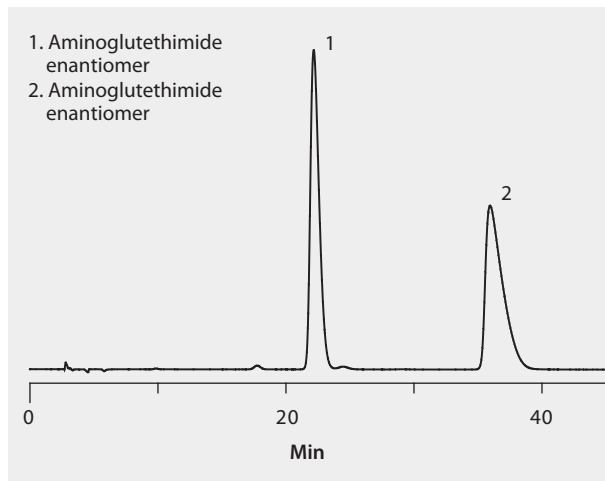
column Discovery Zr-PS, 5 cm × 4.6 mm I.D., 3 μm particles (65740-U)
mobile phase (A) 25 mM HCl, pH 1.8; (B): acetonitrile
flow rate 1 mL/min
column temp. 40 °C
detector UV, 254 nm
injection 1 μL
sample tripeleppamine, triprolidine (1mg/mL), meclizine (3mg/mL)
Application No. **G001870**



HPLC Analysis of Aminoglutethimide Enantiomers on Astec® Cellulose DMP

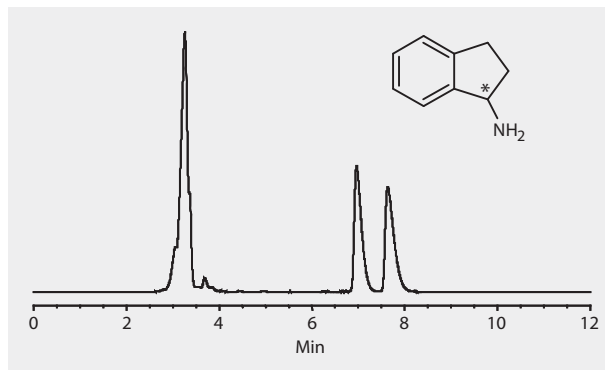
Aminoglutethimide enantiomers are resolved by normal phase chromatography.

column . . . ASTEC Cellulose DMP; 25 cm x 4.6 mm I.D., 5 µm particles (51099AST)
mobile phase . . . (A) heptane; (B) isopropanol; (C) diethylamine; (70:30:0.1, A:B:C)
flow rate 1 mL/min
column temp. 30 °C
injection 15 µL
sample aminoglutethimide, 1 g/L in 50:50, heptane:isopropanol
Application No. [G005466](#)



HPLC Analysis of 1-Aminoindan Enantiomers on LARIHC™ CF6-P

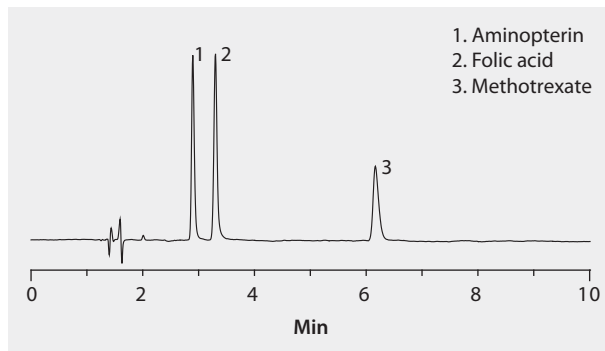
column . . . LARIHC CF6-P, 25 cm x 4.6 mm I.D., 5 µm particles (AZYP Part No.L1001, available from Supelco/Sigma-Aldrich as a custom item)
mobile phase (A) methanol: (B) acetonitrile: (C) acetic acid: (D) triethylamine, (70:30:0.3:0.2, A:B:C:D)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 5 µL
sample 1-Aminoindan, 0.3 mg/mL in ethanol
Application No. **G005255**



HPLC Analysis of Aminopterin and Related Compounds on Ascentis® Express C18

This application demonstrates the suitability of the Ascentis C18 for the analysis of aminopterin, folic acid and methotrexate. Structures along with the optimized chromatogram obtained on the Ascentis Express C18 are presented

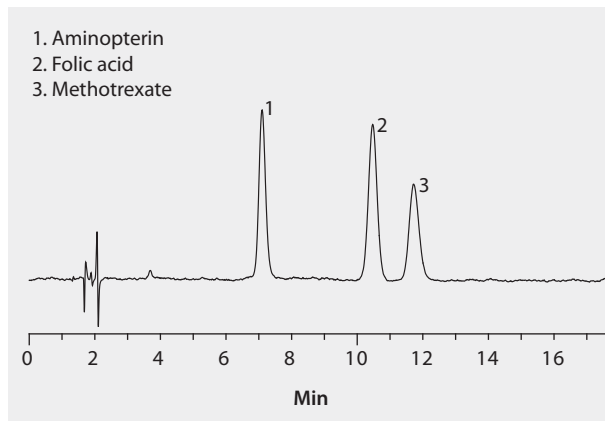
column . . . Ascentis Express C18, 15 cm x 4.6 mm I.D., 2.7 µm particles (53829-U)
mobile phase . . . (A) 10 mM ammonium formate, pH 3.0; (B) acetonitrile; (90:10, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 280 nm
injection 5 µL
Application No. [G005665](#)



HPLC Analysis of Aminopterin and Related Compounds on Ascentis® RP-Amide

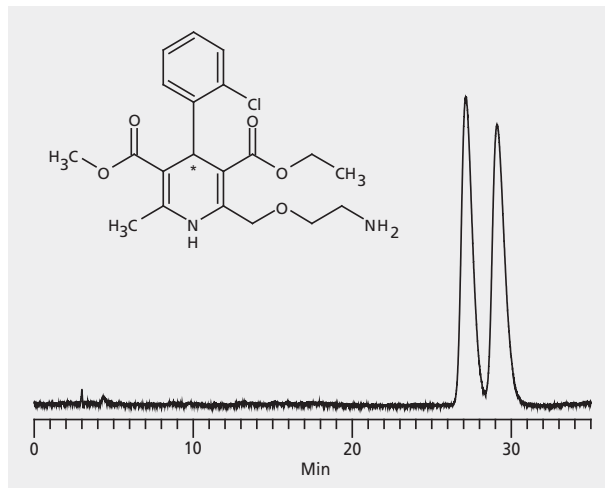
This application demonstrates the suitability of the Ascentis RP-Amide for the analysis of aminopterin, folic acid and methotrexate. Structures along with the optimized chromatogram obtained on the Ascentis RP-Amide are presented.

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565352-U)
mobile phase . . . (A) 10 mM ammonium formate, pH 3.0; (B) acetonitrile; (90:10, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 280 nm
injection 10 µL
Application No. [G005666](#)



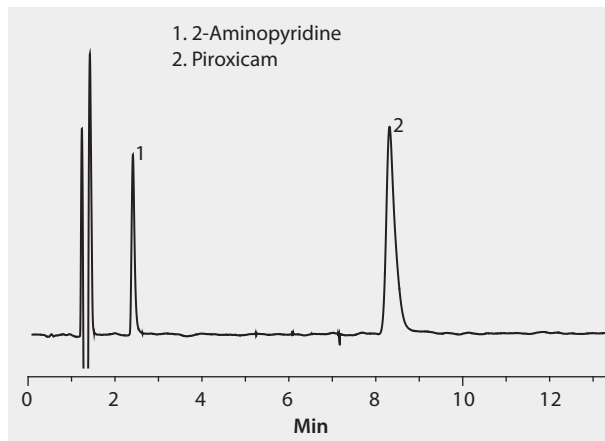
HPLC Analysis of Amlodipine Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase . . . (A) methanol; (B) 20 mM ammonium acetate, pH 4.1; (95:5, A:B)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004463](#)



HPLC Analysis of 2-AMP and Piroxicam on Ascentis® Express F5

column . . . Ascentis Express F5, 10 cm x 4.6 mm I.D., 2.7 µm particles (53590-U)
mobile phase . . . (A) 10 mM ammonium formate, pH=3; (B) acetonitrile; (75:25, A:B)
flow rate 0.8 mL/min
pressure 1635 psi (113 bar)
column temp. 35 °C
detector UV, 230 nm
injection 5 µL
sample 100 µg/mL Piroxicam and 10 µg/mL 2-AMP in mobile phase
Application No. **G005606**

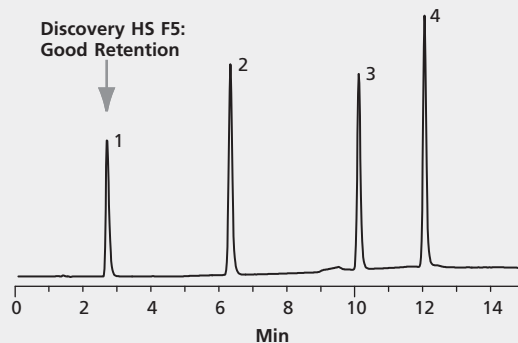


HPLC Analysis of Analgesics on Discovery® HS F5

column Discovery HS F5, 15 cm × 4.6 mm I.D., 5 µm particles (567516-U)
mobile phase (A) 10 mM ammonium acetate, 0.1% formic acid; (B) methanol
flow rate 1.5 mL/min
column temp. 35 °C
detector UV, 254nm
injection 10 µL
Application No. [G001526](#)

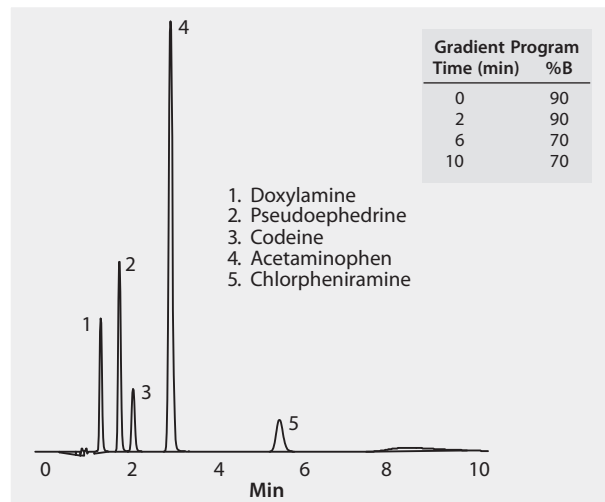
Gradient Program		
Time (min)	%A	%B
0	90	10
3	90	10
10	50	50
15	50	50

1. *p*-Aminophenol (100 g/mL)
2. Acetaminophen (10 g/mL)
3. Acetanilide (10 g/mL)
4. Phenacetin (10 g/mL)



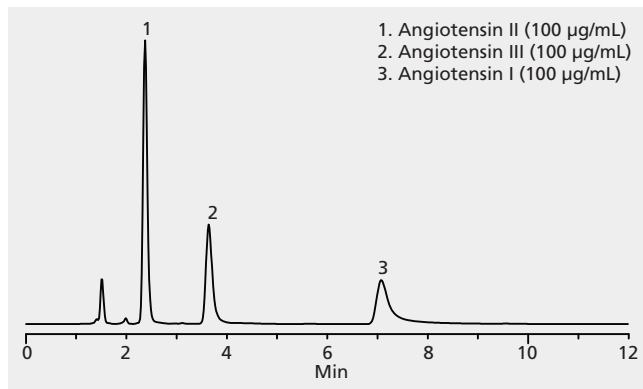
HPLC Analysis of Analgesics on Discovery® RP-Amide C16

column . . . Discovery RP-AmideC16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase (A) 25 mM potassium phosphate (pH 2.3); (B) acetonitrile
flow rate 2 mL/min
column temp. ambient
detector UV, 214 nm
injection 10 µL
Application No. [G000785A](#)



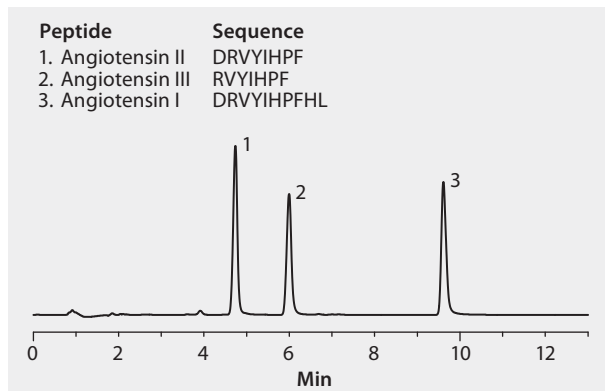
HPLC Analysis of Angiotensins on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 5 mM ammonium phosphate (pH 7.0 with ammonium
hydroxide); (B) acetonitrile; (77.5:22.5, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 215 nm
injection 10 µL
sample as indicated in mobile phase
Application No. **G002914**



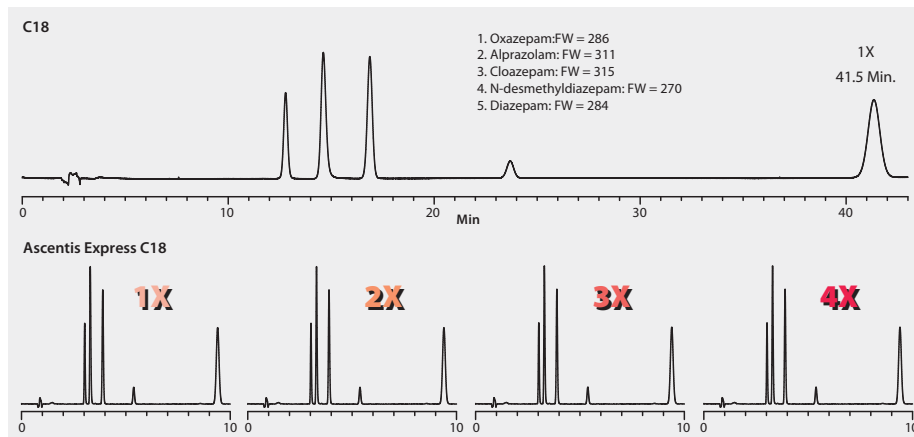
HPLC Analysis of Angiotensins on Discovery® BIO Wide Pore C18

column Discovery BIO Wide Pore C18, 15 cm × 4.6 mm I.D.,
5 µm particles (568222-U)
mobile phase (A) (10 mM NH₄OAc, pH 7):(50% CH₃CN in
20 mM NH₄OAc, pH 7), 65:35 ;
(B) (10 mM NH₄OAc, pH 7):(50% CH₃CN in
20 mM NH₄OAc, pH 7), 25:75
gradient 0-100% B in 12.5 min
flow rate 1 mL/min
column temp. ambient
detector UV, 254 nm
injection 6 µL (10 µg each) in water
Application No. **G001585**



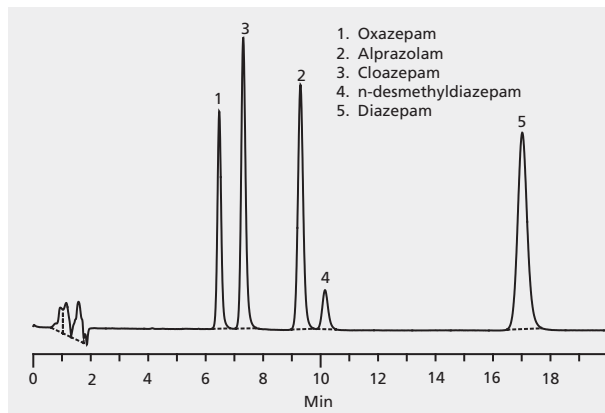
HPLC Analysis of Antianxiety Drugs on Ascentis® Express C18 vs. Standard C18, Demonstrating High Throughput on Ascentis Express

column C18, 25 cm × 4.6 mm I.D., 5 μm particles and
 Ascentis Express C18, 10 cm × 4.6 mm I.D., 2.7 μm particles (53827-U)
 mobile phase (A) water: (B) acetonitrile; (65:35, A:B)
 flow rate 1 mL/min
 column temp. ambient
 detector UV, 254 nm
 Application No. **G004039**



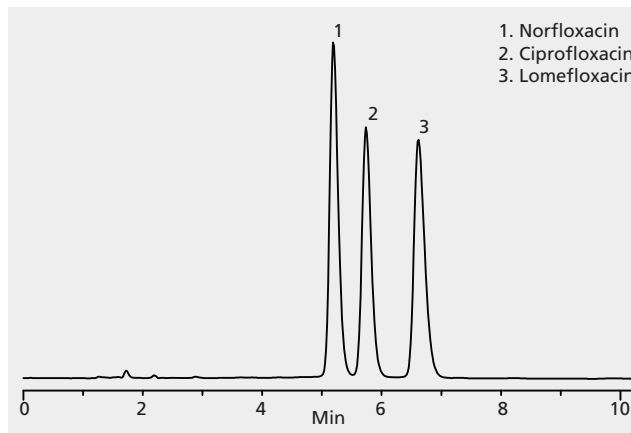
HPLC Analysis of Antianxiety Drugs on Ascentis® Phenyl

column Ascentis Phenyl, 15 cm × 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase (A) acetonitrile; (B) water; (40:60, A:B)
flow rate 1.0 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
Application No. **G003664**



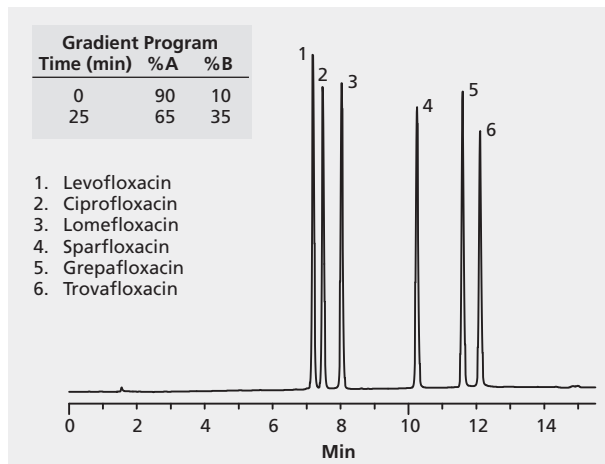
HPLC Analysis of Antibacterials/Antifungals on Ascentis® RP-Amide, Phosphate Mobile Phase

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile; (85:15, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002589**



HPLC Analysis of Antibiotics (Fluoroquinolones from Tablets) on Discovery® HS C18

column Discovery HS C18, 15 cm × 4.6 mm I.D., 5 µm particles (568522-U)
mobile phase (A) 25 mM potassium phosphate (pH 3.0); (B) acetonitrile
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
Application No. **G001425**

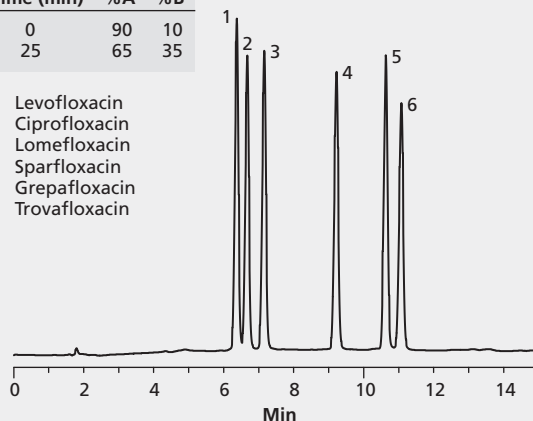


HPLC Analysis of Antibiotics on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase (A) 25 mM potassium phosphate (pH 3.0); (B) acetonitrile
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
Application No. **G001424**

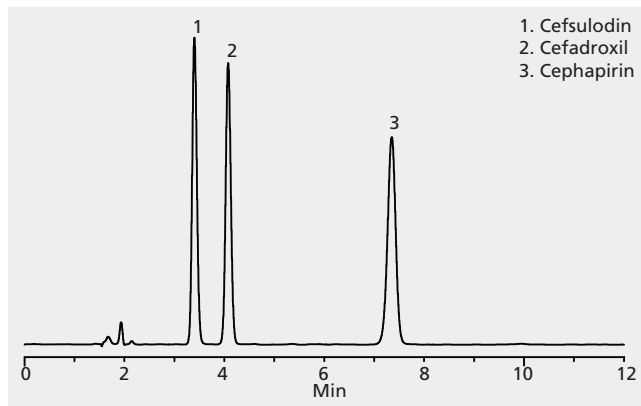
Gradient Program		
Time (min)	%A	%B
0	90	10
25	65	35

1. Levofloxacin
2. Ciprofloxacin
3. Lomefloxacin
4. Sparfloxacin
5. Grepafloxacin
6. Trovafloxacin



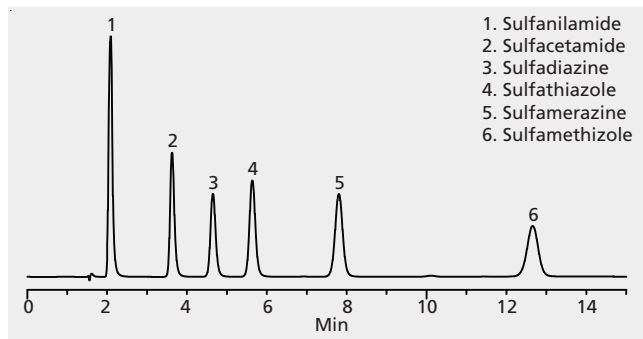
HPLC Analysis of Antibiotics on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile (93:7, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002407**



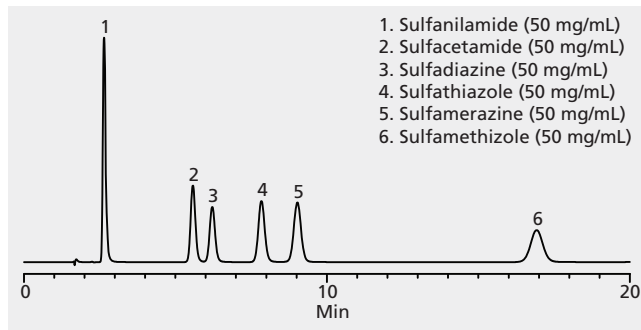
HPLC Analysis of Antibiotic Sulfa Drugs on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) water with 1% acetic acid; (B) methanol; (85:15, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. [G002345](#)



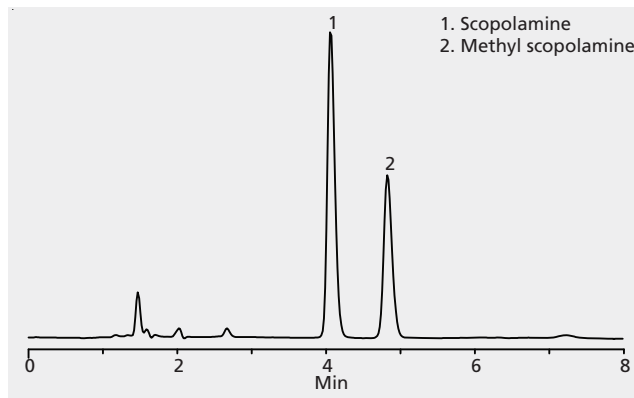
HPLC Analysis of Antibiotic Sulfa Drugs on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 1% acetic acid in water; (B) methanol, (85:15, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample as indicated in 1% acetic acid in water
Application No. **G002637**



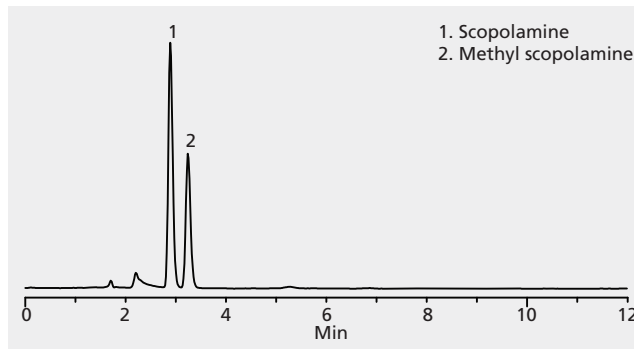
HPLC Analysis of Anticholinergic Drugs on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile; (85:15, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002351**



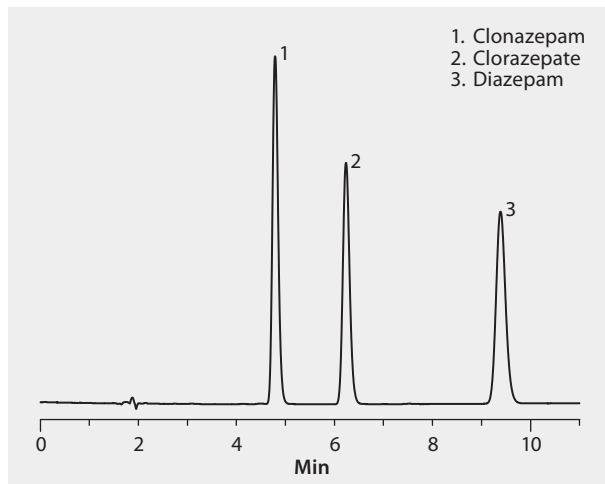
HPLC Analysis of Anticholinergic Drugs on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile; (85:15, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002663**



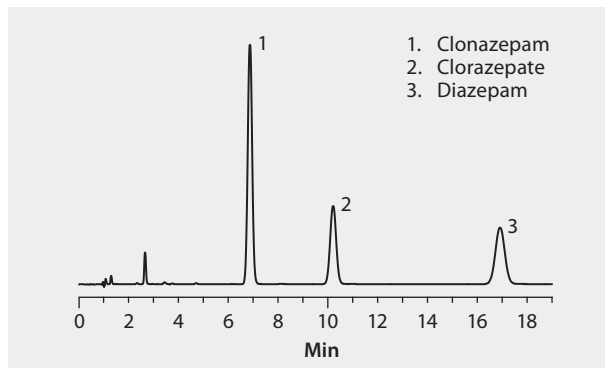
HPLC Analysis of Anticonvulsant Drugs on Discovery® RP-AmideC16

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase . . (A) acetonitrile; (B) 25 mM potassium phosphate, pH 7.0 (40:60, A:B)
flow rate 1 mL/min
column temp. 40 °C
detector UV, 254 nm
injection 10 µL
Application No. **G000188**



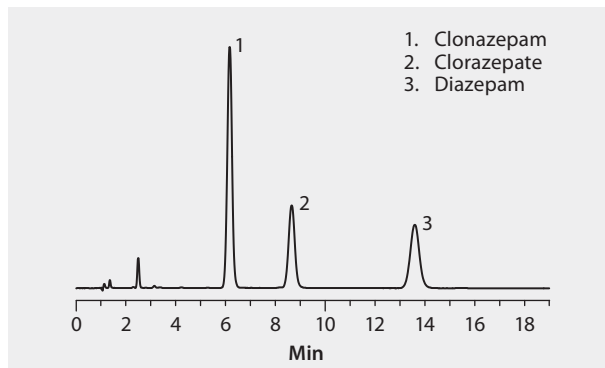
HPLC Analysis of Anticonvulsants on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase (A) water: (B) acetonitrile; (70:30, A:B)
flow rate 2 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 10 µL
Application No. **G000746A**



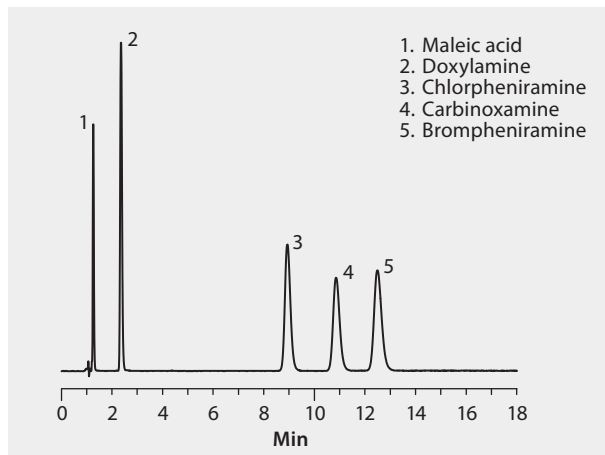
HPLC Analysis of Anticonvulsants on Discovery® C8

column Discovery C8, 15 cm × 4.6 mm I.D., 5 µm particles (595353-U)
mobile phase (A) water; (B) acetonitrile; (70:30, A:B)
flow rate 2 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 10 µL
Application No. **G000748**



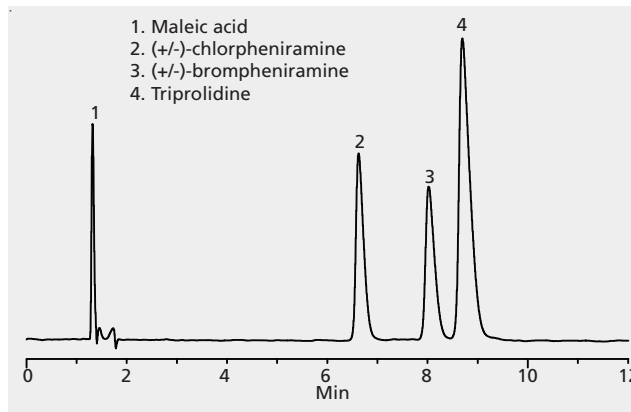
HPLC Analysis of Antihistamines on Discovery® C8

column Discovery C8, 15 cm × 4.6 mm I.D., 5 µm particles (59353-U)
mobile phase . . (A) acetonitrile; (B) 25 mM potassium phosphate, pH 2.3; (8:92, A:B)
flow rate 2 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
Application No. **G001278**



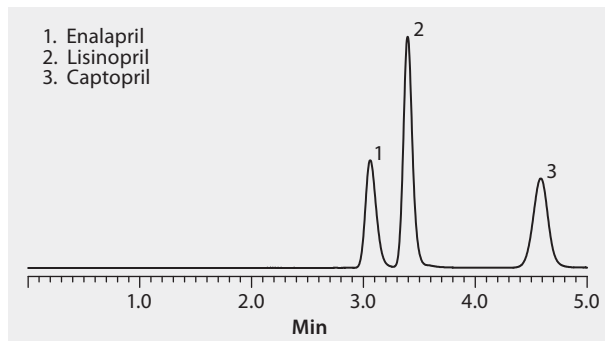
HPLC Analysis of Antihistamines on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile; (75:25, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample 10 µg/mL each in mobile phase
Application No. [G002365](#)



HPLC Analysis of Antihypertensive ACE Inhibitors on Discovery® RP-AmideC16

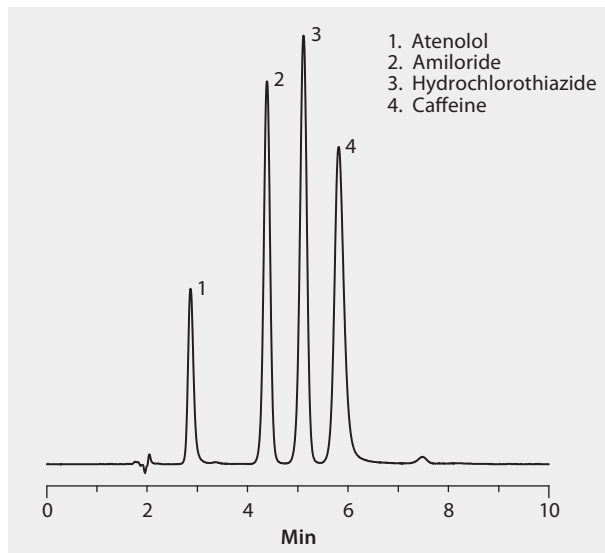
column . . . Discovery RP-AmideC16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase . . . (A) acetonitrile; (B) 25 mM potassium phosphate, pH 2.3 (33:67, A:B)
flow rate 0.6 mL/min
column temp. 35 °C
detector UV, 214 nm
injection 3 µL
Application No. **G000279**



HPLC Analysis of Antihypertensive and Diuretic Drugs on Discovery® RP-Amide C16

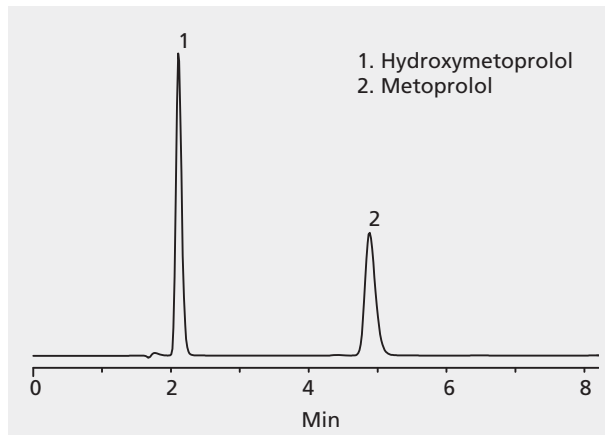
column . . . Discovery RP-AmideC16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase (A) methanol; (B) 25 mM potassium phosphate,
dibasic, pH 7.0 (22:78, A:B)

flow rate 1 mL/min
column temp. 30 °C
detector UV, 254 nm
injection 10 µL
Application No. **G000280**



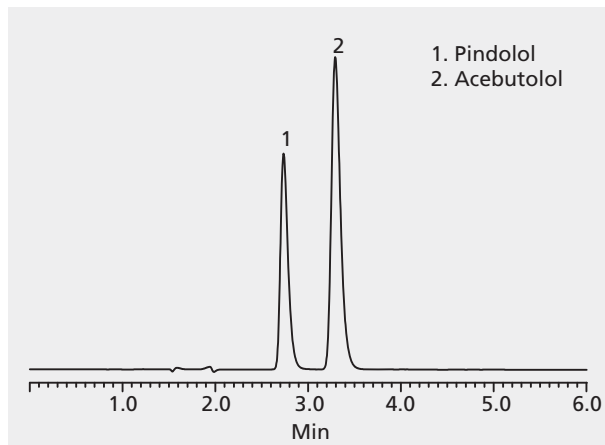
HPLC Analysis of Antihypertensive Drugs on Ascentis® RP-Amide (UV, 220 nm)

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) methanol; (70:30, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002598**



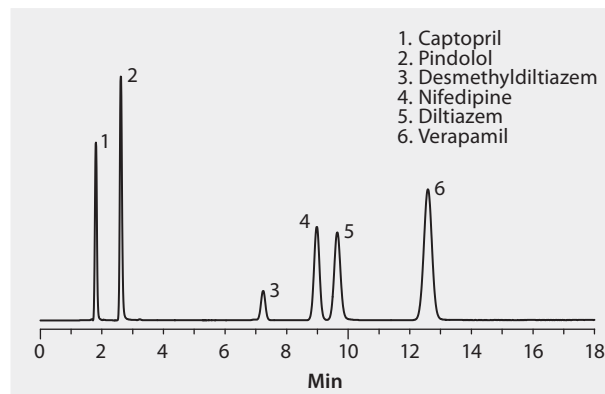
HPLC Analysis of Antihypertensive Drugs on Ascentis® RP-Amide (UV, 254 nm)

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile; (80:20, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002600**



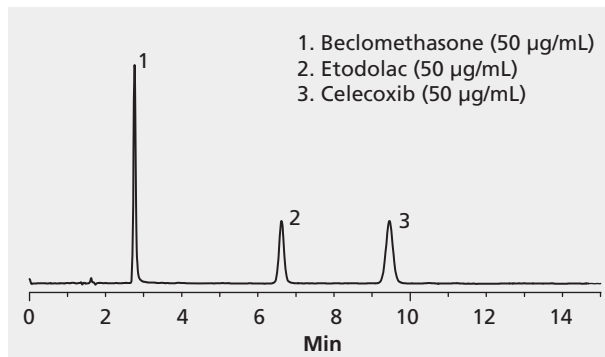
HPLC Analysis of Antihypertensive Drugs (β -Calcium Channel Blockers and ACE Inhibitor) on Discovery® RP-AmideC16

column . . . Discovery RP-AmideC16, 15 cm \times 4.6 mm I.D., 5 μ m particles (505013)
mobile phase (A) methanol; (B) 25 mM KH_2PO_4 , pH 7.0 (40:60, A:B)
flow rate 1 mL/min
column temp. 35 $^\circ\text{C}$
detector UV, 214 nm
injection 5 μL
Application No. **G000112**



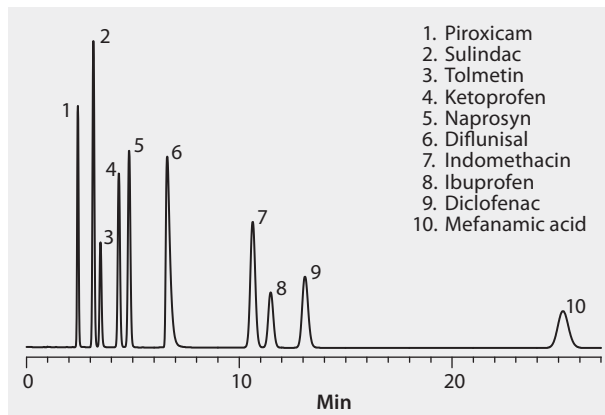
HPLC Analysis of Anti-Inflammatory Drugs on Ascentis® C18

column Ascentis C8, 15 cm x 4.6 mm I.D., 5 µm particles (581424-U)
mobile phase (A) 10 mM ammonium formate
(pH 3.0 with formic acid); (B) acetonitrile; (45:55, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample as indicated in mobile phase
Application No. **G003155**



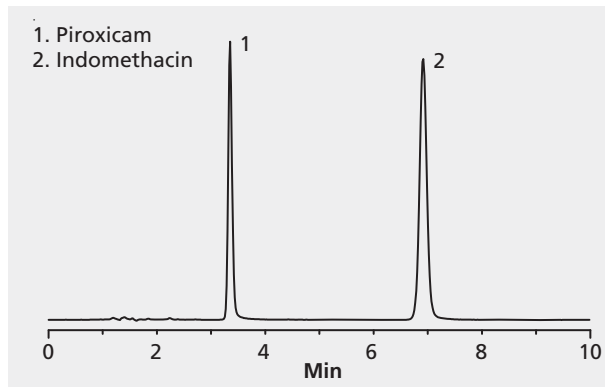
HPLC Analysis of Anti-Inflammatory Drugs on Discovery® RP-Amide C16

column . . . Discovery RP-Amide C16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase (A) acetonitrile; (B) 25 mM KH₂PO₄, pH 3.0; (40:60, A:B)
flow rate 1 mL/min
column temp. 30 °C
detector UV, 230 nm
injection 10 µL, 1 µg/mL each analyte
Application No. **G000061**



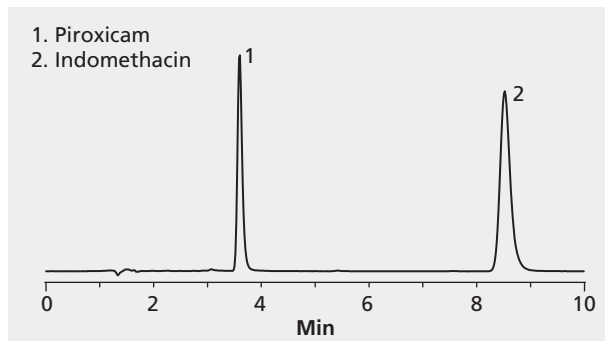
HPLC Analysis of Anti-Inflammatory Drugs on Ascentis® C8

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 25 µg/mL each in mobile phase
Application No. **G002391**



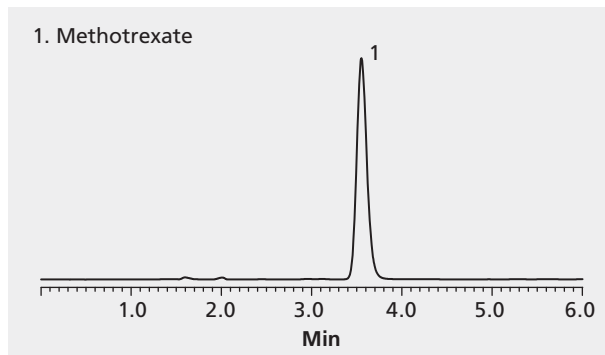
HPLC Analysis of Anti-Inflammatory Drugs on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile; (45:55, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 25 µg/mL each in mobile phase
Application No. **G002660**



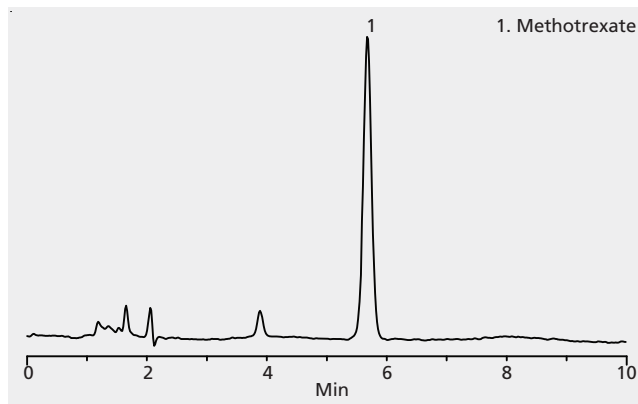
HPLC Analysis of Antineoplastic Drugs on Ascentis® C18

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile; (85:15, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL in mobile phase
Application No. **G002655**



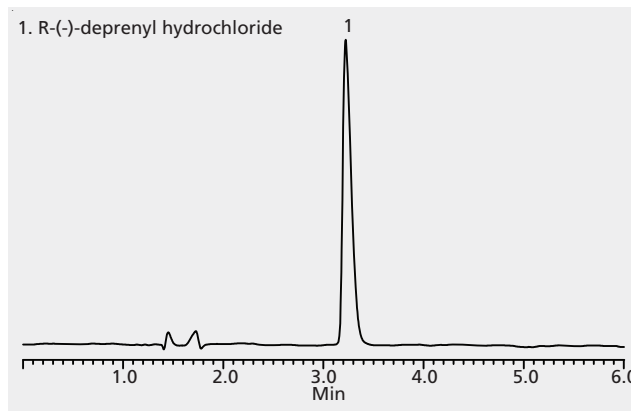
HPLC Analysis of Antineoplastic Drugs on Ascentis® RP-Amide

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile; (88:12, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 10 µg/mL in mobile phase
Application No. **G002396**



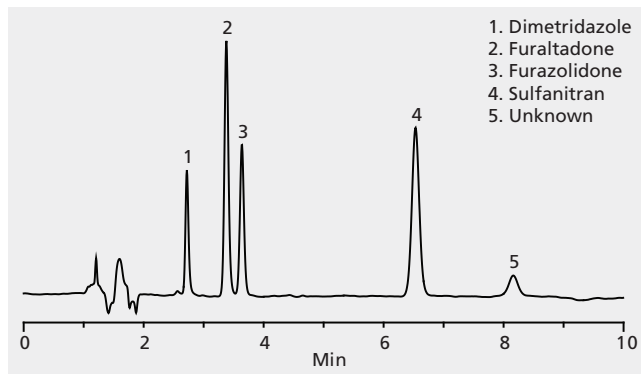
HPLC Analysis of Antiparkinsonian Drugs on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile; (75:25, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL in mobile phase
Application No. **G002398**



HPLC Analysis of Antiprotozoal Drugs on Ascentis® Phenyl

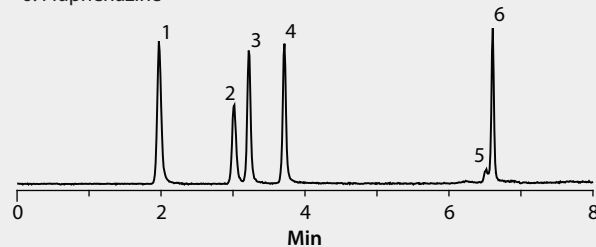
column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase (A) 10 mM ammonium acetate (pH 5.0 with acetic acid); (B) acetonitrile; (60:40, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample 50 µg/mL each in 85:15, water:methanol
Application No. **G003703**



HPLC Analysis of Antipsychotic Drugs on Ascentis® Express RP-Amide

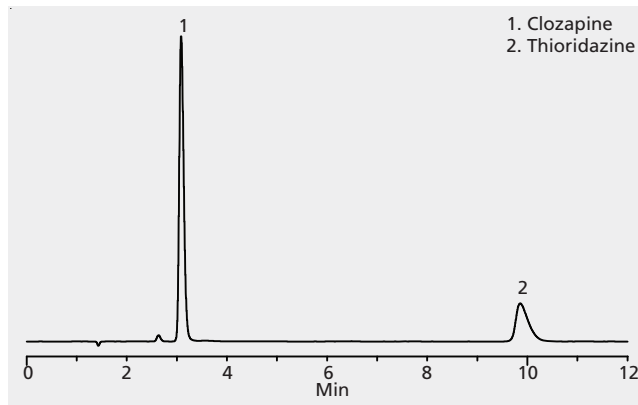
column Ascentis Express RP-Amide, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53913-U)
mobile phase (A) 5 mM ammonium formate (in water);
(B) 5 mM ammonium formate (in 95:5 methanol:water)
flow rate 3 mL/min
column temp. 35 °C
detector ESI(+), TIC 100 - 1000 m/z
injection 1 µL
sample 200 µg/L in water
Application No. **G005373**

1. Desmethyl venlafaxine
2. Hydroxybupropion
3. Hydroxyrisperidon
4. Bupropion
5. Zuclophethixol
6. Fluphenazine



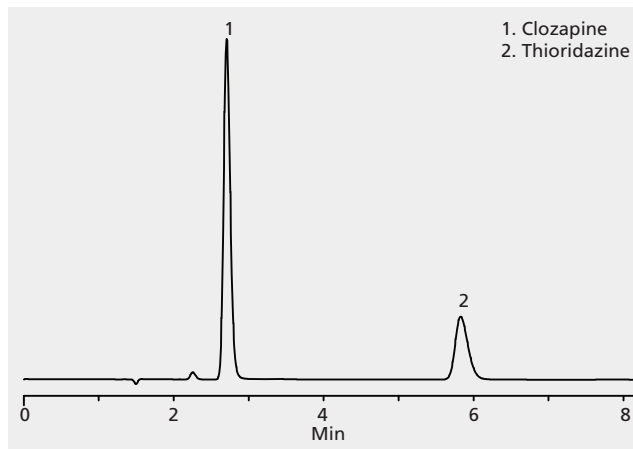
HPLC Analysis of Antipsychotic Drugs on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) methanol; (40:60, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002400**



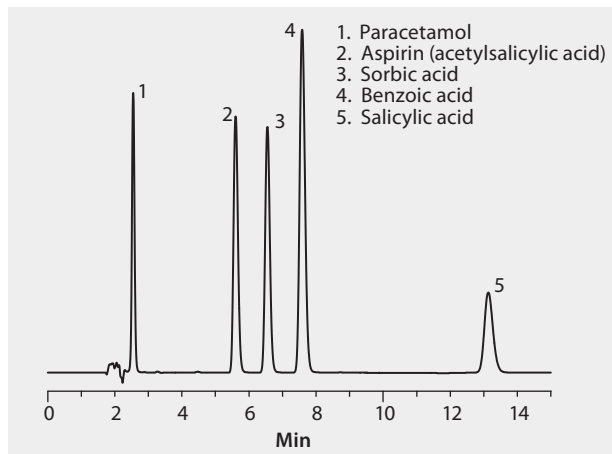
HPLC Analysis of Antipsychotic Drugs on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) methanol; (40:60, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002603**



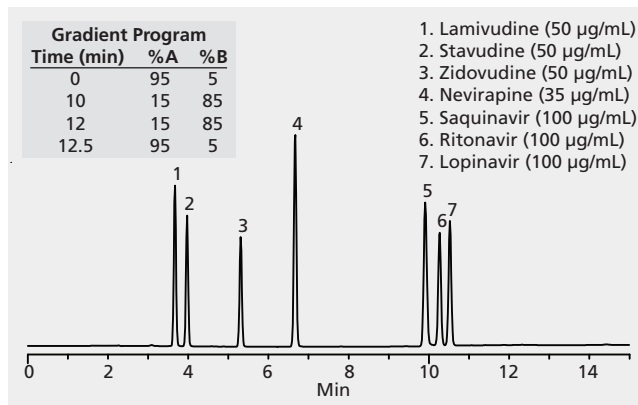
HPLC Analysis of Antipyretics/Analgesics/ Antifungals on Discovery® RP-AmideC16

column . . . Discovery RP-AmideC16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase 0.1% TFA in (25:75) acetonitrile:water
flow rate 1 mL/min
column temp. 30 °C
detector UV, 254 nm
injection 10 µL
Application No. **G000088**



HPLC Analysis of Antiretroviral Drugs on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
 mobile phase (A) 25 mM ammonium phosphate (pH 5.5); (B) acetonitrile
 flow rate 1.0 mL/min
 column temp. 35 °C
 detector UV, 220 nm
 injection 10 µL
 sample as indicated in 25 mM ammonium phosphate (pH 5.5)
 Application No. **G002988**

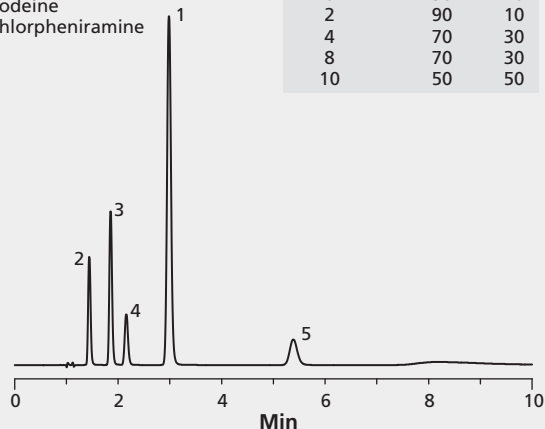


HPLC Analysis of Antitussive/Antihistamine/ Antipyretic Mix on Discovery® RP-Amide C16

column . . . Discovery RP-AmideC16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase (A) 25 mM potassium phosphate (pH 2.3); (B) acetonitrile
flow rate 2 mL/min
column temp. ambient
detector UV, 214 nm
injection 10 µL, each compound 1 µg/mL
Application No. **G000787**

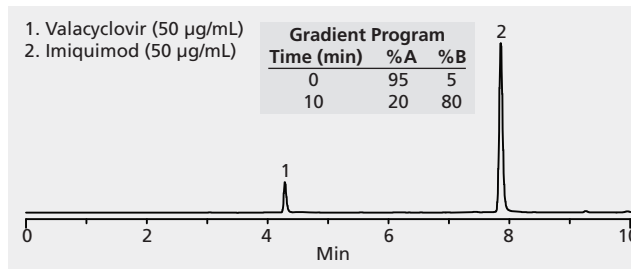
1. Acetaminophen
2. Doxylamine
3. Pseudoephedrine
4. Codeine
5. Chlorpheniramine

Gradient Program		
Time (min)	%A	%B
0	90	10
2	90	10
4	70	30
8	70	30
10	50	50



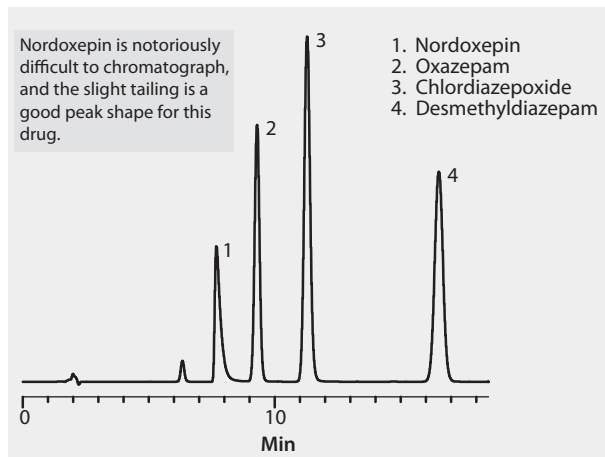
HPLC Analysis of Antiviral Drugs on Ascentis® C8

column Ascentis C8, 15 cm x 2.1 mm I.D., 3 µm particles (581402-U)
mobile phase (A) 10 mM ammonium phosphate (pH 2.5 with phosphoric acid); (B) acetonitrile
flow rate 0.2 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 2 µL
sample as indicated in mobile phase
Application No. [G003201](#)



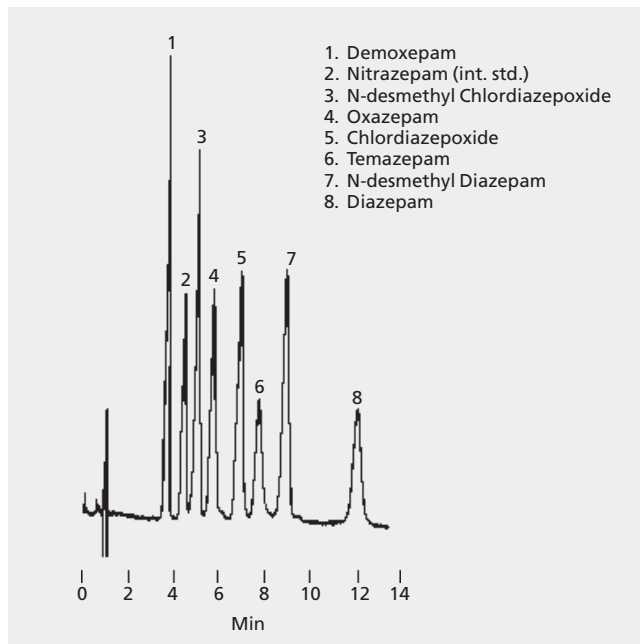
HPLC Analysis of Anxiolytic Drugs on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase (A) acetonitrile; (B) 25mM KH₂PO₄, pH 7.0 (30:70, A:B)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 10 µL
Application No. [797-0662](#)



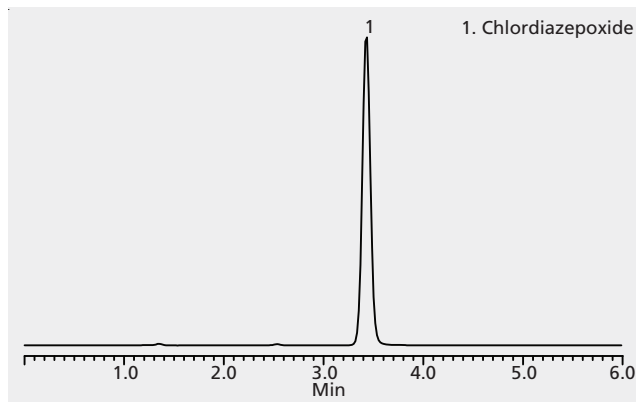
HPLC Analysis of Anxiolytic Drugs on SUPELCOSIL™ LC-8

column SUPELCOSIL LC-8, 15 cm × 4.6 mm I.D., 5 µm particles (58220-U)
mobile phase methanol:acetonitrile:0.005 M KH₂PO₄ and 0.1 M ammonium acetate
buffer (pH 6.0 with glacial acetic acid),26.5:16.5:57 (v/v/v)
flow rate 2 mL/min
column temp. 30 °C
detector UV, 245 nm
injection 10 µL
Application No. **713-1390**



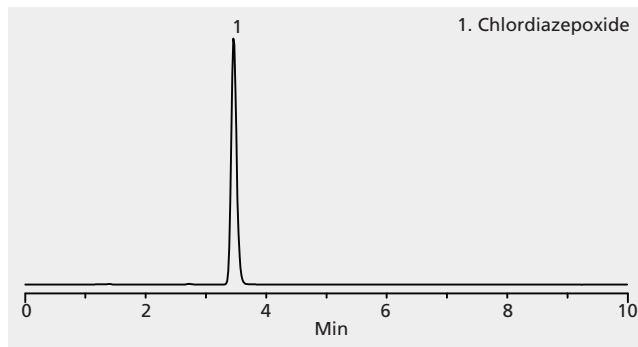
HPLC Analysis of Anxiolytic Drugs on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 10 mM monobasic potassium phosphate (pH 7.0 with
potassium hydroxide); (B) acetonitrile; (50:50, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002403**



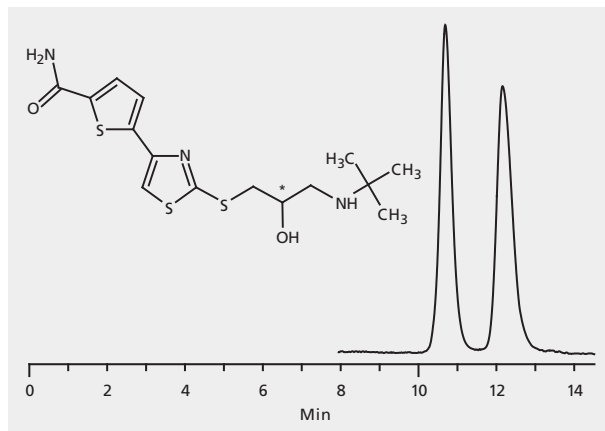
HPLC Analysis of Anxiolytic Drugs on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 10 mM monobasic potassium phosphate (pH 7.0 with
potassium hydroxide); (B) acetonitrile; (50:50, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002645**



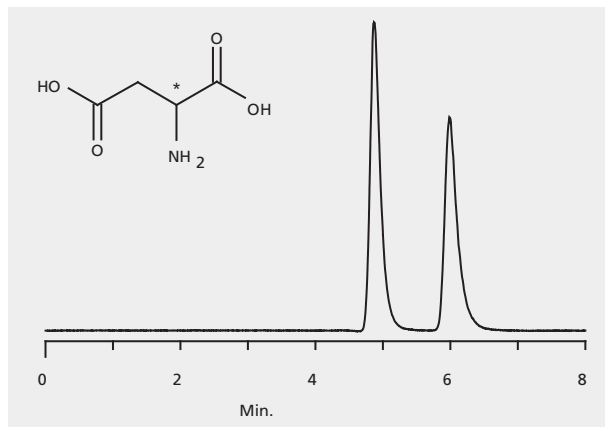
HPLC Analysis of Arotinolol Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) acetonitrile; (B) methanol; (C) acetic acid;
(D) triethylamine; (55:45:0.3:0.2, A:B:C:D)
flow rate 2 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 5 mg/mL in methanol
Application No. **G004539**



HPLC Analysis of Aspartic Acid Enantiomers on Astec® CHIROBIOTIC® T, Ethanol Mobile Phase

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (C) formic acid; (20:80:0.02, A:B:C)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 205 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004489](#)



HPLC Analysis of Aspirin and Salicylic Acid on Ascentis® Express RP-Amide

Salicylic acid is the primary metabolite of aspirin, and is likely responsible for its antiinflammatory properties via suppression of cyclooxygenase genes; it also is thought to suppress colonic carcinogenesis. Ascentis Express RP-Amide provides good retention and resolution at low pH by a combination of hydrophobic and H-bonding interactions.

column Ascentis Express RP-Amide, 10 cm x 4.6 mm I.D.,
2.7 µm particles (53929-U)

mobile phase (A) water with 0.1% TFA; (B) acetonitrile with
0.1% TFA; (65:35, A:B)

flow rate 1 mL/min

pressure 2200 psi (152 bar)

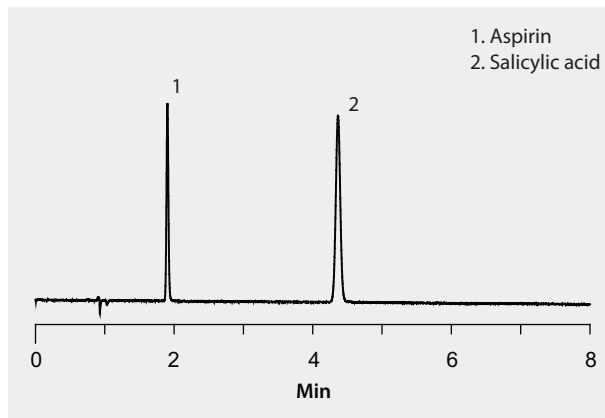
column temp. 30 °C

detector UV, 250 nm

injection 5 µL

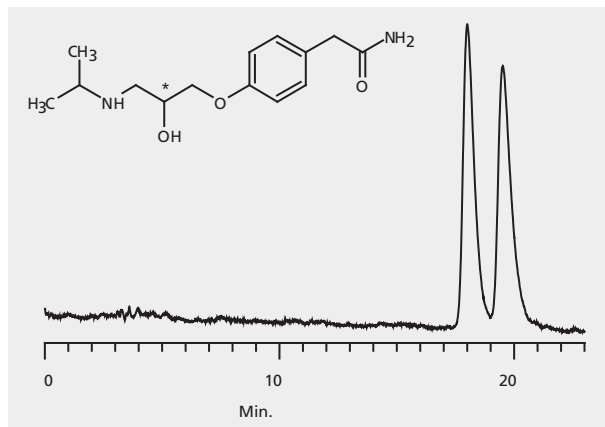
sample 50 µg/mL in 75:25, water:acetonitrile

Application No. **G005797**



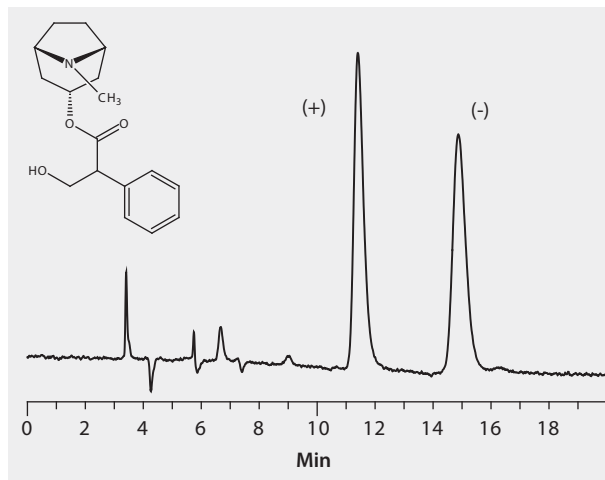
HPLC Analysis of Atenolol Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase 15 mM ammonium formate in methanol
flow rate 1 mL/min
column temp. 20 °C
detector UV, 220 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. [G004490](#)



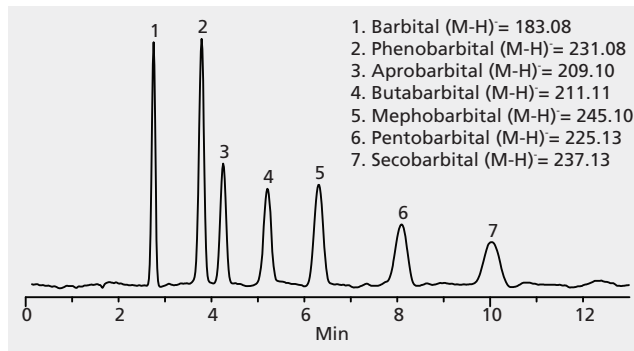
HPLC Analysis of Atropine Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) heptane; (B) IPA; (C) DEA; (90:10:0.1, A:B:C)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G004985](#)



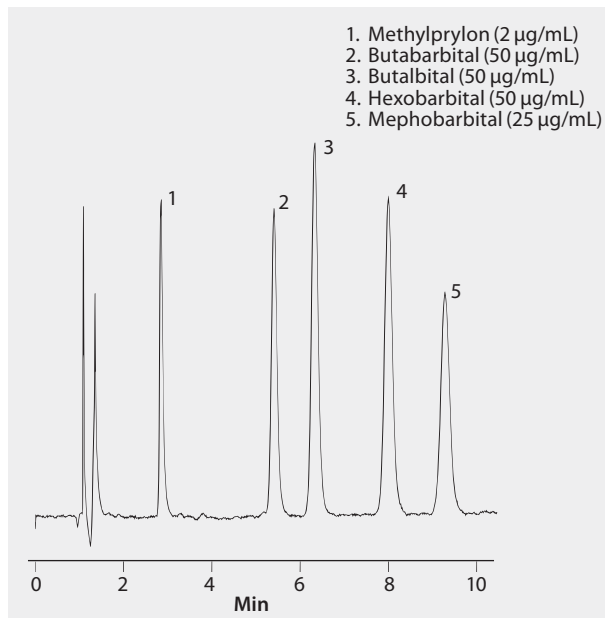
HPLC Analysis of Barbiturates on Ascentis® C8

column Ascentis C8, 15 cm x 4.6 mm I.D., 5 µm particles (581424-U)
mobile phase (A) methanol; (B) water (45:55, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 214 nm
injection 5 µL
sample 10 µg/mL each in 50:50 water:methanol
Application No. **G003307**



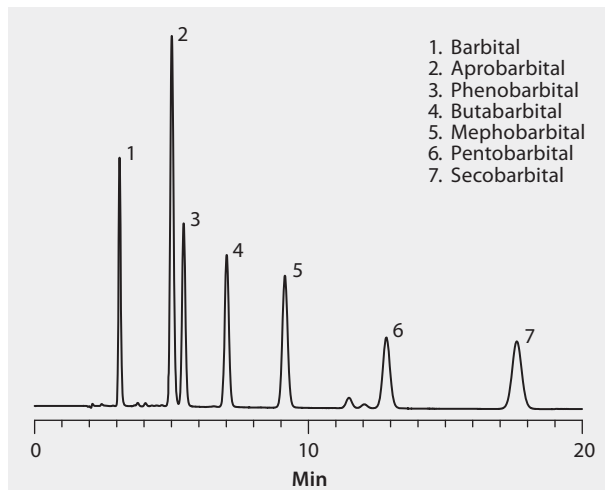
HPLC Analysis of Barbiturates on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase (A) acetonitrile; (B) 25 mM potassium
phosphate buffer, pH 6.9 (25:75, A:B)
flow rate 1.5 mL/min
column temp. ambient
detector UV, 254 nm
injection 25 µL
Application No. **713-0141**



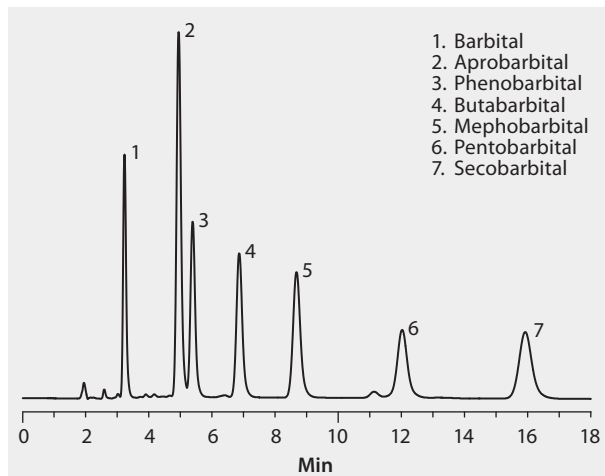
HPLC Analysis of Barbiturates on Discovery® C18, Unbuffered Mobile Phase

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase (A) methanol; (B) water (45:55, A:B)
flow rate 1 mL/min
column temp. ambient
detector UV, 214 nm
injection 10 µL
Application No. **G000190**



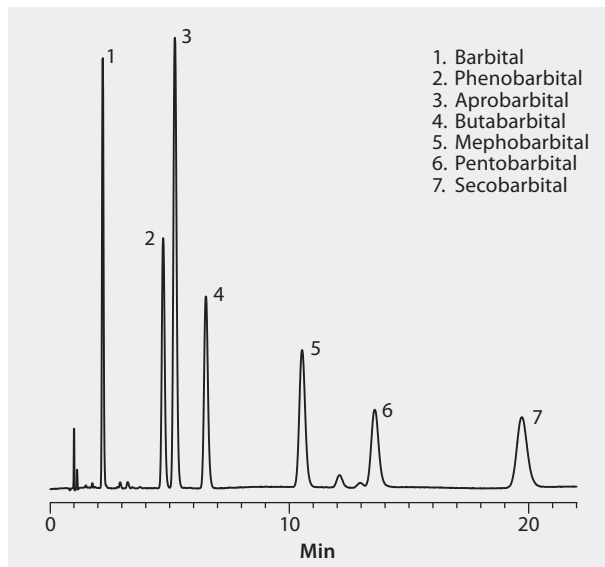
HPLC Analysis of Barbiturates on Discovery® C8

column Discovery C8, 15 cm × 4.6 mm I.D., 5 µm particles (59353-U)
mobile phase (A) methanol; (B) water (45:55, A:B)
flow rate 1 mL/min
column temp. ambient
detector UV, 214nm
injection 5 µL
Application No. **G000791**



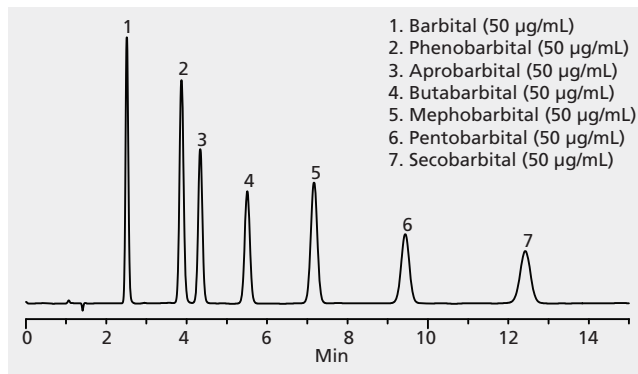
HPLC Analysis of Barbiturates on Discovery® RP-AmideC16

column . . . Discovery RP-AmideC16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase (A) methanol:acetonitrile, 60:40; (B) water; (25:75, A:B)
flow rate 2 mL/min
column temp. 30 °C
detector UV, 214 nm
injection 2 µL
Application No. **G000193**



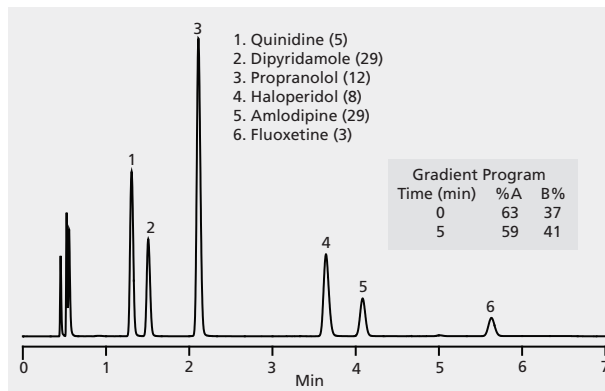
HPLC Analysis of Barbiturates on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) methanol; (B) water (50:50, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 214 nm
injection 10 µL
sample as indicated in 65:35 water:methanol
Application No. [G002877](#)



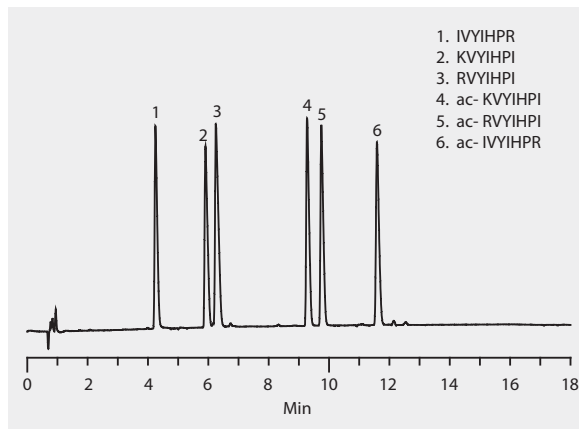
HPLC Analysis of Basic Drug Panel on Ascentis® Express C18

column . . . Ascentis Express C18, 10 cm × 4.6 mm I.D., 2.7 μm particles (53827-U)
mobile phase (A) water with 0.05M potassium phosphate and 0.1% TEA
and 0.6% OSA-Na at pH = 2.9, (B) acetonitrile
flow rate 1.76 mL/min
column temp. ambient
detector UV, 215 nm
injection 100 μL
Application No. **G004213**



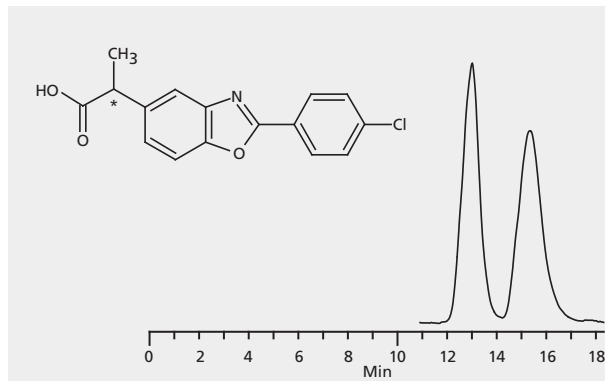
HPLC Analysis of Basic Peptides (Angiotensin Analogs) on Ascentis® Express Peptide ES-C18

column Ascentis Express Peptide ES-C18, 10 cm x 3 mm I.D.,
2.7 µm particles (53313-U)
mobile phase (A) 0.1% (v/v) formic acid, pH 4.0 (titrated with ammonium
hydroxide); (B) 50:50, (0.175% formic acid in
water, pH 4.0) : acetonitrile
gradient 20 to 50% B in 15 min
flow rate 0.6 mL/min
pressure 3002 psi (207 bar)
column temp. 35 °C
detector UV, 215 nm
injection 2.0 µL
sample 0.5 g/L ea. peptide
Application No. **G005379**



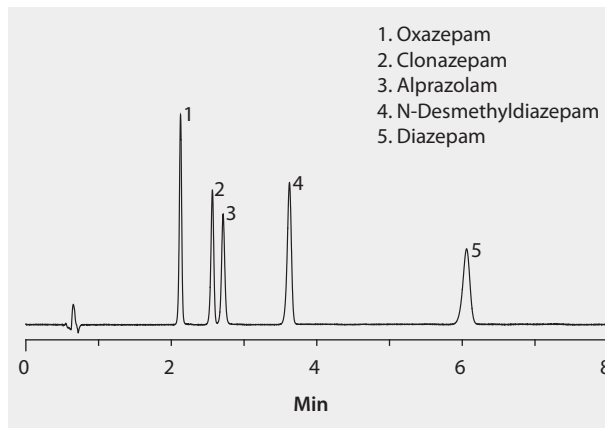
HPLC Analysis of Benoxaprofen Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 0.1 wt% triethylamine, pH 7.0; (B) THF; (90:10, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 5 mg/mL in methanol
Application No. **G004637**



HPLC Analysis of Benzodiazepines on Ascentis® Express C18, Acetonitrile Mobile Phase

column Ascentis Express C18, 10 cm x 3 mm I.D., 2.7 µm particles (53814-U)
mobile phase (A) water; (B) acetonitrile; (66:34, A:B)
flow rate 0.6 mL/min
column temp. 35 °C
detector UV, 250 nm
injection 2 µL
sample 0.1 g/L each in 20% methanol
Application No. **G005673**



HPLC Analysis of Benzodiazepines on Ascentis® Express Phenyl-Hexyl, Methanol Mobile Phase

The Phenyl-Hexyl phase of the Ascentis Express product line displays the best selectivity of this sample; selectivity is markedly affected by choice of organic modifier. The application also demonstrates feasibility of fast LC with Ascentis Express by virtue of low backpressure and high efficiency.

column Ascentis Express Phenyl-Hexyl, 5 cm x 4.6 mm I.D.,
2.7 µm particles (53348-U)

mobile phase (A) water; (B) methanol; (35:65, A:B)

flow rate 1.4 mL/min

pressure 3600 psi (248 bar)

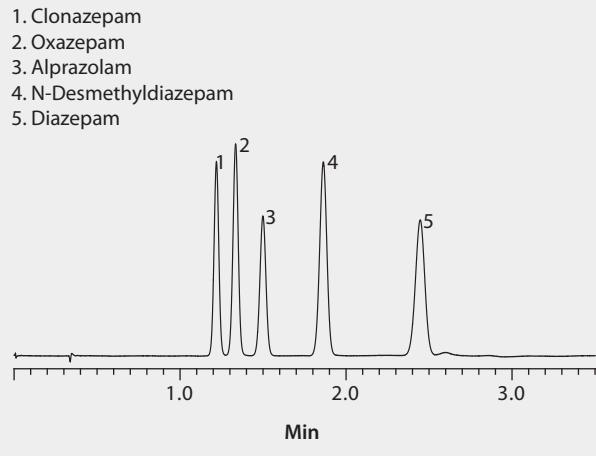
column temp. 35 °C

detector UV, 250 nm

injection 2 µL

sample 0.1 g/L in 20% methanol

Application No. **G005674**



HPLC Analysis of Benzodiazepines on Ascentis® Express Phenyl-Hexyl with Acetonitrile Mobile Phase

The Phenyl-Hexyl phase of the Ascentis Express product line displays the best selectivity of this sample; selectivity is markedly affected by choice of organic modifier. The application also demonstrates feasibility of fast LC with Ascentis Express by virtue of low backpressure and high efficiency.

column Ascentis Express Phenyl-Hexyl, 5 cm x 4.6 mm I.D.,
2.7 µm particles (53348-U)

mobile phase (A) water; (B) acetonitrile; (62:38, A:B)

flow rate 1.4 mL/min

pressure 2600 psi (179 bar)

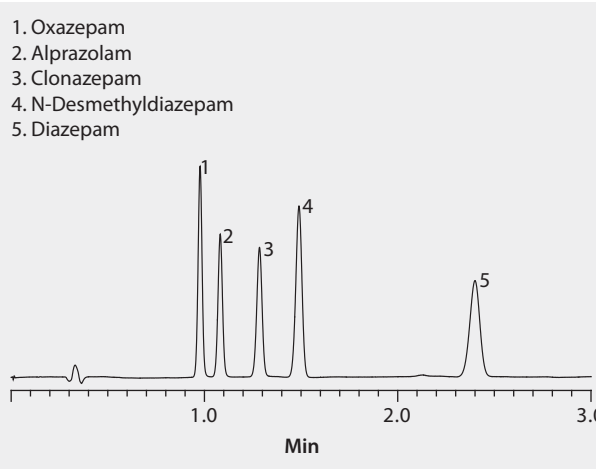
column temp. 35 °C

detector UV, 250 nm

injection 2 µL

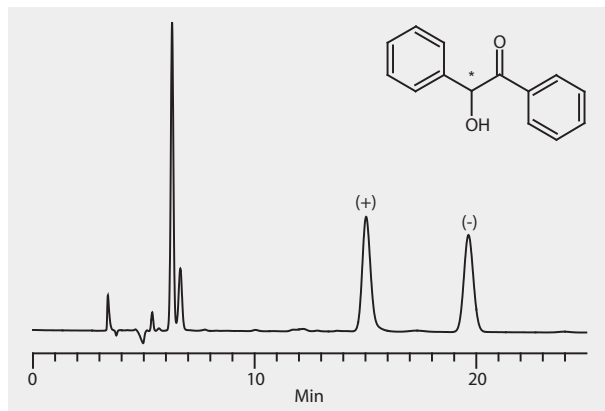
sample 0.1 g/mL of each in 20% methanol

Application No. [G005675](#)



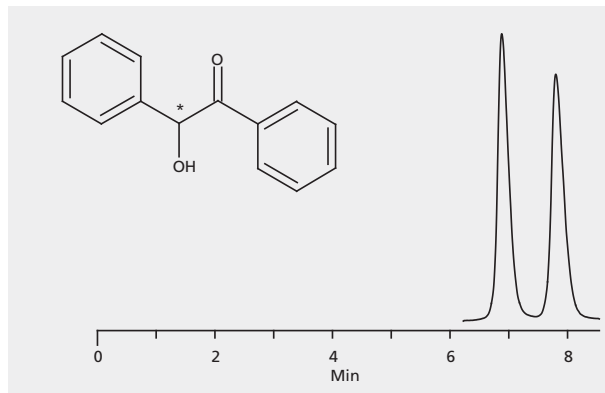
HPLC Analysis of Benzoin Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) heptane; (B) IPA; (C) TFA; (90:10:0.1, A:B:C)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. **G004986**



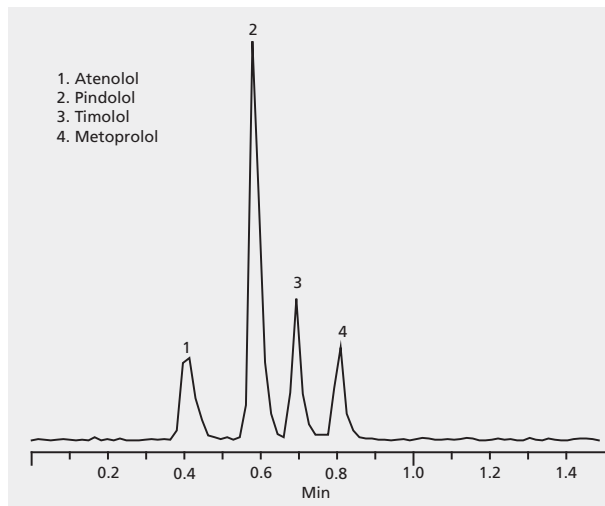
HPLC Analysis of Benzoin Enantiomers on Astec® (R,R) P-CAP™-DP

column . . . Astec (R,R) P-CAP-DP, 25 cm x 4.6 mm I.D., 5 µm particles (35024AST)
mobile phase (A) hexane; (B) ethanol; (80:20, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. [G004726](#)



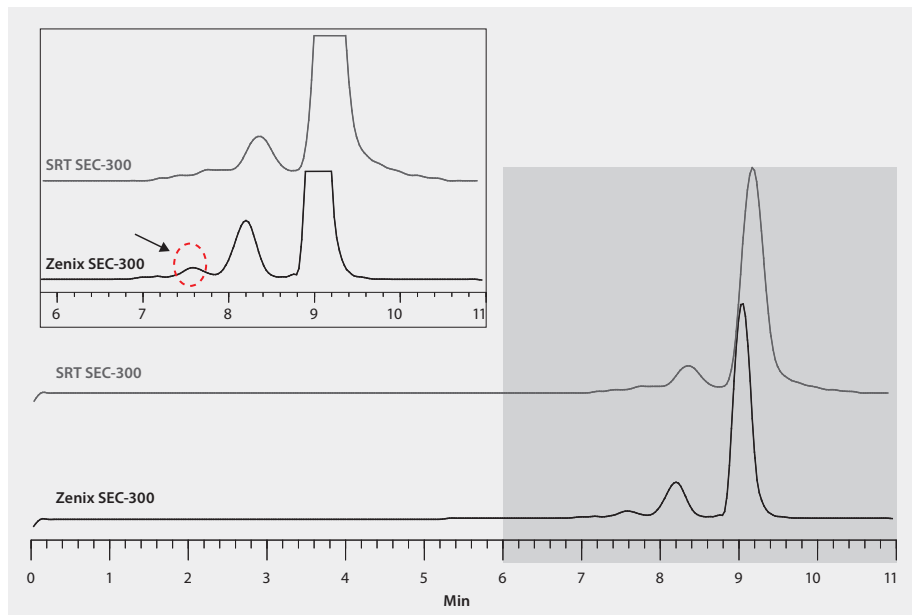
HPLC Analysis of Beta Blockers on Ascentis® Express C18

column . . . Ascentis Express C18, 5 cm × 2.1 mm I.D., 2.7 μm particles (53822-U)
mobile phase . . . (A) 0.1% acetic acid in water; (B) 0.1% acetic acid in acetonitrile
flow rate 0.2 mL/min
column temp. 35 °C
detector ABI 3200 QT; ESI(+), MS/MS
injection 1 μL
instrument Agilent 1100
Application No. **G004063**



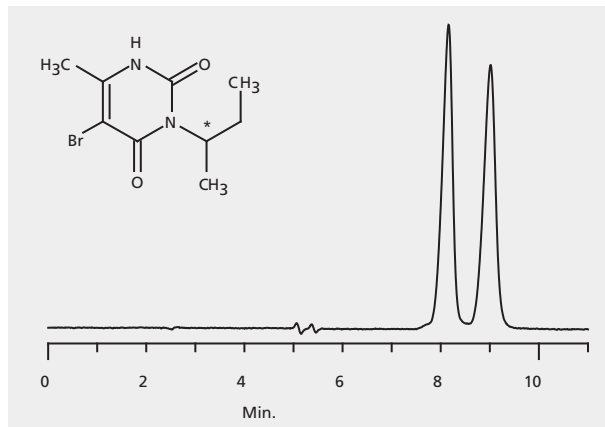
HPLC Analysis of Bovine Serum Albumin (BSA) on Zenix® SEC-300 versus SRT® SEC-300, Effect of Particle Size on Resolution

column SRT SEC-300, 30 cm x 7.8 mm I.D., 5 μ m, 300 Å particles (Z777051)
 column Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 μ m, 300 Å particles (Z777033)
 mobile phase 150 mM sodium phosphate, pH 7
 flow rate 1 mL/min
 column temp. ambient
 detector UV, 214 nm
 injection 10 μ L
 sample 5 mg/mL, BSA
 Application No. **G006119**



HPLC Analysis of Bromacil Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (60:40, A:B)
flow rate 0.6 mL/min
column temp. 23 °C
detector UV, 215 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. [G004492](#)

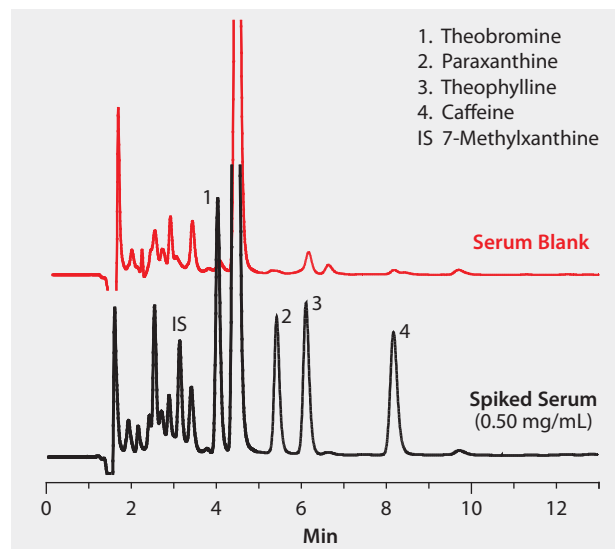


HPLC Analysis of Bronchodilators Theophylline and Other Caffeine Metabolites from Serum on Discovery® RP-AmideC16 after SPE using Discovery® DSC-18

sample preparation SPE (Solid Phase Extraction)
 SPE tube/cartridge Discovery® DSC-18, 500 mg/3 mL (52603-U)
 condition 2 mL methanol, then 2 mL water
 sample preparation 1 mL porcine serum spiked with 0.1 µg/mL, 0.50 µg/mL, or 1.0 µg/mL each analyte
 sample preparation 1 mL methanol; evaporate to dryness with nitrogen stream at room temperature; reconstitute in 200 µL mobile phase containing 0.2 µg/mL or 7-methylxanthine (IS)
 sample preparation 2 mL 5% methanol in water; dry tube 10 min with nitrogen stream
 column Discovery RP-AmideC16, 15 cm × 4.6 mm, 5 µm particles, preceded by a 2 cm RP-AmideC16 guard column and 0.5 µm frit filter (505013)
 mobile phase (A) Methanol; (B) 1% acetic acid (17:38, A:B)
 flow rate 1 mL/min
 column temp. 30 °C
 detector UV, 272 nm
 injection 20 µL reconstituted porcine serum extract
 Application No. **G000594**

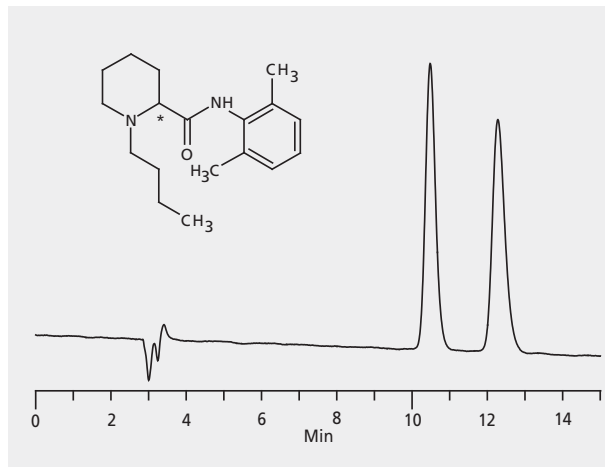
Efficiency of Recovery

Compound	Concentration (µg/mL)	% Recovery	% RSD (n=6)
1. Theobromine	0.1	97.4	±6.8
	0.5	96.4	±8.5
	1.0	96.1	±5.0
2. Paraxanthine	0.1	96.2	±8.4
	0.5	95.2	±8.7
	1.0	95.0	±8.7
3. Theophylline	0.1	97.8	±8.5
	0.5	97.8	±8.8
	1.0	98.5	±5.7
4. Caffeine	0.1	98.8	±3.9
	0.5	95.6	±6.7
	1.0	97.6	±5.8



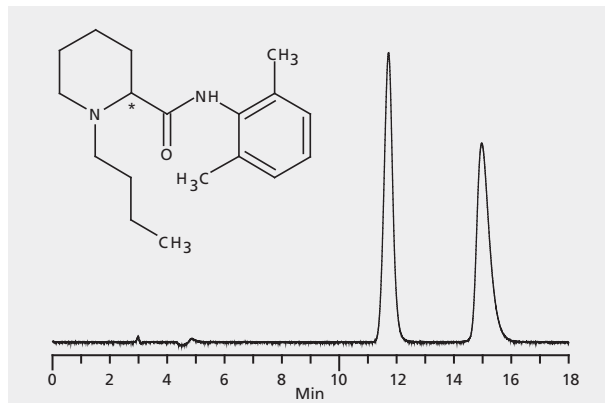
HPLC Analysis of Bupivacaine Enantiomers on Astec® CHIROBIOTIC® V2, Acetate Mobile Phase

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase . . . (A) methanol; (B) 20 mM ammonium acetate, pH 4.1; (80:20, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. [G004464](#)



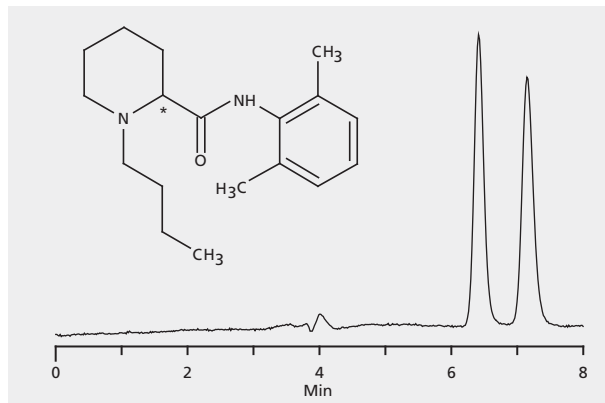
HPLC Analysis of Bupivacaine Enantiomers on Astec® CHIROBIOTIC® V2, Formate Mobile Phase

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase . . . (A) 20 mM ammonium formate, pH 4.1; (B) methanol; (5:95, A:B)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 220 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004619**



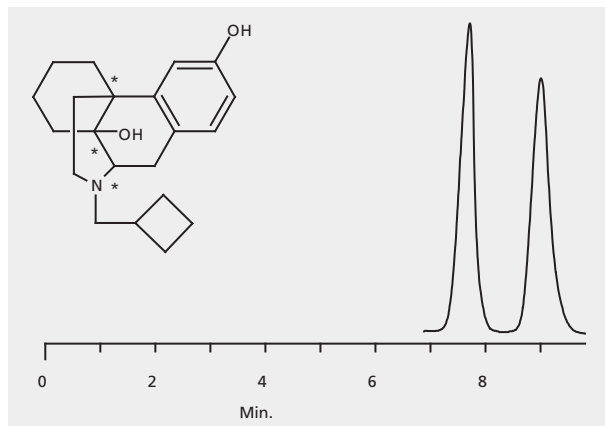
HPLC Analysis of Bupivacaine Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 1% triethylamine, pH 4.1; (B) methanol; (5:95, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 202 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004623](#)



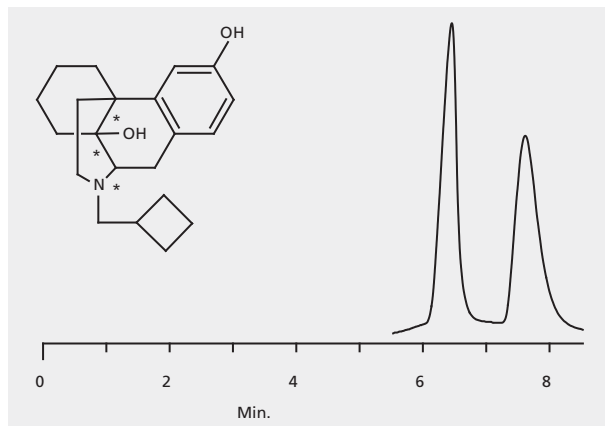
HPLC Analysis of Butorphanol Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase 0.1 wt% ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004574](#)



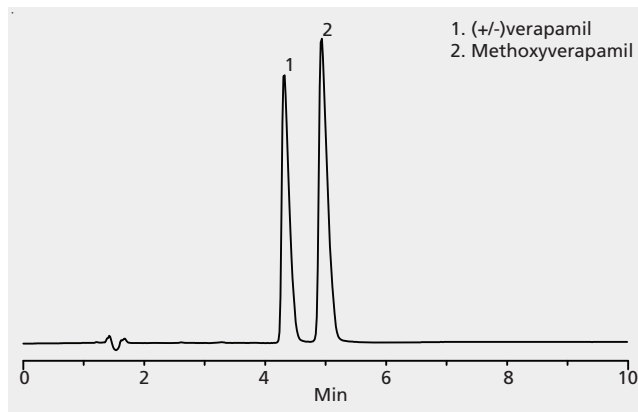
HPLC Analysis of Butorphanol Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase 0.1 wt% ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. **G004591**



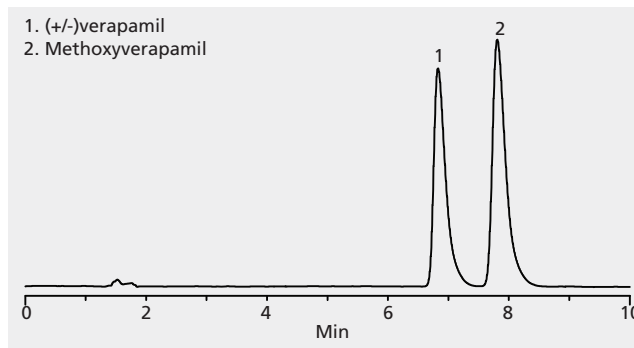
HPLC Analysis of Calcium Channel Blockers on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile; (60:40, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002437**



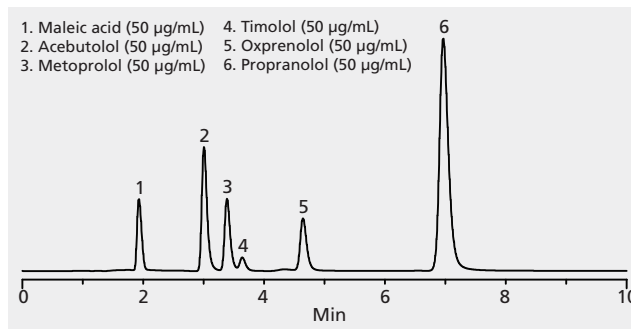
HPLC Analysis of Calcium Channel Blockers on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile; (70:30, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002665**



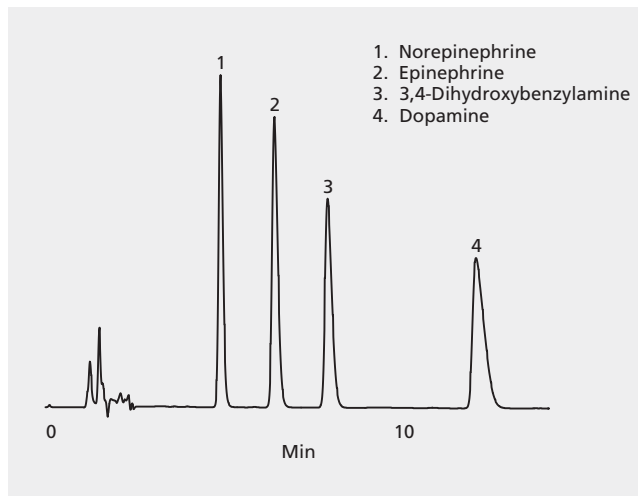
HPLC Analysis of Cardiac Drugs on Ascentis® C8

column Ascentis C8, 15 cm x 2.1 mm I.D., 3 µm particles (581402-U)
mobile phase 0.1% ammonium acetate:acetonitrile with
0.1% ammonium acetate, (47:53)
flow rate 0.2 mL/min
column temp. 30 °C
detector UV, 220 nm
injection 2 µL
sample as indicated in mobile phase
Application No. **G003172**



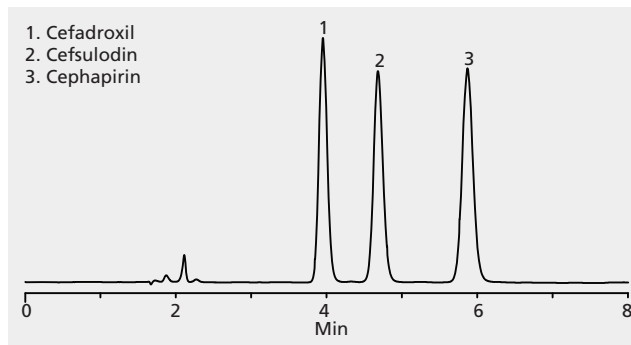
HPLC Analysis of Catecholamines on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase . . . (A) acetonitrile: (B) 50 mM KH₂PO₄, pH 3.0 with phosphoric acid,
100 mg/L EDTA, 200 mg/L 1-octane-sulfonic acid (5:95, A:B)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 10 µL
Application No. **797-0659**



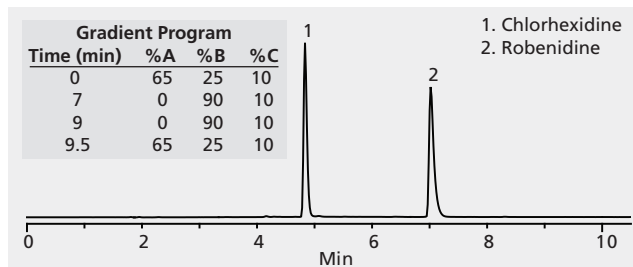
HPLC Analysis of Cephalosporin Antibiotics on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid): (B) acetonitrile; (93:7, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002642**



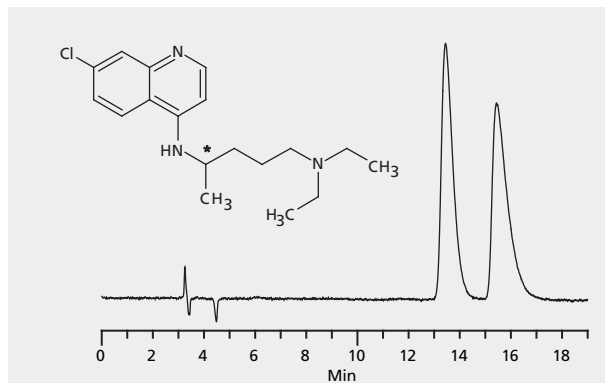
HPLC Analysis of Chlorhexidine and Robenidine on Ascentis® Phenyl

column Ascentis Phenyl 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
 mobile phase (A) water; (B) acetonitrile; (C) 500 mM ammonium formate, pH 3.0, with formic acid
 flow rate 1.0 mL/min
 column temp. 35 °C
 detector UV, 273 nm
 injection 10 µL
 sample 100 µg/mL each in 70:30, 25 mM ammonium formate pH 3.0:acetonitrile
 Application No. **G003711**



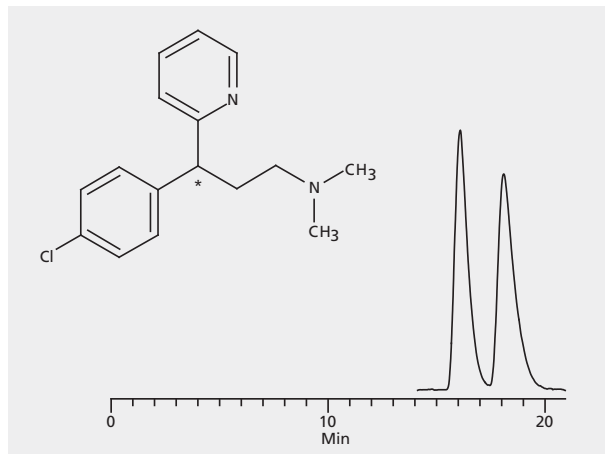
HPLC Analysis of Chloroquine Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) methanol; (B) acetic acid; (C) triethylamine; (98:1:1, A:B:C)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 220 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004620](#)



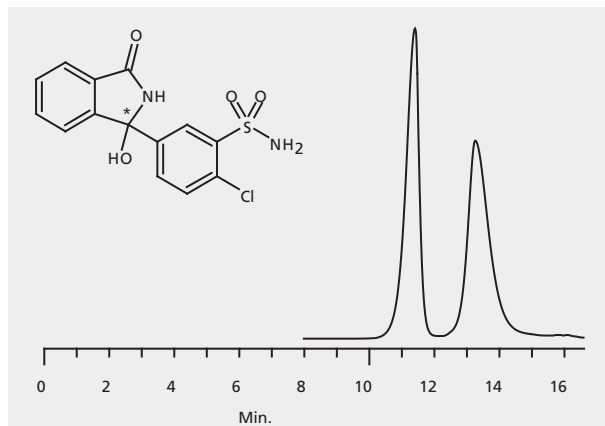
HPLC Analysis of Chlorpheniramine Enantiomers on Astec® CYCLOBOND® I 2000

column CYCLOBOND I 2000, 25 cm x 4.6 mm I.D., 5 µm particles (20024AST)
mobile phase (A) 1% triethylamine acetate, pH 4.1; (B) acetonitrile; (90:10, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 254 nm
injection 2 µL
sample 5 mg/mL in methanol
Application No. [G004688](#)



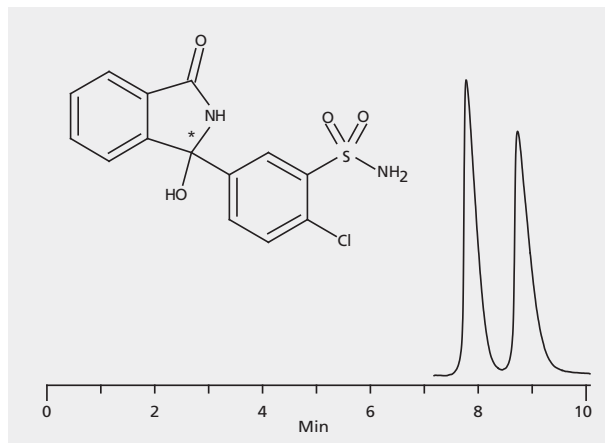
HPLC Analysis of Chlorthalidone Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 10 mM ammonium acetate, pH 4.1; (B) methanol; (80:20, A:B)
flow rate 0.9 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. **G004584**



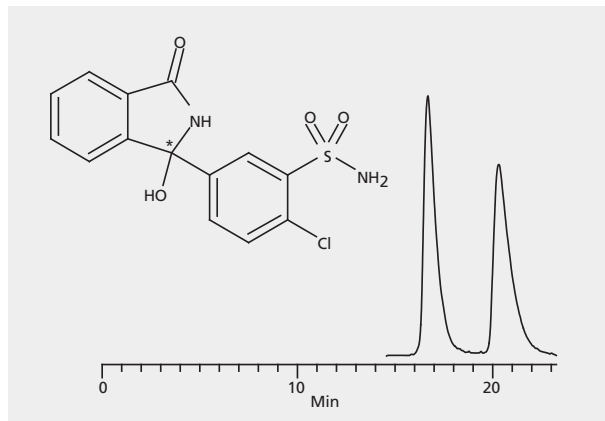
HPLC Analysis of Chlorthalidone Enantiomers on Astec® CYCLOBOND® I 2000 HP-RSP

column CYCLOBOND I 2000 HP-RSP, 25 cm x 4.6 mm I.D.,
5 µm particles (24024AST)
mobile phase ... (A) 10 mM ammonium acetate, pH 4.0; (B) acetonitrile; (85:15, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 235 nm
injection 2 µL
sample 5 mg/mL in methanol
Application No. **G004712**



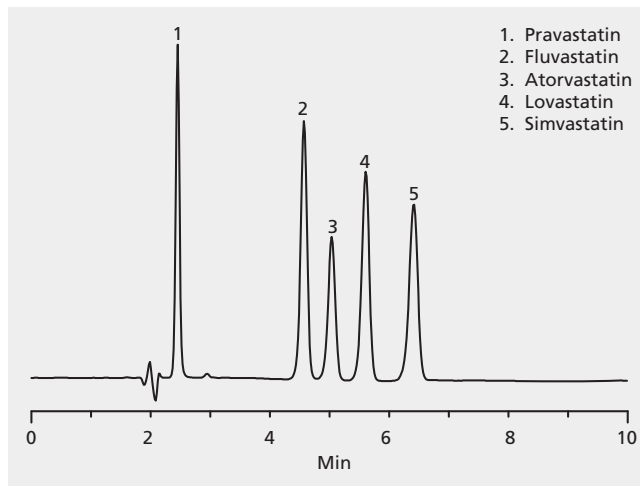
HPLC Analysis of Chlorthalidone Enantiomers on Astec® CYCLOBOND® I 2000 RSP

column . . . CYCLOBOND I 2000 RSP, 25 cm x 4.6 mm I.D., 5 µm particles (20324AST)
mobile phase . . . (A) 1% triethylamine acetate, pH 4.1; (B) acetonitrile; (95:5, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. [G004704](#)



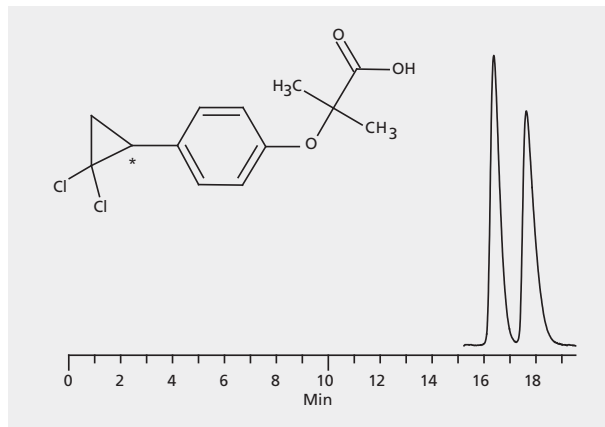
HPLC Analysis of Cholesterol-Lowering Drugs (Statins) on Discovery® Cyano

column Discovery Cyano, 15 cm × 4.6mm I.D., 5 µm particles (59356-U)
mobile phase 60:40 water (10 mM ammonium acetate,
pH 4.0 with acetic acid):acetonitrile
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 230 nm
injection 5 µL
sample 50 µg/mL each in 70:30 water:acetonitrile
Application No. **G002552**



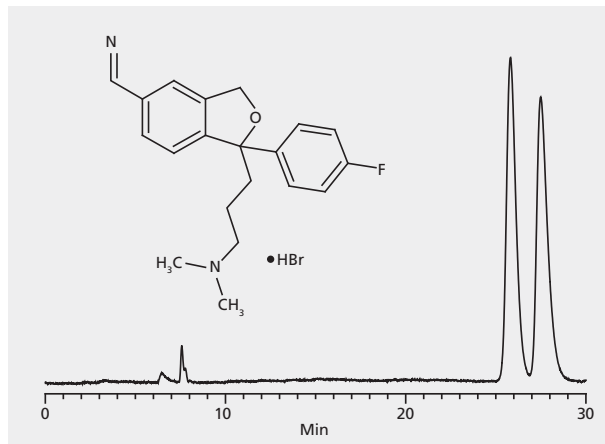
HPLC Analysis of Ciprofibrate Enantiomers on Astec® CYCLOBOND® I 2000

column CYCLOBOND I 2000, 25 cm x 4.6 mm I.D., 5 µm particles (20024AST)
mobile phase (A) acetonitrile; (B) methanol; (C) acetic acid;
(D) triethylamine; (90:10:0.3:0.2, A:B:C:D)
flow rate 1 mL/min
column temp. ambient
detector UV, 230 nm
injection 1 µL
sample 5 mg/mL in methanol
Application No. **G004689**



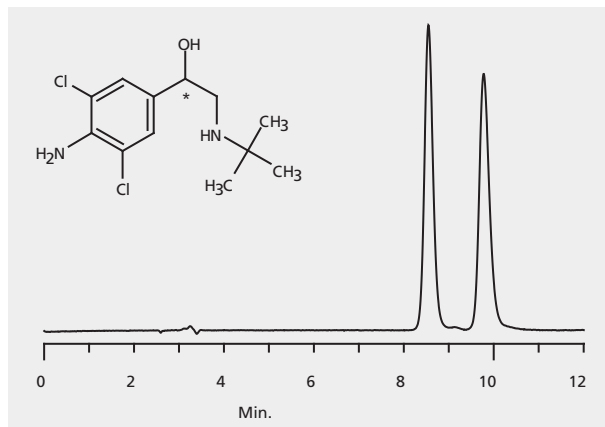
HPLC Analysis of Citalopram Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase . . (A) methanol; (B) acetic acid; (C) triethylamine; (99.8:0.1:0.1, A:B:C)
flow rate 0.5 mL/min
column temp. 20 °C
detector UV, 213 nm
injection 5 µL
sample citalopram, 1 mg/mL in mobile phase
Application No. **G004408**



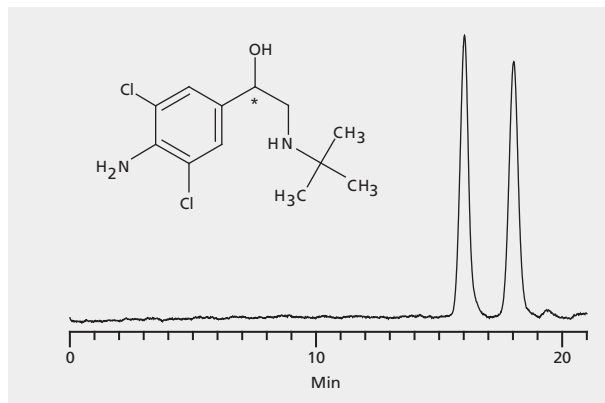
HPLC Analysis of Clenbuterol Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase 15 mM ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 3 µL
sample 1 mg/mL in methanol
Application No. [G004493](#)



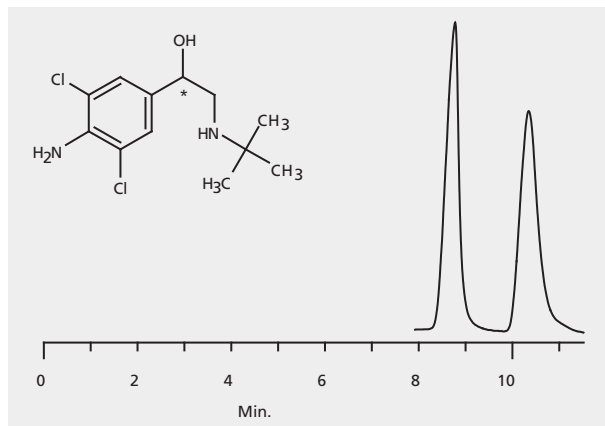
HPLC Analysis of Clenbuterol Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) methanol; (B) acetic acid; (C) triethylamine;
(99.98:0.01:0.01, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004621**



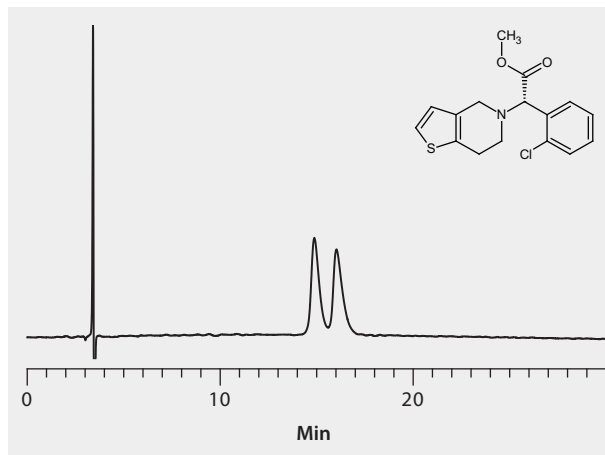
HPLC Analysis of Clenbuterol Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase 0.1 wt% ammonium trifluoroacetic acid in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004596](#)



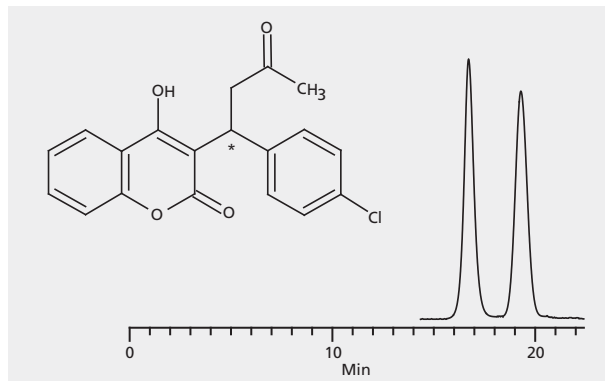
HPLC Analysis of Clopidogrel Enantiomers on Astec® CYCLOBOND® I 2000 DNP

column . . . CYCLOBOND® I 2000 DNP, 25 cm x 4.6 mm I.D., 5 µm particles (25024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.0; (B) acetonitrile; (80:20, A:B)
flow rate 1 mL/min
pressure 1100 psi (76 bar)
column temp. 35 °C
detector UV, 220 nm
injection 2 µL
sample 0.2 mg/mL in methanol
Application No. [G004774](#)



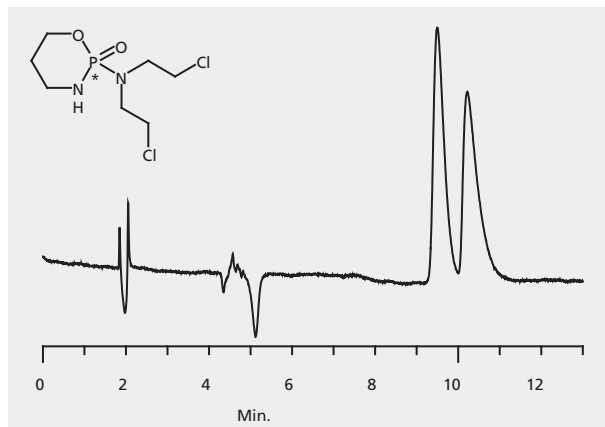
HPLC Analysis of Coumachlor Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 20 mM ammonium nitrate, pH 5.5; (B) THF; (75:25, A:B)
flow rate 0.75 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 2.5 mg/mL in methanol
Application No. **G004638**



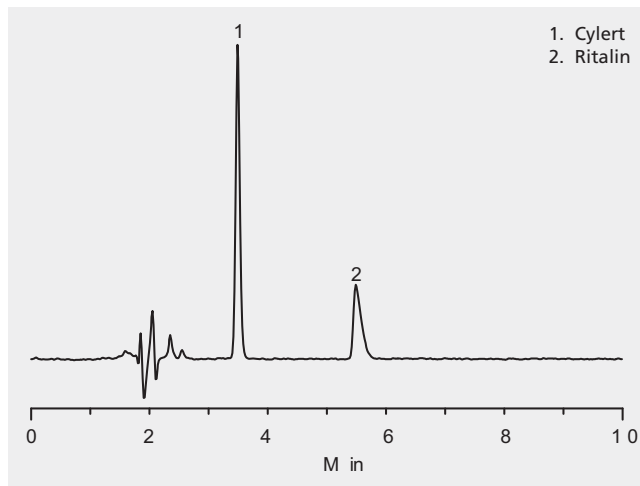
HPLC Analysis of Cyclophosphamide Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) ethanol; (C) THF; (90:5:5, A:B:C)
flow rate 0.75 mL/min
column temp. 23 °C
detector UV, 205 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004494](#)



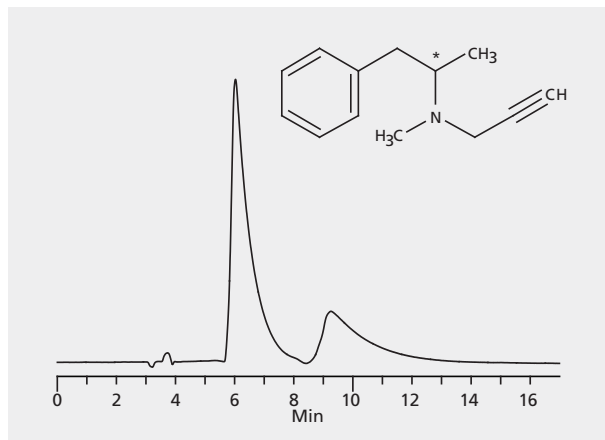
HPLC Analysis of Cylert (Pemoline) and Ritalin (Methylphenidate) on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase 80:20 water 10 mM ammonium acetate,
pH 3.0 with formic acid):acetonitrile
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample Cylert (50 µg/mL) and Ritalin (100 µg/mL) in 85:15 water:CH₃OH
Application No. **G002558**



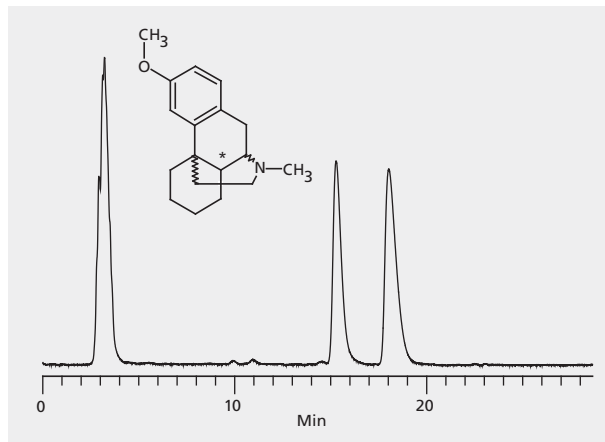
HPLC Analysis of Deprenyl (Selegiline) Enantiomers on Astec® CYCLOBOND® I 2000 DMP

column . . . CYCLOBOND I 2000 DMP, 25 cm x 4.6 mm I.D., 5 µm particles (20724AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.0; (B) methanol; (65:35, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. **G004681**



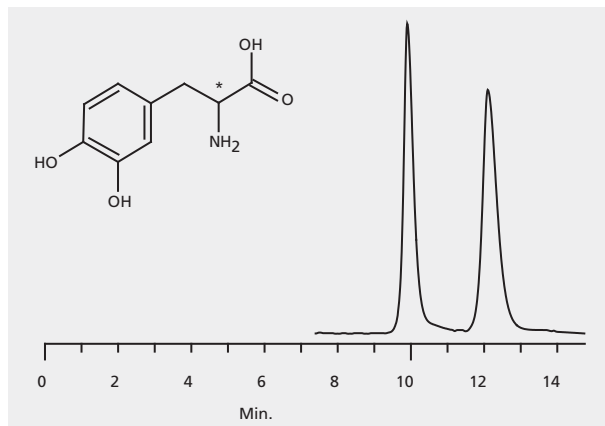
HPLC Analysis of Dextromethorphan Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase . . . (A) methanol; (B) 20 mM ammonium acetate, pH 4.1; (90:10, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. **G004468**



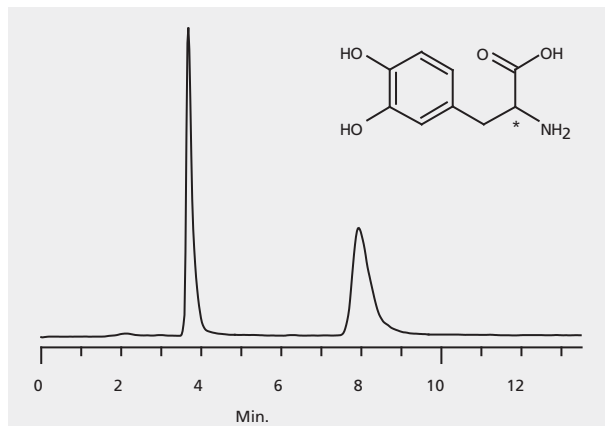
HPLC Analysis of 3,4-Dihydroxyphenylalanine (DOPA) Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) acetonitrile; (25:75, A:B)
flow rate 0.9 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. **G004586**



HPLC Analysis of 3,4-Dihydroxyphenylalanine (DOPA) Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase (A) water; (B) acetonitrile; (50:50, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 5 mg/mL in methanol
Application No. **G004608**

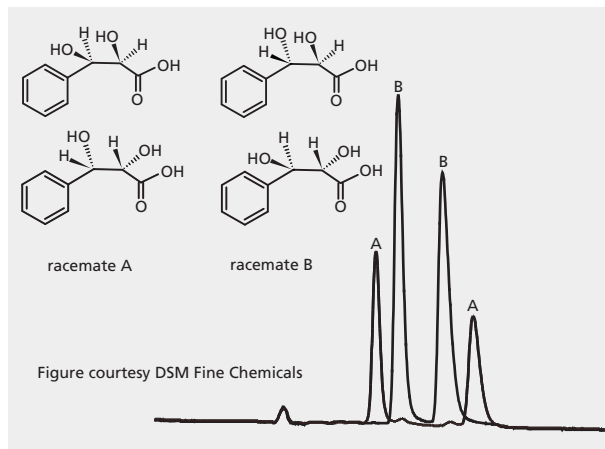


HPLC Analysis of 2,3-Dihydroxy-3-Phenylpropionic Acid Enantiomers on CHIROBIOTIC R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 μ m particles (13024AST)
 mobile phase (A) 0.1% ammonia, pH 4.1 with formic acid;
 (B) methanol; (50:50, A:B)

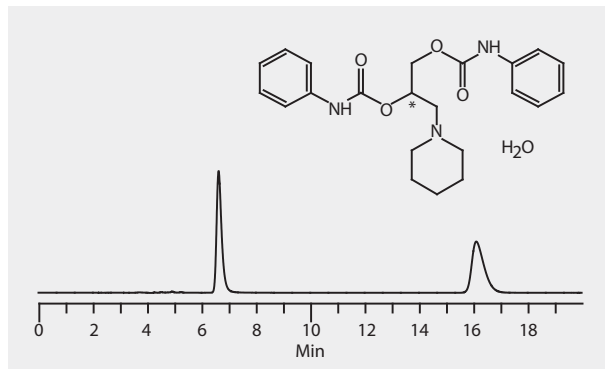
flow rate 1 mL/min
 column temp. ambient
 detector UV, 258 nm
 injection 10 μ L
 sample 2,3-dihydroxy-3-phenyl-propionic acid isomers:
 (A) racemate A (4.85 and 6.95 min)
 (B) racemate B (5.33 and 6.29 min)

Application No. **G004409**



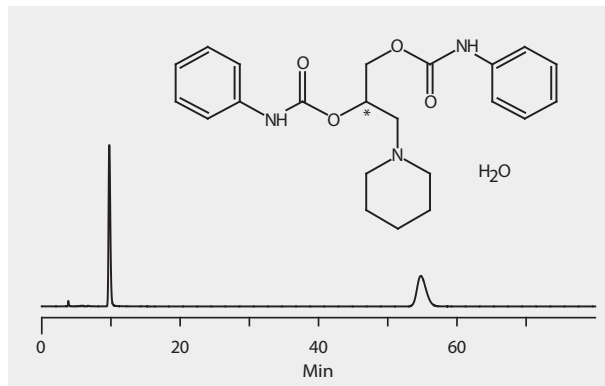
HPLC Analysis of Dipiperdon Enantiomers on Astec® Cellulose DMP, LC/MS Conditions

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) methanol; (B) ammonium formate; (100:0.1, A:B)
(Note: 0.1 w/v ammonium formate, 0.1 g/100 mL)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. **G004987**



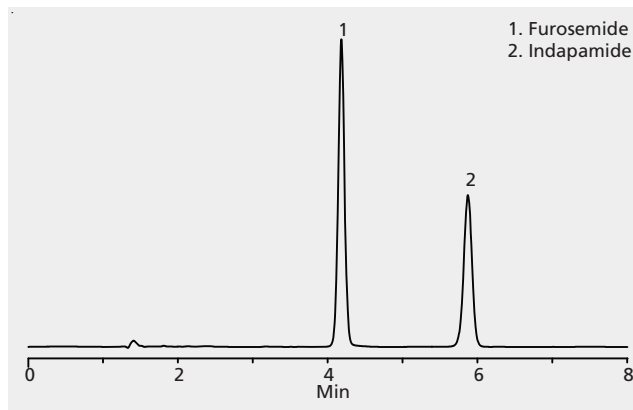
HPLC Analysis of Dipiperdon Enantiomers on Astec® Cellulose DMP (no additives)

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) acetonitrile; (100, A)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G005004](#)



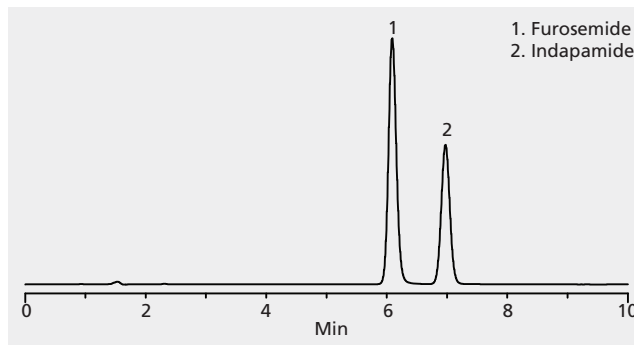
HPLC Analysis of Diuretic Drugs on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile; (A:B, 40:60)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 234 nm
injection 10 µL
sample 10 µg/mL each in mobile phase
Application No. **G002423**



HPLC Analysis of Diuretic Drugs on Ascentis® RP-Amide

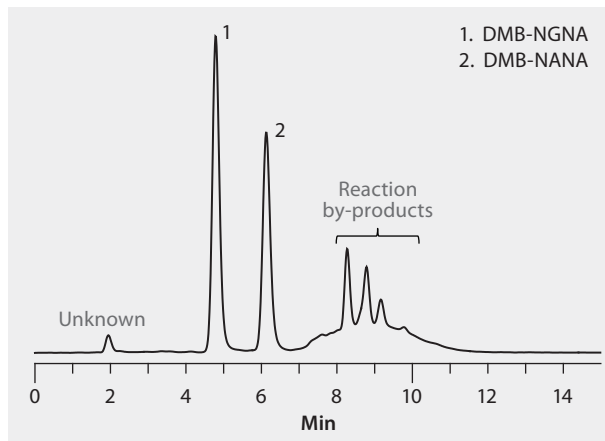
column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) acetonitrile; (60:40, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 234 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. **G002650**



HPLC Analysis of DMB-Labeled Sialic Acids on Ascentis® Express RP-Amide: Comparison of Biosimilars to Reference Materials

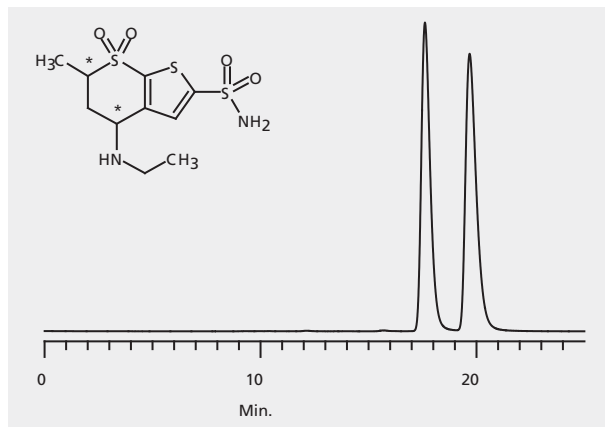
Sialic acids affect the bioavailability, function, stability, and metabolism of glycoproteins. Two forms of sialic acid are commonly present in therapeutic glycoproteins: N-acetylneuraminic acid (NANA) and N-glycolylneuraminic acid (NGNA). One of the most common quantification methods involves releasing sialic acids from the glycoprotein, derivatizing NANA and NGNA with 1,2-diamino-4, 5-methylenedioxybenzene (DMB), and analyzing by C18-HPLC with fluorescence detection. This procedure is subject to interference from peaks originating from excess reagent and other derivatized impurities, limiting sensitivity and reproducibility. The objectives of this study were to develop a significantly improved HPLC-fluorescence method for DMB-NANA and DMB-NGNA, and to apply this method to compare two candidate biosimilar therapeutic proteins to their respective reference materials.

column Ascentis® Express RP-Amide, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53913-U)
mobile phase (A) Water, 0.1% formic acid, (B) ACN, 0.1% formic acid
gradient 0-1 min 6% B; 1.01-4 min 20% B;
4.01-12 min 6% B, total run time 15 min
flow rate 0.2 mL/min
pressure 1300 psi (89.6 bar)
column temp. 30 °C
detector fluorescence, λ excitation = 373 nm, λ emission = 448 nm
injection 0.5 µL
sample Mix of DMB-labeled NGNA and NANA sialic acid, 5 mg/ml each
Application No. [G006199](#)



HPLC Analysis of Dorzolamide Enantiomers on Astec® CHIROBIOTIC® V2

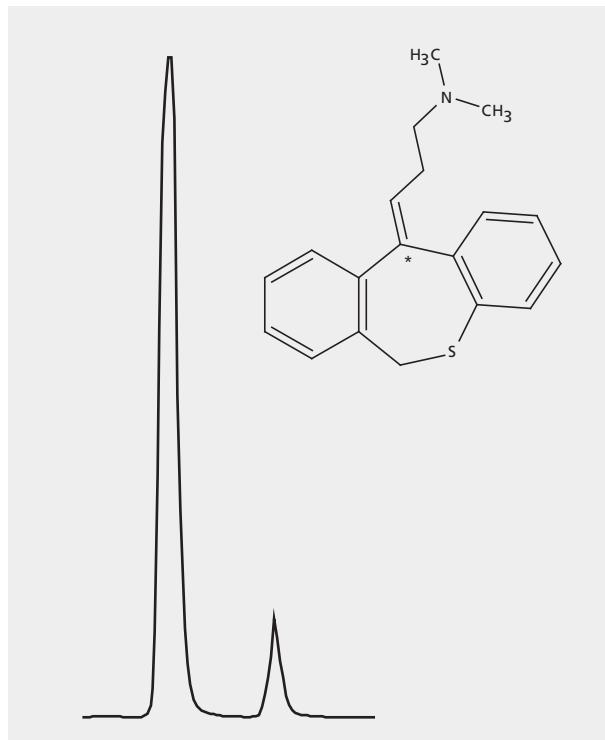
column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase (A) 3.81 mM ammonium trifluoroacetic acid;
(B) methanol; (5:95, A:B)
flow rate 0.3 mL/min
column temp. 22 °C
detector UV, 254 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. **G004478**



HPLC Analysis of cis/trans-Dothiepin Enantiomers on Astec® CYCLOBOND® I 2000 AC

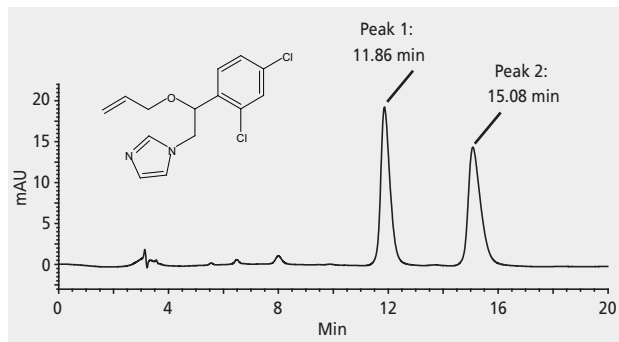
column . . . CYCLOBOND I 2000 AC, 25 cm x 4.6 mm I.D., 5 µm particles (20124AST)
mobile phase . . . (A) 1.0% triethylamine acetate, pH 4.1; (B) acetonitrile; (85:15, A:B)
flow rate 1 mL/min
column temp. 22 °C
detector UV, 254 nm
injection 2 µL
sample 1 mg/mL in methanol
peak 1: 9.48 min.
peak 2: 12.48 min.

Application No. **G004732**



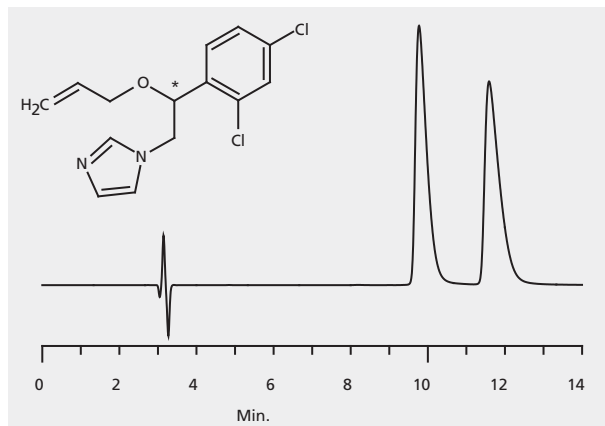
HPLC Analysis of Enilconazole (Imazalil) Enantiomers on Astec® CYCLOBOND® I 2000 HP-RSP

column CYCLOBOND I 2000 HP-RSP, 25 cm × 4.6 mm I.D.,
5 μm particles (24024AST)
mobile phase . . (A) 10 mM ammonium acetate, pH 4.0; (B) acetonitrile; (80:20, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 235 nm
injection 5 μL
Application No. [G004029](#)



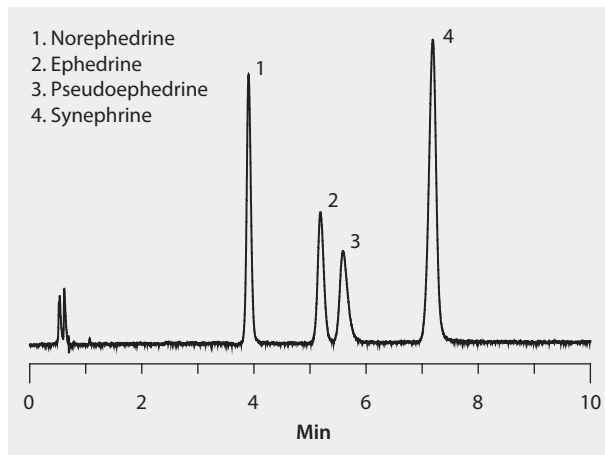
HPLC Analysis of Enilconazol (Imazalil) Enantiomers on Astec® CYCLOBOND® I 2000 HP-RSP

column CYCLOBOND I 2000 HP-RSP, 25 cm x 4.6 mm I.D.,
5 µm particles (24024AST)
mobile phase . . (A) 10 mM ammonium acetate, pH 4.1; (B) acetonitrile; (80:20, A:B)
flow rate 1 mL/min
column temp. 30 °C
detector UV, 220 nm
injection 5 µL
sample 2 mg/mL in mobile phase
Application No. **G004588**



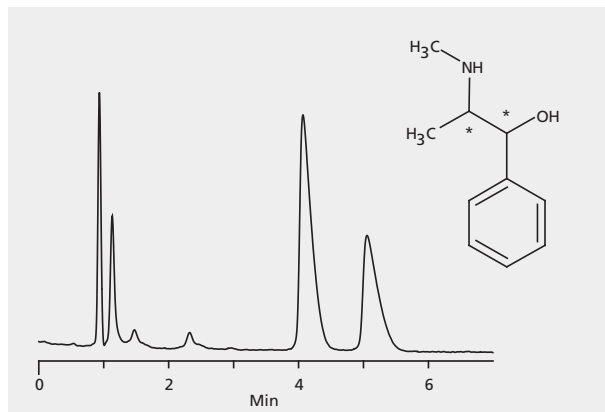
HPLC Analysis of Ephedrine Compounds on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)
mobile phase . . . (A) acetonitrile; (B) 40 mM ammonium acetate in water; (90:10, A:B)
flow rate 0.4 mL
column temp. 35 °C
detector UV, 254 nm
injection 1 µL
sample 150 µg/mL each in mobile phase
Application No. [G005352](#)



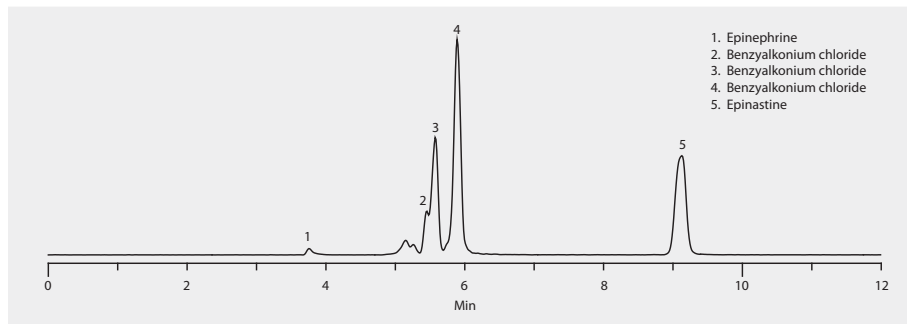
HPLC Analysis of Ephedrine Enantiomers on CHIRALPAK® AGP

column CHIRAL-AGP, 10 cm x 4 mm I.D., 5 µm particles (58170AST)
mobile phase 1 mM octanoic acid in 10 mM (NH₄)₂HPO₄, pH 6.9
flow rate 0.9 mL/min
column temp. 25 °C
detector UV, 225 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. **G004730**



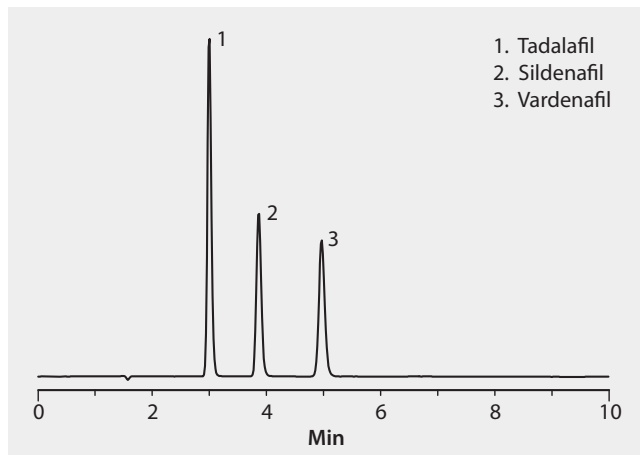
HPLC Analysis of Epinephrine, Epinastine, and Benzalkonium Chlorides on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 15 cm x 4.6 mm I.D., 2.7 µm particles (53981-U)
mobile phase (A) 50 mM ammonium acetate; (B) acetonitrile; (10:90, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector . . . ESI(+), XIC m/z 304 & 332 (BAC), 250 (epinastine), 180 (epinephrine)
injection 10 µL
sample 10 mg/L ea. in acetonitrile
Application No. [G005411](#)



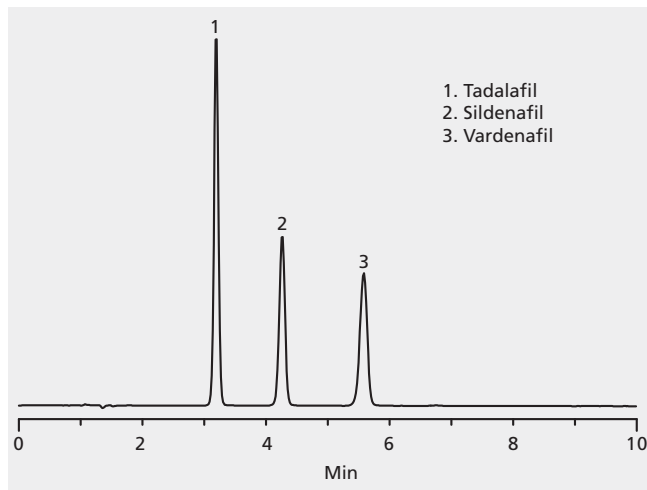
HPLC Analysis of Erectile Dysfunction Drugs on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase (A) water (10 mM NH₄COOH); (B) acetonitrile; (50:50, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 230 nm
injection 5 µL
sample 50 µg/mL each in 50:50 water:acetonitrile
Application No. [G002546](#)



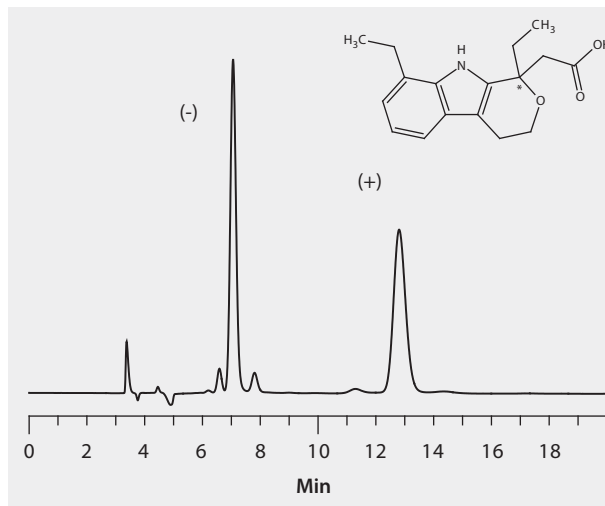
HPLC Analysis of Erectile Dysfunction Drugs on Discovery® HS F5

column Discovery HS F5, 15 cm × 4.6 mm I.D., 5 µm particles (567516-U)
mobile phase 50:50 water (10 mM NH₄COOH):CH₃CN
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 230 nm
injection 5 µL
sample 50 µg/mL each in 50:50 water:acetonitrile
Application No. [G002542](#)



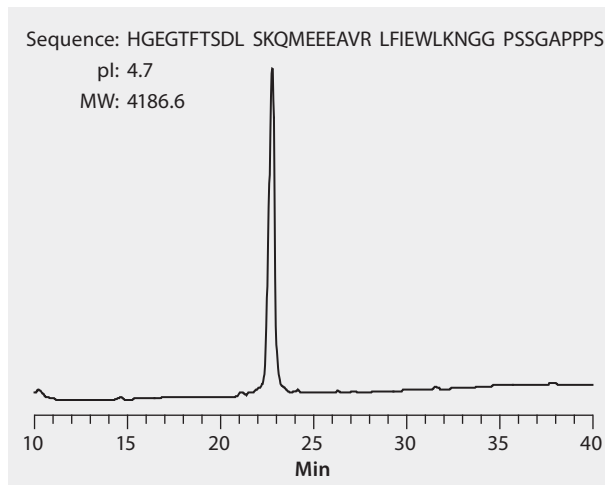
HPLC Analysis of Etodolac Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) heptane; (B) IPA; (C) TFA; (90:10:0.1, A:B:C)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. **G004988**



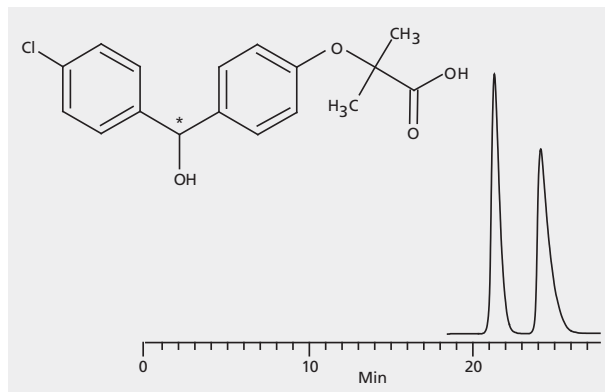
HPLC Analysis of Exenatide Acetate on Proteomix® SCX-NP5

column Proteomix SCX NP5, 25 cm x 4.6mm I.D., 5 µm particles (Z777161)
mobile phase . . . (A) 10 mM monosodium phosphate:acetonitrile (56:44, v/v), adjusted
to pH to 2.0 with phosphoric acid; ((B) 0.5 M NaCl/10 mM monosodium
phosphate:acetonitrile (56:44, v/v), adjusted to pH to 2.0 with
phosphoric acid)
gradient 0 to 65% B in 35 min; held for 5 min; to 0% B in 10 min
flow rate 1.0 mL/min
pressure 1653 psi (114 bar)
column temp. 40 °C
detector UV, 235 nm
injection 20 µL
sample 0.325 mg/mL exenatide acetate in mobile phase A
Application No. [G006163](#)



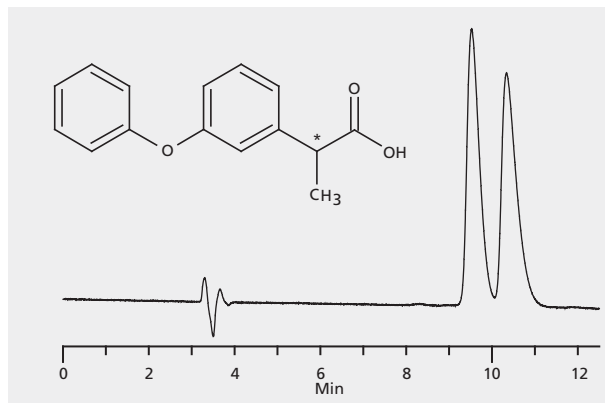
HPLC Analysis of Fenofibric Acid Enantiomers on Astec® CYCLOBOND® I 2000

column CYCLOBOND I 2000, 25 cm x 4.6 mm I.D., 5 µm particles (20024AST)
mobile phase . . . (A) 0.1% triethylamine acetate, pH 4.0; (B) acetonitrile; (20:80, A:B)
flow rate 1 mL/min
column temp. 22 °C
detector UV, 254 nm
injection 1 µL
sample 3 mg/mL in methanol
Application No. [G004691](#)



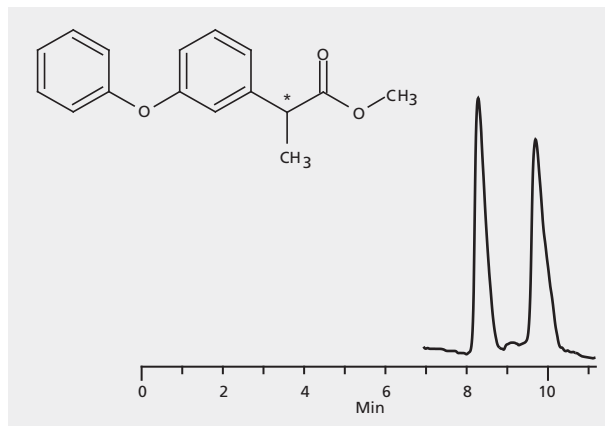
HPLC Analysis of Fenoprofen Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 1% triethylamine, pH 7.0; (B) THF; (90:10, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 215 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. [G004624](#)



HPLC Analysis of Fenoprofen Methyl Ester Enantiomers on Astec® CHIROBIOTIC® V

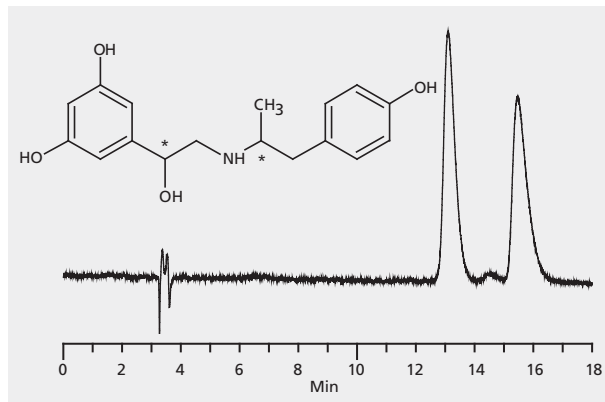
column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 20 mM sodium citrate, pH 6.3; (B) THF; (90:10, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 254 nm
injection 5 µL
sample 5 mg/mL in methanol
Application No. [G004651](#)



HPLC Analysis of Fenoterol Enantiomers on Astec® CHIROBIOTIC® V

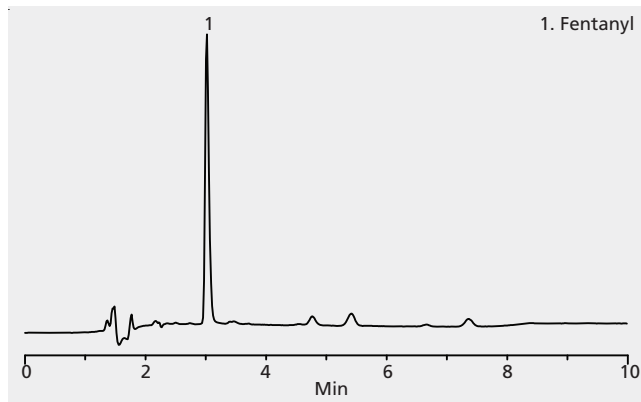
chiral

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 20 mM ammonium nitrate, pH 5.5; (B) THF; (90:10, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 275 nm
injection 15 µL
sample 1 mg/mL in methanol
Application No. [G004625](#)



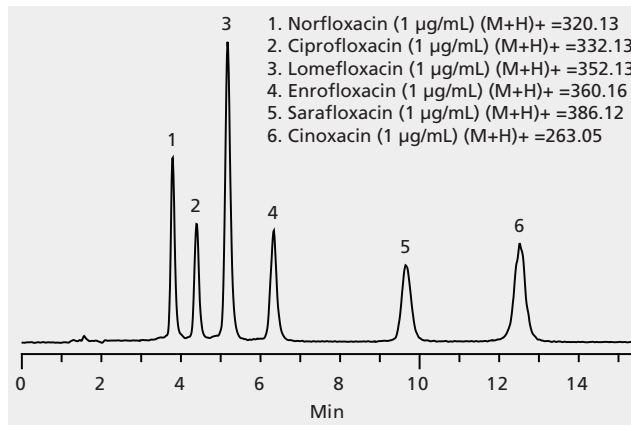
HPLC Analysis of Fentanyl Tranquilizer on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 10 mM monobasic potassium phosphate (pH 3.0 with phosphoric acid): (B) acetonitrile; (67:33, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 215 nm
injection 10 µL
sample 20 µg/mL in mobile phase
Application No. **G002435**



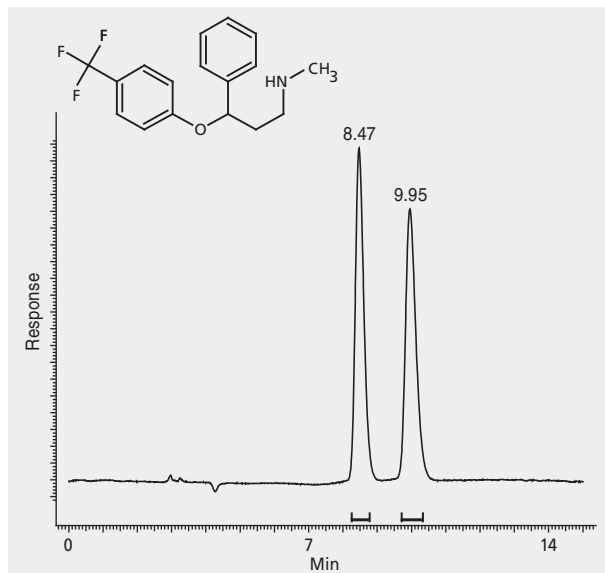
HPLC Analysis of Fluoroquinolone Antibiotics on Ascentis® Phenyl

column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase (A) 13 mM ammonium formate (pH 3.0 with concentrated formic acid); (B) acetonitrile; (80:20, A:B)
flow rate 1 mL/min, split to the MS
column temp. 35 °C
detector MS, ESI (+) in selected ion recording (SIR) mode
injection 5 µL
sample as indicated in 80:20, 13 mM ammonium formate (pH 3.0 with concentrated formic acid):acetonitrile
Application No. **G003713**



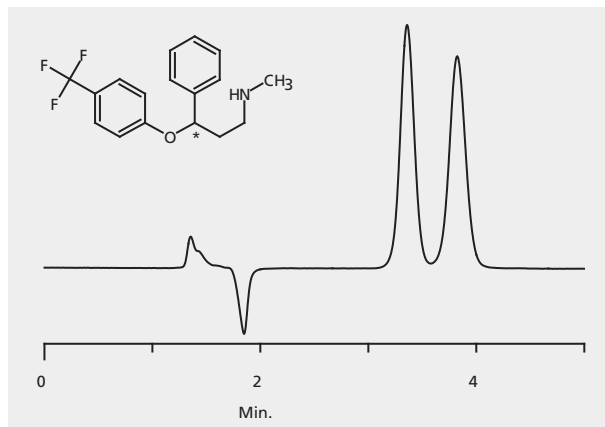
HPLC Analysis of Fluoxetine Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase 15 mM ammonium acetate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004465](#)



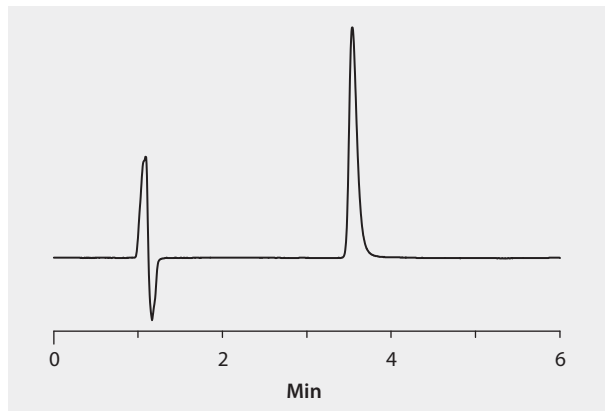
HPLC Analysis of Fluoxetine Enantiomers on Narrowbore Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 10 cm x 2.1 mm I.D., 5 µm particles (15018AST)
mobile phase 13 mM ammonium acetate in methanol
flow rate 0.2 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004476](#)



HPLC Analysis of Fluoxetine (Prozac®) on Discovery® C18

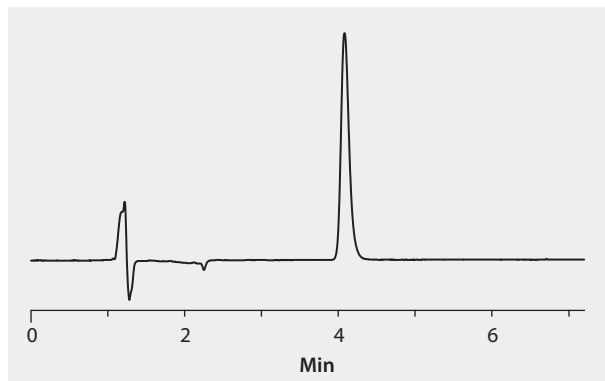
column Discovery C18, 15 cm × 4.6 mm I.D., 5 μm particles (504955)
mobile phase (A) acetonitrile; (B) 25 mM KH₂PO₄, pH 7.0 (40:60, A:B)
flow rate 2 mL/min
column temp. 30 °C
detector UV, 214 nm
injection 1 μL
Application No. **G000900**



HPLC Analysis of Fluoxetine (Prozac®) on Discovery® Cyano

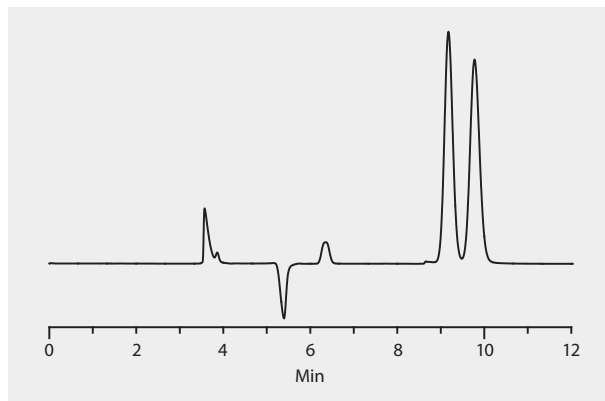
Fluoxetine (Prozac®)

column Discovery Cyano, 15 cm × 4.6 mm I.D., 5 µm particles (59356-U)
mobile phase (A) acetonitrile; (B) 25 mM KH₂PO₄, pH 7.0; (40:60, A:B)
flow rate 2 mL/min
column temp. 30 °C
detector UV, 214 nm
injection 1 µL
Application No. **G000899**



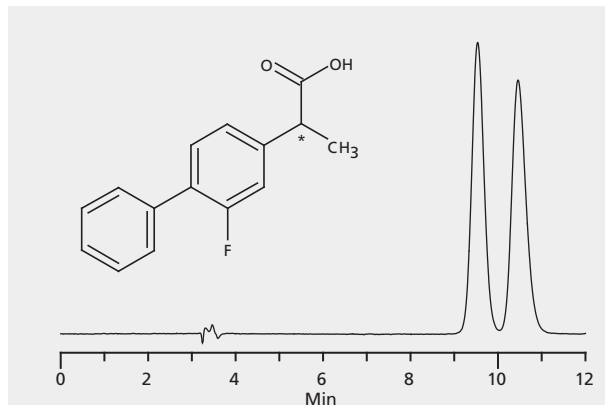
HPLC Analysis of Flurbiprofen Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) heptane; (B) isopropanol; (C) TFA; (95:5:0.1, A:B:C)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 3 µL
sample 1 g/L in methanol
Application No. [G005467](#)



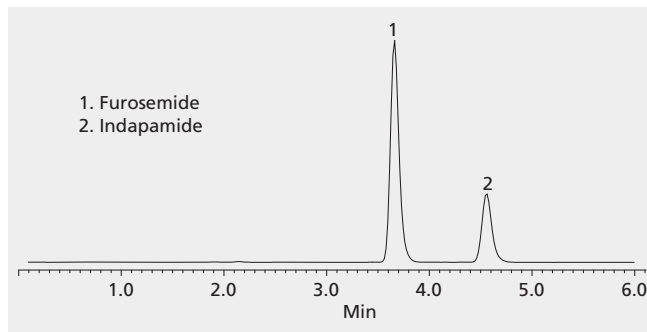
HPLC Analysis of Flurbiprofen Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 20 mM ammonium nitrate, pH 5.5; (B) THF; (80:20, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. [G004626](#)



HPLC Analysis of Furosemide and Indapamide on Discovery® C18

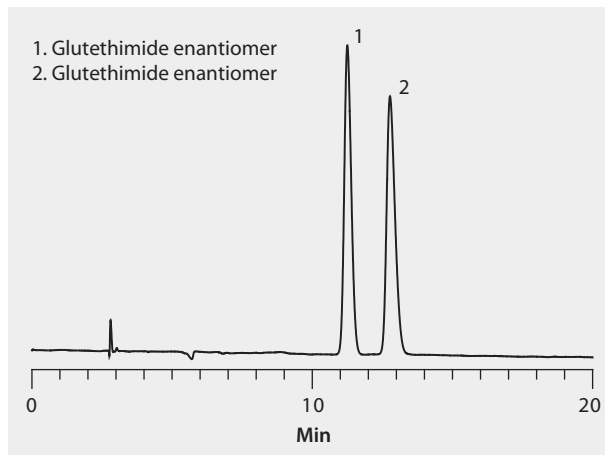
column Discovery C18, 15 cm × 4.6 mm ID, 5 µm particles (504955)
mobile phase (A) 10mM monobasic potassium phosphate,
(pH 3.0 with H₃PO₄): (B) acetonitrile; (40:60, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 234 nm
injection 10 µL
sample 10 µg/mL each in mobile phase
Application No. **G002044**



HPLC Analysis of Glutethimide Enantiomers on Astec® Cellulose DMP

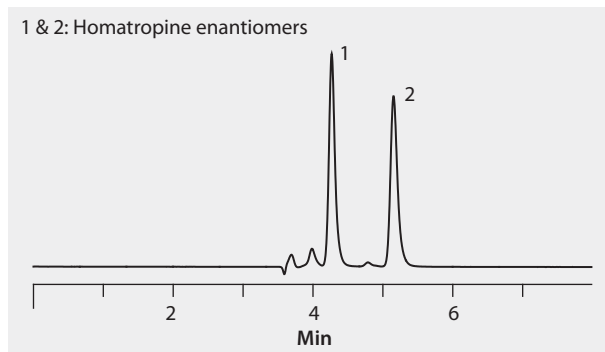
Glutethimide enantiomers are resolved by normal phase chromatography. Glutethimide is used to treat insomnia.

column . . . Astec Cellulose DMP, 25 cm x 4.6 mm I.D., 5 µm particles (51099AST)
mobile phase (A) heptane; (B) isopropanol; (80:20, A:B)
flow rate 1 mL/min
column temp. 30 °C
detector UV, 254 nm
injection 15 µL
sample glutethimide, 1 g/L in heptane:isopropanol (50:50)
Application No. **G005514**



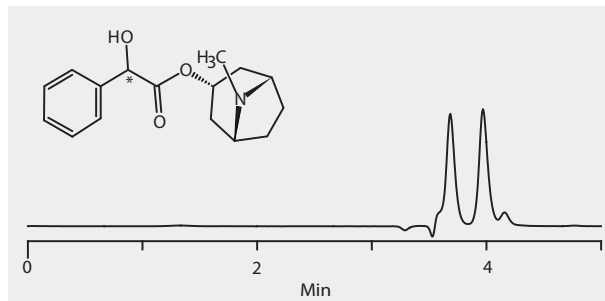
HPLC Analysis of Homatropine Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) methanol; (B) DEA; (100:0.1, A:B)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G004997](#)



HPLC Analysis of Homatropine Enantiomers on Astec® Cellulose DMP, LC/MS Conditions

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) methanol; (B) ammonium formate; (100:0.1, A:B)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G004998](#)

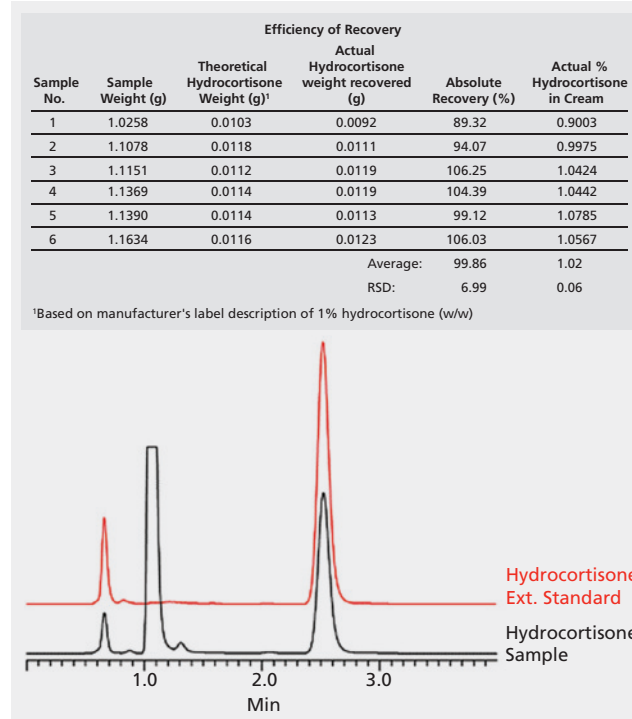


HPLC Analysis of Hydrocortisone in Topical Cream on Discovery® HS C18 after SPE using Discovery® DSC-Si

Sample Pre-treatment:

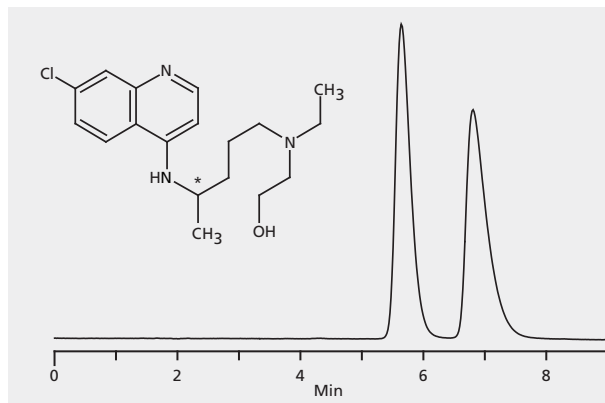
Disolve 1 g 1% hydrocortisone topical hand cream in 10 mL ethyl acetate. Dilute 2 mL of ethyl acetate-cream sample with 8 mL hexane:ethyl acetate (2:1, v/v).

sample preparation SPE (Solid Phase Extraction)
 sample addition hydrocortisone topical hand cream in hexane:ethylacetate
 SPE tube/cartridge Discovery DSC-Si, 500 mg/3 mL (52695-U)
 condition 1 mL hexane:ethyl acetate (2:1, v/v)
 sample addition 1 mL
 washing 1 mL hexane:ethyl acetate (2:1, v/v)
 elution 1 mL methanol:DI water (1:1, v/v)
 eluate post-treatment dilute eluate to 2 mL with methanol:DI water (1:1, v/v)
 column Discovery HS C18, 15 cm x 4.6 mm I.D., 5 µm particles (568520-U)
 mobile phase (A) methanol; (B) DI water (1:1, A:B)
 flow rate 1 mL/min
 column temp. 35 °C
 detector UV, 220 nm
 injection 10 µL
 Application No. **G003765**



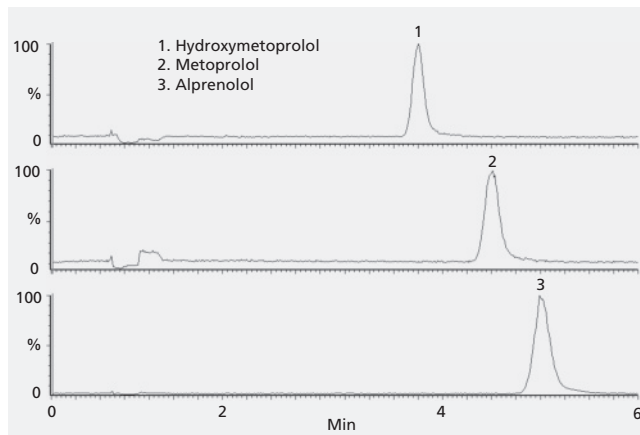
HPLC Analysis of Hydroxychloroquine Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) methanol; (B) acetic acid; (C) triethylamine; (98:1:1, A:B:C)
flow rate 2 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004627](#)



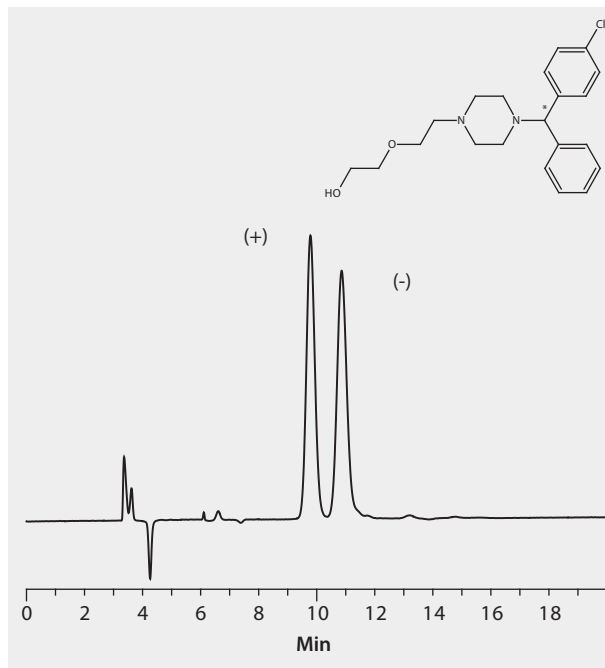
HPLC Analysis of Hydroxymetoprolol, Metoprolol and Alprenolol on Discovery® HS F5

column Discovery HS F5, 5 cm × 2.1 mm I.D., 3 µm particles (567500-U)
mobile phase 5 mM ammonium acetate in 10:90 water:acetonitrile
flow rate 0.2 mL/min
column temp. 60 °C
detector (+) ESI
injection 10 µL
sample as indicated (in mobile phase)
Application No. [G002381](#)



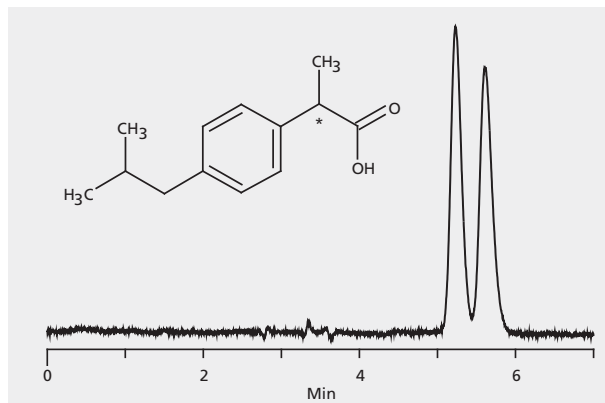
HPLC Analysis of Hydroxyzine Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) heptane; (B) IPA; (C) DEA; (90:10:0.1, A:B:C)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G004989](#)



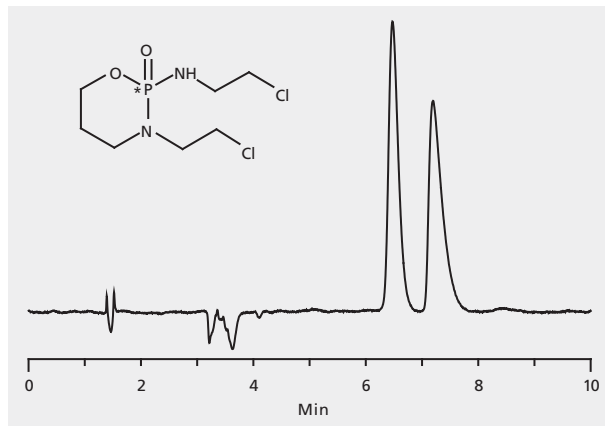
HPLC Analysis of Ibuprofen Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 20 mM sodium citrate; (B) THF; (90:10, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 225 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004628](#)



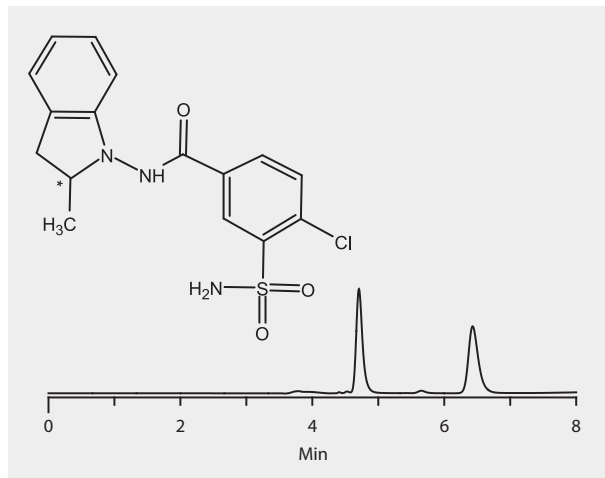
HPLC Analysis of Ifosfamide Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) water; (B) THF; (90:10, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 205 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004499](#)



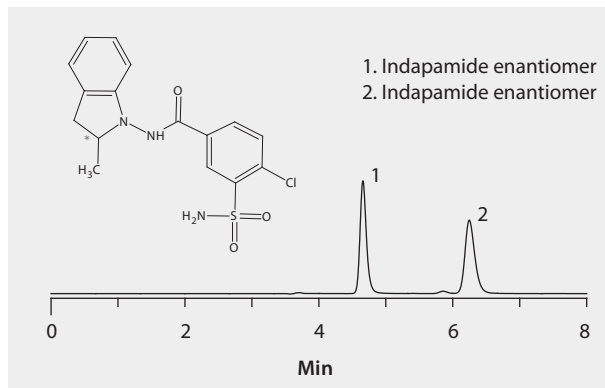
HPLC Analysis of Indapamide Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) methanol; (B) DEA; (100:0.1, A:B)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. **G005000**



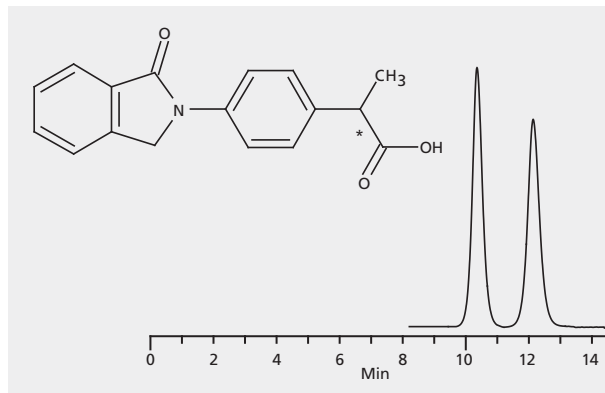
HPLC Analysis of Indapamide Enantiomers on Astec® Cellulose DMP, LC/MS

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) methanol; (B) ammonium formate; (100:0.1, A:B)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µl/h
sample 2 mg/mL in mobile phase
Application No. [G004999](#)



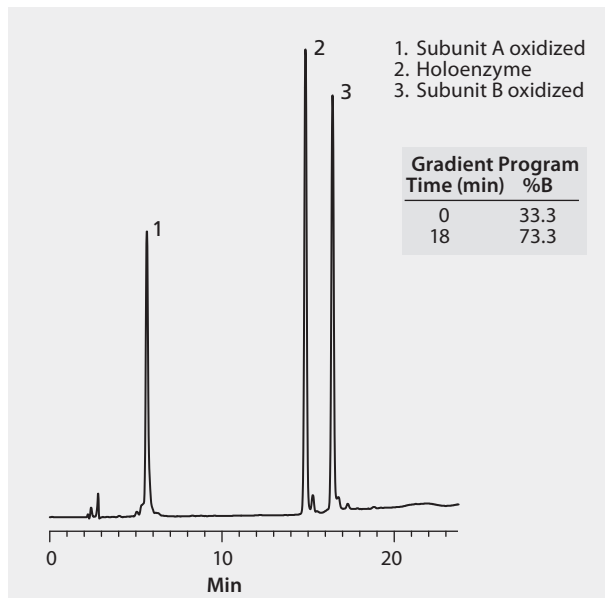
HPLC Analysis of Indoprofen Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 20 mM sodium citrate, pH 6.3; (B) THF; (90:10, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 254 nm
injection 5 µL
sample 5 mg/mL in methanol
Application No. **G004652**



HPLC Analysis of Insulin, Bovine on Discovery® C8

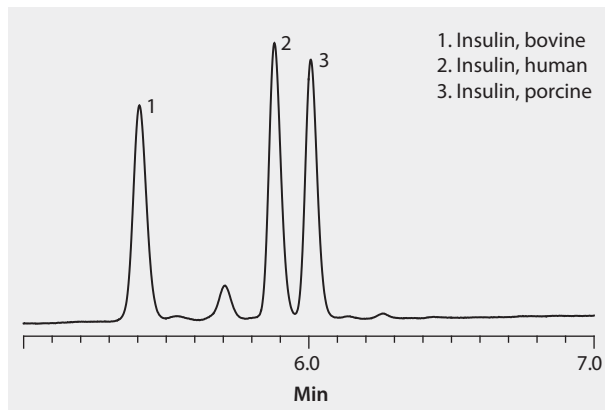
column Discovery C8, 5 cm × 4.6 mm I.D., 5 µm particles (59353-U)
mobile phase 50 mM sodium phosphate, monobasic, 50 mM sodium sulfate,
pH 3.0 (w/phosphoric acid), (A) +5% acetonitrile,
(B) +50% acetonitrile
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
Application No. **G000765**



HPLC Analysis of Insulin (Species Variants) on Ascentis® Express Peptide ES C18

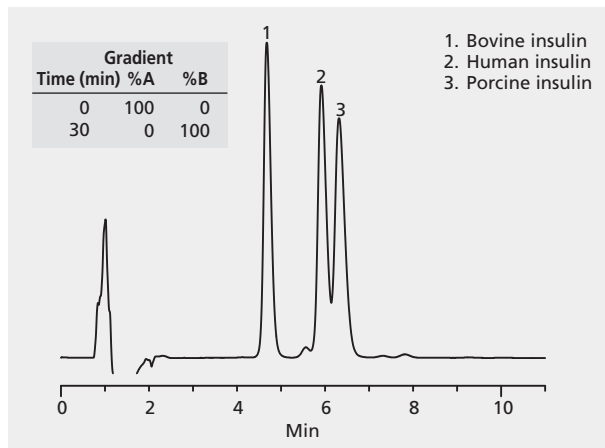
These three insulins have more than 76% identical positions in a primary structure alignment. The human and porcine proteins are most similar with 85% identity. Baseline resolution of these insulins is achieved on Ascentis Express Peptide ES-C18, with relative band spacing of these three peaks approximating their relative sequence similarities. Ascentis Express Peptide ES-C18 is ideally suited for RP chromatography of small proteins or large peptides.

column Ascentis Express Peptide ES C18, 15 cm x 2.1 mm I.D.,
2.7 µm particles (53307-U)
mobile phase (A) 70:30, water with 0.1% TFA:acetonitrile with 0.09% TFA;
(B) 55:45, water with 0.1% TFA:acetonitrile with 0.09% TFA
gradient 0 to 100% B in 7.5 min
flow rate 0.3 mL/min
pressure 4040 psi (278 bar)
column temp. 30 °C
detector UV, 215 nm
injection 0.5 µL
sample 200 µg/mL insulin (bovine, human, porcine) in 0.1% formic acid
Application No. **G005794**



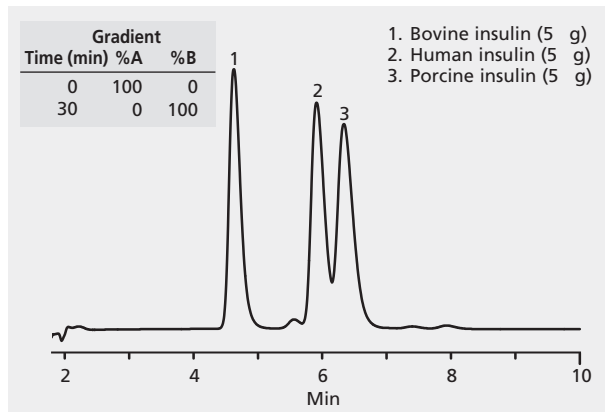
HPLC Analysis of Insulin (Species Variants) on Discovery® BIO Wide Pore C5

column Discovery BIO Wide Pore C5, 15 cm × 4.6 mm I.D.,
5 µm particles (568422-U)
mobile phase (A): 71:29, (0.1% TFA in water):(0.1% TFA in acetonitrile);
(B): 68:32, (0.1% TFA in water):(0.1% TFA in acetonitrile)
gradient 0-100% B in 30 min
flow rate 1 mL/min
column temp. ambient
detector UV, 215 nm
injection ... 5 µL 5 µL in 0.1% TFA containing 5µg each of three insulin variants
Application No. **G001580**



HPLC Analysis of Insulin (Species Variants) on Discovery® BIO Wide Pore C8

column Discovery BIO Wide Pore C8, 15 cm × 4.6 mm I.D.,
5 μm particles (568322-U)
mobile phase (A) (0.1% TFA in water):(0.1% TFA in acetonitrile), 71:29
(B): (0.1% TFA in water):(0.1% TFA in acetonitrile), 68:32,
gradient 0-100% B in 30 min
flow rate 1 mL/min
column temp. 30 °C
detector UV, 215 nm
injection 5 μL in 0.1% TFA containing 5ug each of three insulin variants
Application No. **G001507**



HPLC Analysis of Insulin (Specirs Variants) on Ascentis® Express Phenyl-Hexyl

These three insulins have more than 76% identical positions in a primary structure alignment. The human and porcine proteins are most similar with 85% identity. The Phenyl-Hexyl phase provides an alternate retention and selectivity to a C18 phase, particularly the C18 phase on a larger pore silica, Ascentis Express ES-C18

column Ascentis Express Phenyl-Hexyl, 15 cm x 2.1 mm,
2.7 µm particles (53338-U)

mobile phase (A) 70:30, water with 0.1% TFA:acetonitrile with 0.09% TFA;
(B) 55:45, water with 0.1% TFA:acetonitrile with 0.09% TFA

gradient 0 to 100% B in 7.5 min

flow rate 0.3 mL/min

pressure 3960 psi (273 bar)

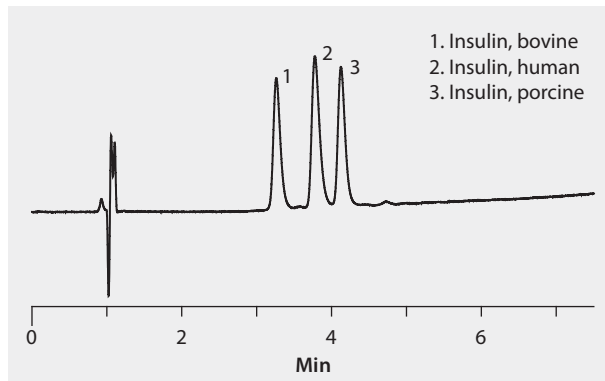
column temp. 30 °C

detector UV, 215 nm

injection 0.5 µL

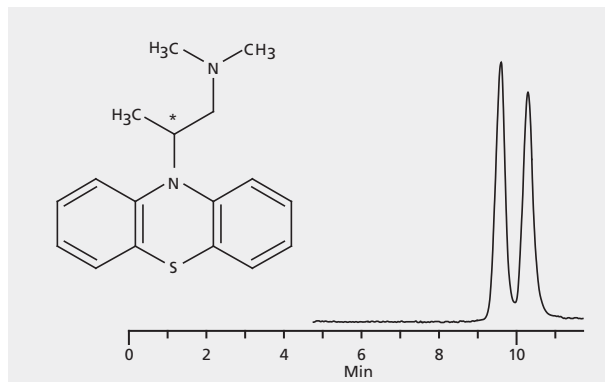
sample 200 µg/mL in 0.1% formic acid

Application No. **G005795**



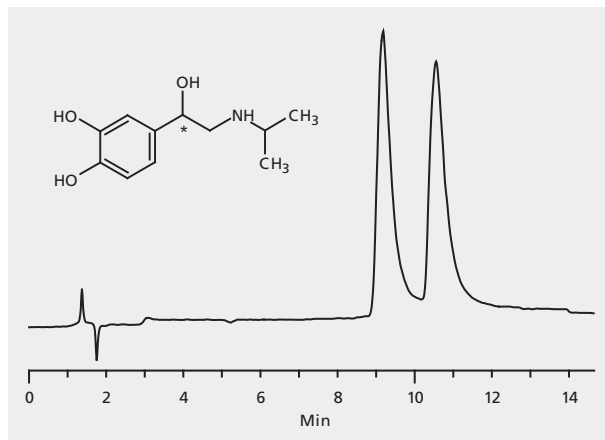
HPLC Analysis of Isopromethazine Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase . . (A) methanol; (B) acetic acid; (C) triethylamine; (100:0.1:0.1, A:B:C)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 240 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004640**



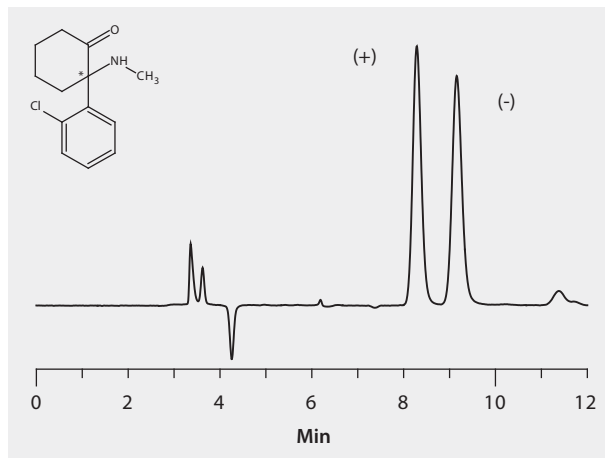
HPLC Analysis of Isoproterenol Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) acetonitrile; (B) methanol; (C) acetic acid;
(D) triethylamine; (55:45:0.3:0.2, A:B:C:D)
flow rate 2 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 5 mg/mL in methanol
Application No. **G004543**



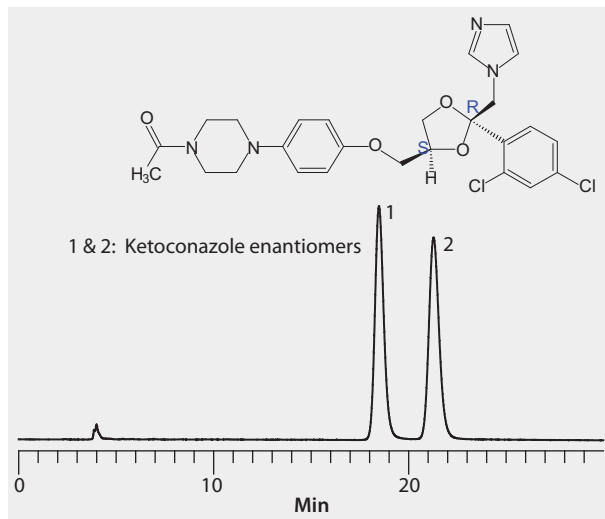
HPLC Analysis of Ketamine Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) heptane; (B) IPA; (C) DEA; (90:10:0.1, A:B:C)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G004990](#)



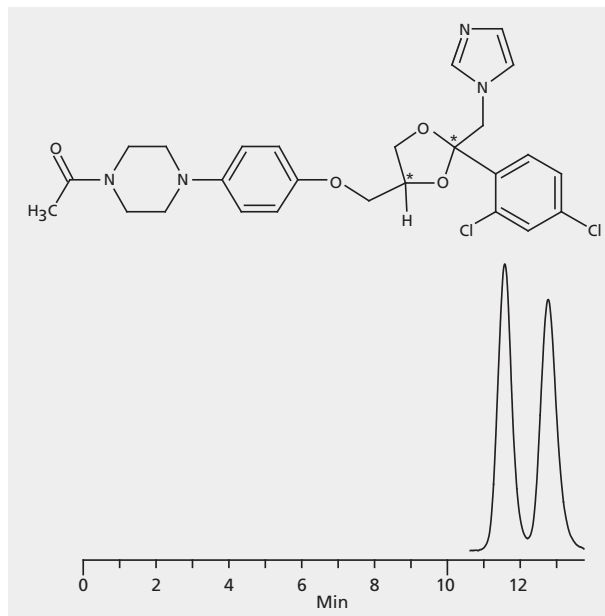
HPLC Analysis of Ketoconazole Enantiomers on Astec® Cellulose DMP, No Additives

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) acetonitrile; (100, A)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G005005](#)



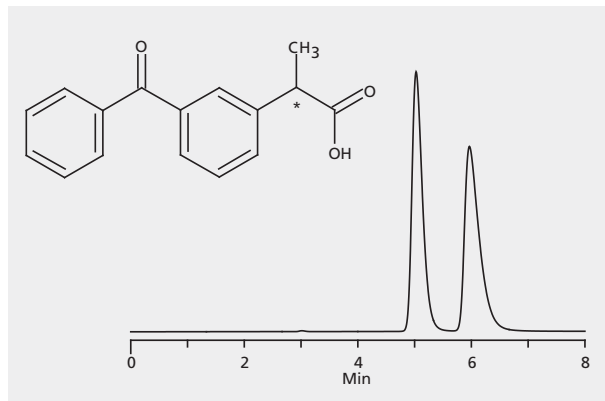
HPLC Analysis of Ketoconazole Enantiomers on Astec® CYCLOBOND® I 2000 HP-RSP

column CYCLOBOND I 2000 HP-RSP, 25 cm x 4.6 mm I.D.,
5 µm particles (24024AST)
mobile phase (A) 0.1% formic acid; (B) acetonitrile; (70:30, A:B)
flow rate 1 mL/min
column temp. 25 °C
injection 1 µL
detector UV, 230 nm
sample 1 mg/mL in methanol
Application No. **G004716**



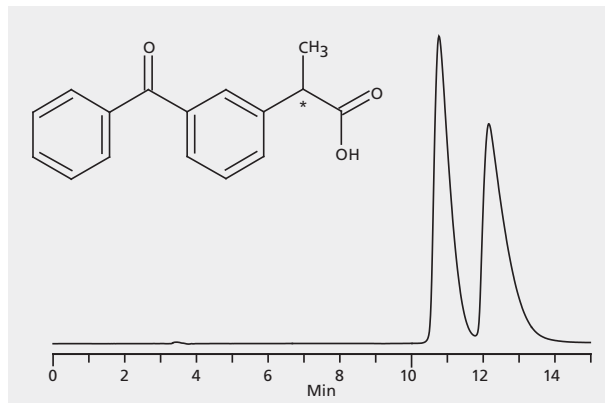
HPLC Analysis of Ketoprofen Enantiomers on Astec® CHIROBIOTIC® R

column CHIROBIOTIC R, 15 cm x 4.6 mm I.D., 5 µm particles (13023AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 5.6; (B) methanol; (50:50, A:B)
flow rate 0.6 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004666](#)



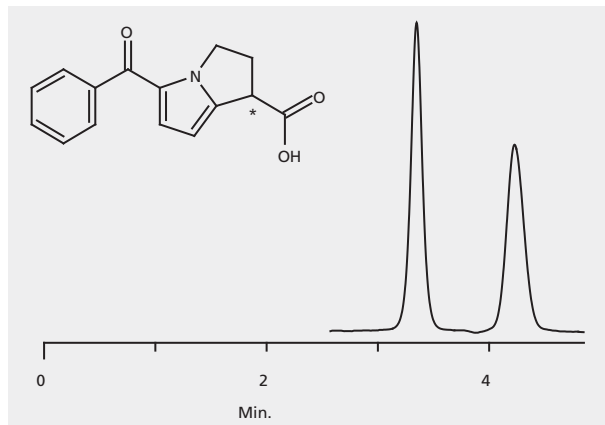
HPLC Analysis of Ketoprofen Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 20 mM sodium citrate; (B) THF; (90:10, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 254 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. [G004629](#)



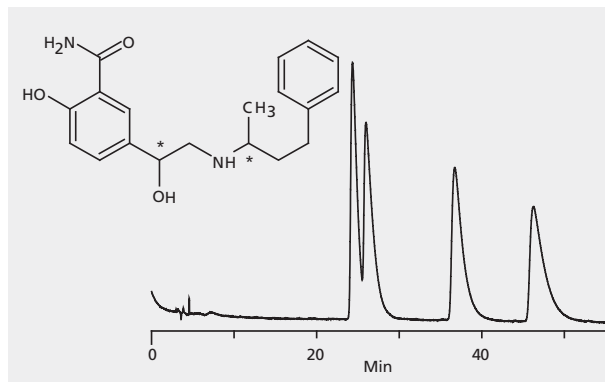
HPLC Analysis of Ketorolac Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase 0.1 wt% mM ammonium acetate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004581**



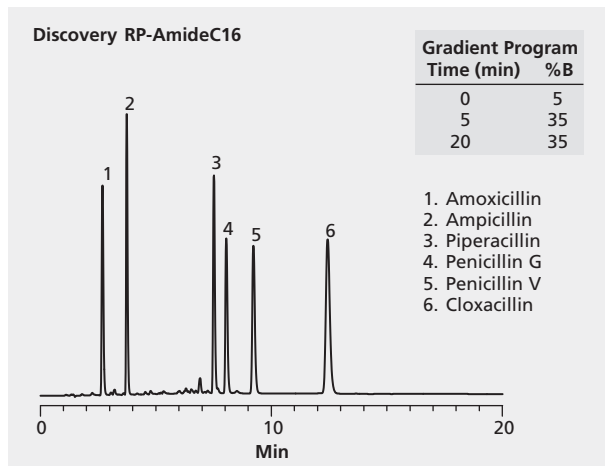
HPLC Analysis of Labetalol Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) methanol; (B) acetic acid; (C) triethylamine;
(99.8:0.15:0.05, A:B:C)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 206 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004630**



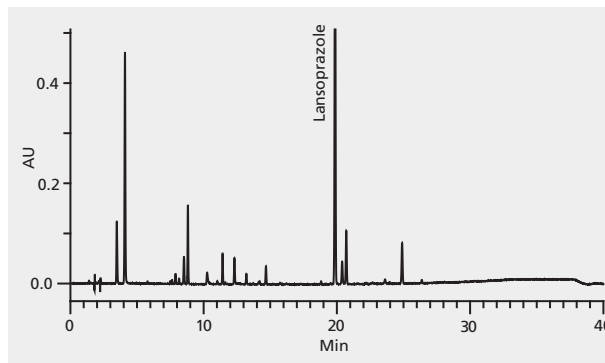
HPLC Analysis of β -Lactam Antibiotics on Discovery[®] RP-Amide C16

column . . . Discovery RP-Amide C16, 15 cm \times 4.6 mm I.D., 5 μ m particles (505013)
mobile phase (A) 0.01% TFA in water; (B) 0.01% TFA in acetonitrile
flow rate 1.5 mL/min
column temp. 30 $^{\circ}$ C
detector UV, 254 nm
Application No. **G001178**



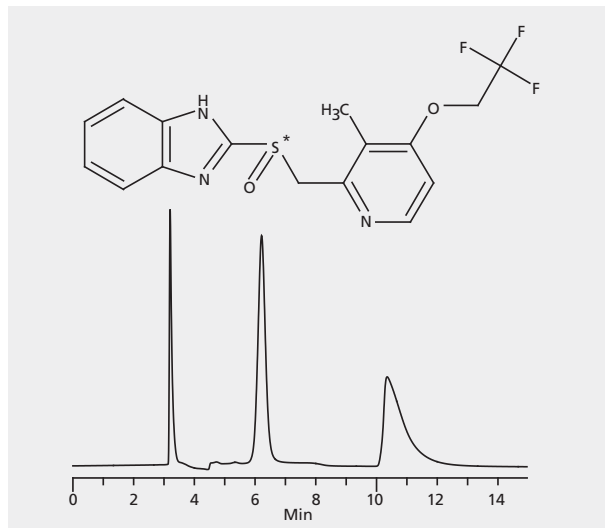
HPLC Analysis of Lansoprazole (Degradation Profile) on Ascentis® Express C18

column Ascentis Express C18, 15 cm × 4.6mm, 2.7 μm particles (53829-U)
mobile phase (A) water, (B) acetonitrile:0.5% triethylamine
in water, pH=7.0 (80:20)
flow rate 0.8 mL/min
column temp. ambient
detector UV, 285 nm
injection 15 μL
Application No. **G004160**



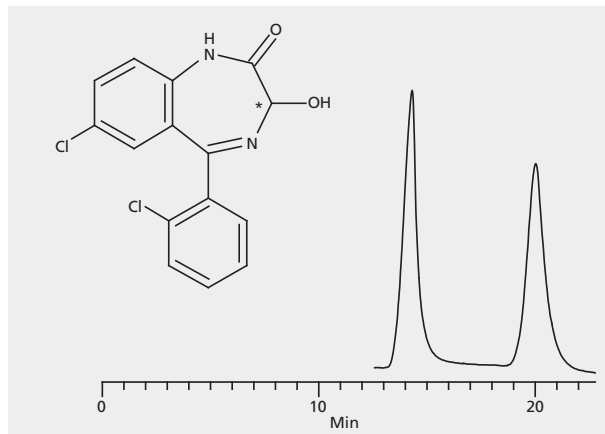
HPLC Analysis of Lansoprazole Enantiomers on Astec® CYCLOBOND® I 2000 DMP

column . . . CYCLOBOND I 2000 DMP, 25 cm x 4.6 mm I.D., 5 µm particles (20724AST)
mobile phase (A) acetonitrile; (B) methanol; (C) acetic acid;
(D) ammonium hydroxide; (95:5:0.4:0.1, A:B:C:D)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. **G004687**



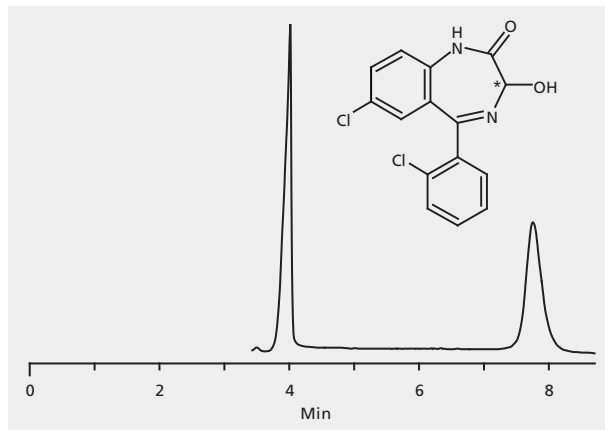
HPLC Analysis of Lorazepam Enantiomers on Astec® (R,R) P-CAP™

column Astec (R,R) P-CAP, 25 cm x 4.6 mm I.D., 5 µm particles (31024AST)
mobile phase (A) ethanol; (B) heptane; (50:50, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004721**



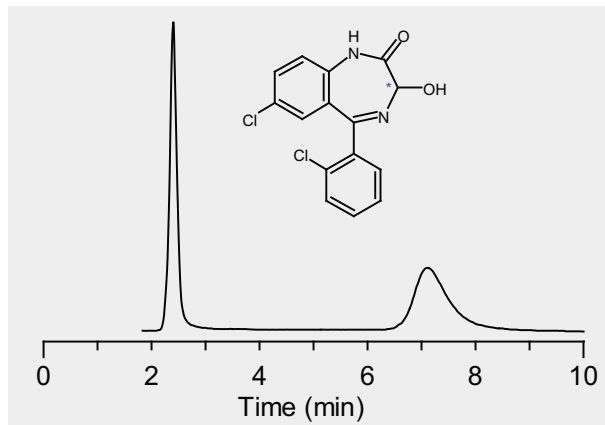
HPLC Analysis of Lorazepam Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 1 µL
sample 5 mg/mL in methanol
Application No. **G004551**



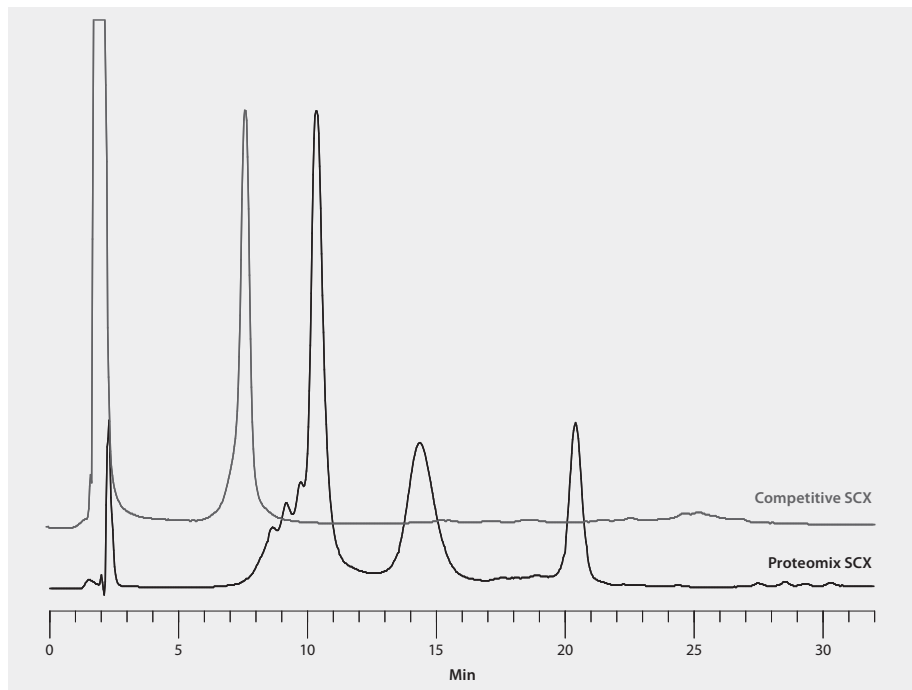
HPLC Analysis of Lorazepam Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase methanol
flow rate 2 mL/min
column temp. 23 °C
detector UV, 220 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. **G004609**



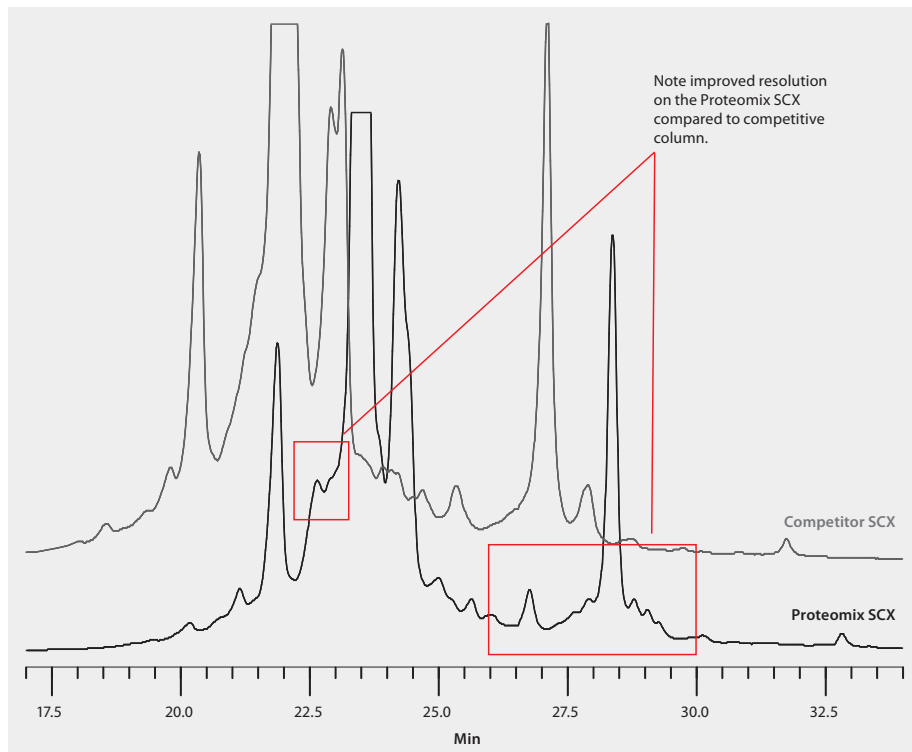
HPLC Analysis of MAb 016 on Proteomix® SCX NP5 versus Competitive SCX using a Salt Gradient

column Proteomix SCX-NP5, 25 cm x 4.6 mm I.D. (PEEK hardware),
5 µm particles (Z777164)
mobile phase (A) 20 mM phosphate buffer, pH 7.5; (B) A + 1 M NaCl
gradient 0 to 6% B in 30 min
flow rate 0.8 mL/min
detector UV, 280 nm
injection 4 µL
sample MAb 016 (11.8 mg/mL)
Application No. **G006107**



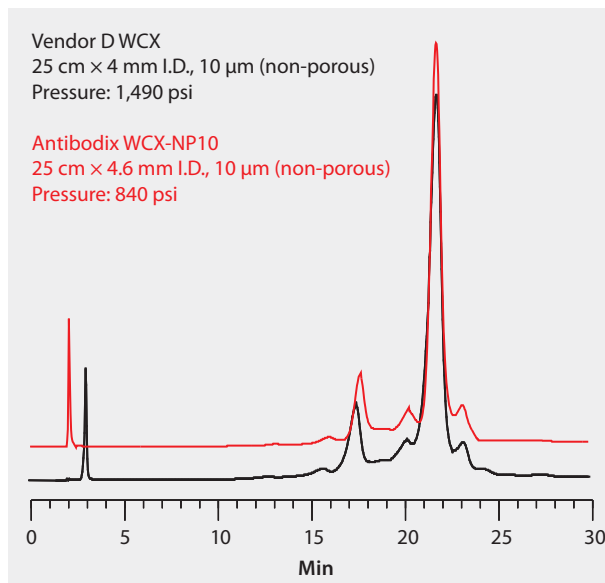
HPLC Analysis of MAb 321 on Proteomix® SCX NP5 versus Competitive SCX using pH and Salt Gradients

column Proteomix SCX-NP5, 25 cm x 4.6 mm I.D. (PEEK hardware),
5 µm particles (Z777164)
mobile phase . . . (A) 2.4 mM Tris, 1.5 mM imidazole, 11.6 mM piperazine, pH 6.0;
(B) A + 0.5 M NaCl, pH 10.5
flow rate 0.8 mL/min
detector UV, 280 nm
injection 20 µL
sample MAb 321 (5 mg/mL)
Application No. **G006098**



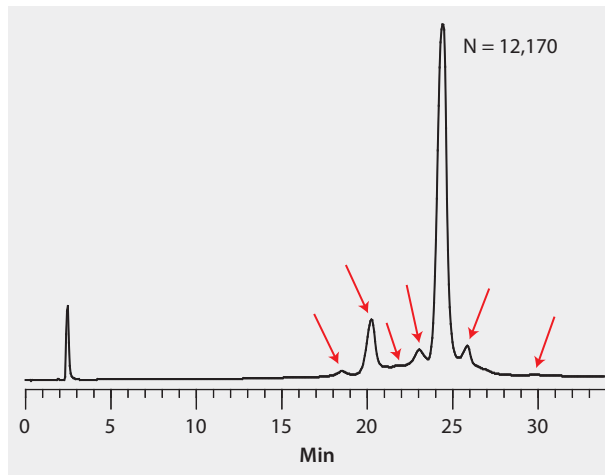
HPLC Analysis of mAb on Antibodix® WCX-NP10, Competitive Comparison

column . . . Antibodix WCX-NP10, 25 cm x 4.6 mm I.D., 10 µm particles (Z777272)
mobile phase (A) 10 mM phosphate buffer, pH 7.5; (B) A + 100 mM NaCl
gradient 15 to 55% B in 30 min
flow rate 0.8 mL/min
column temp. ambient
detector UV, 214 nm
injection 5 µL
sample monoclonal antibody
Application No. **G005939**



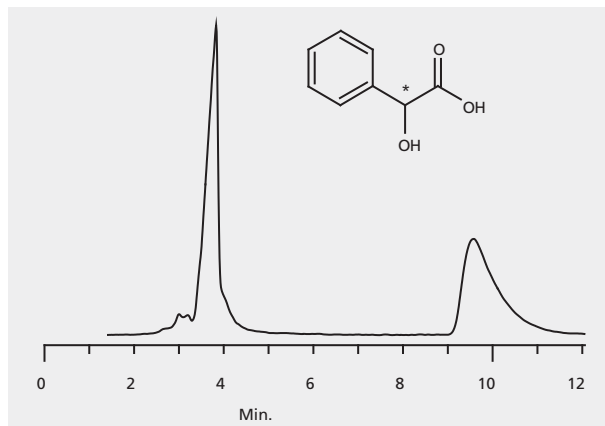
HPLC Analysis of mAb on Antibodix® WCX-NP5, 25 cm Columns

column Antibodix WCX-NP5, 25 cm x 4.6 mm I.D., 5 µm particles (Z777294)
mobile phase . . . (A) 10 mM sodium phosphate buffer, pH 7.5; (B) A + 100 mM NaCl
gradient 15 to 55% B in 30 min
flow rate 0.8 mL/min
column temp. ambient
detector UV, 214 nm
injection 10 µL
sample monoclonal antibody
Application No. **G005942**



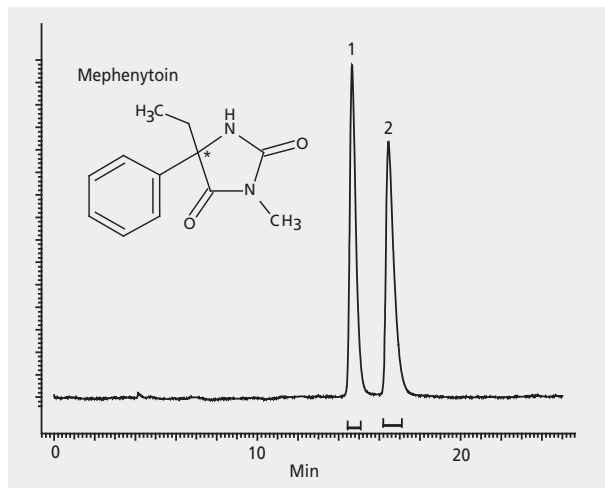
HPLC Analysis of Mandelic Acid Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase 0.1 wt% ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. **G004610**



HPLC Analysis of Mephenytoin Enantiomers on Astec® CHIROBIOTIC® V

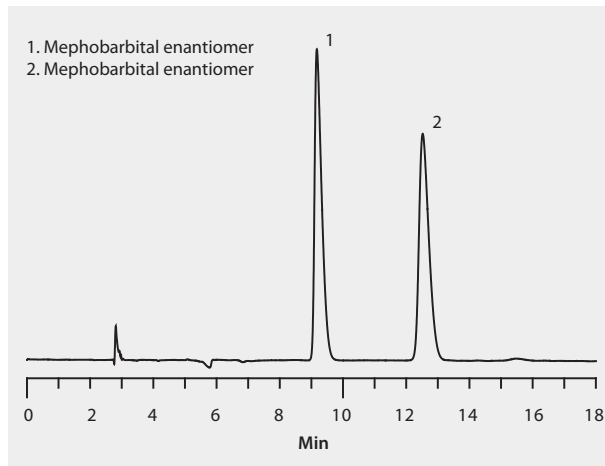
column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) hexane; (B) ethanol; (95:5, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 5 µL
sample 1 mg/mL in mobile phase
Application No. [G004471](#)



HPLC Analysis of Mephobarbital Enantiomers on Astec® Cellulose DMP

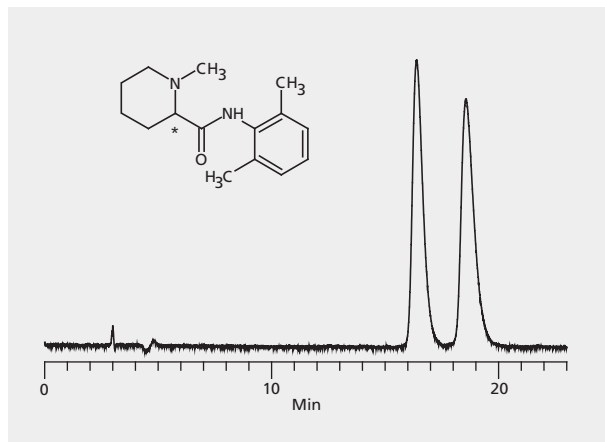
Mephobarbital enantiomers are resolved by normal phase chromatography. Mephobarbital (aka methyphenobarbital) is used as a sedative, anxiolytic and anticonvulsant. It is the N-methylated analogue of phenobarbital, and has similar indications, therapeutic value, and tolerability.

column . . . Astec Cellulose DMP; 25 cm x 4.6 mm I.D., 5 µm particles (51099AST)
mobile phase (A) heptane; (B) isopropanol; (80:20, A:B)
flow rate 1 mL/min
column temp. 30 °C
detector UV, 254 nm
injection 15 µL
sample mephobarbital, 1 g/L in 50:50, heptane:isopropanol
Application No. **G005519**



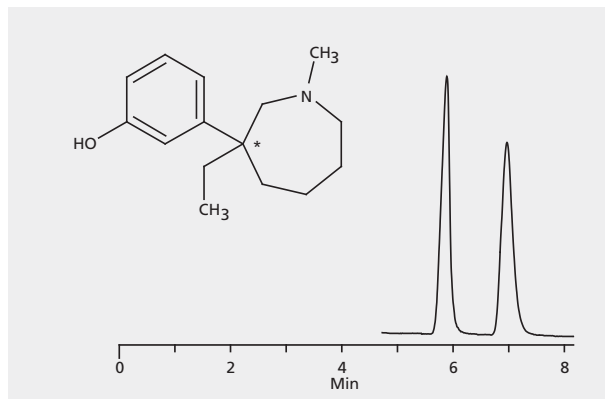
HPLC Analysis of Mepivacaine Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase . . . (A) methanol; (B) 20 mM ammonium acetate, pH 4.1; (95:5, A:B)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 220 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004466](#)



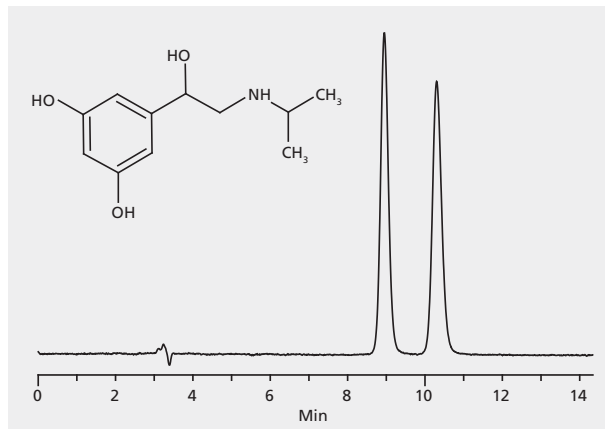
HPLC Analysis of Meptazinol Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase 0.1 wt% ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. [G004660](#)



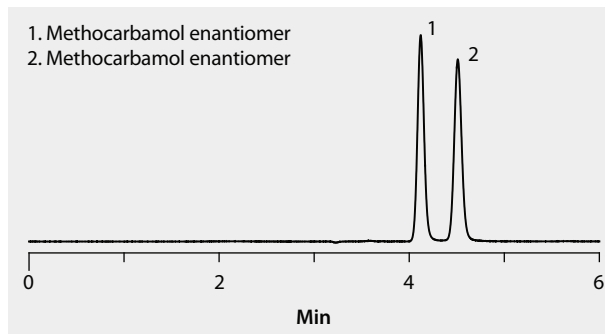
HPLC Analysis of Metaproterenol Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase 15 mM ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
sample 1 mg/mL in mobile phase
Application No. [G004406](#)



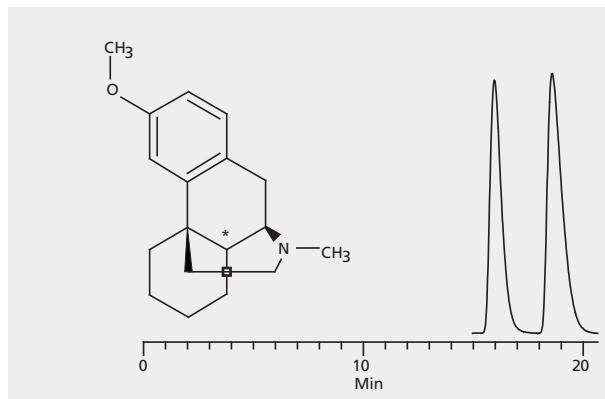
HPLC Analysis of Methocarbamol (Guaiacol Glyceryl Ether Carbamate) Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) methanol; (B) ammonium formate; (100:0.1, A:B)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G005372](#)



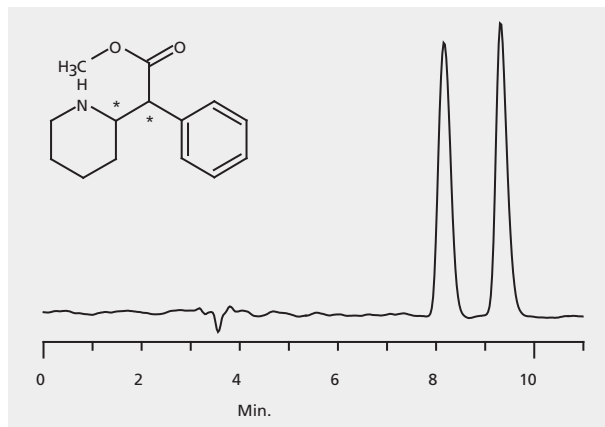
HPLC Analysis of Methorphan Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase 0.05 wt% ammonium trifluoroacetic acid in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 1 µL
sample 5 mg/mL in methanol
Application No. [G004659](#)



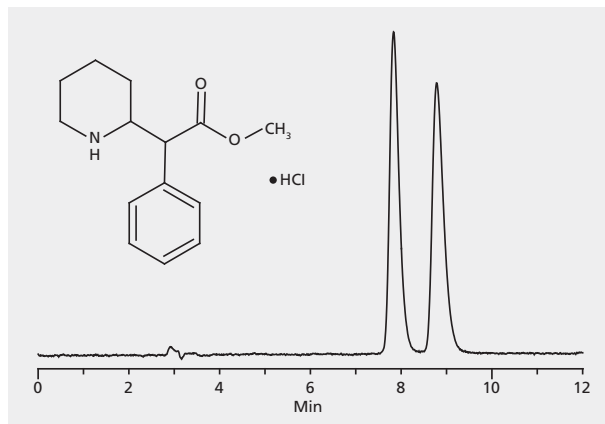
HPLC Analysis of Methylphenidate Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) methanol; (B) 1% triethylamine, pH 4/1; (95:5, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. **G004505**



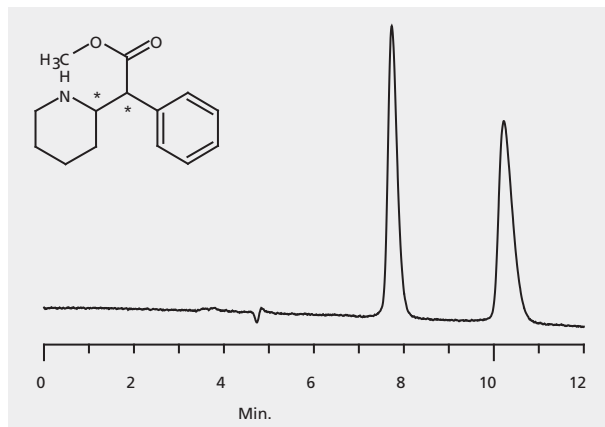
HPLC Analysis of Methylphenidate (Ritalin) Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase 15 mM ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample methylphenidate, 1 mg/mL in mobile phase
Application No. [G004405](#)



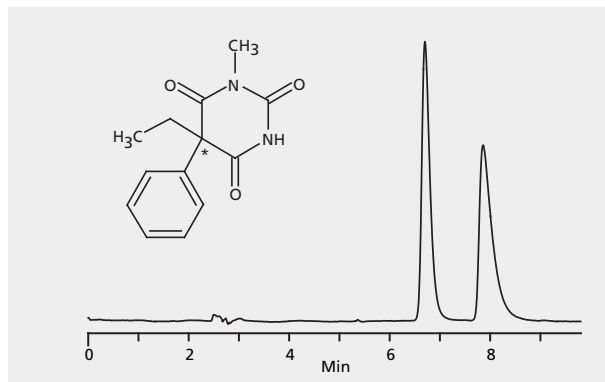
HPLC Analysis of Methylphenidate (Ritalin) Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase 15 mM ammonium acetate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 215 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004504**



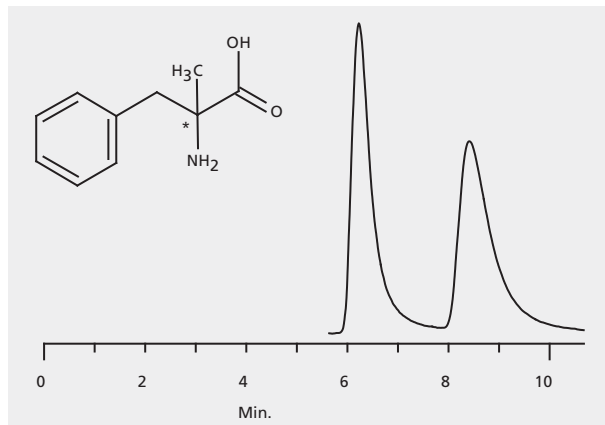
HPLC Analysis of Methylphenobarbital (Mephobarbital) Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) ethanol; (B) hexane; (25:75, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 205 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. **G004631**



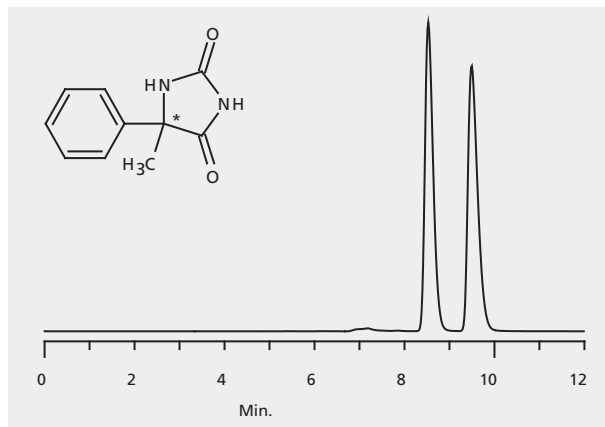
HPLC Analysis of α -Methyl Phenylalanine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 μ m particles (12024AST)
mobile phase methanol
flow rate 1 mL/min
column temp. 25 $^{\circ}$ C
detector UV, 254 nm
injection 2 μ L
sample 1 mg/mL in methanol
Application No. **G004590**



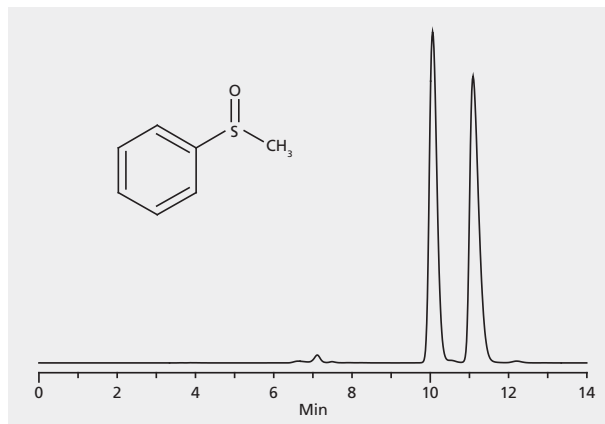
HPLC Analysis of 5-Methyl-5-Phenylhydantoin Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase methanol
flow rate 0.48 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. **G004477**



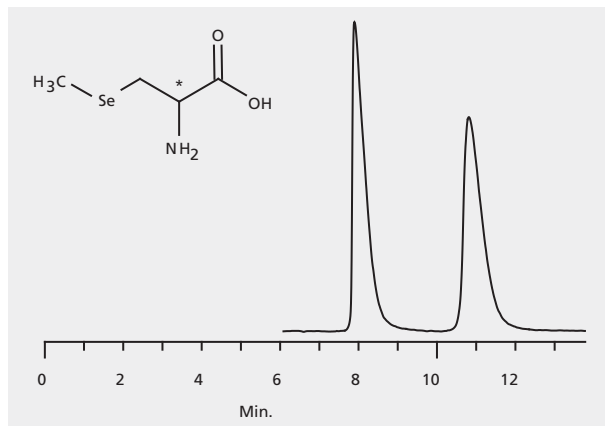
HPLC Analysis of Methyl Phenyl Sulfoxide Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase methanol
flow rate 0.48 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 10 µL
sample 1 mg/mL in mobile phase
Application No. [G004407](#)



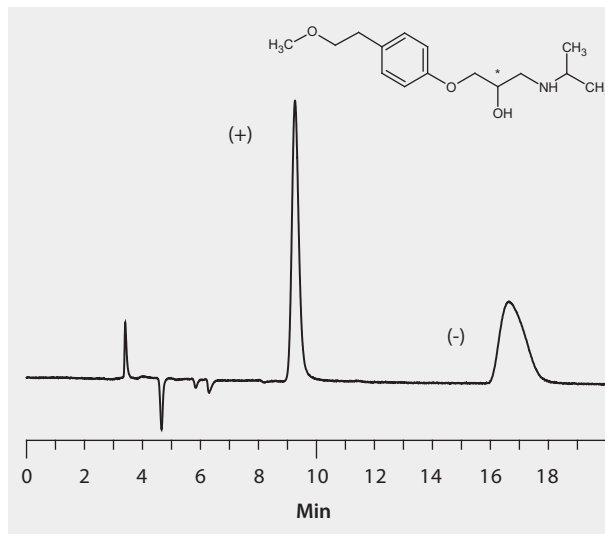
HPLC Analysis of Methylselenocysteine Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase (A) water; (B) acetonitrile; (30:70, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV at 230 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. [G004615](#)



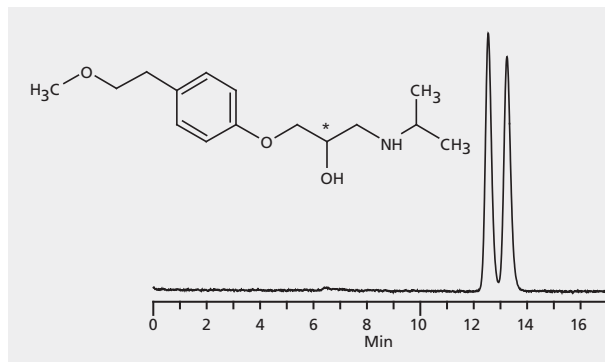
HPLC Analysis of Metoprolol Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) heptane; (B) IPA; (C) DEA; (90:10:0.1, A:B:C)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. **G004991**



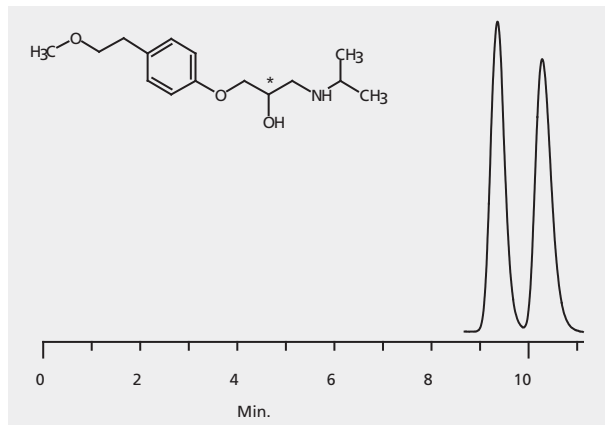
HPLC Analysis of Metoprolol Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase . . (A) methanol; (B) acetic acid; (C) triethylamine; (99.8:0.1:0.1, A:B:C)
flow rate 0.5 mL/min
column temp. 20 °C
detector UV, 225 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. [G004632](#)



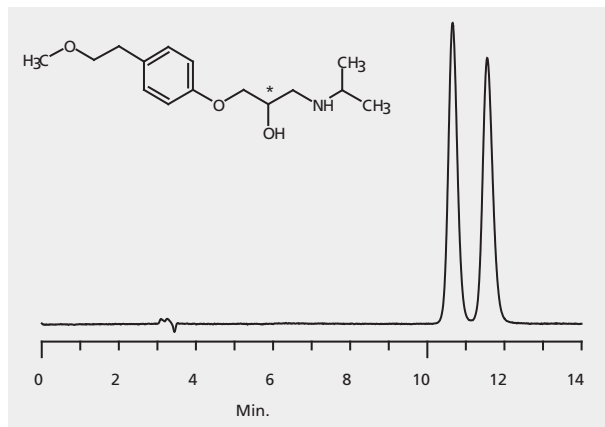
HPLC Analysis of Metoprolol Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase 0.1 wt% ammonium trifluoroacetic acid in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004597](#)



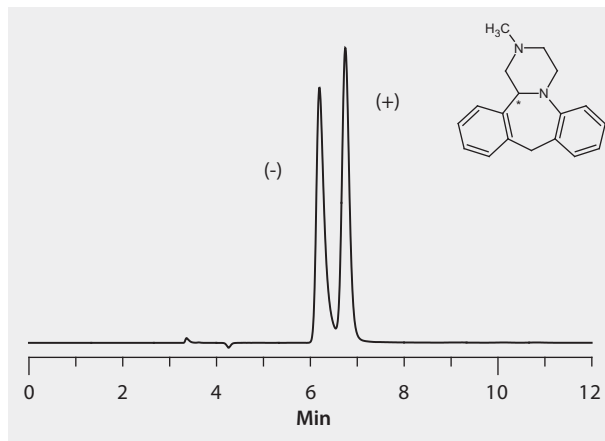
HPLC Analysis of Metoprolol Enantiomers on Astec® CHIROBIOTIC® T2 (MS Mobile Phase)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase 15 mM ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample gas 1 mg/mL in methanol
Application No. [G004484](#)



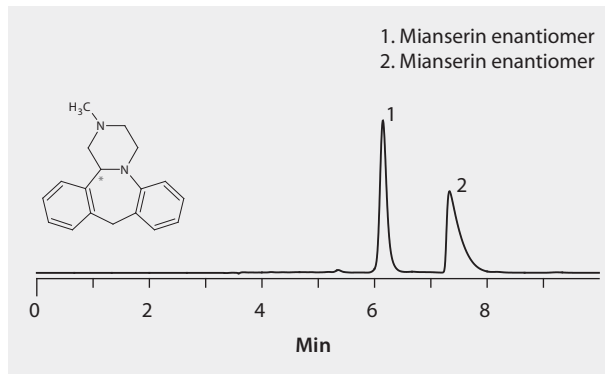
HPLC Analysis of Mianserin Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) heptane; (B) IPA; (C) DEA; (90:10:0.1, A:B:C)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G004993](#)



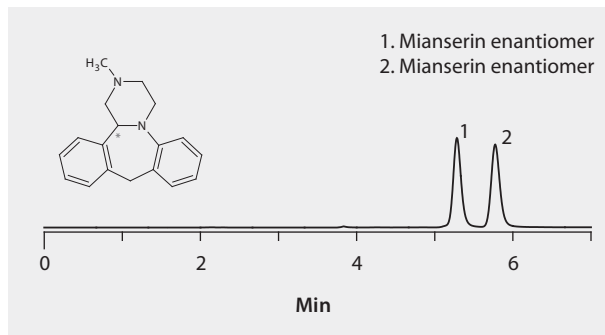
HPLC Analysis of Mianserin Enantiomers on Astec® Cellulose DMP, LC/MS Conditions

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) methanol; (B) ammonium formate; (100:0.1, A:B)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G005003](#)



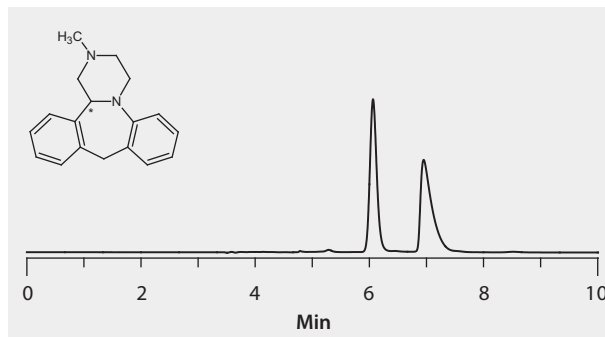
HPLC Analysis of Mianserin Enantiomers on Astec® Cellulose DMP (No Additives)

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) acetonitrile; (100, A)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G005006](#)



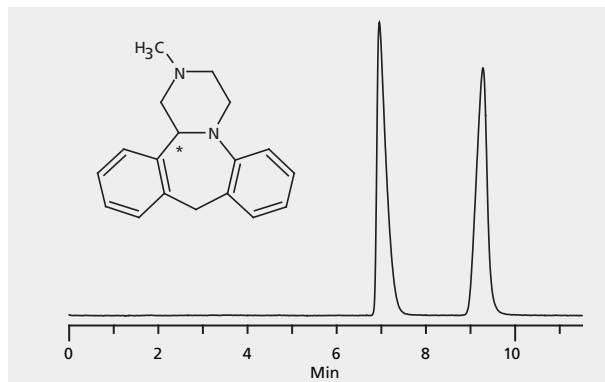
HPLC Analysis of Mianserin Enantiomers on Astec® Cellulose DMP, POM Conditions

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) methanol; (B) DEA; (100:0.1, A:B)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 230 nm
inj. temp. 2 µL
sample 2 mg/mL in mobile phase
Application No. [G004992](#)



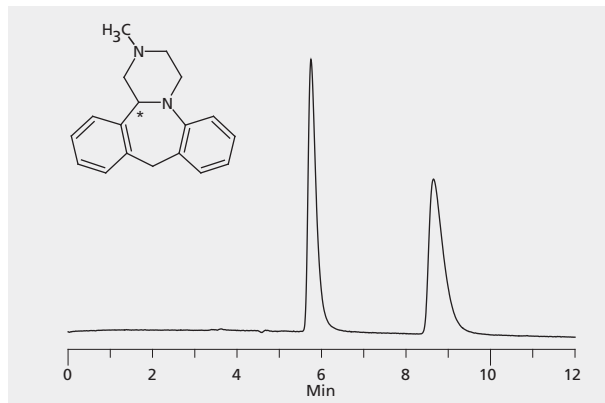
HPLC Analysis of Mianserin Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase . . (A) methanol; (B) acetic acid; (C) triethylamine; (99.8:0.1:0.1, A:B:C)
flow rate 1 mL/min
column temp. 29 °C
detector UV, 254 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004633](#)



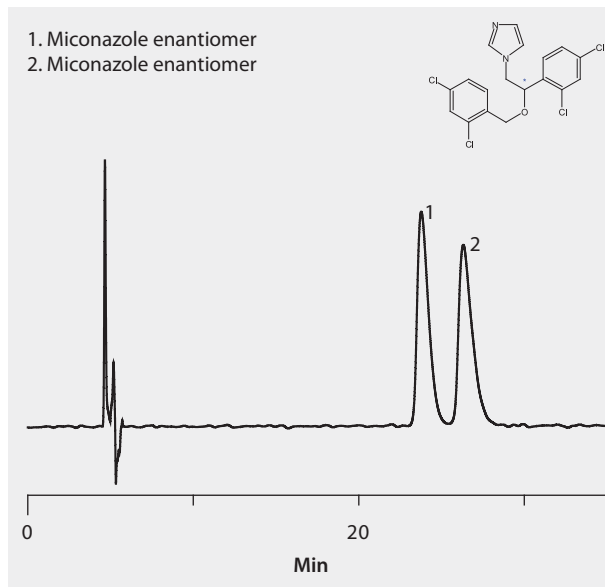
HPLC Analysis of Mianserin Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase 15 mM ammonium acetate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004469](#)



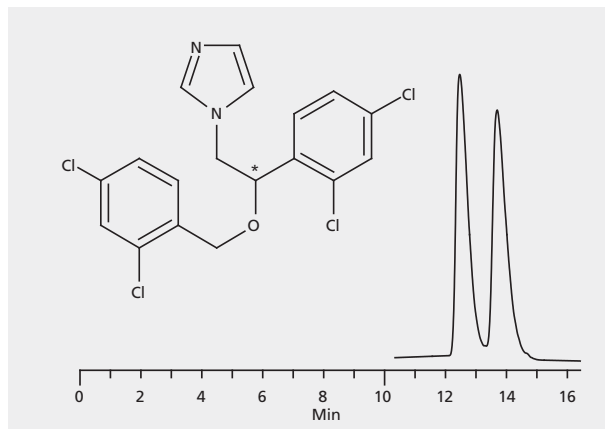
HPLC Analysis of Miconazole Enantiomers on Astec® CYCLOBOND® I 2000 HP-RSP

column CYCLOBOND I 2000 HP-RSP, 25 cm x 4.6 mm I.D.,
5 µm particles (24024AST)
mobile phase . . . (A) acetonitrile; (B) 20 mM ammonium acetate, pH 4.0; (25:75, A:B)
flow rate 0.6 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample miconazole, 1 mg/mL in acetonitrile:water (50:50)
Application No. **G005164**



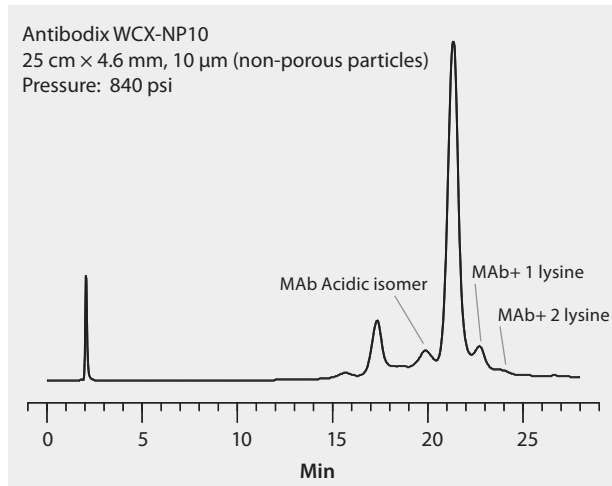
HPLC Analysis of Miconazole Enantiomers on Astec® CYCLOBOND® I 2000 RSP

column . . . CYCLOBOND I 2000 RSP, 25 cm x 4.6 mm I.D., 5 µm particles (20324AST)
mobile phase . . . (A) 1% triethylamine acetate, pH 4.1; (B) acetonitrile; (80:20, A:B)
flow rate 2 mL/min
column temp. ambient
detector UV, 230 nm
injection 5 µL
sample 5 mg/mL in methanol
Application No. [G004706](#)



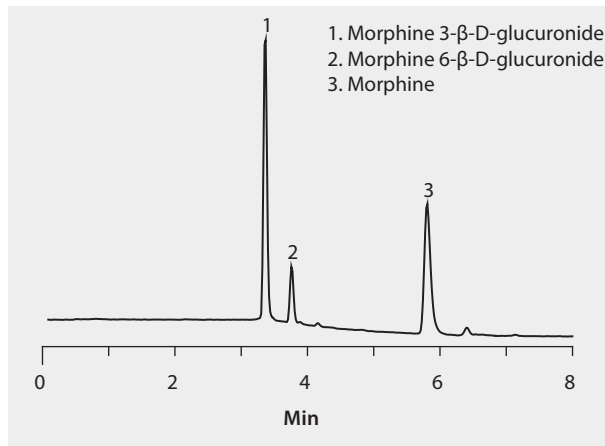
HPLC Analysis of Monoclonal Antibodies (mAb) with Charge Variance on Antiodix® WCX-NP10

column . . . Antiodix WCX-NP10, 25 cm x 4.6 mm I.D., 10 µm particles (Z777272)
mobile phase . . . (A) 10 mM sodium phosphate buffer, pH 7.5; (B) A + 100 mM NaCl
gradient 15 to 55% B in 30 min
flow rate 0.8 mL/min
pressure 840 psi (58 bar)
column temp. ambient
detector UV, 214 nm
injection 5 µL
sample monoclonal antibody
Application No. **G005940**



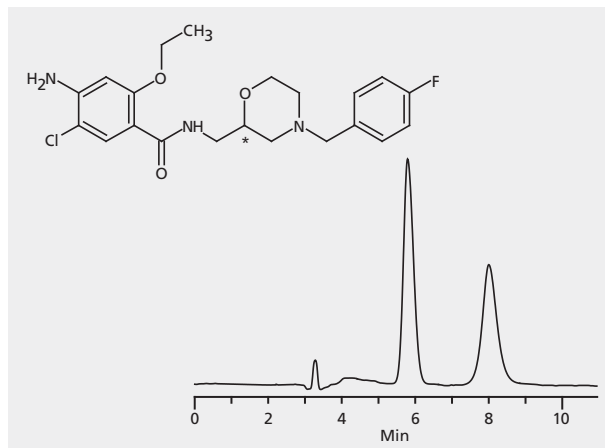
HPLC Analysis of Morphine and Glucuronide Metabolites on Discovery® HS F5

column Discovery HS F5, 5 cm x 4.6 mm I.D., 5 µm particles (567513-U)
mobile phase . . . (A) 10 mM ammonium acetate, pH 6.8 (unadjusted); (B) acetonitrile
gradient 0% B for 1 min, to 30% B in 4 min, held 3 min
flow rate 1 mL/min
column temp. 40 °C
detector UV, 280 nm
injection 10 µL
sample 50 µg/mL in final mobile phase
Application No. [G006123](#)



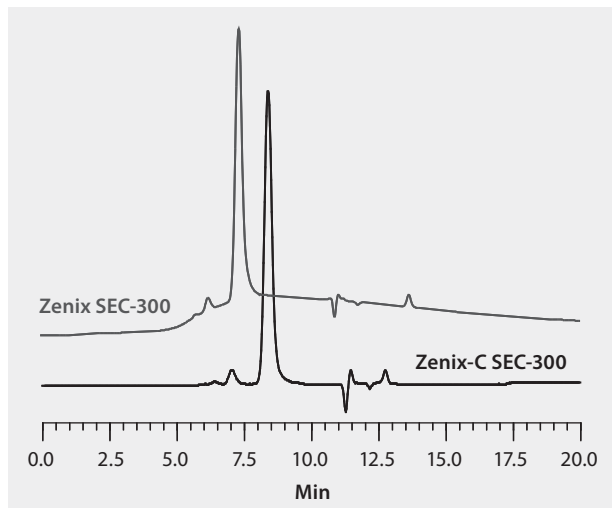
HPLC Analysis of Mosapride Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 20 mM ammonium nitrate, pH 5.5; (B) THF; (60:40, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 254 nm
injection 1 µL
sample 3 mg/mL in methanol
Application No. [G004650](#)



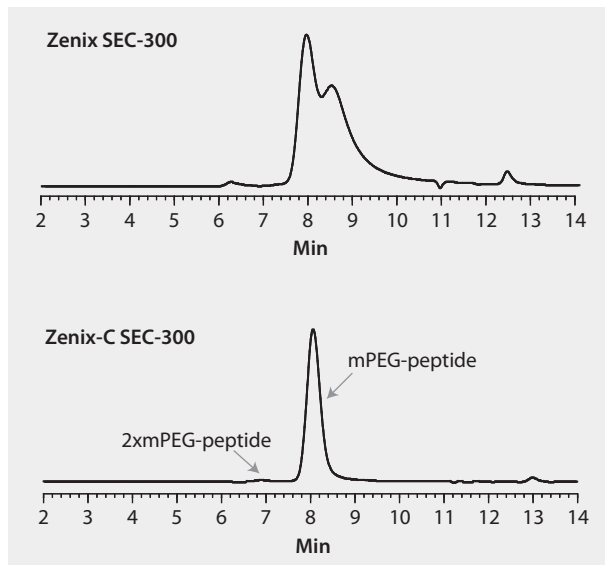
HPLC Analysis of mPEG and mPEG-Peptide (Methoxy-PEG-Maleimide) on Zenix® and Zenix®-C SEC

column Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777033)
column Zenix-C SEC-300, 30 cm x 7.8 mm, I.D., 3 µm particles (Z777092)
mobile phase 150 mM sodium phosphate buffer, pH 7.0
flow rate 1.0 mL/min
column temp. 25 °C
detector UV, 214 nm
injection 20 µL
sample 20kD peptide mPEG-MAL (methoxy-PEG-Maleimide), 1 mg/mL
Application No. [G005948](#)



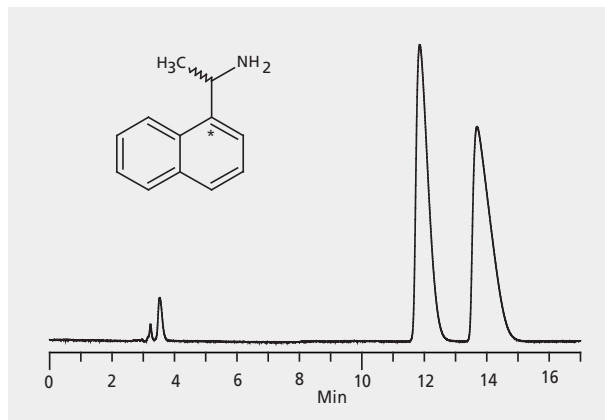
HPLC Analysis of mPEG and mPEG-Peptide on Zenix® and Zenix®-C SEC

column Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777033)
column Zenix-C SEC-300, 30 cm x 7.8 mm, I.D., 3 µm particles (Z777092)
mobile phase 150 mM sodium phosphate buffer, pH 7.0
flow rate 1.0 mL/min
column temp. 25 °C
detector UV, 214 nm
injection 20 µL
sample 4kD peptide and 20kD mPEG-MAL(methoxy-PEG-Maleimide) (6 mg/mL)
Application No. [G005947](#)



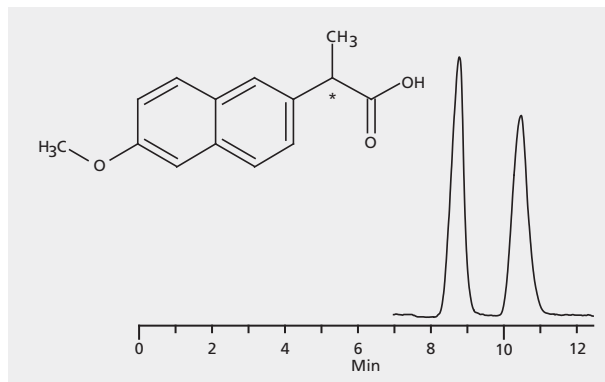
HPLC Analysis of 1-(1-Naphthyl)ethylamine Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase (A) methanol; (B) 20 mM ammonium acetate; (90:10, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. [G004458](#)



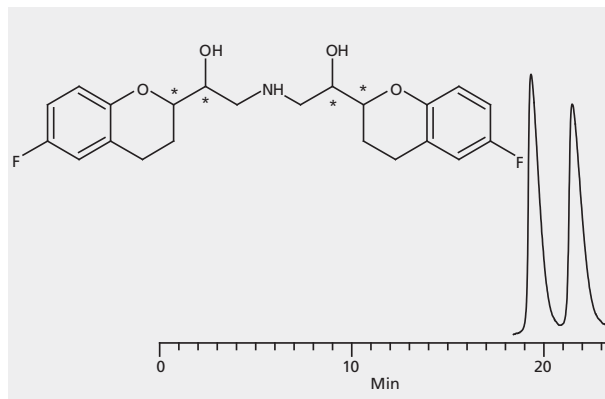
HPLC Analysis of Naproxen Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 0.1% triethylamine, pH 7.0; (B) THF; (90:10, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 5 mg/mL in methanol
Application No. [G004644](#)



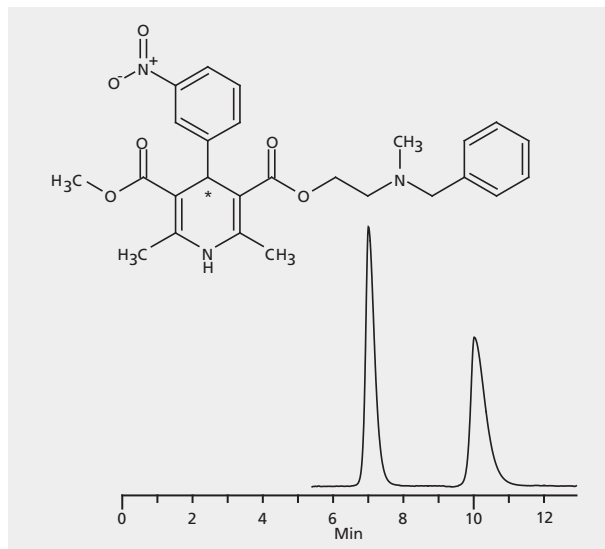
HPLC Analysis of Nebivolol Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase 0.05% ammonium trifluoroacetic acid in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 0.5 µL
sample 1 mg/mL in methanol
Application No. [G004658](#)



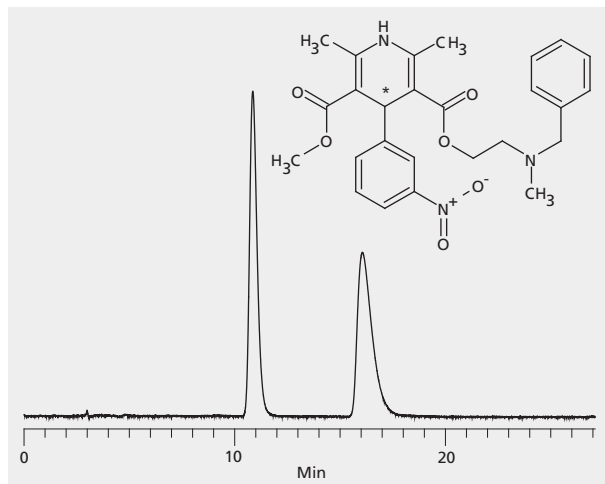
HPLC Analysis of Nicardipine Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) methanol; (B) acetic acid; (C) triethylamine;
(100:0.02:0.01, A:B:C)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 254 nm
injection 2 µL
sample 5 mg/mL in methanol
Application No. **G004654**



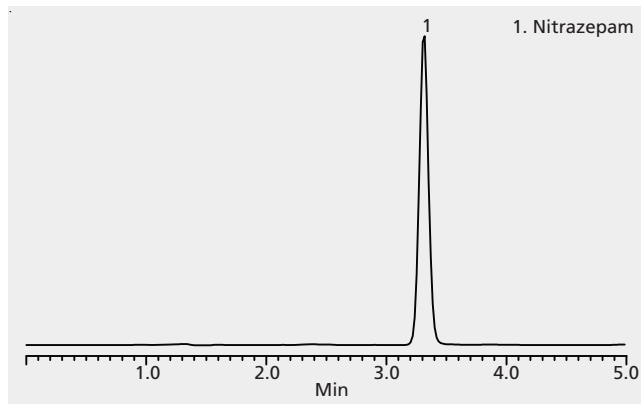
HPLC Analysis of Nicardipine Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase . . . (A) methanol; (B) 20 mM ammonium acetate, pH 4.1; (95:5, A:B)
flow rate 1 mL/min
column temp. 30 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004470**



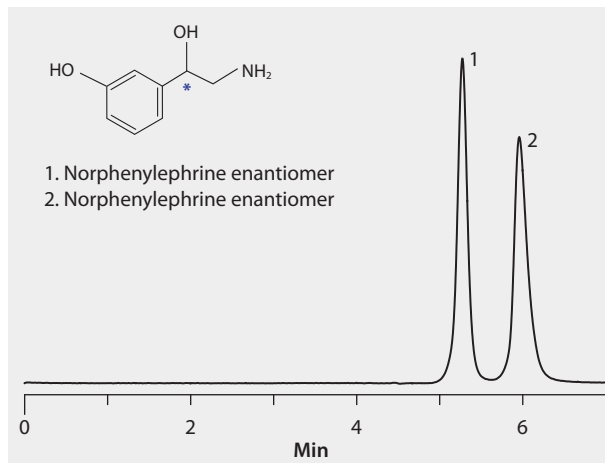
HPLC Analysis of Nitrazepam Anticonvulsant Drugs on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 7.0 with potassium hydroxide); (B) acetonitrile; (50:50, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL in mobile phase
Application No. **G002356**



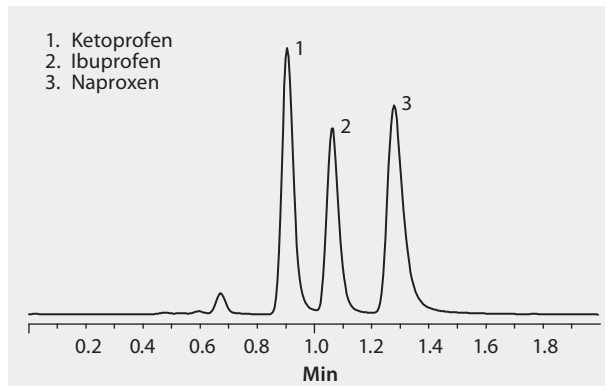
HPLC Analysis of Norphenylephrine Enantiomers on Astec® CYCLOBOND® I 2000 AC (pH 5.0)

column . . . CYCLOBOND I 2000 AC, 25 cm x 4.6 mm I.D., 5 µm particles (20124AST)
mobile phase . . . (A) methanol; (B) 20 mM ammonium acetate, pH 5.0; (5:95, A:B)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample norphenylephrine, 1 mg/mL in acetonitrile:water (50:50)
Application No. [G005159](#)



HPLC Analysis of NSAIDs on Discovery® Zr-Carbon C18

column . . . Discovery Zr-Carbon C18, 15 cm × 4.6 mm I.D., 3 µm particles (65706-U)
mobile phase . . . (A) 50 mM phosphoric acid (pH 1.75); (B) acetonitrile; (50:50, A:B)
flow rate 4 mL/min
column temp. 80 °C
detector UV, 254 nm
injection 1 µL
sample ketoprofen, ibuprofen, naproxen, each 1 mg/mL
Application No. [G001864](#)



HPLC Analysis of Oenothien B on Ascentis® Express RP-Amide, UV and MS Detection

Optimization of a published method showing much better retention, peak shape and resolution on Supelco Ascentis Express RP-Amide 2.7 μm compared to a C18 phase. Isomers and small amounts of homologues are resolved and detectable with higher sensitivity.

column Ascentis Express RP-Amide, 10 cm x 4.6 mm I.D.,
2.7 μm particles (53929-U)

mobile phase (A) 0.2% formic acid; (B) methanol

gradient 5% B for 2 min; to 90% B over 18 min; held at 90% B for 10 min

flow rate 0.6 mL/min

column temp. 35 $^{\circ}\text{C}$

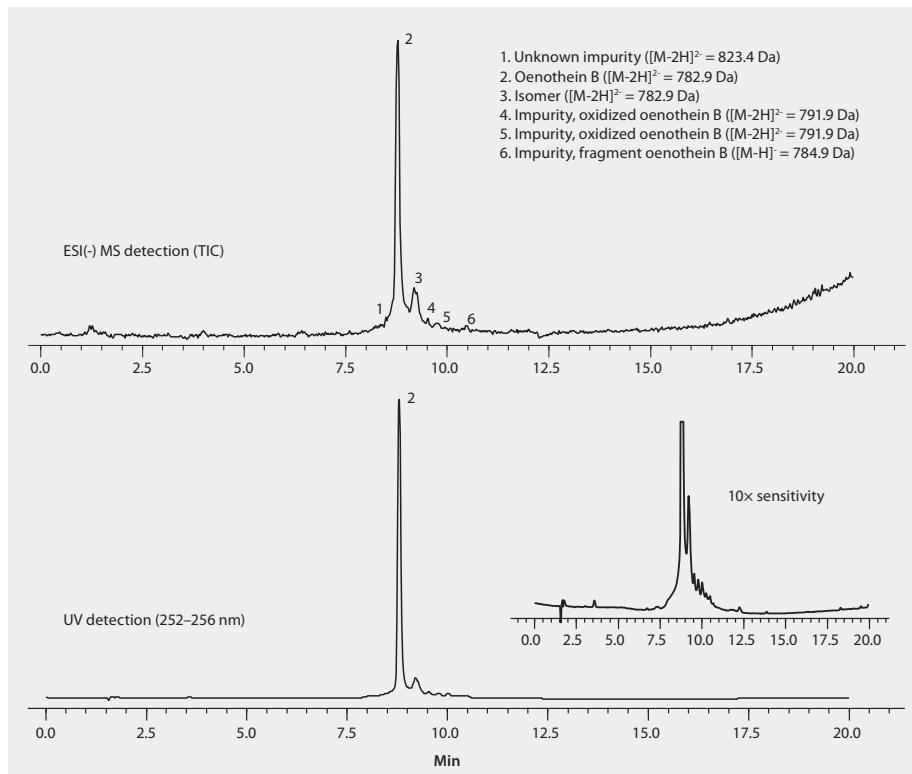
detector UV, 254 nm

detector MS (ion trap), m/z 100-1500

injection 2 μL

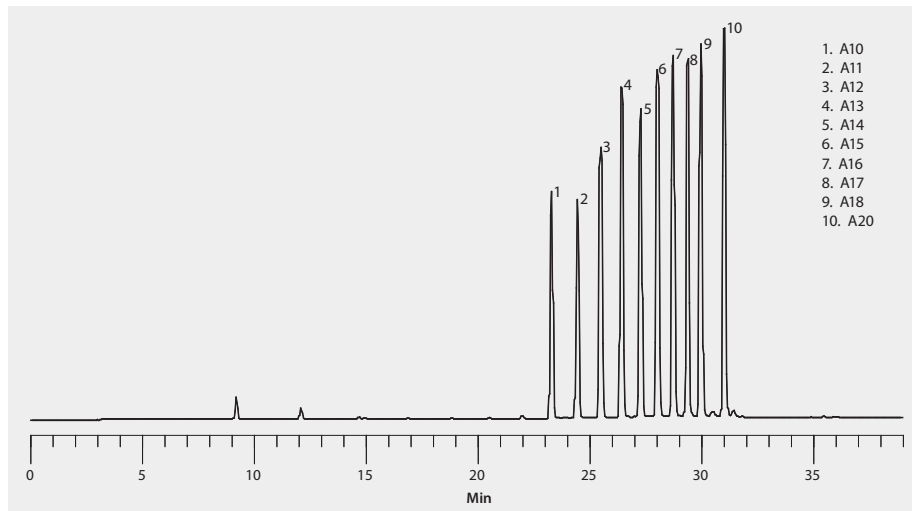
sample 1 mg/mL in methanol

Application No. **G006164**



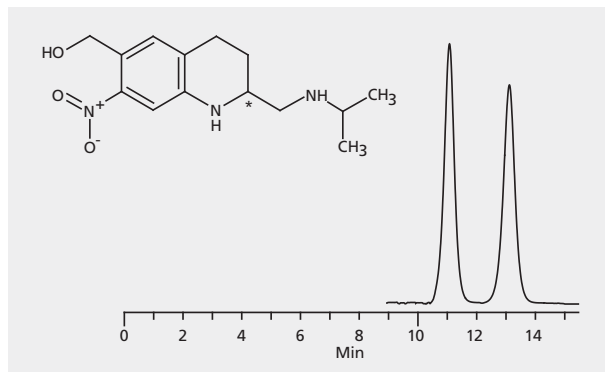
HPLC Analysis of Oligonucleotides on Proteomix® SAX

column Proteomix SAX-NP5, 25 cm x 4.6 mm I.D., 5 µm particles (Z777229)
mobile phase A: 20 mM Tris, pH 8.0 B: A + 0.5 M NaCl
gradient 0 - 100% B in 30 minutes
flow rate 0.5 mL/min
pressure 1073 psi (74 bar)
column temp. 25 °C
detector UV 260 nm
injection 5 µL
sample (10 mM each oligonucleotide in water)
Application No. **G005994**



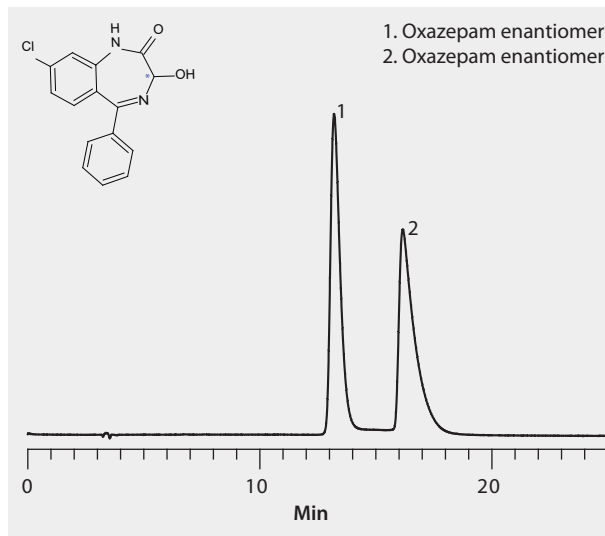
HPLC Analysis of Oxamniquine Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase 0.1 wt% ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004656](#)



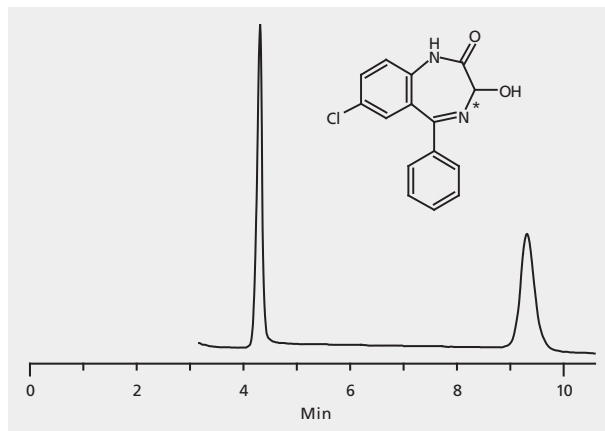
HPLC Analysis of Oxazepam Enantiomers on Astec® CYCLOBOND® I 2000 DNP

column . . . CYCLOBOND I 2000 DNP, 25 cm x 4.6 mm I.D., 5 µm particles (25024AST)
mobile phase (A) acetonitrile; (B) 20 mM ammonium phosphate,
pH 2.9; (20:80, A:B)
flow rate 1 mL/min
column temp. 5 °C
detector UV, 254 nm
injection 3 µL
sample oxazepam, 1 mg/mL in acetonitrile:water (50:50)
Application No. **G005162**



HPLC Analysis of Oxazepam Enantiomers on Astec® CHIROBIOTIC® T

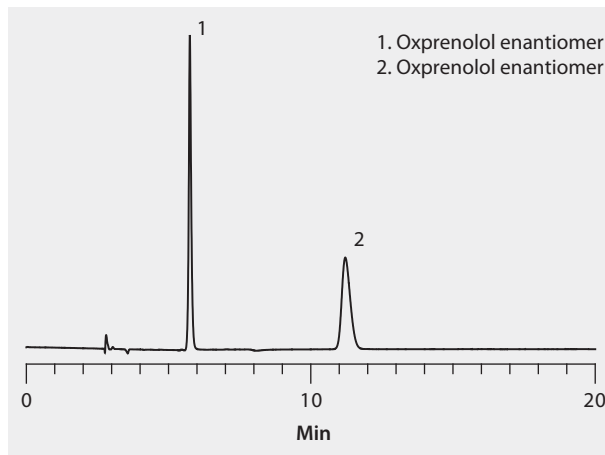
column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 1 µL
sample gas 1 mg/mL in methanol
Application No. **G004545**



HPLC Analysis of Oxprenolol Enantiomers on Astec® Cellulose DMP

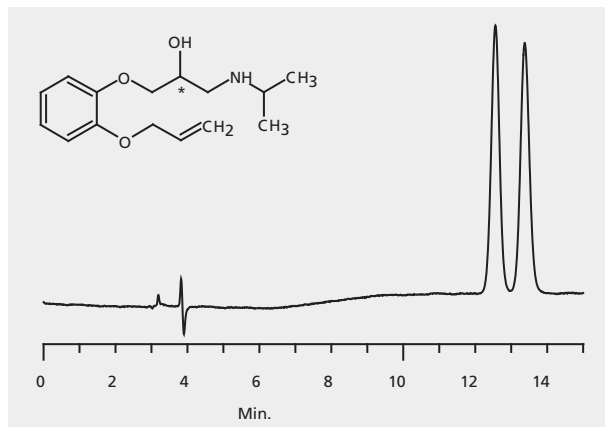
Oxprenolol enantiomers are resolved by normal phase chromatography. Oxprenolol is a nonselective beta-blocker and is used to treat angina and hypertension.

column . . . Astec Cellulose DMP, 25 cm x 4.6 mm I.D., 5 µm particles (51099AST)
mobile phase . . . (A) heptane; (B) isopropanol; (C) diethylamine; (80:20:0.1, A:B:C)
flow rate 1 mL/min
column temp. 30 °C
detector UV, 254 nm
injection 15 µL
sample oxprenolol, 1 g/L in 50:50 heptane:isopropanol
Application No. [G005522](#)



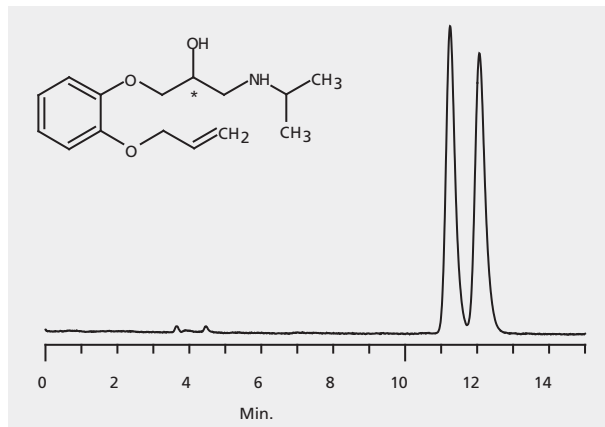
HPLC Analysis of Oxprenolol Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) acetonitrile; (B) methanol; (C) acetic acid;
(D) triethylamine; (54.5:45:0.3:0.2, A:B:C:D)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004507**



HPLC Analysis of Oxprenolol Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase 5 mM ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004480](#)

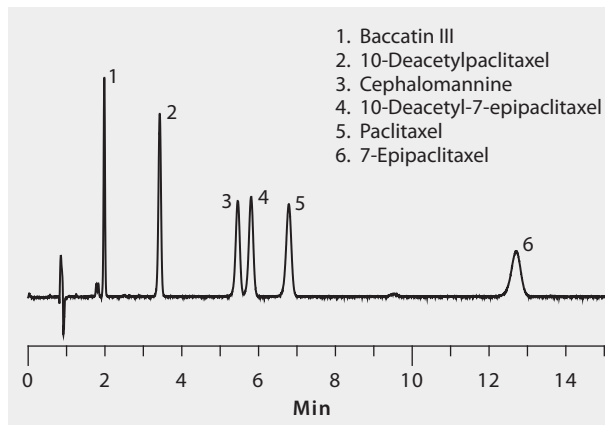


HPLC Analysis of Paclitaxel and Related Compounds on Ascentis® Express F5 5 µm

An efficient reverse phase HPLC method for the HPLC analysis of Paclitaxel (Taxol) and related compounds is developed using the Ascentis® Express F5 5µm Fused Core HPLC column. Paclitaxel is a natural product with antitumor activity. TAXOL (paclitaxel) is obtained via a semi-synthetic process from *Taxus baccata*.

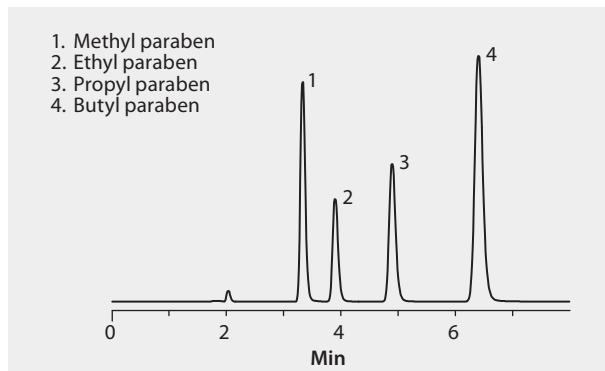
The developed method can be easily used for the routine quality control of bulk and Parenterals dosage form of Paclitaxel within a short analysis time. This method offers the advantages of higher efficiencies, reduced backpressure and shorter run times over a traditionally run methods over 5 µm totally porous particle columns.

column Ascentis Express F5, 15 cm x 4.6 mm I.D., 5 µm particles (50631-U)
 mobile phase (A) water; (B) acetonitrile; (60:40, A:B)
 flow rate 1.5 mL/min
 pressure 2727 psi (188 bar)
 column temp. 30 °C
 detector UV, 227 nm
 injection 5 µL
 sample taxols 25 µg/mL in 70:15:15, water:methanol:acetonitrile
 Application No. **G005890**



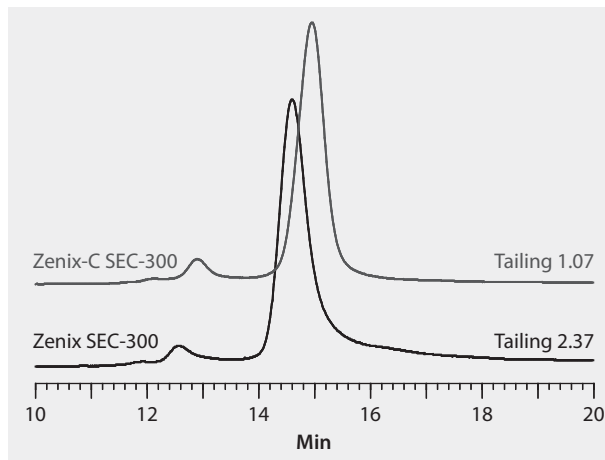
HPLC Analysis of Paraben Preservatives on Discovery® Cyano

column Discovery Cyano, 15 cm × 4.6 mm I.D., 5 µm particles (59356-U)
mobile phase (A) acetonitrile; (B) water; (40:60, A:B)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 10 µL
Application No. **G001237**



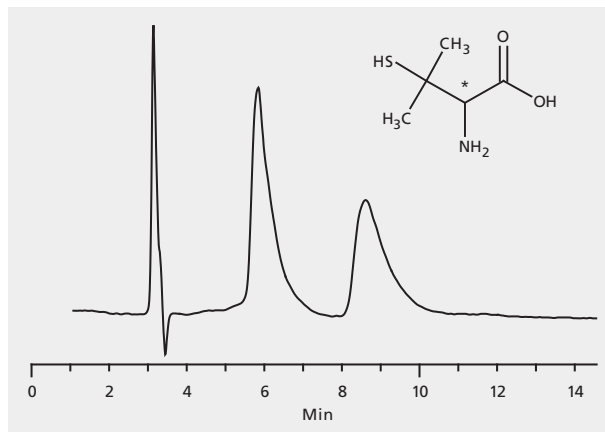
HPLC Analysis of Pegylated Exenatide on Zenix® SEC-300 and Zenix®-C SEC-300

column Zenix-C SEC-300, 30 cm x 7.8 mm, I.D., 3 µm particles (Z777092)
column Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm particles (Z777033)
mobile phase . . . (A) 50 mM Ammonium acetate; (B) acetonitrile; (90:10, A:B, v/v)
flow rate 0.5 mL/min
pressure 609 psi (42 bar)
column temp. 25 °C
detector UV, 214 nm
injection 15 µL
sample 3.3 mg/ml PEG-Exenatide in water (PEG 23 kD)
Application No. **G005949**



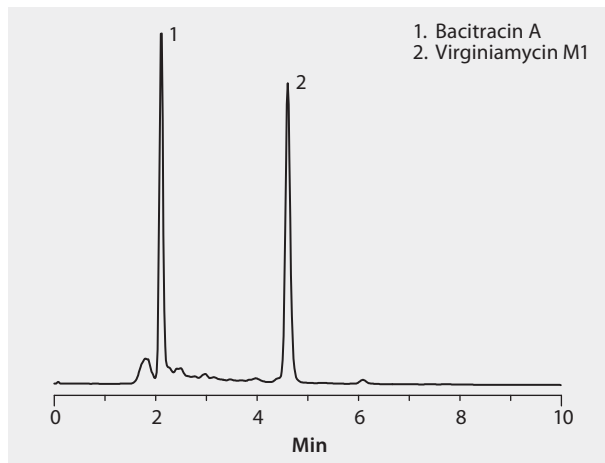
HPLC Analysis of Penicillamine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) 0.1% triethylamine acetate, pH 3.8; (B) ethanol; (20:80, A:B)
flow rate 1 mL/min
column temp. 23 °C
injection 5 µL
detector UV, 225 nm
sample 5 mg/mL in methanol
Application No. **G004549**



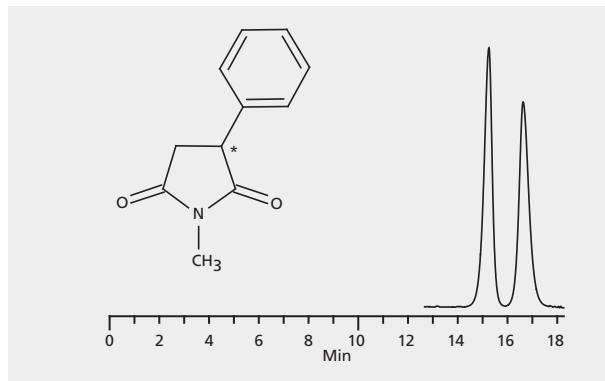
HPLC Analysis of Peptide Antibiotics on Discovery® C8

column Discovery C8, 15 cm × 4.6 mm I.D., 5 µm particles (59353)
mobile phase . . . (A) 25mM potassium phosphate, pH 3; (B) acetonitrile, (60:40, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL 10 µL
Application No. **G000911B**



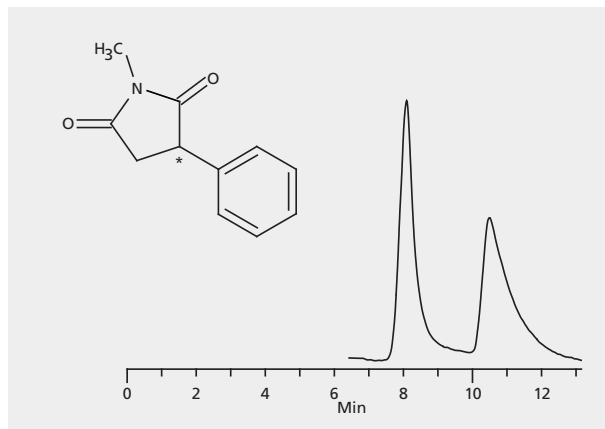
HPLC Analysis of Phensuximide Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) hexane; (B) ethanol; (70:30, A:B)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
sample 4 mg/mL in methanol
Application No. [G004645](#)



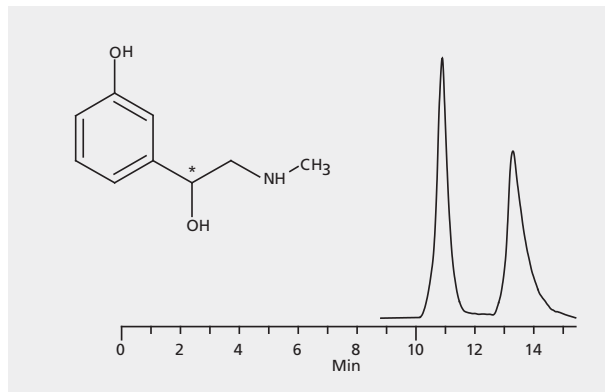
HPLC Analysis of Phensuximide Enantiomers on Astec® CYCLOBOND® I 2000 DMP

column . . . CYCLOBOND I 2000 DMP, 25 cm x 4.6 mm I.D., 5 µm particles (20724AST)
mobile phase (A) isopropanol; (B) hexane; (80:20, A:B)
flow rate 1 mL/min
column temp. 22 °C
detector UV, 254 nm
injection 10 µL
sample 4 mg/mL in methanol
Application No. [G004699](#)



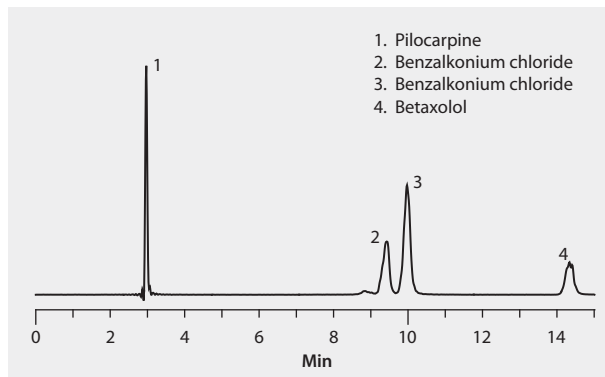
HPLC Analysis of Phenylephrine Enantiomers on Astec® CYCLOBOND® I 2000 AC

column . . . CYCLOBOND I 2000 AC, 25 cm x 4.6 mm I.D., 5 µm particles (20124AST)
mobile phase . . . (A) 0.5% w/v sodium acetate, pH 5.5; (B) methanol; (90:10, A:B)
flow rate 0.5 mL/min
column temp. 22 °C
detector UV, 254 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004694](#)



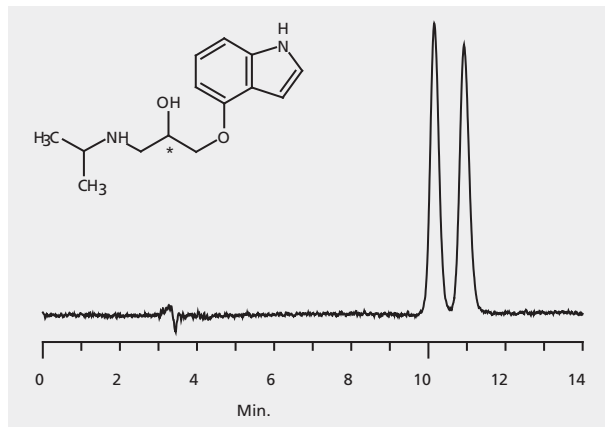
HPLC Analysis of Pilocarpine, Betaxolol, and Benzalkonium Chloride on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 15 cm x 4.6 mm I.D., 2.7 μ m particles (53981-U)
mobile phase (A) 20 mM ammonium acetate; (B) acetonitrile; (10:90, A:B)
flow rate 1 mL/min
column temp. 35 $^{\circ}$ C
detector ESI (+), XIC m/z 304, 332 (BAC), 209 (pilocarpine), 308 (betaxolol)
injection 2 μ L
sample 10 mg/L in acetonitrile
Application No. [G005412](#)



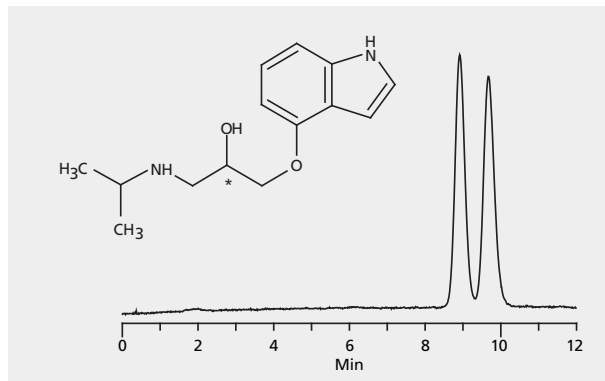
HPLC Analysis of Pindolol Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase 15 mM ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample gas 1 mg/mL in methanol
Application No. [G004509](#)



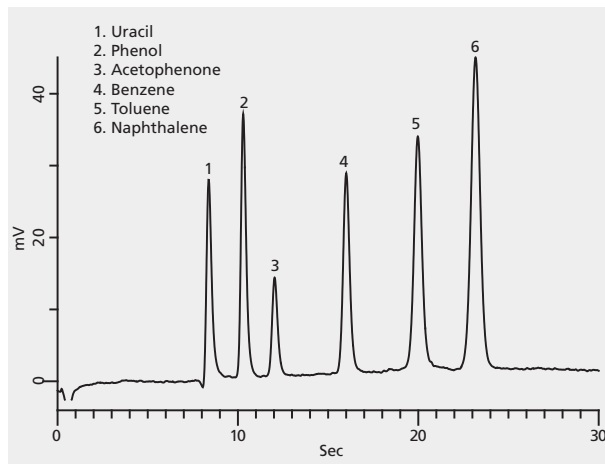
HPLC Analysis of Pindolol Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) methanol; (B) acetic acid; (C) triethylamine;
(99.98:0.01:0.01, A:B:C)
flow rate 2 mL/min
column temp. 23 °C
detector UV, 254 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004634**



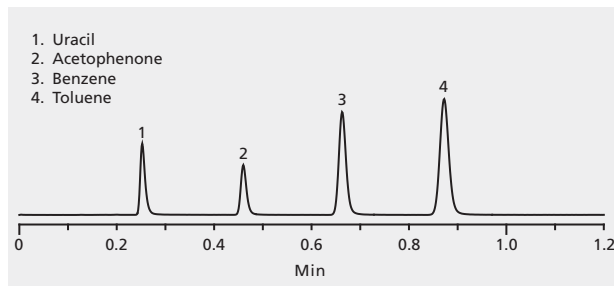
HPLC Analysis of Polar and Non-Polar Analytes on Ascentis® Express C18, Column Test Mixture

column . . . Ascentis Express C18, 5 cm × 3.0 mm I.D. 2.7 μm particles (53811-U)
mobile phase 80% acetonitrile
flow rate 1.2 mL/min
pressure 3700 psi (255 bar)
column temp. 35 °C
Application No. **G004158**



HPLC Analysis of Polar and Non-Polar Analytes on Ascentis® Express C8, Column Test Mixture

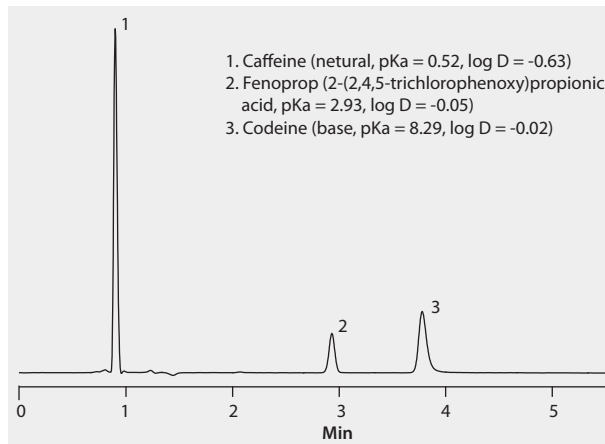
column . . . Ascentis Express C8, 5 cm × 4.6 mm I.D., 2.7 μm particles (58336-U)
mobile phase (A) water; (B) acetonitrile; (45:55, A:B)
flow rate 1.76 mL/min
column temp. 30 °C
detector UV, 254 nm
injection 5 μL
Application No. **G003954**



HPLC Analysis of Polar Compounds on Ascentis® Express OH5 (HILIC Mode)

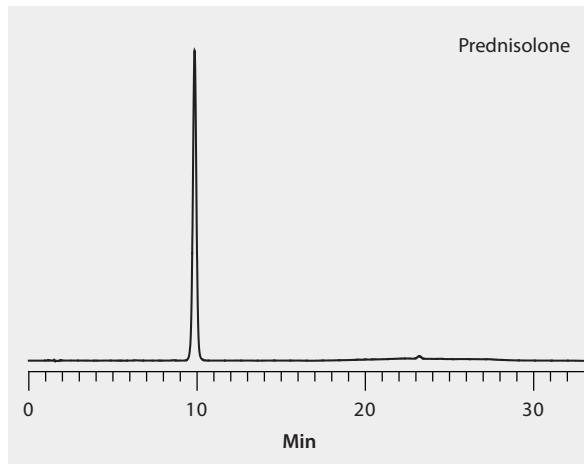
The impact of partitioning and ion exchange in HILIC separations is demonstrated using a mixture of acidic, neutral, and basic polar compounds in this Figure. All three analytes have similar log D values, both acid and base are ionized at mobile phase pH.

column . . . Ascentis Express OH5, 10 cm x 3 mm I.D., 2.7 μ m particles (53769-U)
mobile phase 5 mM ammonium formate (95:5 acetonitrile:water) pH 6.8
flow rate 0.6 mL/min
pressure 965 psi (66.5 bar)
column temp. 30 °C
detector UV, 254 nm
injection 1 μ L
sample 100 μ g/mL in 25:75, water:methanol
Application No. **G005802**



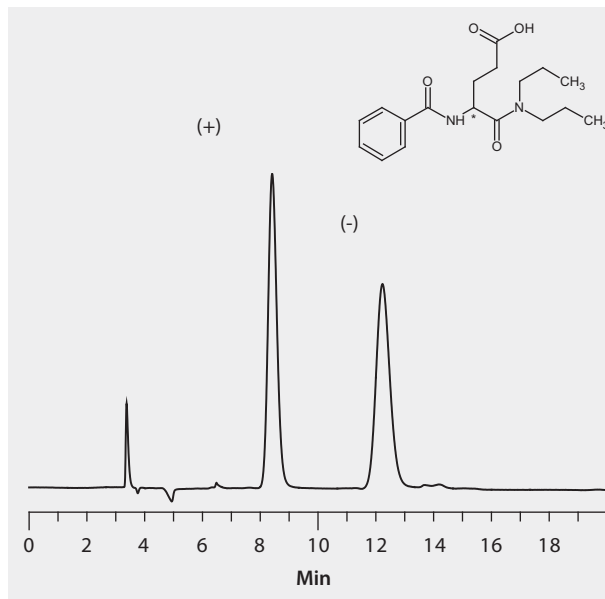
HPLC Analysis of Prednisolone (Fluka Secondary Pharma Standard) on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) water; (B) methanol:acetonitrile (50:50, A:B)
gradient 40% B for 14 min; to 80% B in 6 min; held at 80% B for 5 min
flow rate 1 mL/min
column temp. 40 °C
detector UV, 254 nm
injection 10 µL
sample 125 µg/mL in water:acetonitrile (60:40)
Application No. **G005589**



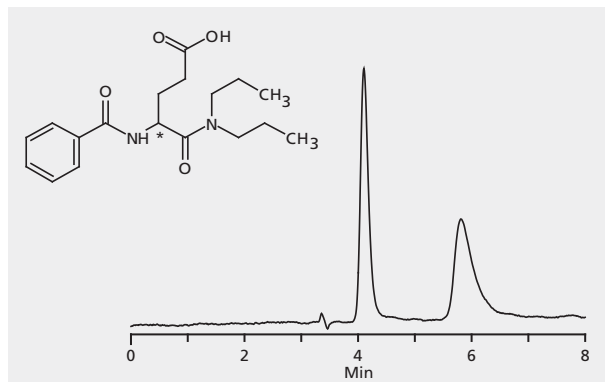
HPLC Analysis of Proglumide Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) heptane; (B) IPA; (C) TFA; (90:10:0.1, A:B:C)
flow rate 0.5 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G004994](#)



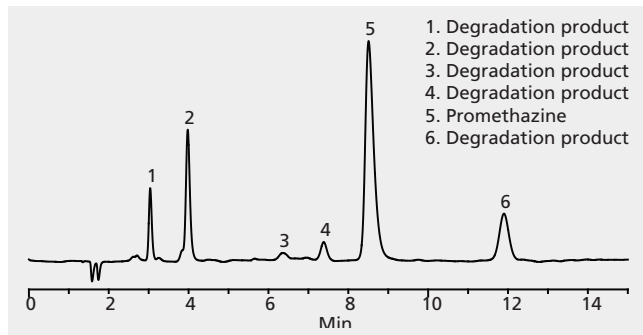
HPLC Analysis of Proglumide Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 13 mM ammonium acetate; (B) acetonitrile; (90:10, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 225 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004635](#)



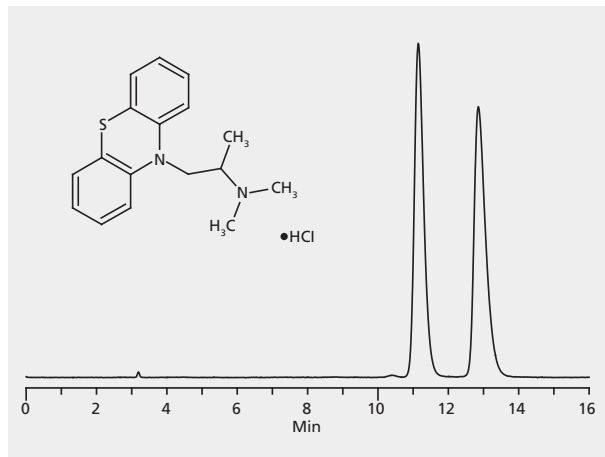
HPLC Analysis of Promethazine and Degradants on Ascentis® Phenyl

column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase (A) 0.1% ammonium acetate; (B) methanol; (25:75, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL in 20:80, water:methanol
Application No. **G003700**



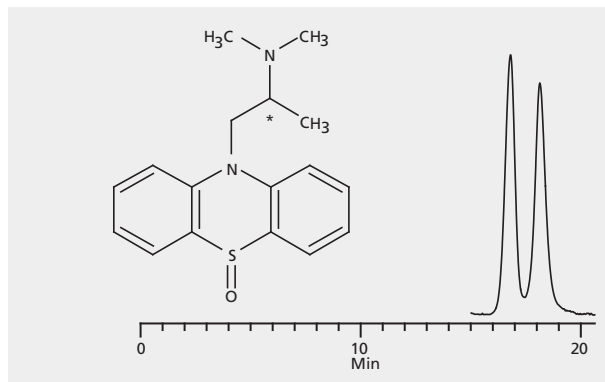
HPLC Analysis of Promethazine Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase . . (A) methanol; (B) acetic acid; (C) triethylamine; (99.8:0.1:0.1, A:B:C)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 254 nm
injection 10 µL
sample 1 mg/mL in mobile phase
Application No. [G004404](#)



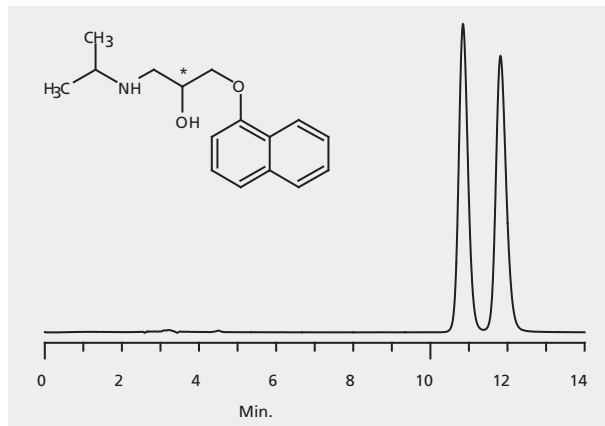
HPLC Analysis of Promethazine Sulfoxide Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase . . (A) methanol; (B) acetic acid; (C) triethylamine; (100:0.1:0.1, A:B:C)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 240 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. [G004646](#)



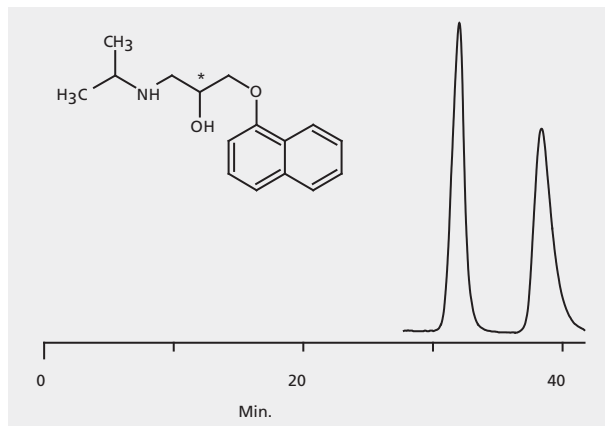
HPLC Analysis of Propranolol Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase 15 mM ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004510](#)



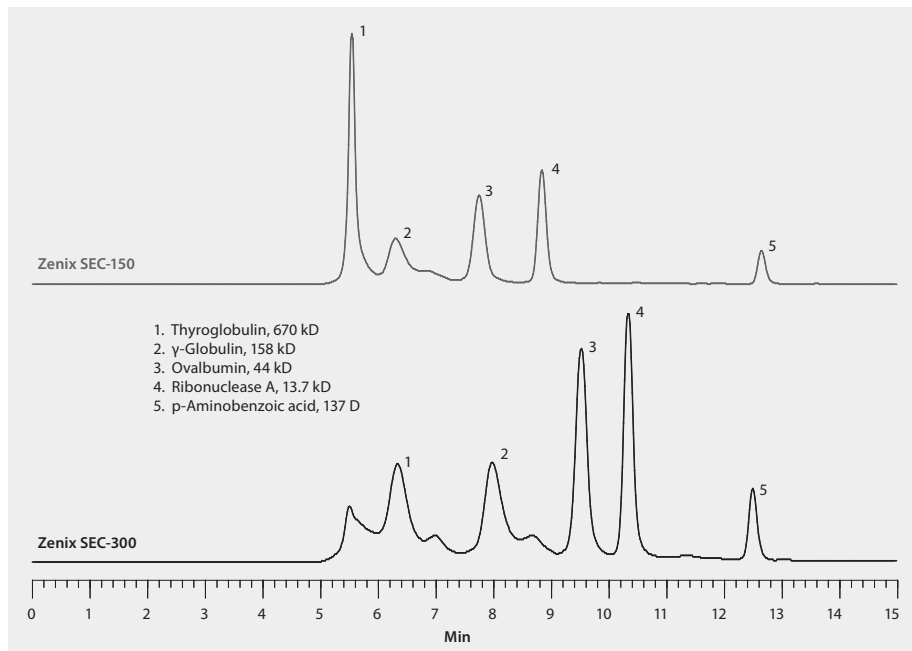
HPLC Analysis of Propranolol Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase 0.1 wt% ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 0.5 µL
sample 1 mg/mL in methanol
Application No. [G004616](#)



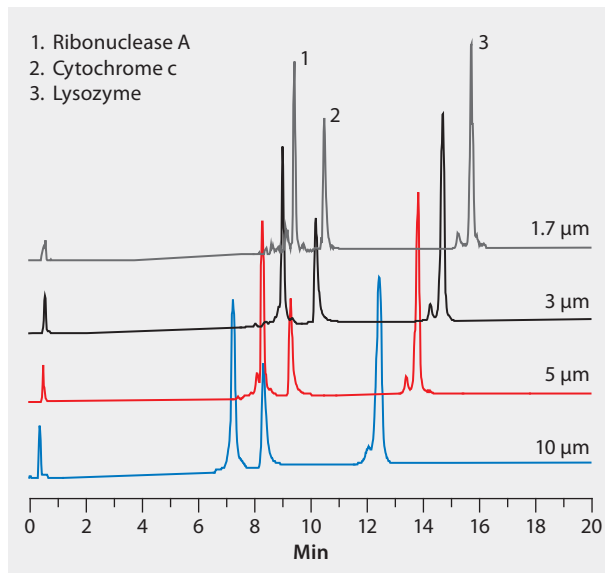
HPLC Analysis of a Protein Mixture on Zenix® SEC-150 versus Zenix® SEC-300, Effect of Pore Size on Resolution

column . . . Zenix SEC-150, 30 cm x 7.8 mm I.D., 3 µm, 150 Å particles (Z777018)
column . . . Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm, 300 Å particles (Z777033)
mobile phase 150 mM sodium phosphate, pH 7
flow rate 1 mL/min
column temp. ambient
detector UV, 214 nm
injection 10 µL
sample protein mixture
Application No. **G006118**



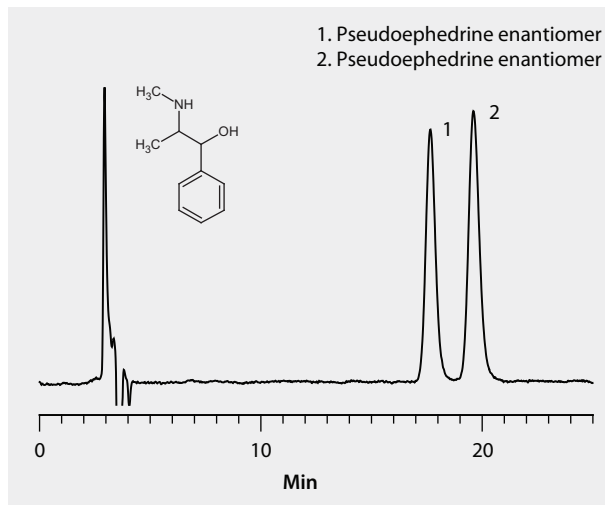
HPLC Analysis of Proteins on Proteomix® SCX Columns, Effect of Particle Size of Resolution

column . . . Proteomix SCX-NP1.7, 5 cm x 4.6 mm I.D., 1.7 μm particles (Z777146)
column Proteomix SCX-NP3, 5 cm x 4.6 mm I.D., 3 μm particles (Z777151)
mobile phase . . . (A) 20 mM sodium phosphate buffer, pH 6.0, (B) A + 1.0 M NaCl
gradient 0–25 min from 0–75% B, 15 min prewash
flow rate 0.75 mL/min
column temp. Ambient
detector 214 nm
injection 5 μL
sample each 1 mg/mL
Application No. **G006134**



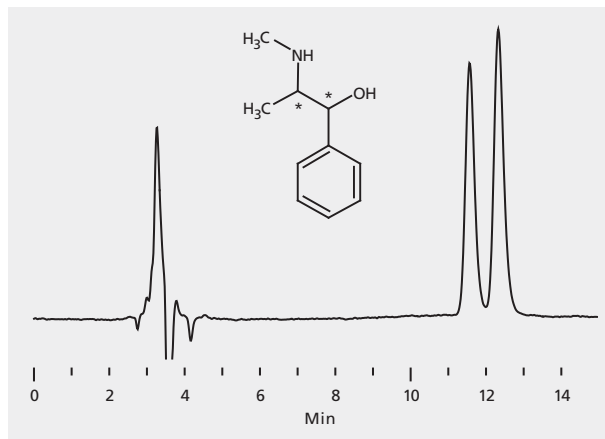
HPLC Analysis of Pseudoephedrine Enantiomers on Astec® CHIROBIOTIC® TAG

column CHIROBIOTIC TAG, 25 cm x 4.6 mm I.D., 5 µm particles (14024AST)
mobile phase . . . (A) methanol; (B) acetic acid; (C) triethylamine;(99.8:0.1:0.1, A:B:C)
flow rate 1 mL/min
detector UV, 254 nm
injection 10 µL
sample 200 µg/mL in methanol
column temp. 25 °C
Application No. [G005350](#)



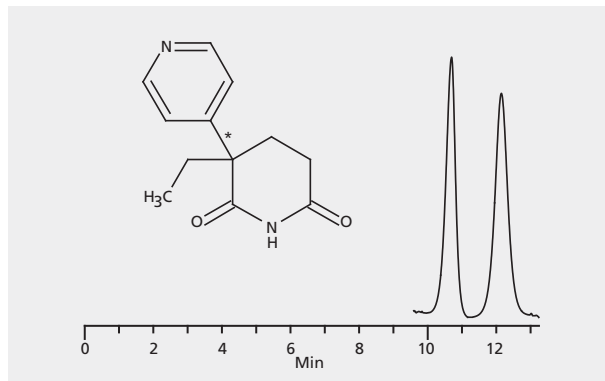
HPLC Analysis of Pseudoephedrine Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . (A) methanol; (B) acetic acid; (C) triethylamine; (100:0.1:0.1, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. [G004530](#)



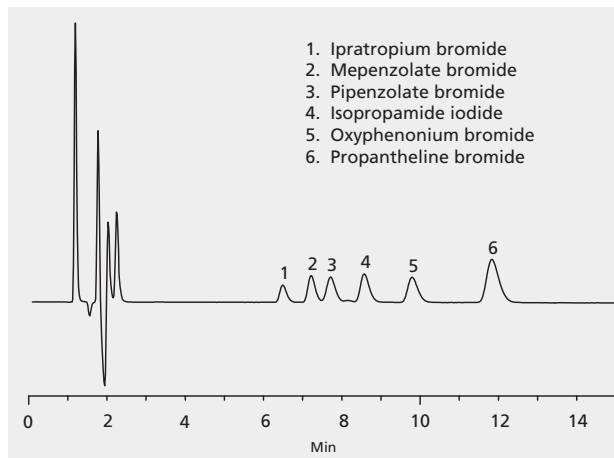
HPLC Analysis of Pyroglutethimide Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase . . (A) 0.1% triethylamine acetate, pH 7.0; (B) acetonitrile; (90:10, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 3 µL
sample 2 mg/mL in methanol
Application No. [G004647](#)



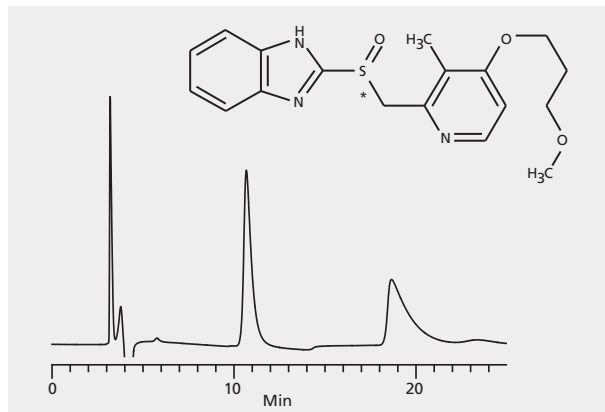
HPLC Analysis of Quaternary Ammonium Drugs on Discovery® HS F5

column Discovery HS F5, 15 cm × 4.6 mm I.D., 5 µm particles (567516-U)
mobile phase 10 mM ammonium acetate in 80% acetonitrile
flow rate 1 mL/min
column temp. 60 °C
detector UV, 225 nm
injection 10 µL
sample 50 mg/mL in 70:30, 10 mM ammonium acetate
in 80% acetonitrile:methanol
Application No. **G002221**



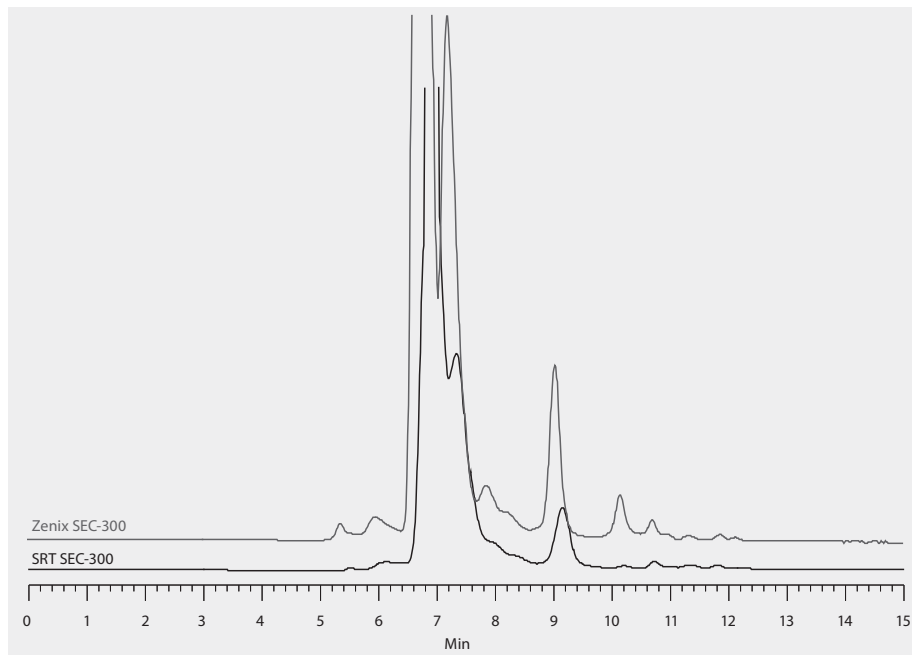
HPLC Analysis of Rabeprazole Enantiomers on Astec® CYCLOBOND® I 2000 DMP

column . . . CYCLOBOND I 2000 DMP, 25 cm x 4.6 mm I.D., 5 µm particles (20724AST)
mobile phase (A) acetonitrile; (B) methanol; (C) acetic acid;
(D) ammonium hydroxide; (95:5:0.4:0.1, A:B:C:D)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004686**



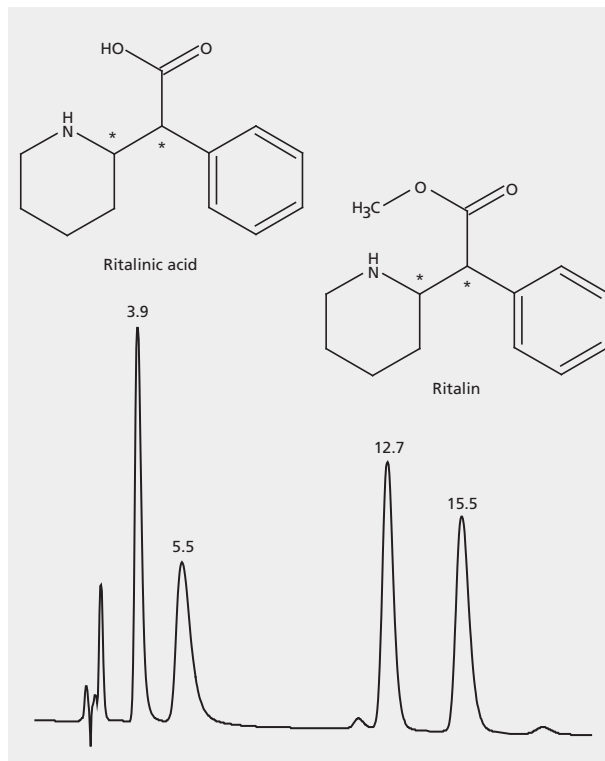
HPLC Analysis of Recombinant Tumor Necrosis Factor Receptor-Fc Fusion Protein (rhTNFR-Fc) on Zenix® SEC-300 versus SRT® SEC-300, Effect of Particle Size on Resolution

column . . . Zenix SEC-300, 30 cm x 7.8 mm I.D., 3 µm, 300 Å particles (Z777051)
column SRT SEC-300, 30 cm x 7.8 mm I.D., 5 µm,
300 Å particles (Z777051) (Z777033)
mobile phase 150 mM sodium phosphate, pH 7.0
flow rate 1 mL/min
detector UV, 214 nm
injection 20 µL
sample Recombinant tumor necrosis factor receptor-Fc fusion
protein (rhTNFR-Fc), including oligomers (440 kD and 360 kD),
monomer (150 kD), and impurity (120 kD)
Application No. **G006121**



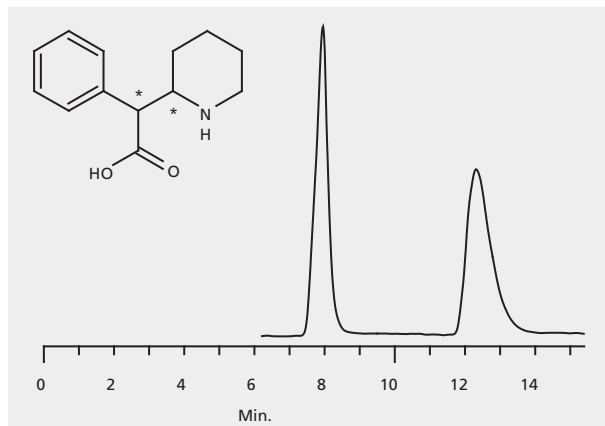
HPLC Analysis of Ritalinic Acid and Ritalin (Methylphenidate) Enantiomers on Astec® CHIROBIOTIC® V2 with T2 Guard Column

column CHIROBIOTIC V2, 15 cm x 4.6 mm I.D., 5 µm particles (15023AST)
column CHIROBIOTIC T2 guard column, 2 cm x 4 mm I.D.,
5 µm particles (16100AST (requires holder 21150AST))
mobile phase . . (A) 20 mM ammonium acetate, pH 4.1; (B) methanol; (7:93, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. **G004733**



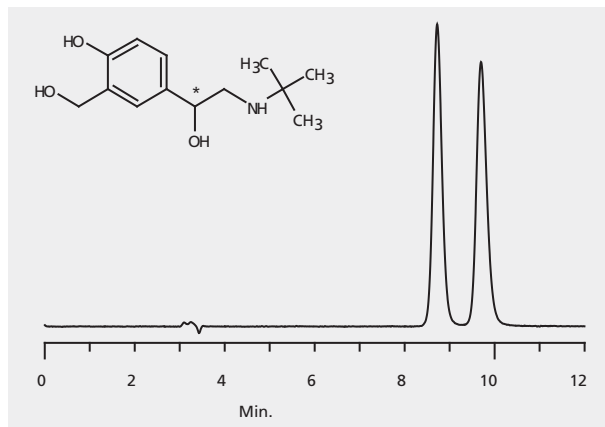
HPLC Analysis of Ritalinic Acid Enantiomers on Astec® CHIROBIOTIC® T2

column CHIROBIOTIC T2, 25 cm x 4.6 mm I.D., 5 µm particles (16024AST)
mobile phase . . . (A) 10 mM ammonium acetate, pH 5.5; (B) acetonitrile; (70:30, A:B)
flow rate 0.9 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. **G004600**



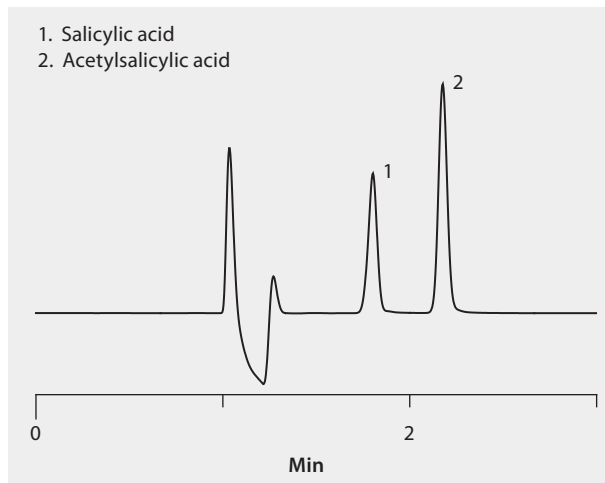
HPLC Analysis of Salbutamol Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase 15 mM ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004512**



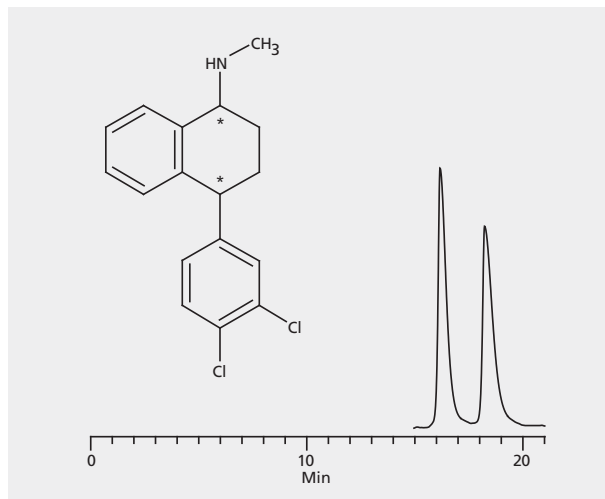
HPLC Analysis of Salicylic Acid and Acetylsalicylic Acid (Aspirin) on Ascentis® Express OH5

column . . . Ascentis Express OH5, 10 cm x 3.0 mm I.D., 2.7 µm particles (53769-U)
mobile phase 2 mM ammonium acetate in 10:90 water:acetonitrile,
pH to 7.0 with acetic acid, glacial
flow rate 0.5 mL/min
pressure 850 psi (59 bar)
column temp. 35 °C
detector UV, 235 nm
injection 2 µL
sample 100 µg/mL salicylic acid, 200 µg/mL acetylsalicylic
acid in methanol:acetonitrile (3:7)
Application No. [G006124](#)



HPLC Analysis of Sertraline Enantiomers on Astec® CYCLOBOND® I 2000 RSP

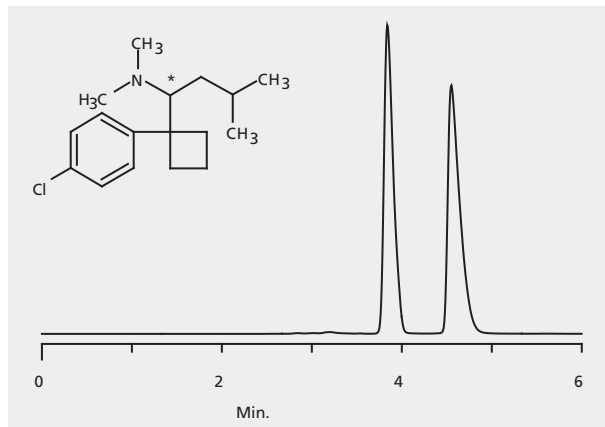
column CYCLOBOND I 2000 HP-RSP, 25 cm x 4.6 mm I.D.,
5 µm particles (24024AST)
mobile phase . . . (A) 20 mM ammonium acetate, pH 4.1; (B) acetonitrile; (70:30, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004705**



HPLC Analysis of Sibutramine Enantiomers on Astec® CHIROBIOTIC® V

Sibutramine, one of a few drugs approved for long-term treatment of obesity, is a chiral compound. The (R) enantiomer has the desired effect of reducing body weight and food intake, but the (S) enantiomer has the opposite effect: A perfect example of why chiral HPLC is important to pharmaceutical and clinical analysts. Astec® CHIROBIOTIC® V successfully separates sibutramine enantiomers, using a simple, MS-friendly mobile phase.

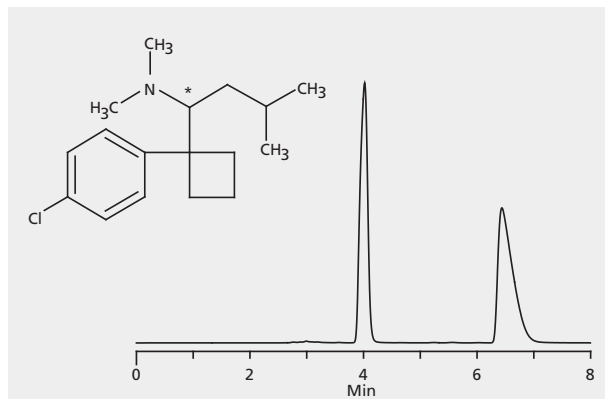
column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase 15 mM ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004479](#)



HPLC Analysis of Sibutramine Enantiomers on Astec® CHIROBIOTIC® V2

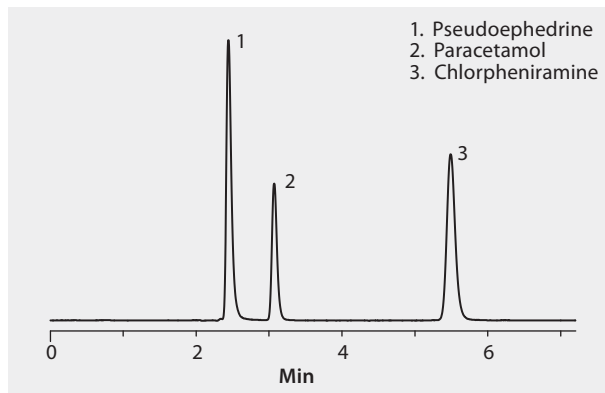
Sibutramine, one of a few drugs approved for long-term treatment of obesity, is a chiral compound. The (R) enantiomer has the desired effect of reducing body weight and food intake, but the (S) enantiomer has the opposite effect: A perfect example of why chiral HPLC is important to pharmaceutical and clinical analysts. Astec® CHIROBIOTIC® V2 successfully separates sibutramine enantiomers, using a simple, MS-friendly mobile phase.

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase 15 mM ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. [G004661](#)



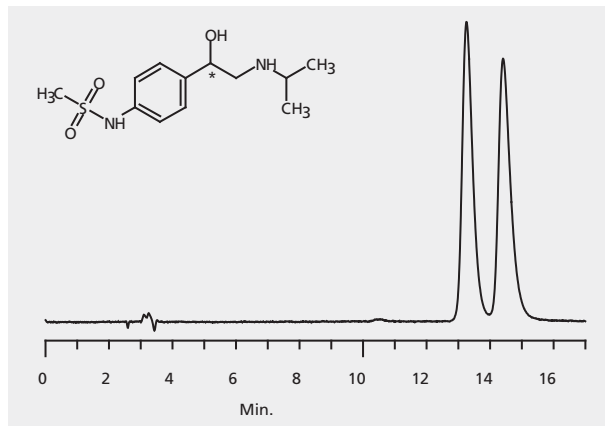
HPLC Analysis of Sinus Medications on Discovery® RP-AmideC16

column . . . Discovery RP-AmideC16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase (A) acetonitrile: (B) 50 mM KH₂PO₄, pH 3.0 (25:75, A:B)
flow rate 1 mL/min
column temp. 30 °C
detector UV, 220 nm
injection 10 µL
Application No. **G000087**



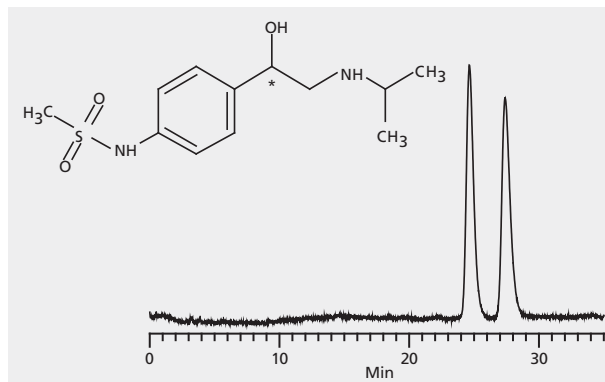
HPLC Analysis of Sotalol Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase 15 mM ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004514**



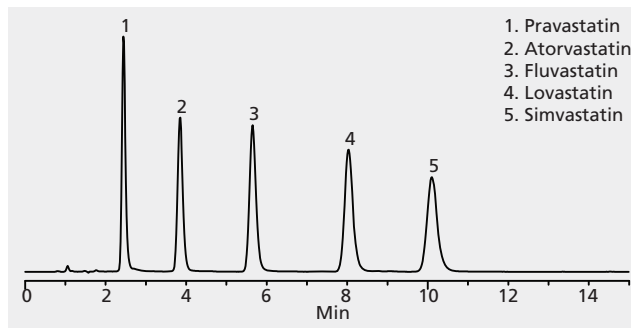
HPLC Analysis of Sotalol Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) methanol; (B) acetic acid; (C) triethylamine;
(99.98:0.01:0.01, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004636**



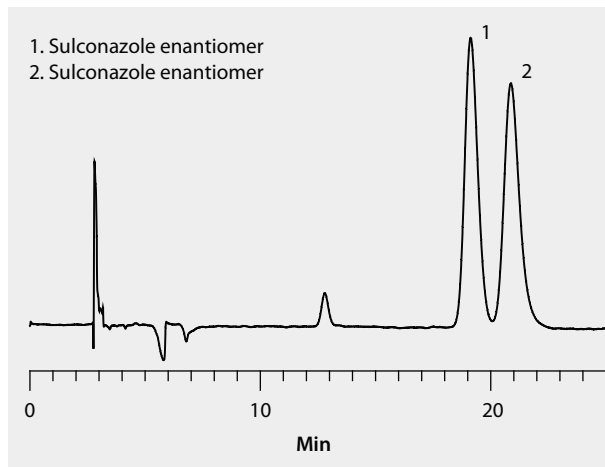
HPLC Analysis of Statins on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase . . . (A) water with 0.1% formic acid (34673): (B) methanol; (25:75, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 240 nm
injection 10 µL
sample 50 µg/mL in mobile phase
Application No. **G003270**



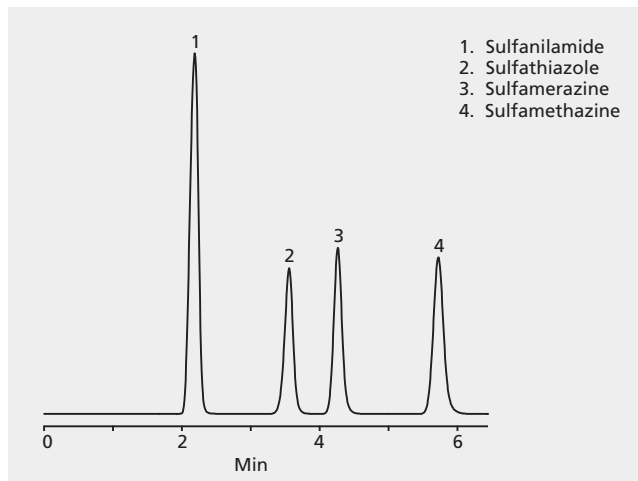
HPLC Analysis of Sulconazole Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 25 cm x 4.6 mm I.D., 5 µm particles (51099AST)
mobile phase (A) heptane; (B) isopropanol; (80:20, A:B)
flow rate 1 mL/min
column temp. 30 °C
detector UV, 254 nm
injection 15 µL
sample 1 g/L in 50:50, heptane:isopropanol
Application No. [G005468](#)



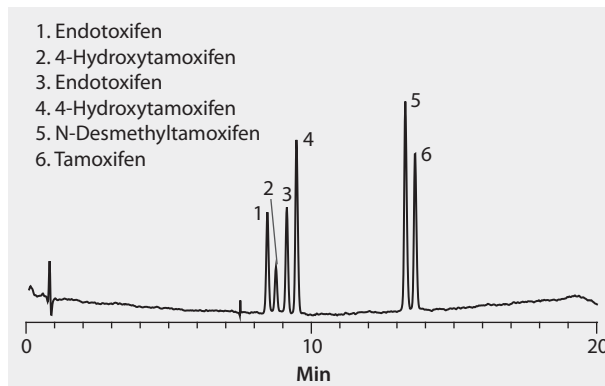
HPLC Analysis of Sulfa Drugs on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase (A) methanol; (B) water with 1% acetic acid (20:80, A:B)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 10 µL
Application No. [797-0655](#)



HPLC Analysis of Tamoxifen E/Z isomers and Related Compounds on Ascentis® Express RP-Amide

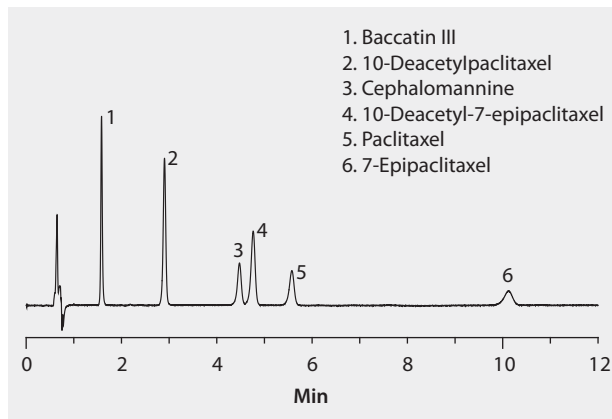
column . . . Ascentis Express RP-Amide, 10 cm x 3 mm I.D., 2.7 µm particles (53918-U)
mobile phase . . . (A) 0.1% formic acid in water; (B) 0.1% formic acid in acetonitrile
gradient held at 25% B for 2 min; 25 to 40% B in 15 min;
40 to 25% B in 0.1 min; held at 25% B for 2.9 min
flow rate 0.6 mL/min
pressure 2292 psi (158 bar)
column temp. 35 °C
detector UV, 260 nm
injection 2 µL
sample 10 mg/L in 10:90, water: methanol
Application No. [G005748](#)



HPLC Analysis of Taxols on Ascentis® Express F5

This application demonstrates the suitability of Ascentis Express F5 for the efficient separation of taxols.

column Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 µm particles (53569-U)
mobile phase (A) water; (B) acetonitrile; (60:40, A:B)
flow rate 0.3 mL/min
column temp. 30 °C
detector UV, 227 nm
injection 2 µL
sample 25 mg/L in 70:30, water:methanol
Application No. **G005749**

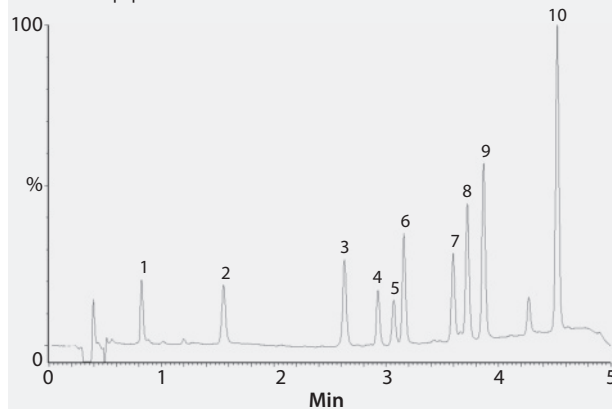


HPLC Analysis of Taxols on Discovery® HS F5

column Discovery HS F5, 15 cm × 2.1 mm I.D., 3 μm particles (567503-U)
 mobile phase . . . (A) 10 mM ammonium acetate (pH 6.8 unadjusted); (B) acetonitrile
 flow rate 0.2 mL/min
 column temp. ambient
 detector UV, 227 nm
 injection 10 μL
 sample 10 μg/mL (in 50:50, water:acetonitrile)
 Application No. **G002150**

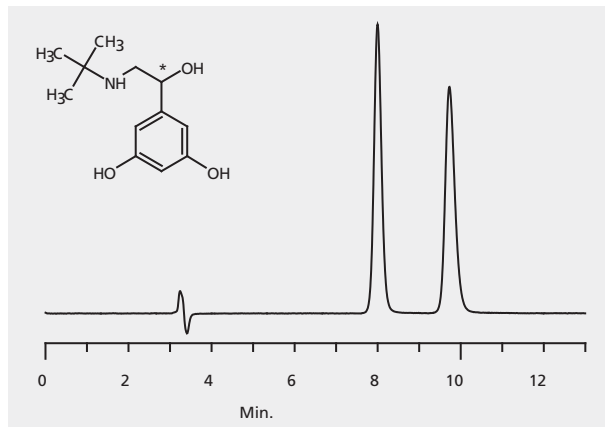
1. 10-deacetyl baccatin III
2. Baccatin III
3. 10-deacetyl-7-xylosyl-β-paclitaxel
4. 10-deacetyl-7-β-xylosyl paclitaxel C
5. 10-deacetyl paclitaxel
6. 7-β-xylosyl paclitaxel
7. Cephalomannine
8. 10-deacetyl-7-epi paclitaxel
9. Paclitaxel
10. 7-epi paclitaxel

Gradient Program		
Time (min)	%A	%B
0	65	35
5	65	35
20	55	45
23	55	45
25	65	35



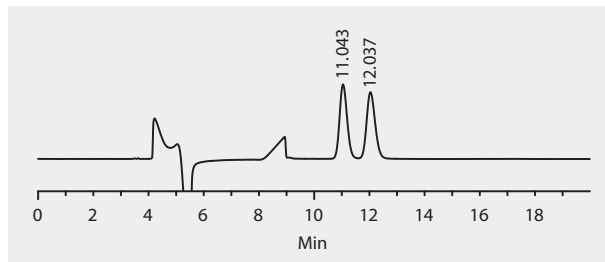
HPLC Analysis of Terbutaline Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase 15 mM ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. **G004515**



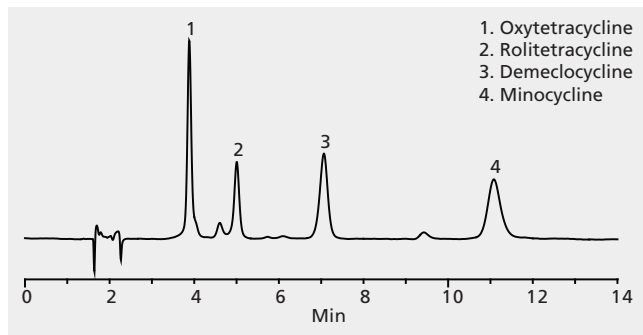
HPLC Analysis of Terfenadine Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) heptane; (B) ethanol; (C) diethylamine; (98:2:0.1, A:B:C)
flow rate 0.5 mL/min
column temp. 40 °C
detector UV, 230 nm
injection 3 µL
sample 1 g/L in methanol
Application No. [G005465](#)



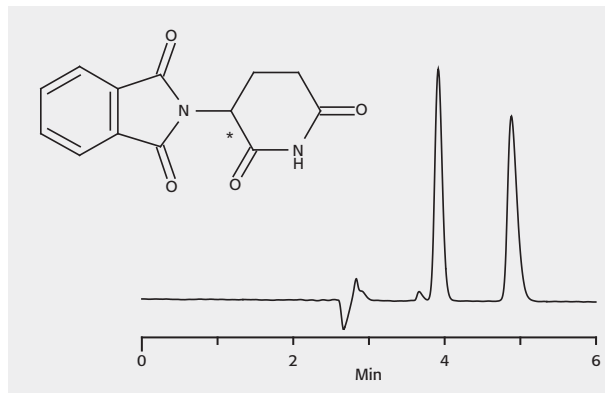
HPLC Analysis of Tetracycline Antibiotics on Ascentis® Phenyl

column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase (A) 0.1% ammonium acetate;
(B) acetonitrile with 0.1% ammonium acetate; (80:20, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 353 nm
injection 10 µL
sample 50 µg/mL each in 80:20, water:methanol
Application No. **G003715**



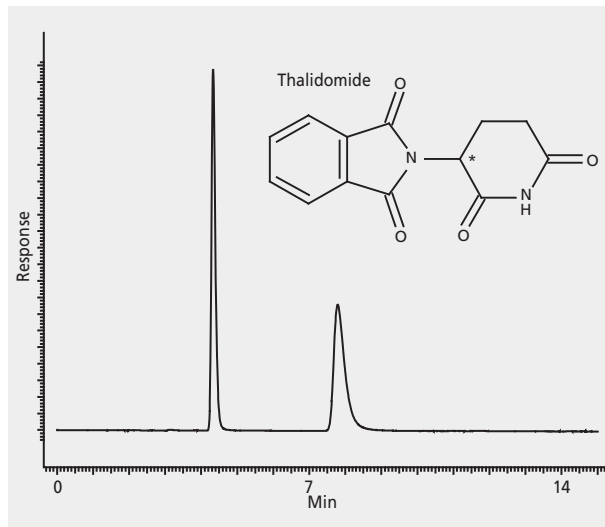
HPLC Analysis of Thalidomide Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase . . . (A) 18 mM ammonium nitrate, pH 5.5; (B) acetonitrile; (65:35, A:B)
flow rate 1 mL/min
column temp. 22 °C
detector UV, 240 nm
injection 20 µL
sample 1 mg/mL in methanol
Application No. **G004653**



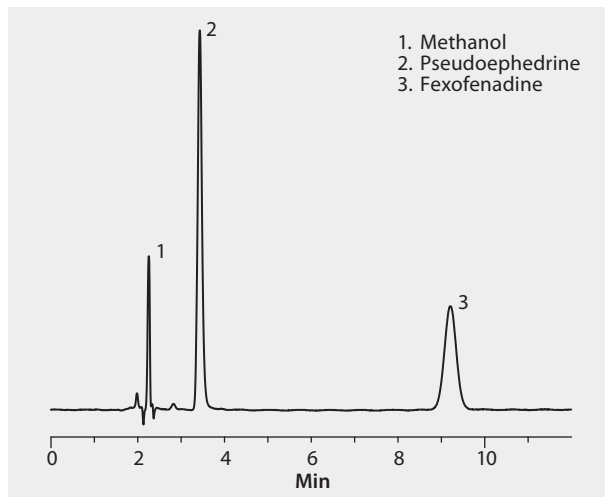
HPLC Analysis of Thalidomide Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase methanol
flow rate 1 mL/min
column temp. 25 µL
detector UV, 230 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. [G004473](#)



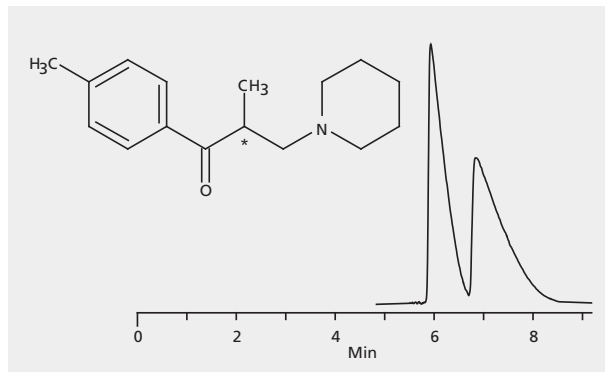
HPLC Analysis of Allegra® on Discovery® Cyano

column Discovery Cyano, 15 cm × 4.6 mm I.D., 5 µm particles (59356-U)
mobile phase acetonitrile:25 mM KH₂PO₄, pH 7.0 (15:85)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
Application No. **G001279**



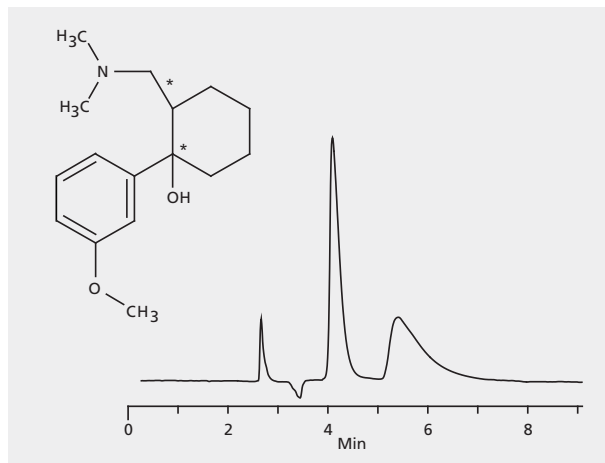
HPLC Analysis of Tolperisone Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase 0.1% ammonium formate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004657](#)



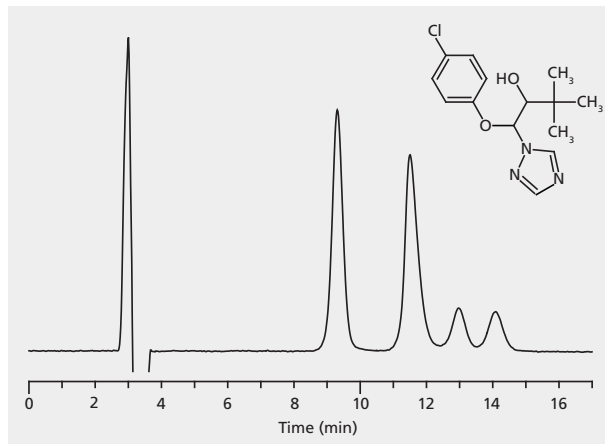
HPLC Analysis of Tramadol Enantiomers on Astec® CYCLOBOND® I 2000 DMP

column . . . CYCLOBOND I 2000 DMP, 25 cm x 4.6 mm I.D., 5 µm particles (20724AST)
mobile phase . . . (A) 0.1% triethylamine acetate, pH 5.0; (B) acetonitrile; (80:20, A:B)
flow rate 1.2 mL/min
column temp. 23 °C
detector UV, 254 nm
injection 5 µL
sample 5 mg/mL in methanol
Application No. **G004700**



HPLC Analysis of Triadimenol Enantiomers on Astec® CYCLOBOND® I 2000 HP-RSP

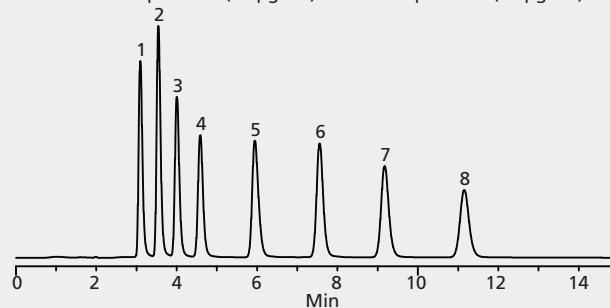
column CYCLOBOND I 2000 HP-RSP, 25 cm x 4.6 mm I.D.,
5 µm particles (24024AST)
mobile phase ... (A) 20 mM ammonium acetate, pH 4.0; (B) acetonitrile; (70:30, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 220 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. **G004396**



HPLC Analysis of Tricyclic Antidepressants on Ascentis® C8

column Ascentis C8, 15 cm x 2.1 mm I.D., 3 µm particles (581402-U)
mobile phase (A) 25 mM ammonium phosphate dibasic
(pH 7.0 with phosphoric acid): (B) methanol; (25:75, A:B)
flow rate 0.2 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 10 µL
sample as indicated in 60:40 water:methanol
Application No. **G003156**

- | | |
|-------------------------------|-----------------------------|
| 1. Nordoxepin (50 µg/mL) | 5. Doxepin (50 µg/mL) |
| 2. Desipramine (50 µg/mL) | 6. Imipramine (50 µg/mL) |
| 3. Nortriptyline (50 µg/mL) | 7. Amitriptyline (50 µg/mL) |
| 4. Norclomipramine (50 µg/mL) | 8. Clomipramine (50 µg/mL) |

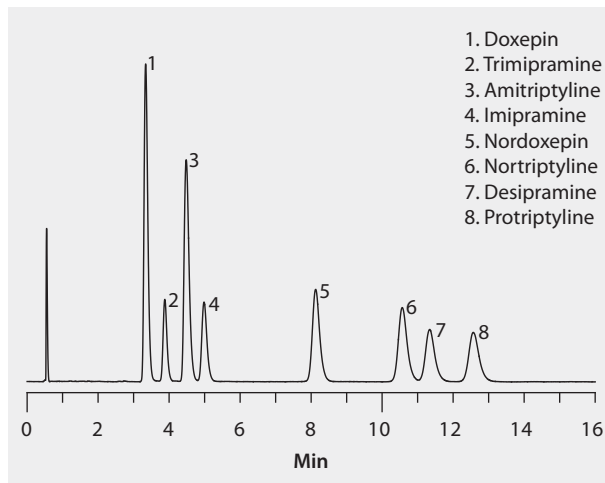


HPLC Analysis of Tricyclic Antidepressants on Ascentis® ES Cyano

This application demonstrates the suitability of Ascentis ES Cyano for the efficient separation of tricyclic antidepressants.

column Ascentis ES Cyano, 15 cm x 4.6 mm I.D., 5 µm particles (577306-U)
mobile phase . . . (A) 10 mM potassium phosphate dibasic, pH 7 with phosphoric acid;
(B) acetonitrile; (C) methanol; (25:60:15, A:B:C)

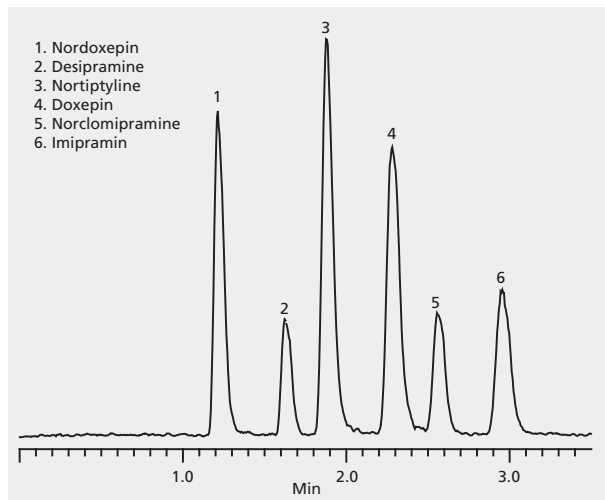
flow rate 2 mL/min
column temp. 25 °C
detector UV, 215 nm
injection 5 µL
sample 100 µg/mL in water: methanol (70:30)
Application No. **G005630**



HPLC Analysis of Tricyclic Antidepressants on Ascentis® Express C18

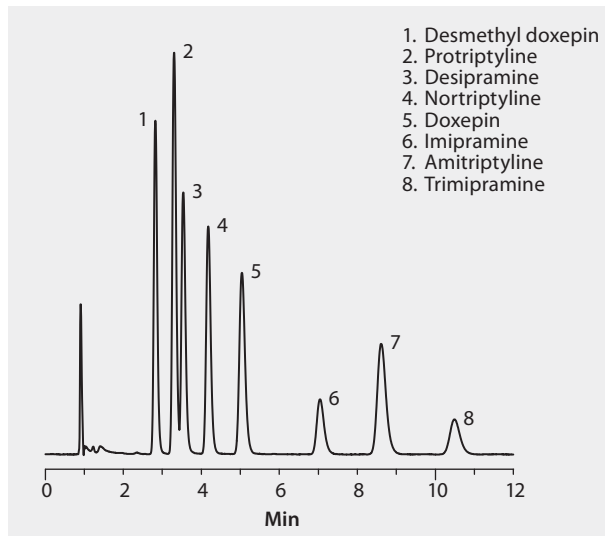
column . . . Ascentis Express C18, 10 cm × 2.1 mm I.D., 2.7 μm particles (53823-U)
mobile phase (A) 100 mM ammonium acetate (pH 7.0; titrated
with ammonium hydroxide), (B) water, (C) methanol

flow rate 0.3 mL/min
column temp. 55 °C
detector Thermo LCQ Advantage; ESI(+), m/z 250-320
injection 1 μL
instrument Jasco X-LC
Application No. **G004062**



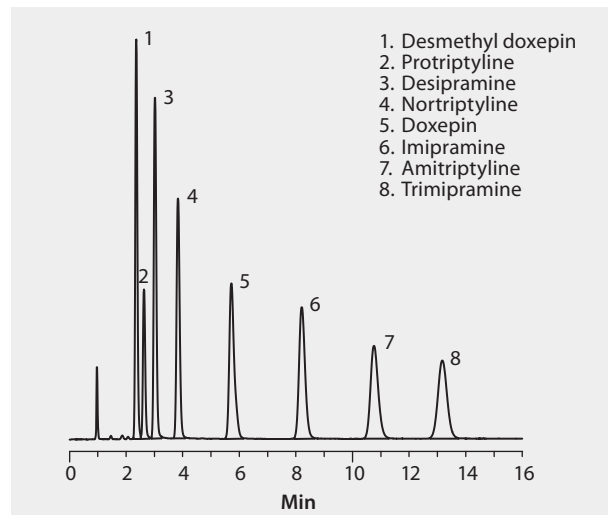
HPLC Analysis of Tricyclic Antidepressants on Discovery® RP-AmideC16

column . . . Discovery RP-AmideC16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase . . . (A) water/acetonitrile (40:60 v/v); (B) 10 mM potassium phosphate
flow rate 2 mL/min
detector UV, 230 nm
injection 10 µL
Application No. **G000163**



HPLC Analysis of Tricyclic Antidepressants on Discovery® C8

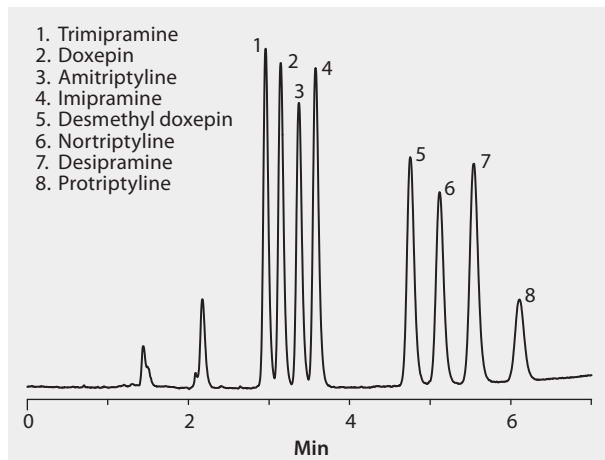
column Discovery C8, 15 cm × 4.6 mm I.D., 5 µm particles (59353-U)
mobile phase (A) methanol: (B) 10 mM potassium phosphate, dibasic, pH 7.0
flow rate 2 mL/min
column temp. 40 °C
detector UV, 254 nm
Application No. **G000541**



HPLC Analysis of Tricyclic Antidepressants on Discovery® Cyano

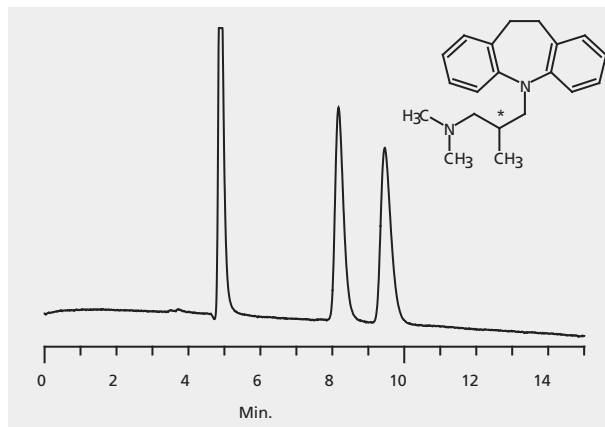
column Discovery Cyano, 15 cm × 4.6 mm I.D., 5 µm particles (59356-U)
mobile phase (A) acetonitrile; (B) methanol:
(C) 10 mM potassium phosphate,
dibasic, pH 7.0, (60:20:20, A:B:C)

flow rate 1 mL/min
column temp. 35 °C
detector UV, 254 nm
Application No. **G000727**



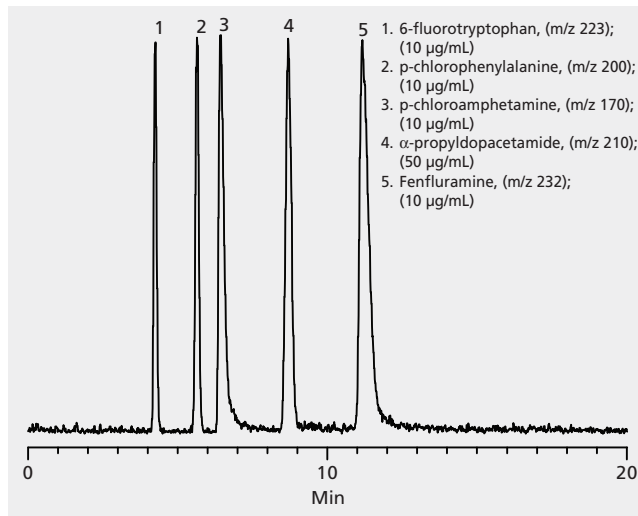
HPLC Analysis of Trimipramine Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase 15 mM ammonium acetate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 5 µL
sample 1 mg/mL in methanol
Application No. [G004474](#)



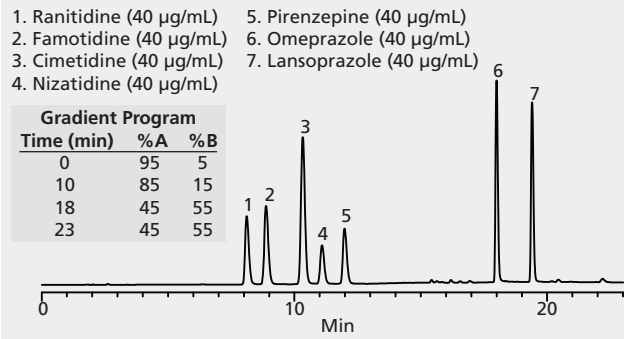
HPLC Analysis of Tryptophan Hydroxylase Inhibitors on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 40 mM formic acid, (pH ~2.5): (B) methanol; (65:35, A:B)
flow rate 0.7 mL/min
column temp. 35 °C
detector full scan MS; overlay of extracted ion chromatograms of individual (M+H)⁺ species
injection 10 µL
sample as indicated in 90:10, 10 mM formic acid:methanol
Application No. **G002453**



HPLC Analysis of Ulcer Treatment Drugs on Ascentis® RP-Amide

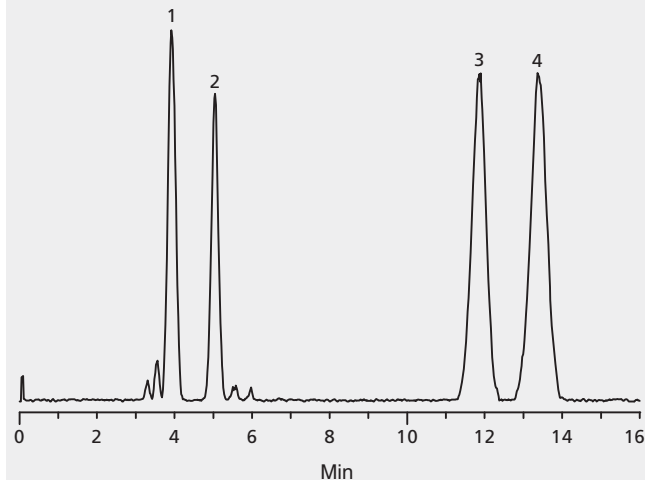
column Ascentis RP-Amide, 15 cm x 2.1 mm I.D., 5 µm particles (565305-U)
 mobile phase (A) 10 mM ammonium phosphate (pH 6.2 with phosphoric acid); (B) acetonitrile
 flow rate 0.2 mL/min
 column temp. 35 °C
 detector UV, 220 nm
 injection 5 µL
 sample as indicated in 95:5 water:methanol
 Application No. **G002992**



HPLC Analysis of Veterinary Antibiotics on Discovery® HS C18

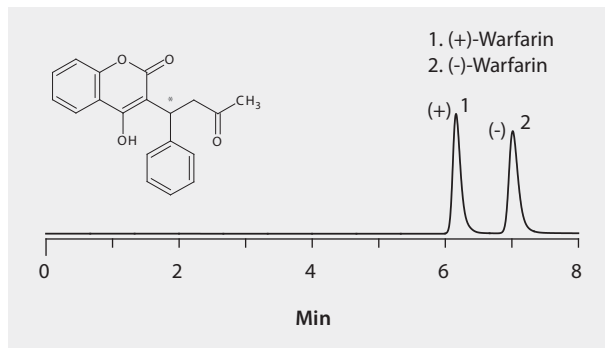
column Discovery HS C18, 5 cm × 2.1 mm I.D., 3 μm particles (569253-U)
mobile phase (A) (50 mM acetic acid/ammonium hydroxide,
pH 6.0); (B) methanol; (20:80, A:B):
flow rate 0.2 mL/min
column temp. 22 °C
detector ESI (+), full scan
injection 2 μL
sample as indicated in 50:50 water:methanol
Application No. **G002575**

1. Lasalocid A (1 g/mL); m/z 589.5
2. Monensin (10 g/mL); m/z 669.6
3. Salinomycin SV (10 g/mL); m/z 749.5
4. Narasin (3 g/mL); m/z 763.5



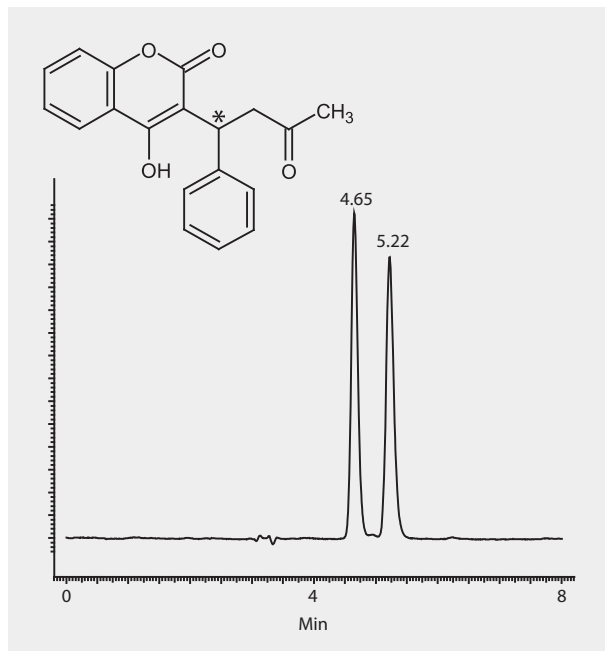
HPLC Analysis of Warfarin™ Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) methanol; (B) acetic acid; (C) TEA; (100:0.2:0.1, A:B:C)
column temp. 25 °C
flow rate 0.5 mL/min
detector UV, 278 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. [G005007](#)



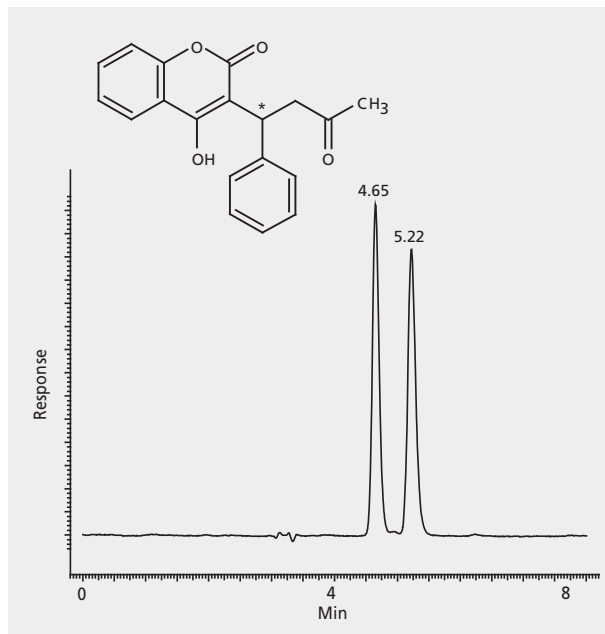
HPLC Analysis of Warfarin™ Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase . . . (A) 5 mM ammonium acetate, pH 4.1; (B) acetonitrile; (70:30, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. **G004349**



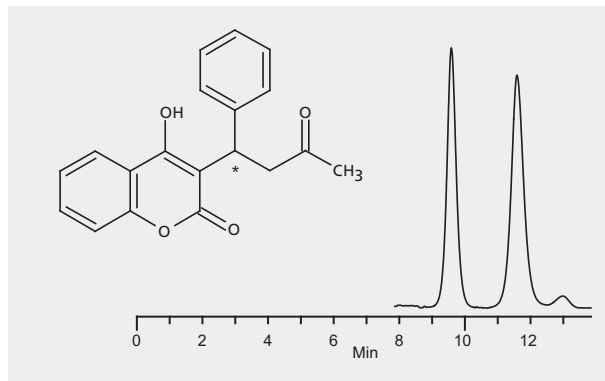
HPLC Analysis of Warfarin™ Enantiomers on Astec® CHIROBIOTIC® V (Method 1)

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase . . . (A) acetonitrile; (B) 5 mM ammonium acetate, pH 4.1; (30:70, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 5 µL
sample 1 mg/mL in mobile phase
Application No. [G004472](#)



HPLC Analysis of Warfarin™ Enantiomers on Astec® CHIROBIOTIC® V (Method 2)

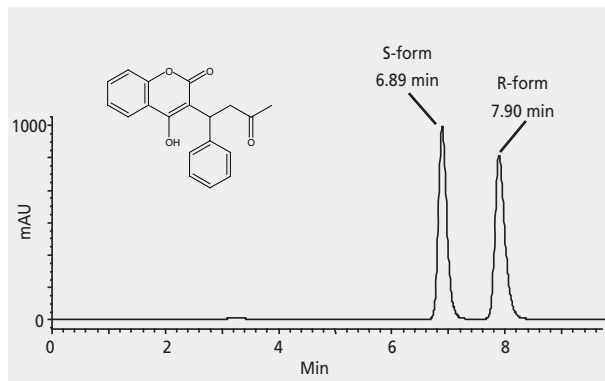
column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 0.1% triethylamine acetate, pH 5.0; (B) THF; (80:20, A:B)
flow rate 1 mL/min
column temp. ambient
detector UV, 254 nm
injection 1 µL
sample 4 mg/mL in methanol
Application No. [G004649](#)



HPLC Analysis of Warfarin™ Enantiomers on Astec® CYCLOBOND® I 2000 (UV at 254 nm)

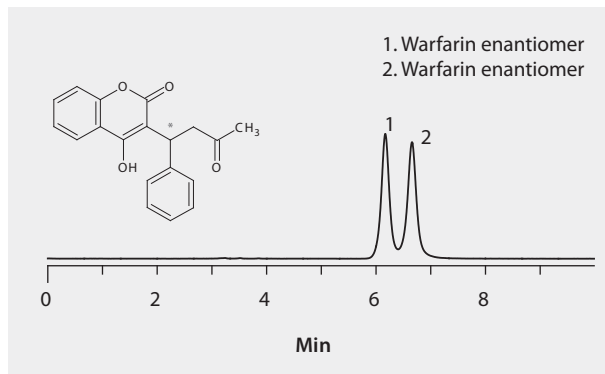
column . . . CYCLOBOND I 2000, 25 cm × 4.6 mm I.D., 5 μm particles (20024AST)
mobile phase (A) acetonitrile: (B) acetic acid: (C) triethylamine;
(100:0.3:0.25, A:B:C)

flow rate 1 mL/min
column temp. 23 °C
detector UV, 254 nm
injection 5 μL
Application No. **G004027**



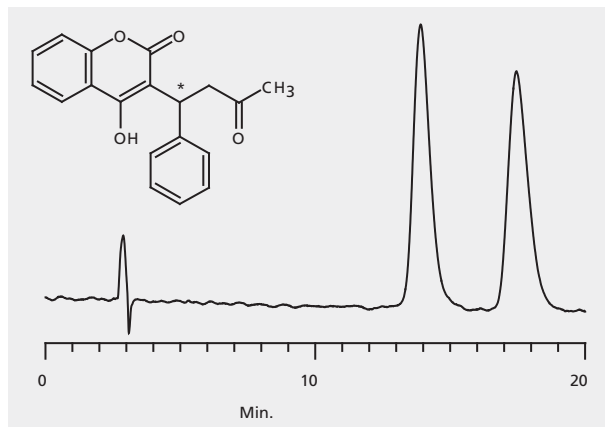
HPLC Analysis of Warfarin™ Enantiomers on Astec® CYCLOBOND® I 2000 (UV at 278 nm)

column CYCLOBOND I 2000, 25 cm x 4.6 mm I.D., 5 µm particles (20024AST)
mobile phase (A) acetonitrile; (B) acetic acid; (C) TEA; (100:0.3:0.2, A:B:C)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 278 nm
injection 2 µL
sample 2 mg/mL in mobile phase
Application No. **G005008**



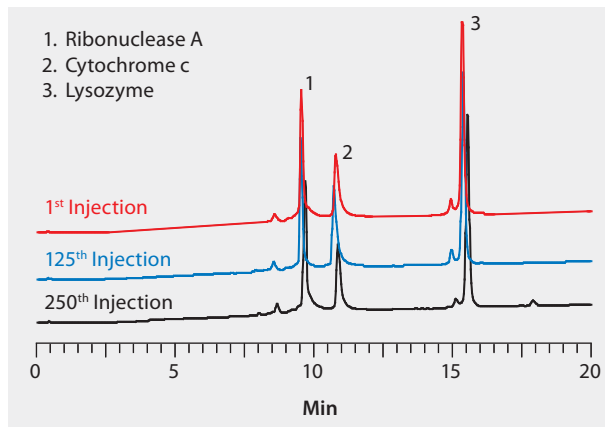
HPLC Analysis of Warfarin™ Enantiomers on Astec® CHIROBIOTIC® V2

column CHIROBIOTIC V2, 25 cm x 4.6 mm I.D., 5 µm particles (15024AST)
mobile phase . . (A) 10 mM ammonium acetate, pH 4.1; (B) acetonitrile; (70:30, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 280 nm
injection 10 µL
sample 1 mg/mL in methanol
Application No. [G004475](#)



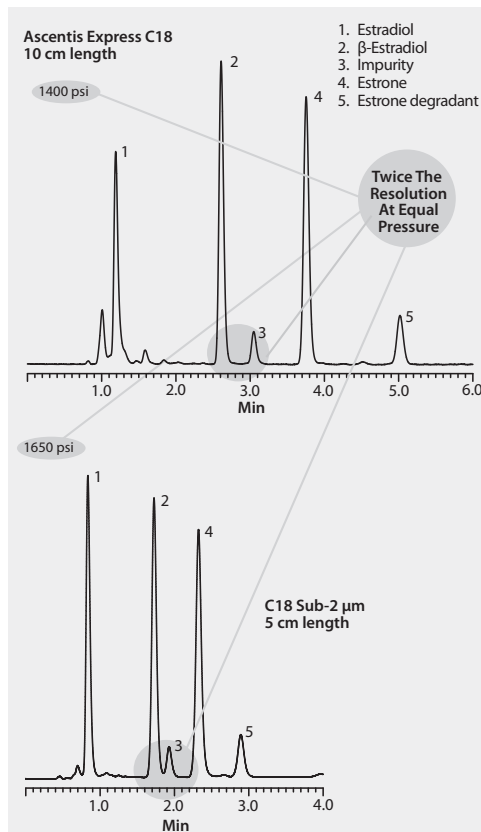
HPLC Analysis Proteins on Proteomix® SCX-NP1.7, Demonstration of Column Stability with Repeated Injections

column . . . Proteomix SCX-NP1.7, 5 cm x 4.6 mm I.D., 1.7 µm particles (Z777146)
column Proteomix SCX-NP1.7 guard cartridge with holder,
1 cm x 4 mm I.D. (Z777144)
mobile phase . . . (A) 20 mM sodium phosphate buffer, pH 6.5, (B) A + 1.0 M NaCl
gradient 0 - 100% B in 25 min, 15 min prewash
flow rate 0.5 mL/min
column temp. ambient
detector UV, 214 nm
injection 5 µL
sample each compound 1 mg/mL
Application No. **G006135**



Hyper-Fast Separations on Ascentis® Express at Half the Pressures of sub-2 μm Columns

column Ascentis Express C18, 10 cm \times 2.1 mm I.D., 2.7 μm particles and sub-2 μm particle column, 5 cm \times 2.1 mm I.D. (53823-U)
 mobile phase (A) water; (B) acetonitrile; (55:45 or 54:46, A:B)
 flow rate 0.2 mL/min
 column temp. ambient
 detector UV, 200 nm
 injection 1 μL
 Application No. **G003973**



LC-MS Analysis of Angiotensins on Discovery® BIO Wide Pore C18

column Discovery BIO Wide Pore C18, 10 cm × 0.32 mm I.D.,
3 μm particles (65527-U)

mobile phase . . . (A) 65:35, (10mM ammonium acetate, pH 7):(50% acetonitrile in
20mM ammonium acetate, pH 7); (B) 25:75, (10mM ammonium
acetate, pH 7):(50% acetonitrile in 20mM ammonium acetate, pH 7)

gradient 0-100% B in 12.5 min

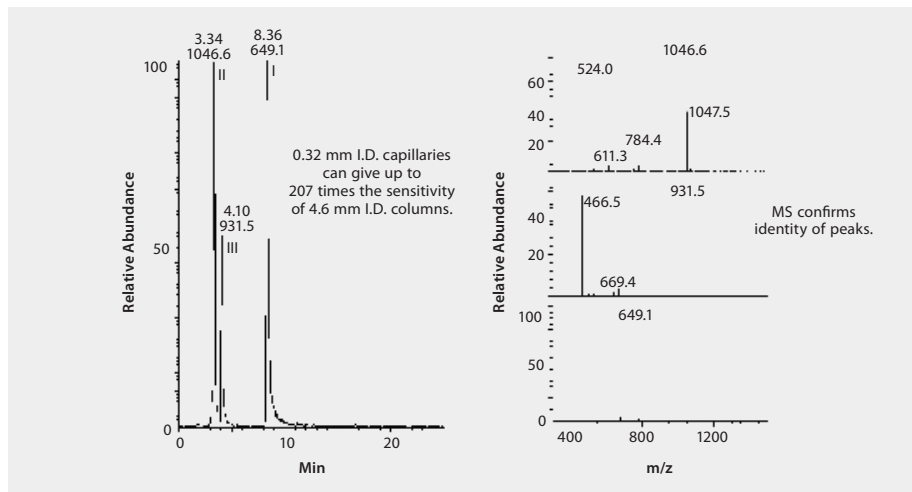
flow rate 6 μL/min

column temp. ambient

detector +ESI mode

injection 50 pmol angiotensin I, II and III in water

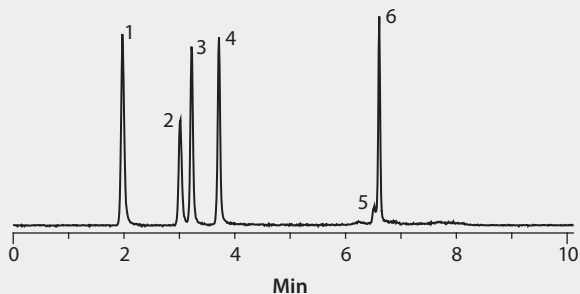
Application No. [G001592](#)



LC-MS Analysis of Antipsychotic Drugs on Ascentis® Express RP Amide

column Ascentis Express RP Amide, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53913-U)
mobile phase (A) 5 mM ammonium formate water;
(B) 5mM ammonium formate in 95:5 (v/v) methanol:water
gradient held at 35% B for 0.5 min; 35 to 85% B in 5.5 min;
held at 85% B for 1 min
flow rate 0.3 mL/min
pressure 4641 psi (320 bar)
column temp. 35 °C
detector ESI(+), m/z 100-1000
injection 1 µL
sample 200 ng/mL in water
Application No. **G005668**

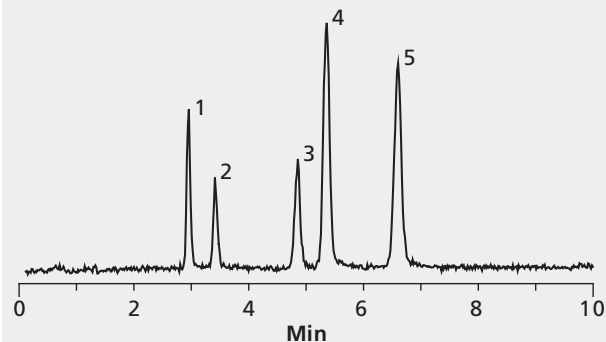
1. Desmethyl venlafaxine
2. Hydroxybupropion
3. Hydroxyrisperidon
4. Bupropion
5. Zuclopenthixol
6. Fluphenazine



LC-MS Analysis of Benzodiazepines on Ascentis® Phenyl (Analyte Mix 1)

column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase (A) 0.1% ammonium acetate in water (pH unadjusted),
(B): 0.1% ammonium acetate in acetonitrile, (50:50, A:B)
flow rate 1 mL/min., split to the MS
column temp. 35 °C
detector MS, ESI (+) in selected ion recording (SIR) mode
injection 5 µL
sample as indicated in 0.1% ammonium acetate in 90:10:water:acetonitrile
Application No. **G003705**

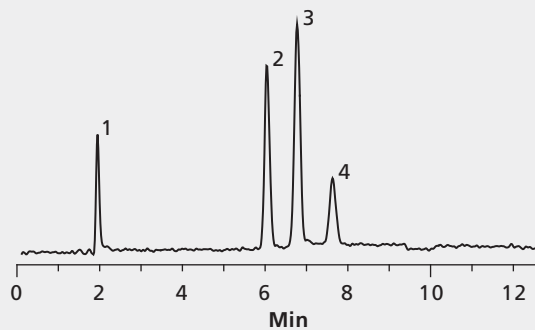
1. Demoxepam (1 µg/mL) (M+H)⁺ = 287.05
2. Oxazepam (1 µg/mL) (M+H)⁺ = 287.05
3. Temazepam (1 µg/mL) (M+H)⁺ = 301.06
4. Clobazam (1 µg/mL) (M+H)⁺ = 301.06
5. Diazepam (1 µg/mL) (M+H)⁺ = 285.07



LC-MS Analysis of Benzodiazepines on Ascentis® Phenyl (Analyte Mix 2)

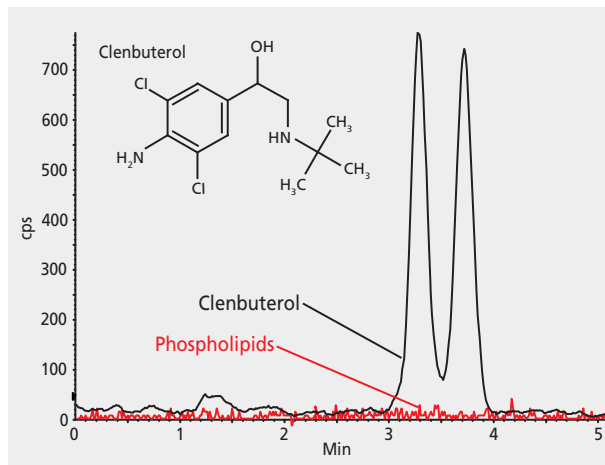
column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase (A) 0.1% ammonium acetate in water (pH unadjusted);
(B) 0.1% ammonium acetate in acetonitrile; (60:40, A:B)
flow rate 1 mL/min., split to the MS
column temp. 35 °C
detector MS, ESI (+) in selected ion recording (SIR) mode
injection 5 µL
sample as indicated in 0.1% ammonium acetate in 90:10:water:acetonitrile
Application No. **G003706**

1. Fenoldopam (10 µg/mL) (M+H)+ = 306.08
2. Lorazepam (10 µg/mL) (M+H)+ = 321.01
3. Nitrazepam (10 µg/mL) (M+H)+ = 282.08
4. Clonazepam (10 µg/mL) (M+H)+ = 316.04



LC-MS Analysis of Clenbuterol Enantiomers in Plasma on Astec® CHIROBIOTIC® T after SPE using HybridSPE®-Phospholipid

column CHIROBIOTIC T, 10 cm x 2.1 mm I.D., 5 µm particles (12018AST)
mobile phase 10 mM ammonium formate in methanol
flow rate 0.3 mL/min
column temp. 30 °C
detector ESI(+)
sample clenbuterol, 10 ng/mL in rat plasma (phospholipids removed by extraction with HybridSPE-Phospholipid)
Application No. **G004245**

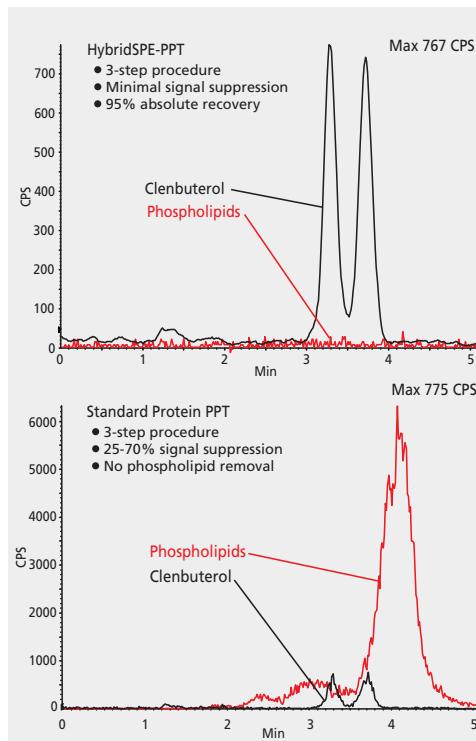


LC-MS Analysis of Clenbuterol In Plasma on Astec® CHIROBIOTIC® T with Phospholipid Removal Using HybridSPE® Phospholipid

The HybridSPE method provides significant improvement in LC-MS baseline. sample preparation SPE (Solid Phase Extraction) sample/matrix rat plasma spiked with clenbuterol enantiomers at 10 ng/mL SPE well plate HybridSPE-Precipitation 96-well Plate, 50 mg/well (575656-U) sample addition 100 µL spiked rat plasma followed by 300 µL 1% formic acid in acetonitrile. Mix by vortexing the HybridSPE-PPT plate briefly.

elution apply vacuum column CHIROBIOTIC T, 10 cm x 2.1 mm I.D., 5 µm particles (12018AST) mobile phase 10 mM ammonium formate in methanol flow rate 0.3 mL/min column temp. 30 °C detector ABI 3200 QT; ESI(+), MRM: 184/104 m/z (phospholipids); 277.2/203.1 m/z (clenbuterol)

injection 10 µL Application No. **G004431**



LC-MS Analysis of Erythromycin Analogs on Ascentis® Express HILIC

This application shows the suitability of Ascentis Express Silica columns for the analysis of erythromycin analogs in aqueous normal phase/HILIC mode of chromatography. Other relatively hydrophobic aminoglycosides have also been shown to separate under these conditions.

column . . . Ascentis Express HILIC, 15 cm x 4.6 mm I.D., 2.7 µm particles (53981-U)
mobile phase . . . (A) 100 mM ammonium formate, pH 3.0 (titrated with formic acid);
(B) acetonitrile; (10:90, A:B)

flow rate 1.0 mL/min
pressure 1247 psi (86 bar)

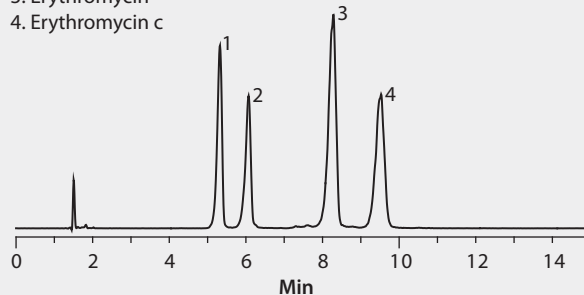
column temp. 35 °C

detector ESI(+); SIR

injection 5 µL

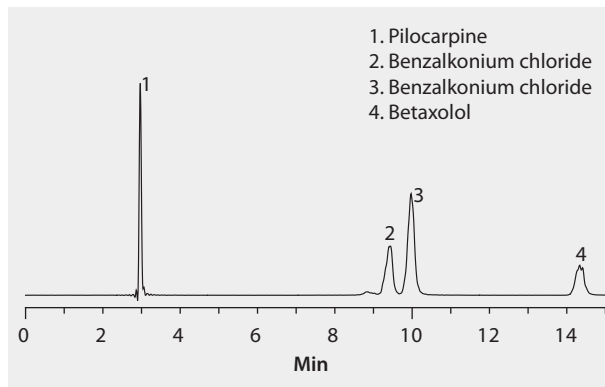
Application No. [G005696](#)

1. Erythromycin ethylsuccinate
2. Erythromycin estolate
3. Erythromycin
4. Erythromycin c



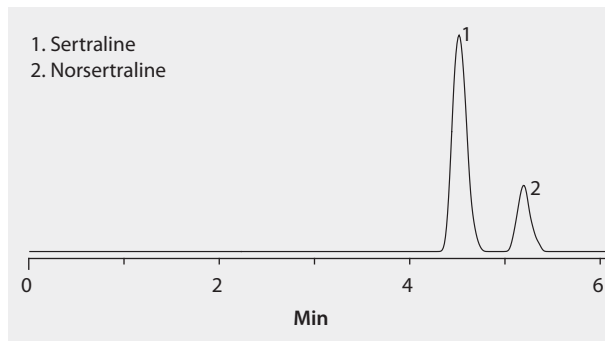
LC-MS Analysis of Pilocarpine and Betaxolol in the Presence of Benzalkonium Chlorides on Ascentis® Express HILIC

column . . . Ascentis Express HILIC, 15 cm x 4.6 mm I.D., 2.7 µm particles (53981-U)
mobile phase (A) 2 mM ammonium acetate, pH 6.7 in (B) 10:90 (v/v) water:acetonitrile
flow rate 1.0 mL/min
pressure 1160 psi (80 bar)
column temp. 35 °C
detector ESI(+), XIC, m/z 304, 332 (BACs), m/z 209 (pilocarpine), m/z 308 (betaxolol)
injection 2 µL
sample 10 µg/mL each in acetonitrile
Application No. [G005721](#)



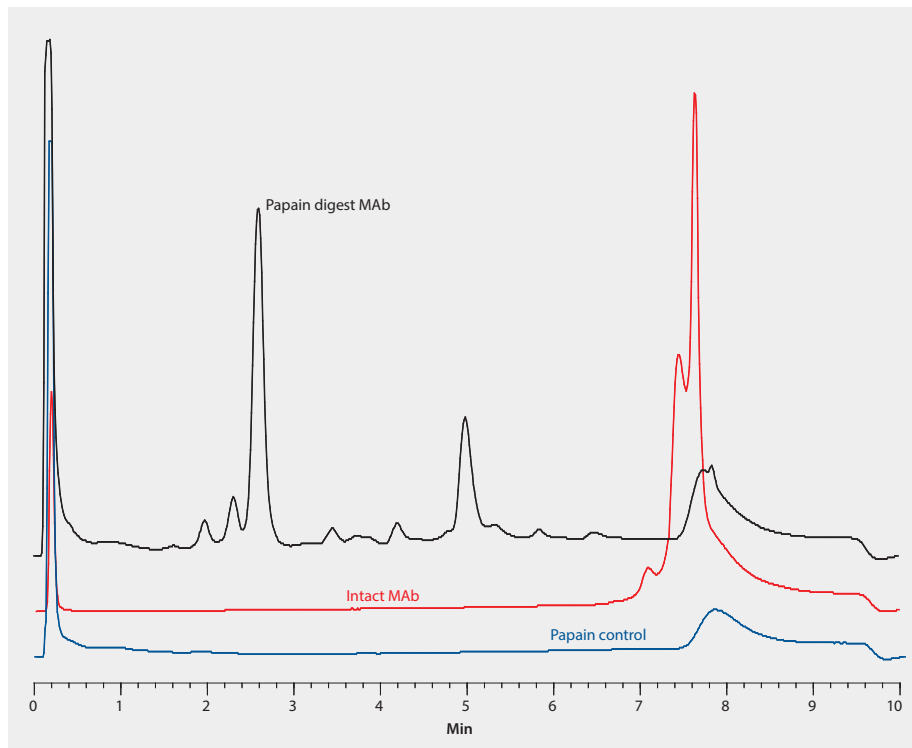
LC-MS Analysis of Sertraline and Norsertaline on Ascentis® Express RP-Amide

column Ascentis Express RP Amide, 10 cm x 3.0 mm I.D.,
2.7 µm particles (53918-U)
mobile phase (A) 10 mM ammonium formate, water, pH 3.6;
(B) 10 mM ammonium formate, acetonitrile, pH 3.6; (65:35, A:B)
flow rate 0.6 mL/min
column temp. 55 °C
detector ESI(+), 100-1000 m/z
injection 2 µL
sample 200 ng/mL in 25:75, water: acetonitrile
Application No. [G005736](#)



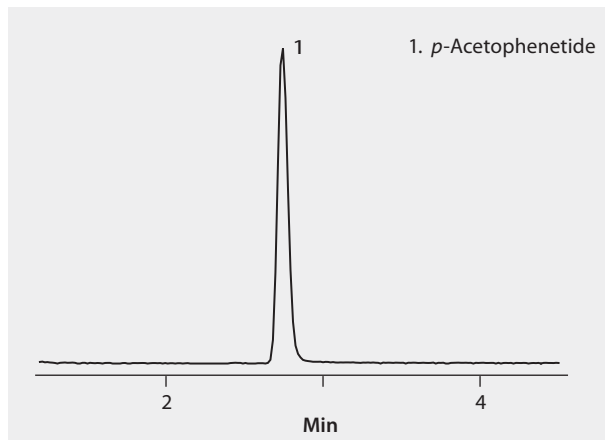
Proteomix WCX-NP1.7, 3 cm x 4.6 mm I.D., 1.7 μm particles

column . . . Proteomix WCX-NP1.7, 3 cm x 4.6 mm I.D., 1.7 μm particles (Z777179)
mobile phase (A) 20 mM sodium acetate, pH 5.15; (B) A + 1 M LiCl
gradient 12% to 40% B in 6.7 min; to 100% B in 0.1 min; held for 2 min
flow rate (1.5 mL/min)
pressure 3335-3916 psi (230 - 270 bar)
detector UV 280 nm
injection 25 μL
sample 1 mg/mL papain digested MAb 321
Application No. **G006023**



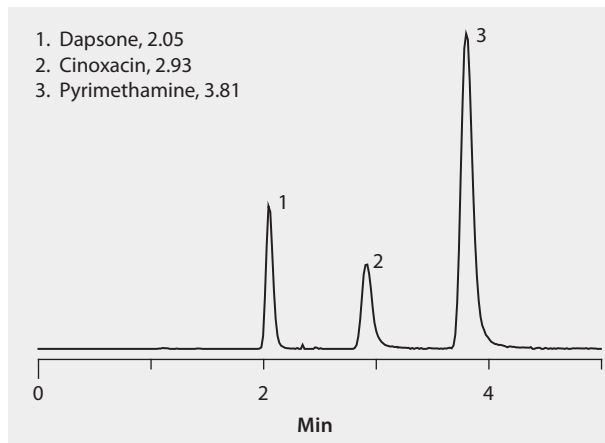
UHPLC Analysis of p-Acetophenetide (Phenacetin) Titan™ C18

column TITAN C18, 10 cm x 2.1 mm I.D., 1.9 μ m particles (577124-U)
mobile phase . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 °C
detector MS, XIC m/z 180.10
injection 2 μ L
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. [G006101](#)



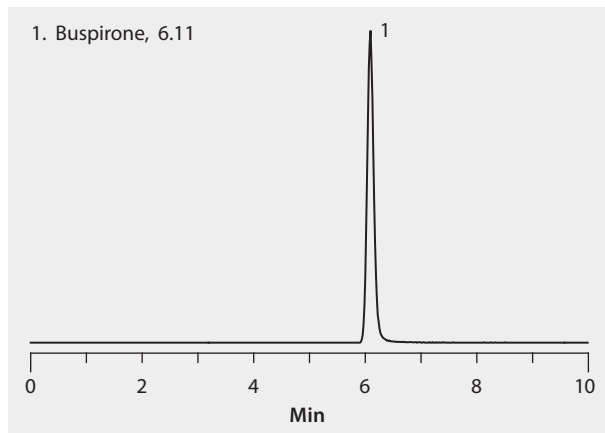
UHPLC Analysis of Antibiotics/Antimalarials on Titan™ C18

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 °C
detector MS, XIC m/z 249.09, 249.07, 263.14
injection 2 µL
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. **G006088**



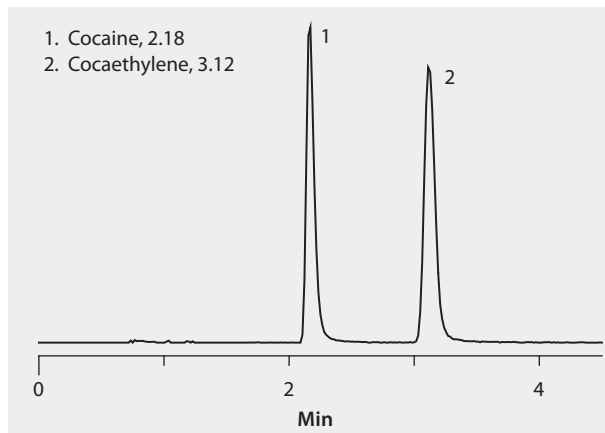
UHPLC Analysis of Buspirone on Titan™ C18

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 °C
detector MS, XIC m/z 386.26
injection 2 µL
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. **G006090**



UHPLC Analysis of Cocaine and Cocaethylene on Titan™ C18

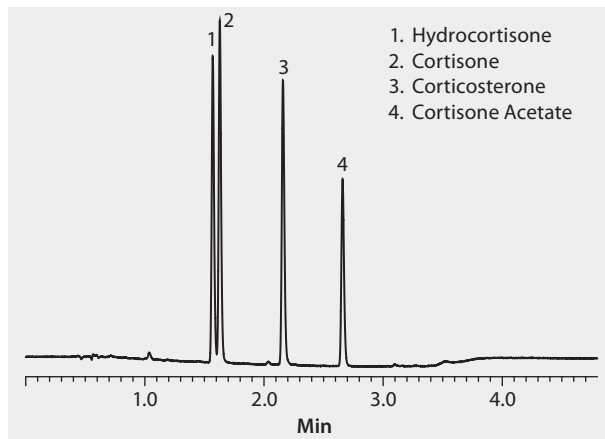
column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase . . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 °C
detector MS, XIC m/z 304.15 and 318.17
injection 2 µL
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. [G006091](#)



UHPLC Analysis of Corticosteroids on Titan™ C18

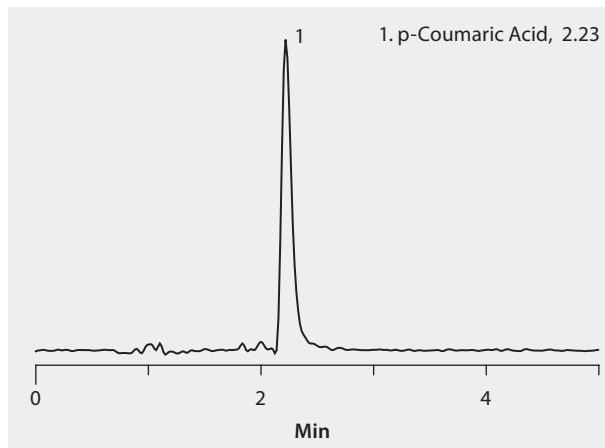
Analysis of Corticosteroids on a Titan C18 UPLC column with MS detection in ESI (+) Mode

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase (A) water; (B) acetonitrile; (70:30, A:B)
gradient 30% to 60% B in 3 minutes, hold for 0.2 min
flow rate 0.4 mL/min
pressure 7423 psi (512 bar)
column temp. 35 °C
detector UV, 240 nm
injection 1 µL
sample 1000 ng/ml in mobile phase
detector ESI (+) MS TIC SIR
Application No. **G006147**



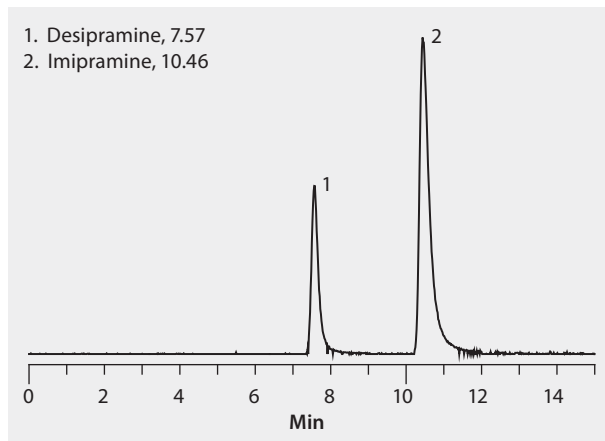
UHPLC Analysis of p-Coumaric Acid on Titan™ C18

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 °C
detector MS, XIC m/z 163.15
injection 2 µL
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. [G006103](#)



UHPLC Analysis of Desipramine and Imipramine on Titan™ C18

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase . . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 °C
detector MS, XIC m/z 267.19 and 281.20
injection 2 µL
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. [G006105](#)

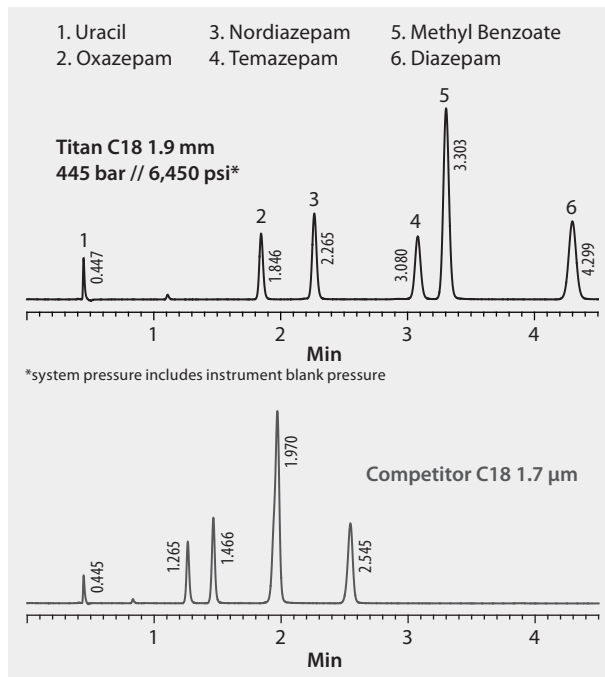


UHPLC Analysis of Diazepam and Metabolites on Titan™ C18, Competitive Comparison

This application shows a comparison between Titan™ C18 and a competitive column for diazepam and its metabolites using a MS compatible mobile phase.

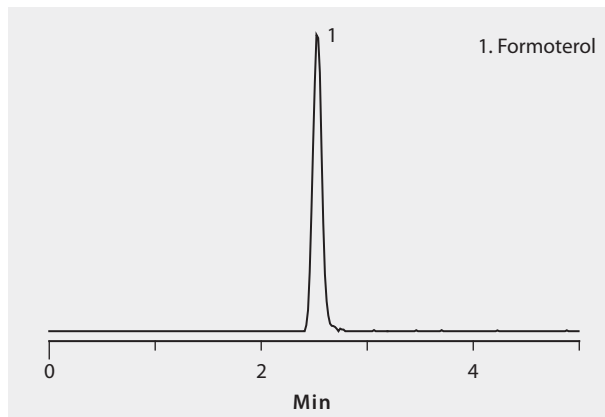
Used 75 µm I.D. x 250 mm L tubing in system.

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
 mobile phase (A) 0.1% formic acid; (B) acetonitrile; (60:40, A:B)
 pressure 6450 psi (445 bar)
 column temp. 35 °C
 detector UV, 254 nm
 Application No. **G006001**



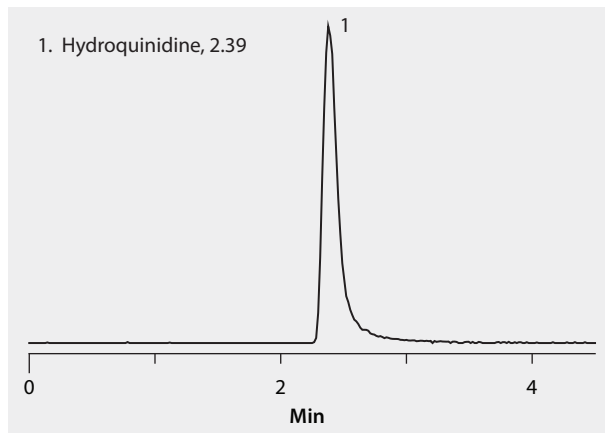
UHPLC Analysis of Formoterol on Titan™ C18

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 μ m particles (577124-U)
mobile phase . . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 $^{\circ}$ C
detector MS, XIC m/z 345.20
injection 2 μ L
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. [G006092](#)



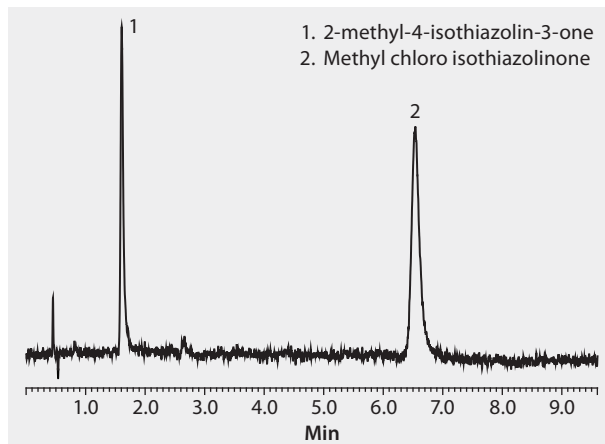
UHPLC Analysis of Hydroquinidine on Titan™ C18

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase . . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 °C
detector MS, XIC m/z 327.21
injection 2 µL
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. [G006094](#)



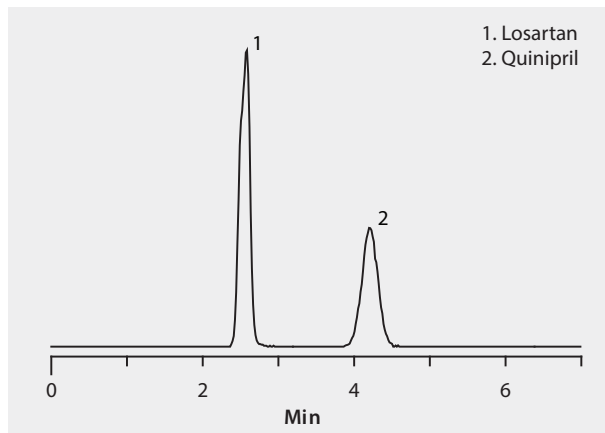
UHPLC Analysis of Kathon on Titan™ C18 Using MS Detection

column Titan C18 50 mm x 2.1 mm, I.D, 1.9 µm particles (577122-U)
mobile phase (A) 0.1% formic acid in water (B):methanol
flow rate 500 µL/min
detector MS, ESI (+) MRM TIC
detector Diode Array at 275 nm
injection 1.0 µL
sample Diluted Kathon at 1 ug/ml in 95:5 0.1% formic acid in water::methanol
Application No. [G006148](#)



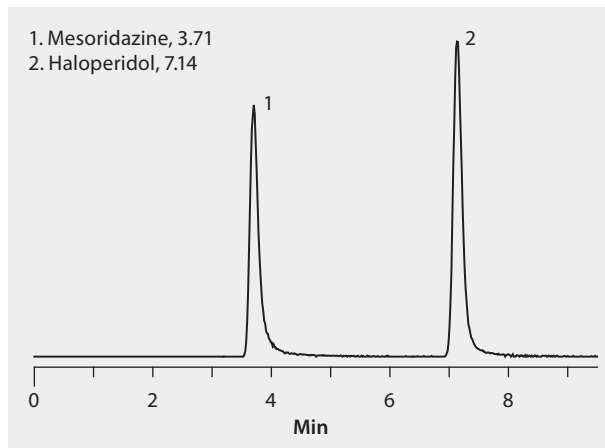
UHPLC Analysis of Losartan and Quinapril on Titan™ C18

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 °C
detector MS, XIC m/z 423.17 and 439.22
injection 2 µL
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. [G006095](#)



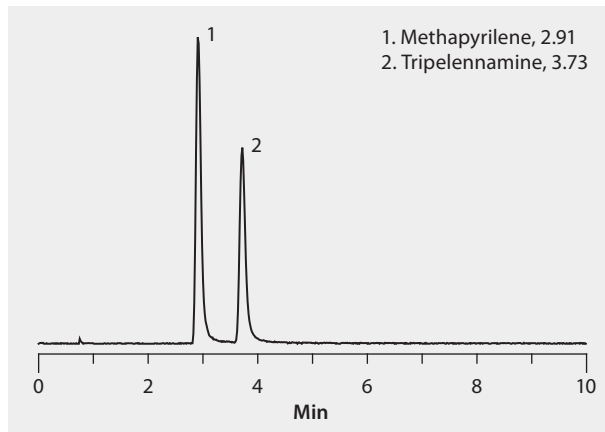
UHPLC Analysis of Mesoridazine and Haloperidol on Titan™ C18

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 μ m particles (577124-U)
mobile phase . . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 $^{\circ}$ C
detector MS, XIC m/z 387.16 and 376.15
injection 2 μ L
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. [G006099](#)



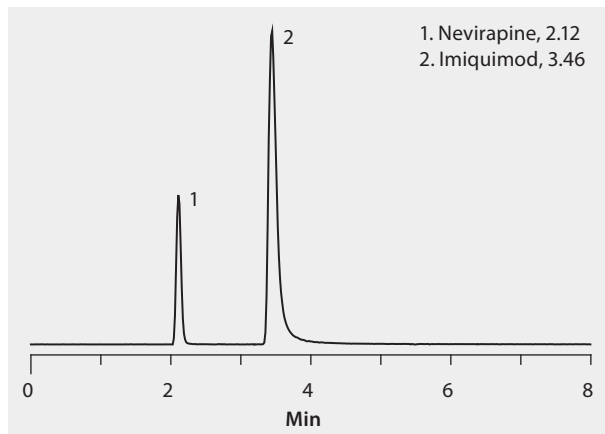
UHPLC Analysis of Methapyrilene and Tripeleonnamine on Titan™ C18

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase . . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 °C
detector MS, XIC m/z 262.14 and 256.18
injection 2 µL
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. [G006106](#)



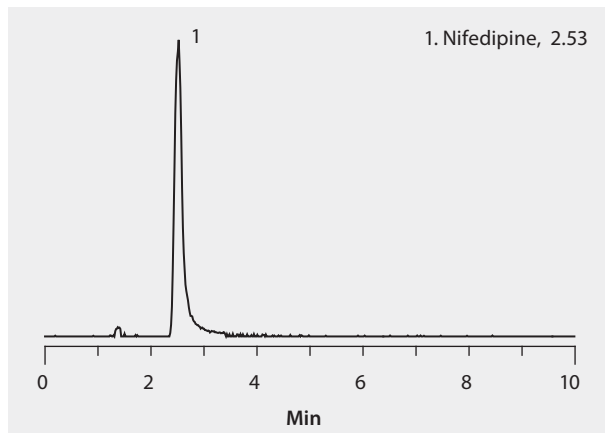
UHPLC Analysis of Nevirapine and Imiquimod on Titan™ C18

column TITAN C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 °C
detector MS, XIC m/z 267.12 and 241.15
injection 2 µL
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. **G006113**



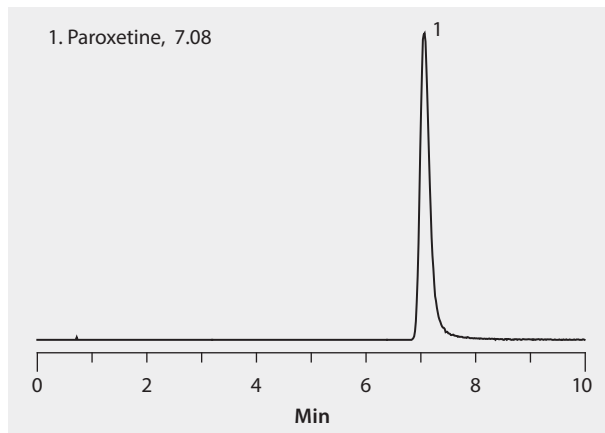
UHPLC Analysis of Nifedipine on Titan™ C18

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 °C
detector MS, XIC m/z 347.18
injection 2 µL
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. **G006100**



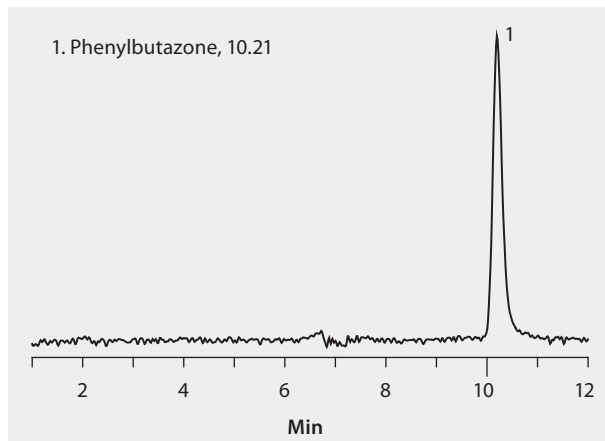
UHPLC Analysis of Paroxetine Titan™ C18

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 °C
detector MS, XIC m/z 330.15
injection 2 µL
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. **G006102**



UHPLC Analysis of Phenylbutazone on Titan™ C18

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 μ m particles (577124-U)
mobile phase . . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 °C
detector MS, XIC m/z 309.20
injection 2 μ L
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. **G006104**



UHPLC Analysis of Riboflavin and Impurities on Titan™ C18 with MS Detection

Riboflavin (vitamin B2) is a water-soluble vitamin. It is synthesized by all plants and many microorganisms, but it is not produced by higher animals. It is a precursor of coenzymes that are required for the enzymatic oxidation of carbohydrates, so it is essential to basic metabolism. Riboflavin is used as an additive to food and feed and is also used in fortification of baby food and cereal. The current USP method for impurity analysis is non-quantitative, and uses an ion pair reagent in the mobile phase. An alternative to USP and EP methods using LC-MS/MS to identify and quantify the riboflavin and impurities is presented. This new proposed method is also compatible with UV-Vis detection.

A riboflavin certified reference material (CRM) was used in this study. MRM transitions for the determination of ions for the parent and four impurities were made. Three transitions were used for each ion. Structures for each of these major impurities were confirmed by MS. In addition to improving the specificity of the method with MS/MS detection, two additional goals were to decrease analysis time and eliminate the need for ion pairing reagents that are not compatible with MS.

Other MS Conditions

Capillary (kV) 2.29

Cone (V) 54.95

Extractor (V) 5.13

Source Temperature (°C) 151

Desolvation Temperature (°C) 349

Cone Gas Flow (L/Hr) 2

Desolvation Gas Flow (L/Hr) 646

Collision Gas Flow (mL/Min) ON

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)

mobile phase (A) 0.1% formic acid in water;

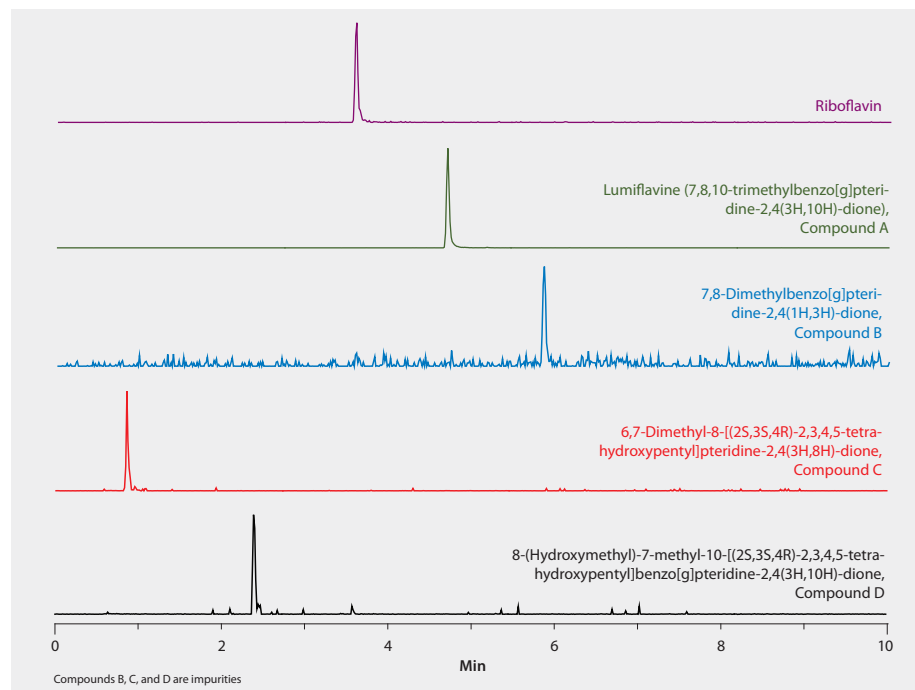
(B) 0.1% formic acid in acetonitrile (95:5)

gradient 5% to 25% in 6 min, return to 5% b in 0.1 min,

and re-equilibrate for 4 min

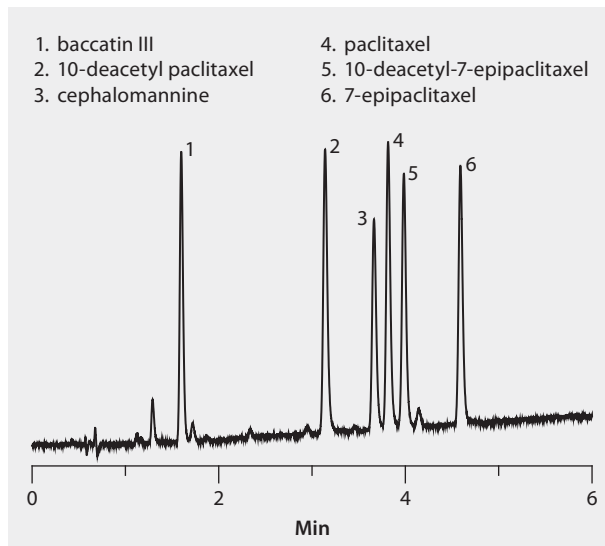
flow rate 500 µL/min

pressure 5000 psi (345 bar)
 column temp. 35 °C
 detector ESI (+), MRM and TIC
 detector Diode Array at 276 nm
 injection 2.0 µL
 Application No. G006138



UHPLC analysis of Taxanes on Titan C18 Column

column Titan C18 10 cm x 2.1 mm, 1.9 μ m (577124-U)
mobile phase (A) water; (B) (50:50, methanol:acetonitrile)
gradient 60 to 80% B in 4.5 min; 80% B held for 1.5 min
flow rate 0.4 mL/min
pressure 6090 psi (420 bar)
column temp. 40 $^{\circ}$ C
detector UV, 227 nm
injection 2 μ L
sample 25 μ g/mL in 70:30, water:methanol
Application No. [G006139](#)



UHPLC Analysis of Temeirolimus on Titan™ C18

Intravenous drug for the treatment of renal cell carcinoma

column Titan C18 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)

mobile phase (A) 0.1% formic acid in water, (B) methanol

gradient 75% B for 2 minutes, 75% B to 90% B from 2 to 12 minutes,
90% B from 12 to 14 minutes.

flow rate 0.3 mL/min

pressure 3300 psi (228 bar)

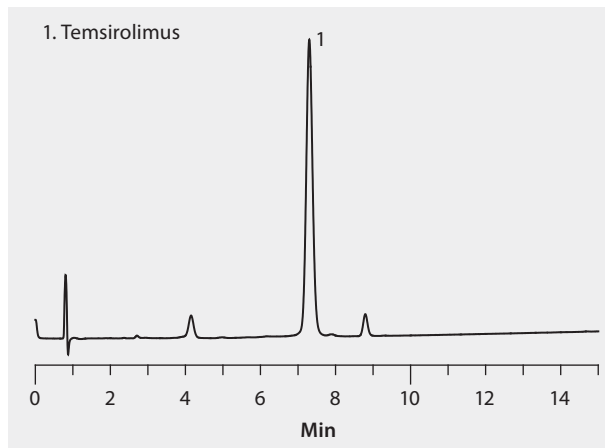
column temp. 55 °C

detector UV, 276 nm

injection 2.0 µL

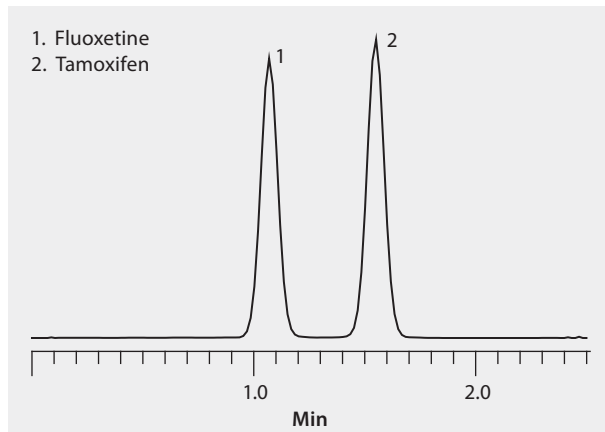
sample 100 µg/mL in 10% methanol

Application No. [G006283](#)



UHPLC-MS Analysis of Antineoplastic and Antidepressants in Plasma on Titan™ C18 1.9 µm after SPE using HybridSPE®-PLus

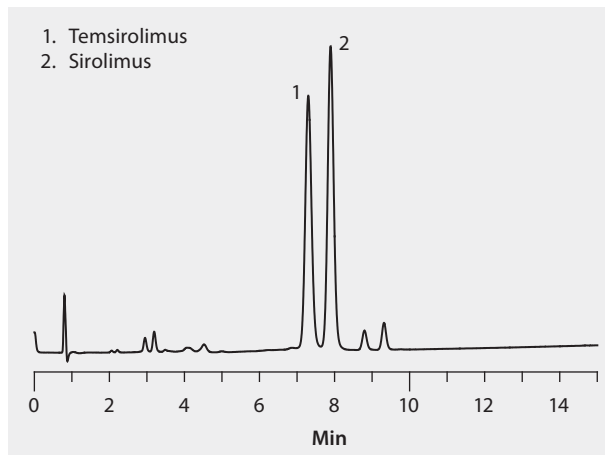
sample/matrix rat plasma
 SPE tube/cartridge HybridSPE-PLus 96-Well Plate,
 50 mg/2 mL per well (575659-U)
 sample addition ... 400 µL of 1% formic acid acetonitrile:spiked plasma (3:1) per well
 sample preparation final analyte concentration 50 ng/mL
 column Titan C18, 5 cm x 2.1 mm I.D., 1.9 µm particles (577122-U)
 mobile phase (A) 5 mM ammonium formate;
 (B) 5 mM ammonium formate in 90:10 (v:v) acetonitrile:water
 gradient 35 to 90% B in 1.5 min, held at 90% B for 0.4 min
 flow rate 0.4 mL/min
 pressure 3582 psi (247 bar)
 column temp. 35 °C
 detector TOF/MS
 injection 1 µL
 Application No. **G006151**



UHPLC Separation of Temsirolimus and Sirolimus on Titan™ C18

column Titan C18 10 cm x 2.1 mm, 1.9 µm particles (577124-U)
mobile phase (A) 0.1% formic acid in water, (B) methanol
gradient 75% B for 2 minutes, 75% B to 90% B from 2 to 12 minutes,
90% B from 12 to 14 minutes.

flow rate 0.3 mL/min
pressure 3300 psi (228 bar)
column temp. 55 °C
detector UV, 276 nm
injection 2.0 µL
sample 100 µg/mL each in 20% methanol
Application No. **G006270**



USP HPLC Analysis of Ampicillin Sodium on Ascentis® Express 5µm C18

This application was generated by RTC on an Ascentis Express C18.

column . . . Ascentis Express C18, 10 cm × 4.6 mm I.D., 5 µm particles (50536-U)

mobile phase (A:B:C:D) (A) acetonitrile,(B)water, (C)1M Potassium phosphate monobasic in water, (D)1N acetic acid in water (80:909:10:1)

flow rate 1.0 mL/min

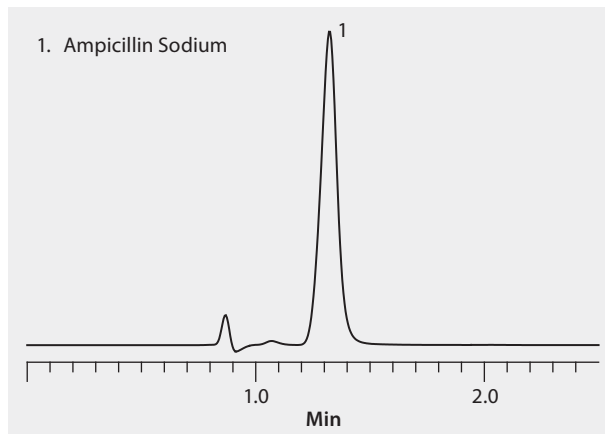
column temp. 30 °C

detector UV, 254 nm

injection 10 µL

sample 1 mg/mL in mobile phase

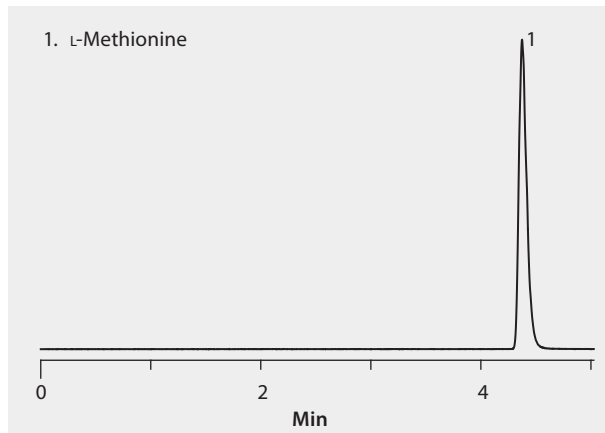
Application No. **G006262**



USP HPLC Analysis of L-Methionine on Ascentis® Express OH5

This USP application was generated by RTC on an Ascentis® Express OH5 column.

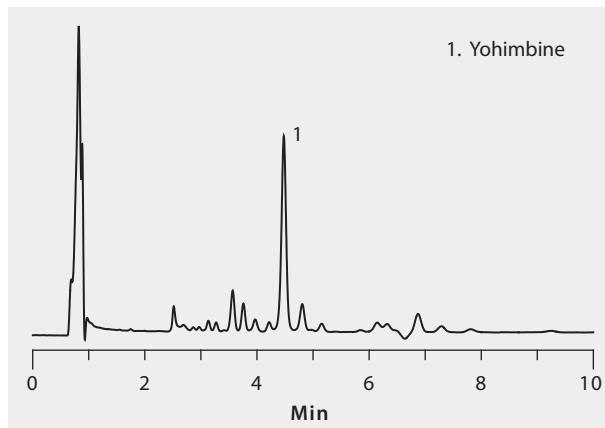
column Ascentis Express OH5 15 cm x 4.6 mm, 5 µm particles (50347-U)
mobile phase (A)0.005M Ammonium formate in Water
(pH: 3.15 with Trifluoroacetic Acid), (B)Acetonitrile (30:70, A:B)
flow rate 1.0 mL/min
pressure 914 psi (63 bar)
column temp. 40 °C
detector Agilent 380-ELSD
injection 3.0 µL
sample 0.8 mg/mL water:acetonitrile (1:1)
Application No. [G006286](#)



Vitamins, Nutraceuticals, and Natural Products

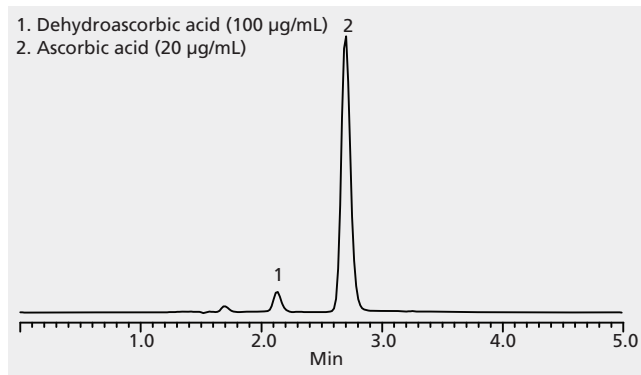
HPLC Analysis of Alkaloids from Herbal Supplements on Ascentis® Express F5, HILIC Mode

column . . . Ascentis® Express F5, 3 cm x 3.0 mm I.D., 2.7 µm particles (53574-U)
mobile phase 2 mM ammonium acetate in 10:90 water:acetonitrile,
pH to 6.0 with acetic acid
flow rate 0.5 mL/min
pressure 1100 psi (76 bar)
column temp. 35 °C
detector UV, 275 nm
injection 2 µL
sample methanolic extract of Yohimbe Herbal Supplement
Application No. [G005905](#)



HPLC Analysis of Ascorbic Acid on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase 25 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 230 nm
injection 10 µL
sample as indicated each in mobile phase
Application No. **G002722**

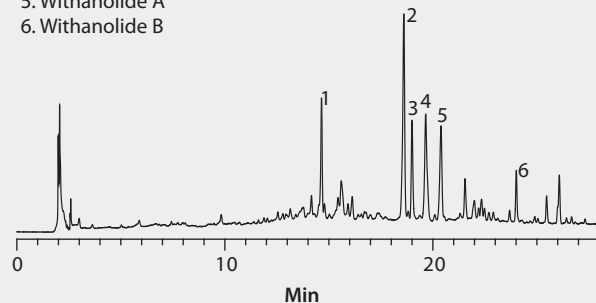


HPLC Analysis of Aswagandha Extract on Discovery® C18

This application demonstrates the suitability of Discovery C18 for the efficient separation of withania extract by the USP monograph.

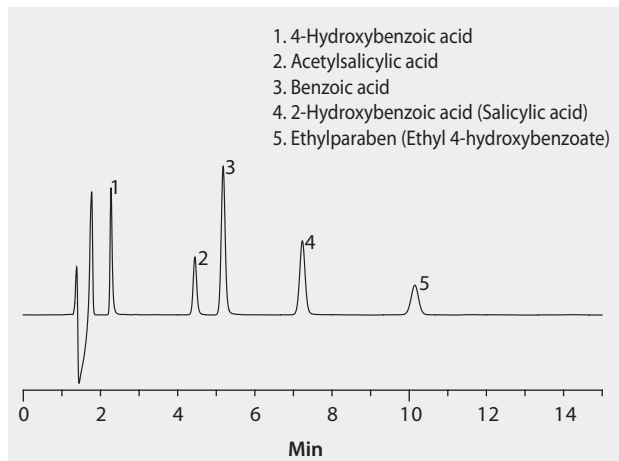
column Discovery C18, 25 cm x 4.6 mm I.D., 5 µm particles (504971)
mobile phase (A) 1 mM potassium phosphate, monobasic; (B) acetonitrile
gradient 5 to 45% B in 18 min; 45 to 80% B in 7 min; held at 80% B for 3 min
flow rate 1.5 mL/min
pressure 3191 psi (220 bar)
column temp. 27 °C
detector UV, 227 nm
injection 20 µL
sample 20 µg/mL in water: acetonitrile (86:14)
Application No. [G005669](#)

1. Withanoside IV
2. Withanoside V
3. Withaferin A
4. 12-Deoxywithastramonolide
5. Withanolide A
6. Withanolide B



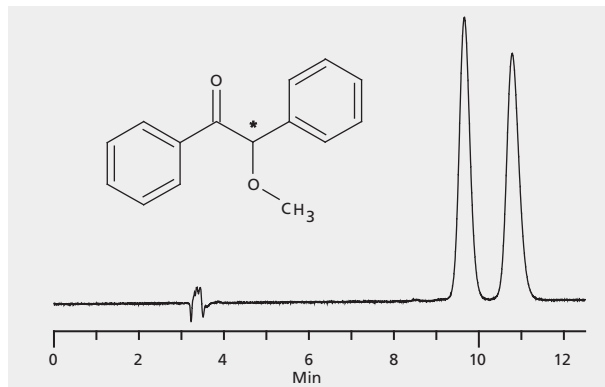
HPLC Analysis of Benzoic Acid Derivatives on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase . . . (A) 10mM TFA in water; (B) 10 mM TFA in acetonitrile; (70:30, A:B)
flow rate 1.0 mL/min
column temp. 30 °C
detector UV, 220 nm
injection 10 µL
Application No. **G005676**



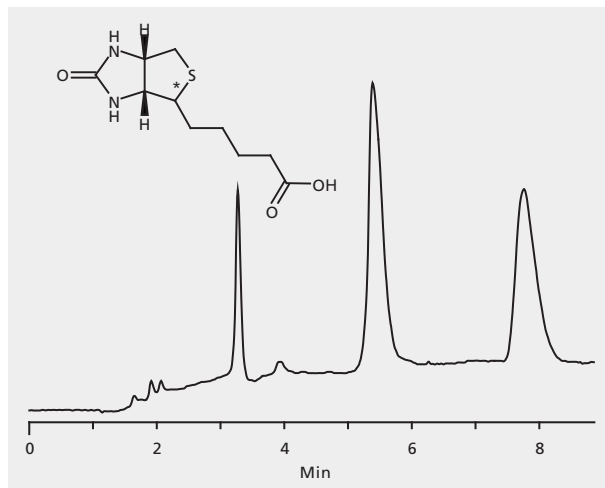
HPLC Analysis of Benzoin Methyl Ether Enantiomers on Astec® CHIROBIOTIC® V

column CHIROBIOTIC V, 25 cm x 4.6 mm I.D., 5 µm particles (11024AST)
mobile phase (A) 1% triethylamine, pH 7.0; (B) THF; (90:10, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 2 µL
sample 1 mg/mL in methanol
Application No. [G004618](#)



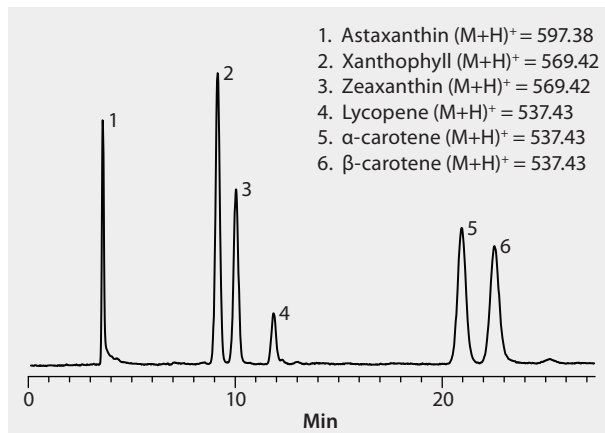
HPLC Analysis of Biotin Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) 0.1% sodium phosphate, pH 4.1; (B) methanol; (60:40, A:B)
flow rate 1 mL/min
column temp. 23 °C
detector UV, 210 nm
injection 2 µL
sample 4 mg/mL in methanol
Application No. **G004540**



HPLC Analysis of Carotene Compounds on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase 100% acetonitrile
flow rate 1.0 mL/min
column temp. 35 °C
detector MS, ESI(+) in selective ion monitoring (SIR) mode
injection 5 µL
sample 10 µg/mL each in 100% acetonitrile
Application No. **G003138**



HPLC Analysis of Carotenes on Ascentis® Express RP-Amide, Methanol Mobile Phase

Analysis was conducted using juice extract, detection via UV.

column Ascentis Express RP-Amide, 15 cm x 4.6 mm I.D.,
2.7 µm particles (53931-U)

mobile phase methanol

flow rate 1 mL/min

pressure 1653 psi (114 bar)

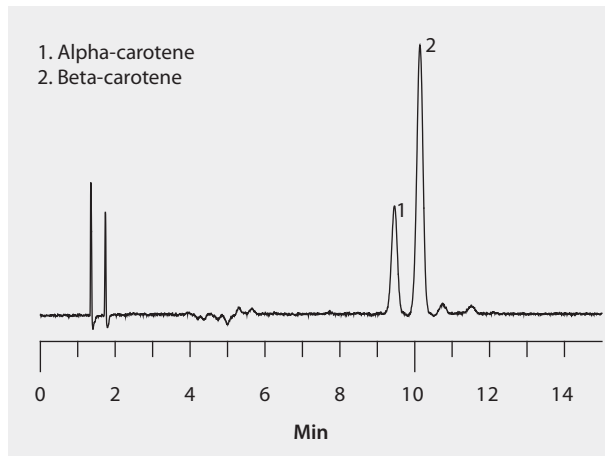
column temp. 30 °C

detector UV-VIS, 454 nm

injection 5 µL

sample V8 Splash® fruit juice was extracted with hexane,
the extract dissolved 1:1 into ethanol for HPLC injection

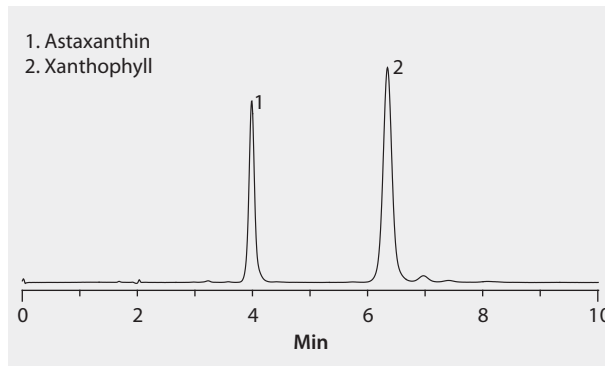
Application No. [G005859](#)



HPLC Analysis of Carotenoids by Normal Phase Chromatography on Ascentis® Si

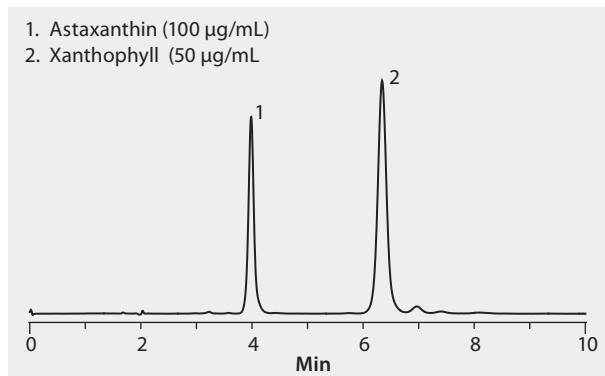
Ascentis silica is used in the analysis of naturally occurring carotenoid pigments in the form of alcohols, xanthophyll and astaxanthin.

column Ascentis Si, 15 cm x 4.6 mm I.D., 5 µm particles (581512-U)
mobile phase (A) hexane; (B) ethyl acetate; (C) isopropanol; (85:10:5, A:B:C)
flow rate 1.0 mL/min
column temp. 30 °C
detector UV, 450 nm
injection 10 µL
sample 50-100 µg/mL hexane
Application No. [G005685](#)



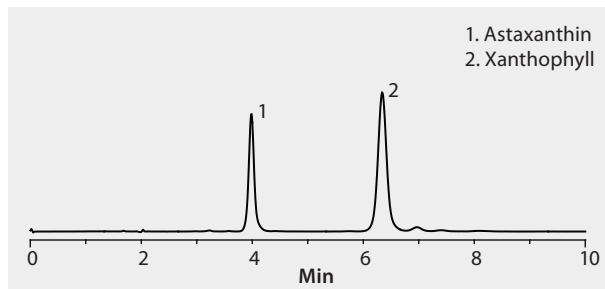
HPLC Analysis of Carotenoids on Ascentis® Si (Silica), Normal Phase

column Ascentis Si, 15 cm × 4.6 mm I.D., 5 µm particles (581512-U)
mobile phase (A) hexane: (B) ethyl acetate: (C) isopropanol; (85:10:5, A:B:C)
flow rate 1.0 mL/min
column temp. 30 °C
detector UV-VIS, 450 nm
injection 10 µL
sample as indicated in hexane
Application No. [G003813](#)



HPLC Analysis of Carotenoids on Ascentis® Si

column Ascentis Si, 15 cm x 4.6 mm I.D., 5 µm particles (581512-U)
mobile phase (A) hexane; (B) ethylacetate; (C) isopropanol; (85:10:5, A:B:C)
flow rate 1.0 mL/min
column temp. 30 °C
detector UV-VIS, 450 nm
injection 10 µL
sample as indicated in hexane
Application No. **G003726**



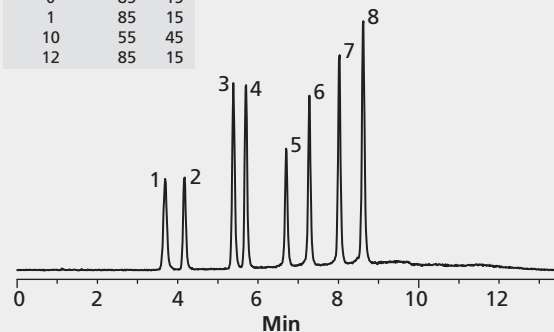
HPLC Analysis of Catechins on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
 mobile phase (A) 10 mM ammonium formate (pH 3.0 with concentrated formic acid); (B) acetonitrile
 flow rate 1 mL/min
 column temp. 35 °C
 detector MS, ESI (-) in selected ion recording (SIR) mode
 injection 5 µL
 sample 10 µg/mL each in water:acetonitrile 1:1
 Application No. [G002723](#)

1. Gallo catechin, m/z 305
2. Epigallo catechin, m/z 305
3. Catechin, m/z 289
4. Epicatechin, m/z 289

5. Epigallo catechin gallate, m/z 457
6. Gallo catechin gallate, m/z 457
7. Epicatechin gallate, m/z 441
8. Catechin gallate, m/z 441

Gradient Program		
Time (min)	%A	%B
0	85	15
1	85	15
10	55	45
12	85	15



HPLC Analysis of Conjugated Flavonoids on Discovery® HS-C18

column Discovery HS C18, 15 cm × 4.6 mm I.D., 3 µm particles (569252-U)
mobile phase (A) 10 mM sodium citrate (pH 7.0 with 10 mM citric acid);
(B) acetonitrile; (80:20, A:B)

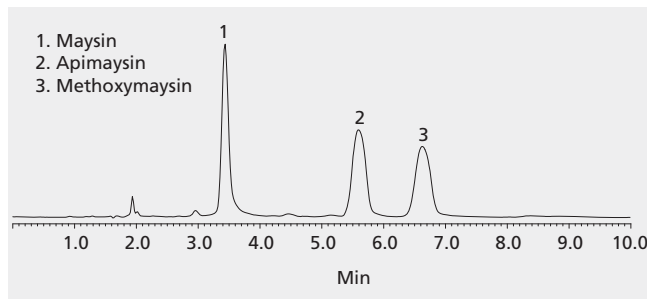
flow rate 1 mL/min
column temp. 60 °C

detector UV, 340 nm

injection 10 µL

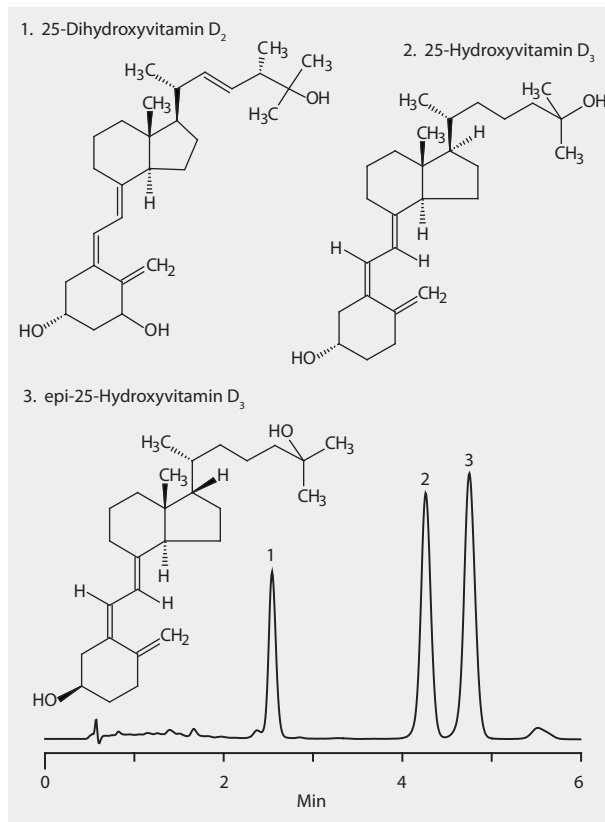
sample 50 µg/mL each (Maysin, Apimaysin, Methoxymaysin) in
10 mM sodium citrate (pH 7.0 with 10 mM citric acid)

Application No. **G002048**



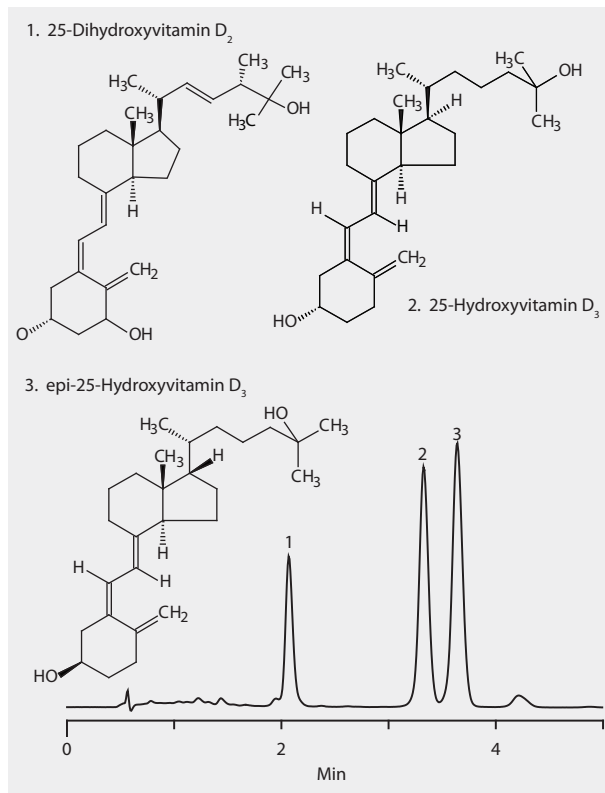
HPLC Analysis of 25-Dihydroxyvitamin D₂, 25-Hydroxyvitamin D₃ and 3-epi-25- Hydroxyvitamin D₃ on Ascentis® Express F5, 20 °C

column Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 μm particles (53569-U)
 mobile phase (A) 5 mM ammonium formate; (B) methanol:water (75:25)
 flow rate 0.4 mL/min
 pressure 3553 psi (245 bar)
 column temp. 20 °C
 detector (UV, 265 nm, ESI(+), m/z 100 - 1000)
 injection 1 μL
 sample 500 mg/L in 25:75, water:methanol
 Application No. **G005375**



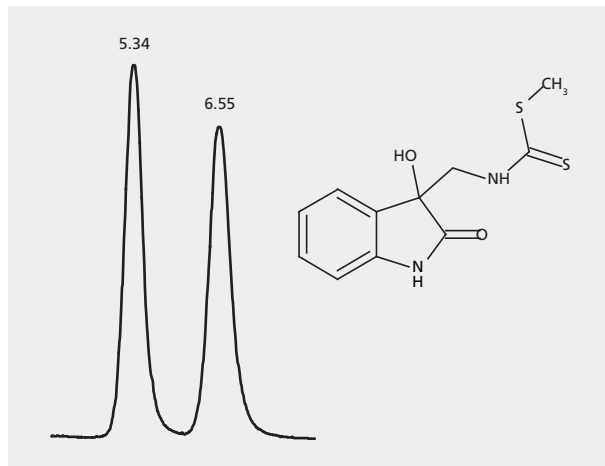
HPLC Analysis of 25-Dihydroxyvitamin D₂, 25-Hydroxyvitamin D₃ and 3-epi-25- Hydroxyvitamin D₃ on Ascentis® Express F5, 30 °C

column . . . Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 μm particles (53569-U)
 mobile phase . . . (A) 5 mM ammonium formate in methanol; (B) water (25:75, A:B)
 flow rate 0.4 mL/min
 pressure 4293 psi (296 bar)
 column temp. 30 °C
 detector UV, 265 nm
 ESI(+), m/z 100 - 1000
 injection 1 μL
 sample 500 μg/mL in methanol
 Application No. **G005376**



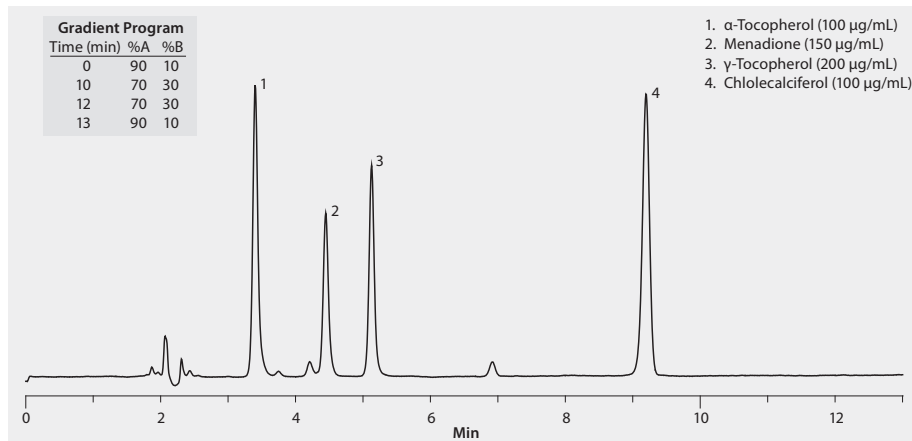
HPLC Analysis of Dioxibrassinin Enantiomers on Astec® P-CAP™

column . . . Astec (R,R) P-CAP-DP, 25 cm x 4.6 mm I.D., 5 µm particles (35024AST)
mobile phase (A) acetonitrile; (B) methanol; (97:3, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 255 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004400](#)



HPLC Analysis of Fat Soluble Vitamins by Normal Phase Chromatography on Ascentis® Si, 15 cm Column

column Ascentis Si, 15 cm × 4.6 mm I.D., 5 µm particles (581512-U)
mobile phase (A) hexane, (B) ethyl acetate
flow rate 1.0 mL/min
column temp. 30 °C
detector UV, 290 nm
injection 10 µL
sample as indicated in 96:4 (hexane:isopropanol)
Application No. **G003693**

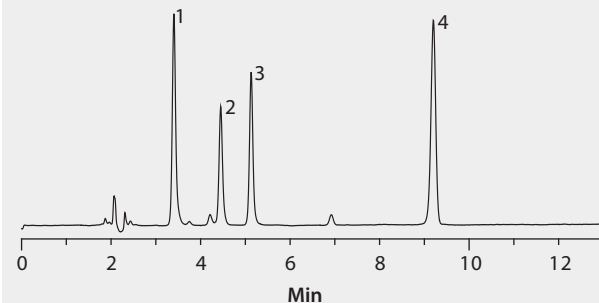


HPLC Analysis of Fat Soluble Vitamins by Normal Phase Chromatography on Ascentis® Si (25 cm Column)

Ascentis silica is used in the analysis of fat-soluble vitamins using a normal phase gradient. These include vitamin K 3 (menadione), vitamin E (alpha and gamma tocopherol), and vitamin D3 (cholecalciferol).

column Ascentis Si, 25 cm x 4.6 mm I.D., 5 µm particles (581512-U)
mobile phase (A) hexane; (B) ethyl acetate
gradient 10 to 30% B in 10 min; held at 30% B for 2 min
flow rate 1.0 mL/min
column temp. 30 °C
detector UV, 290 nm
injection 10 µL
Application No. **G005697**

1. alpha-Tocopherol
2. Menadione
3. gamma-Tocopherol
4. Cholecalciferol



HPLC Analysis of Fat Soluble Vitamins on Ascentis® Express RP-Amide, Methanol Mobile Phase

Analysis was conducted using standard solution, detection via UV.

column Ascentis Express RP-Amide, 15 cm x 4.6 mm I.D.,
2.7 µm particles (53931-U)

mobile phase methanol

flow rate 1.0 mL/min

pressure 1653 psi (114 bar)

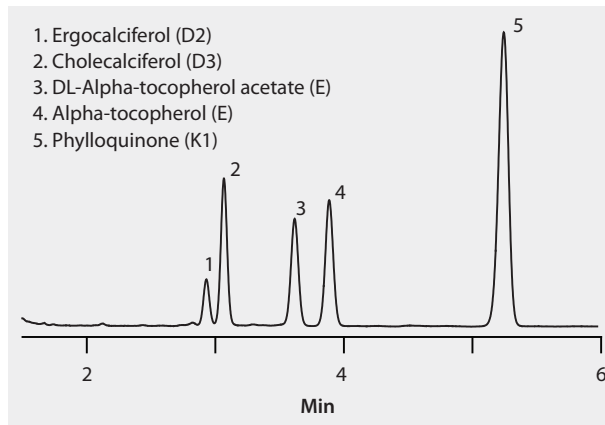
column temp. 30 °C

detector UV, 280 nm

injection 5 µL

sample 0.4 mg/mL tocopherol acetate, alpha-tocopherol
and K1, 0.04 mg/mL D2 and D3, all in ethanol

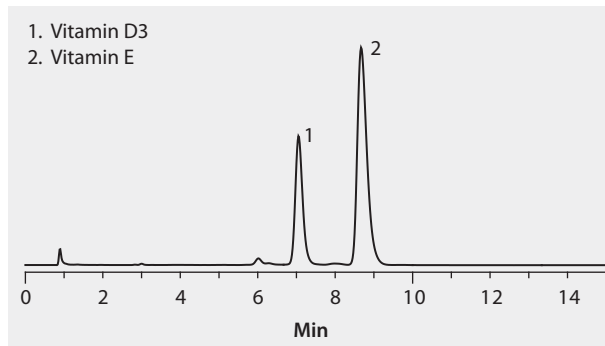
Application No. [G005862](#)



HPLC Analysis of Fat Soluble Vitamins on Ascentis® RP-Amide

The Ascentis RP-Amide is shown to be suitable for the analysis of fat soluble vitamins, alpha tocopherol (vitamin E) and cholecalciferol (vitamin D3).

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase acetonitrile
flow rate 2.0 mL/min
column temp. 35 °C
detector UV, 215 nm
injection 20 µL
Application No. **G005698**



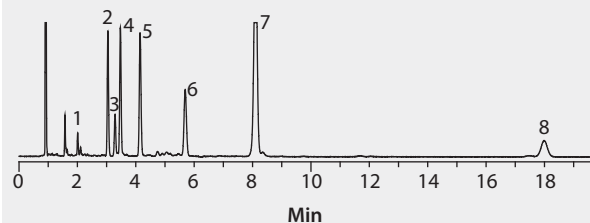
HPLC Analysis of Fat-Soluble Vitamins on Ascentis® Express C18, Methanol Mobile Phase

Analysis was conducted using standard solution, detection via UV.

column . . . Ascentis Express C18, 15 cm x 4.6 mm I.D., 2.7 µm particles (53829-U)
mobile phase methanol
flow rate 1.5 mL/min
pressure 3249 psi (224 bar)
column temp. 30 °C
detector UV, 280 nm
injection 5 µL
sample 0.5 mg/mL tocopherol acetate, alpha-tocopherol,
delta-tocopherol and K1, 0.05 mg/mL D2, D3 and
retinol acetate, 1.5 mg/mL retinol palmitate, all in ethanol.

Application No. [G005861](#)

1. Retinol acetate (A)
2. Delta-tocopherol (E)
3. Ergocalciferol (D2)
4. Cholecalciferol (D3)
5. Alpha-tocopherol (E)
6. DL-alpha-tocopherol acetate (E)
7. Phylloquinone (K1)
8. Retinol palmitate (A)



HPLC Analysis of Fat Soluble Vitamins on Ascentis® Express RP-Amide, Acetonitrile Mobile Phase

Analysis was conducted using standard solution, detection via UV.

column Ascentis Express RP-Amide, 15 cm x 4.6 mm I.D.,
2.7 µm particles (53931-U)

mobile phase acetonitrile

flow rate 1.5 mL/min

pressure 1682 psi (116 bar)

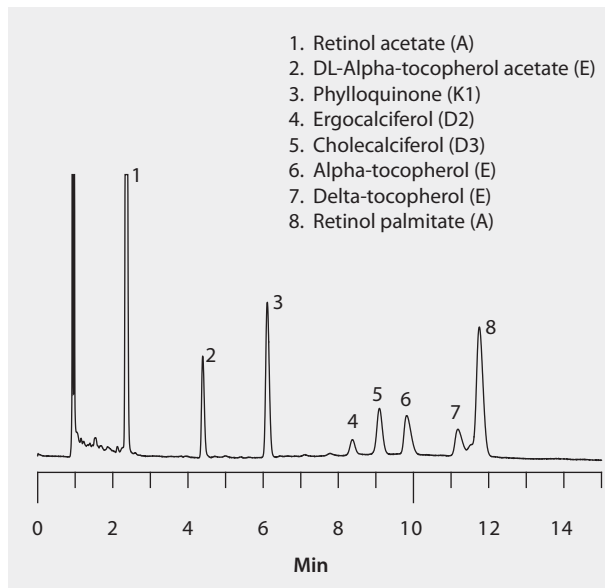
column temp. 30 °C

detector UV, 280 nm

injection 5 µL

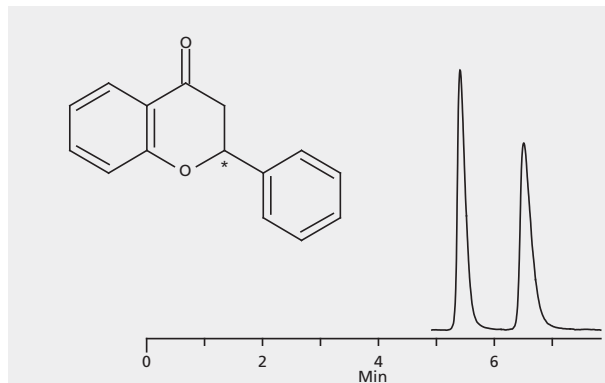
sample 0.5 mg/mL tocopherol acetate, alpha-tocopherol,
delta-tocopherol and K1, 0.05 mg/mL D2, D3 and
retinol acetate, 1.5 mg/mL retinol palmitate, all in ethanol

Application No. **G005860**



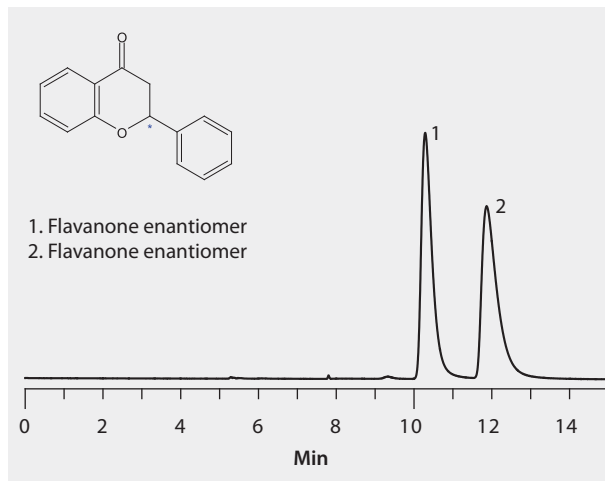
HPLC Analysis of Flavanone Enantiomers on Astec® CYCLOBOND® I 2000 DMP, Ethanol:Hexane Mobile Phase

column . . . CYCLOBOND I 2000 DMP, 25 cm x 4.6 mm I.D., 5 µm particles (20724AST)
mobile phase (A) ethanol; (B) hexane; (20:80, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. [G004697](#)



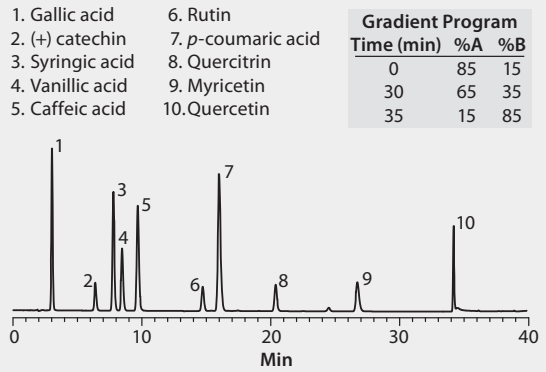
HPLC Analysis of Flavanone Enantiomers on Astec® CYCLOBOND® I 2000 DMP, IPA:Heptane Mobile Phase

column . . . CYCLOBOND I 2000 DMP, 25 cm x 4.6 mm I.D., 5 µm particles (20724AST)
mobile phase (A) isopropanol; (B) heptane; (30:70, A:B)
flow rate 0.6 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 5 µL
sample flavanone, 1 mg/mL in heptane
Application No. **G005161**



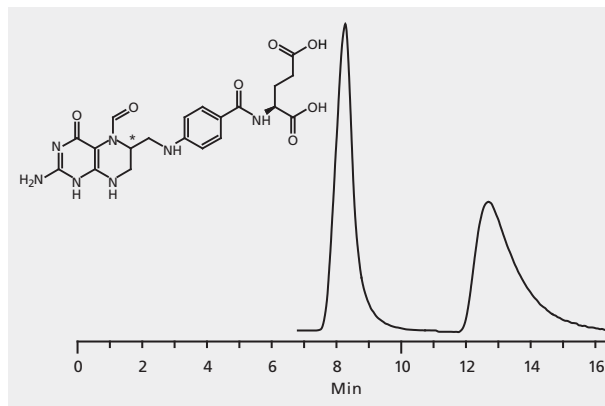
HPLC Analysis of Flavonoids on Ascentis® RP-Amide

column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
 mobile phase (A) 0.085% orthophosphoric acid; (B) acetonitrile;
 flow rate 1.0 mL/min
 column temp. 30 °C
 detector UV, 280 nm
 injection 10 µL
 sample as indicated in mobile phase A
 Application No. **G003025**



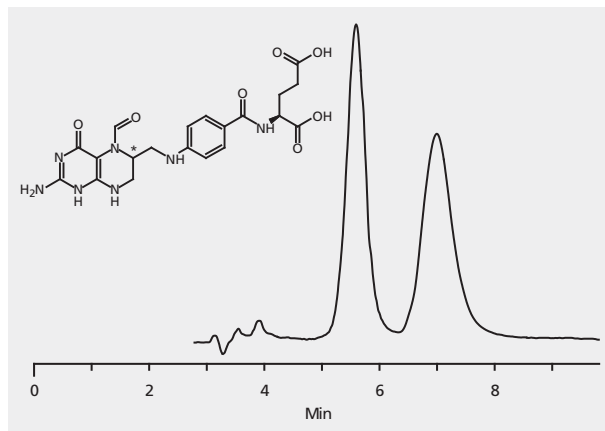
HPLC Analysis of Folinic Acid Enantiomers on Astec® CHIROBIOTIC® T

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase . . . (A) methanol; (B) acetic acid; (C) triethylamine; (100:1:0.5, A:B:C)
flow rate 2 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 2 µL
sample 5 mg/mL in methanol
Application No. [G004541](#)



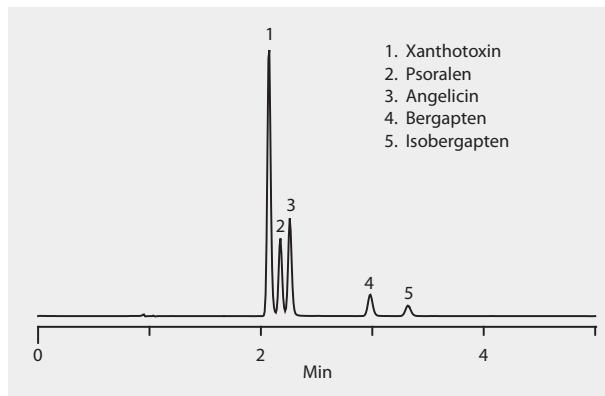
HPLC Analysis of Folinic Acid Enantiomers on Astec® CHIROBIOTIC® T (RP mode)

column CHIROBIOTIC T, 25 cm x 4.6 mm I.D., 5 µm particles (12024AST)
mobile phase (A) 1% triethylamine acetate, pH 4.5; (B) ethanol; (50:50, A:B)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 5 µL
sample 1.25 mg/mL in methanol
Application No. [G004542](#)



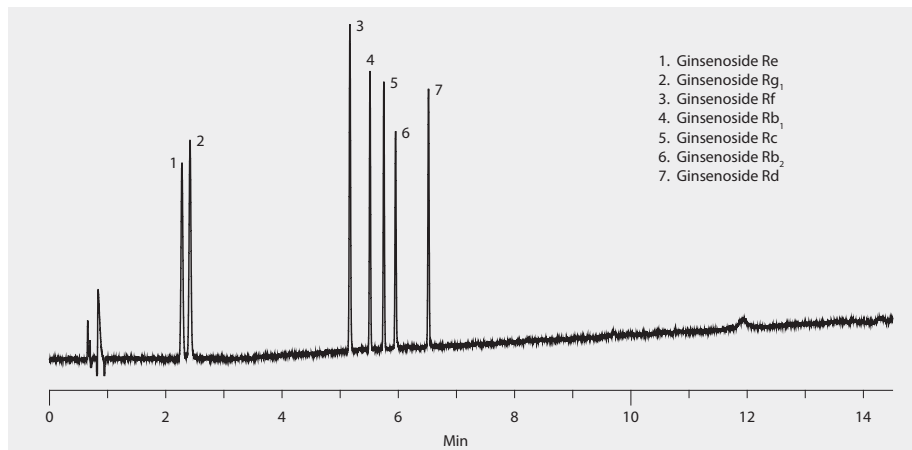
HPLC Analysis of Furocoumarins on Ascentis® Express RP-Amide

column Ascentis Express RP-Amide, 10 cm x 4.6 mm I.D.,
2.7 µm particles (53929-U)
mobile phase (A) water; (B) methanol; (40:60, A:B)
flow rate 1.0 mL/min
pressure 2843 psi (196 bar)
column temp. 35 °C
detector UV, 254 nm
injection 5 µL
sample 25 µg/mL in water:methanol (90:10)
Application No. **G005394**



HPLC Analysis of Ginsenosides on Ascentis® Express C18

column . . . Ascentis Express C18, 15 cm x 4.6 mm I.D., 2.7 µm particles (53829-U)
mobile phase (A) water; (B) acetonitrile
gradient . . . 25% B for 1.5 min; 25 to 85% B in 12 min; hold at 85% B for 1 min
flow rate 1 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 5 µL
sample 50 µg/mL in 82:18, water:methanol
Application No. **G005443**

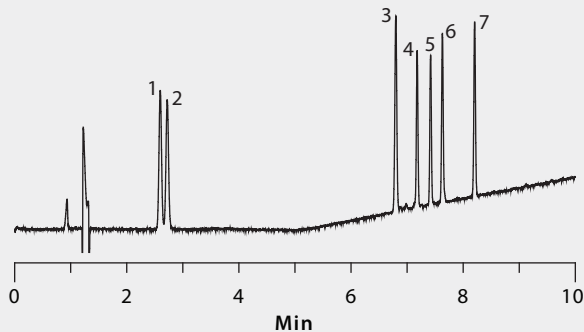


HPLC Analysis of Ginsenosides on Ascentis® Express 5 µm

column . . . Ascentis Express C18, 15 cm x 4.6 mm I.D., 5 µm particles (50537-U)
mobile phase (A) water, (B) acetonitrile
gradient 25% B held for 3 min; to 85% B in 12 min; 85% B held for 1 min
flow rate 1 mL/min
pressure 1470 psi (101 bar)
column temp. 60 °C
detector UV, 205 nm
injection 5 µL
sample 50 µg/mL in 82:18, water:acetonitrile
Application No. **G005888**

1. Ginsenoside Re
2. Ginsenoside Rg1
3. Ginsenoside Rf
4. Ginsenoside Rb1

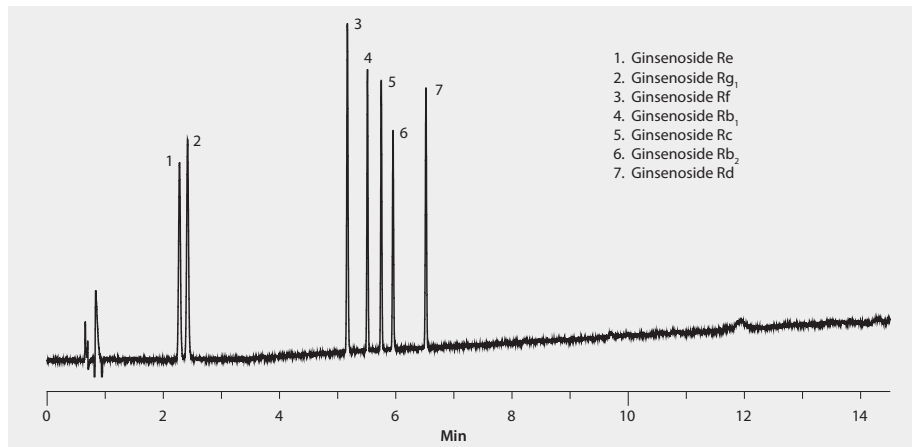
5. Ginsenoside Rc
6. Ginsenoside Rb2
7. Ginsenoside Rd



HPLC Analysis of Ginsenoside Standards on Ascentis® Express C18

This application demonstrates the suitability of Ascentis Express C18 for the efficient separation of ginseng.

column . . . Ascentis Express C18, 15 cm x 4.6 mm I.D., 2.7 µm particles (53829-U)
mobile phase (A): water; (B): acetonitrile
gradient . . . held at 25% for 1.5 min; 25 to 85% B in 12 min; held at 85% B for 1 min
flow rate 1.0 mL/min
pressure 3481 psi (240 bar)
column temp. 60 °C
detector UV, 205 nm
injection 25 µL
sample 50 µg/mL in water:methanol (82:18)
Application No. [G005397](#)



HPLC Analysis of Herbal Supplement Containing Milk Thistle on Ascentis® Express C18

This application demonstrates the suitability of Ascentis Express C18 for the efficient separation of milk thistle containing herbal supplement.

column . . . Ascentis Express C18, 10 cm x 3.0 mm I.D., 2.7 µm particles (53814-U)

mobile phase (A) water with 0.1% formic acid;

(B) methanol

gradient held at 35% B for 3 min; 35 to 45% B in 10 min;
held at 45% B for 2 min; 45 to 100% B in 5 min

flow rate 0.6 mL/min

pressure 4105 psi (283 bar)

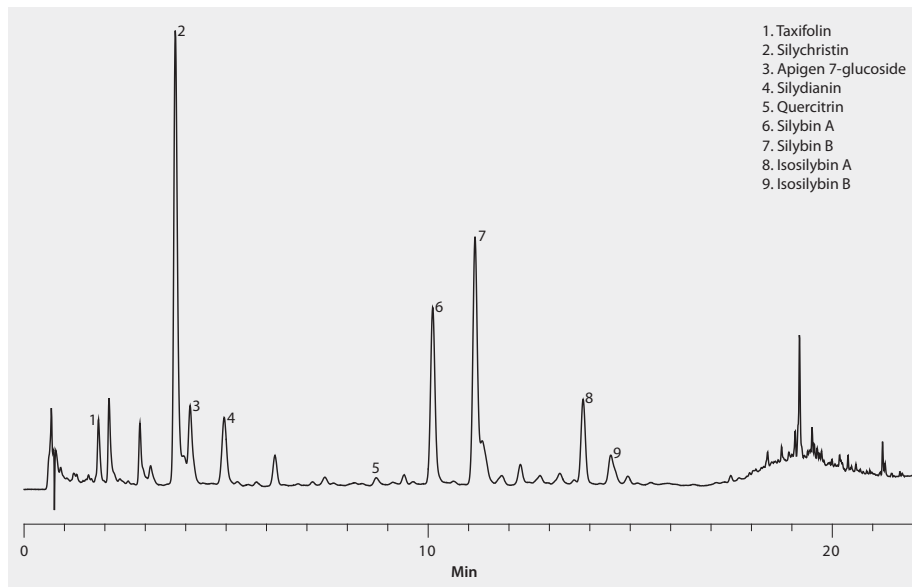
column temp. 35 °C

detector UV, 254 nm

injection 20 µL

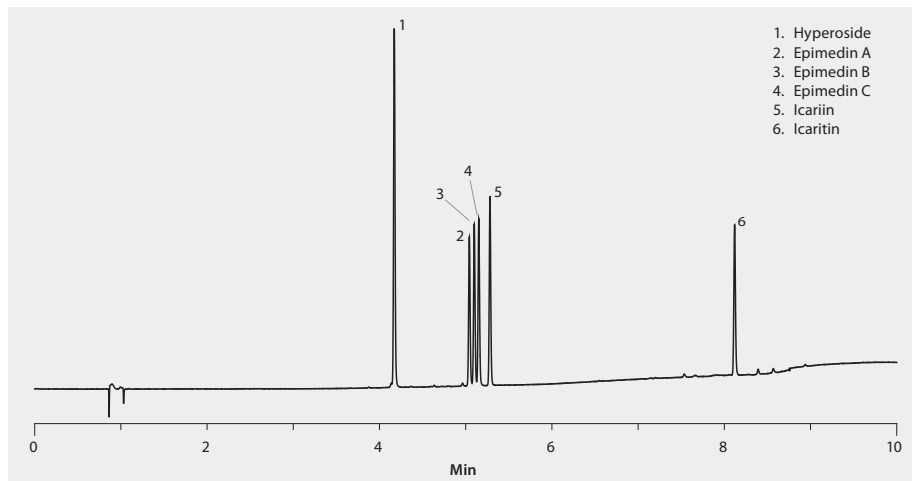
sample 20 mg/mL in water:ethanol (5:95); sonicate 15 minutes;
filter 0.45 µm; dilute to water:ethanol (80:20)

Application No. **G005604**



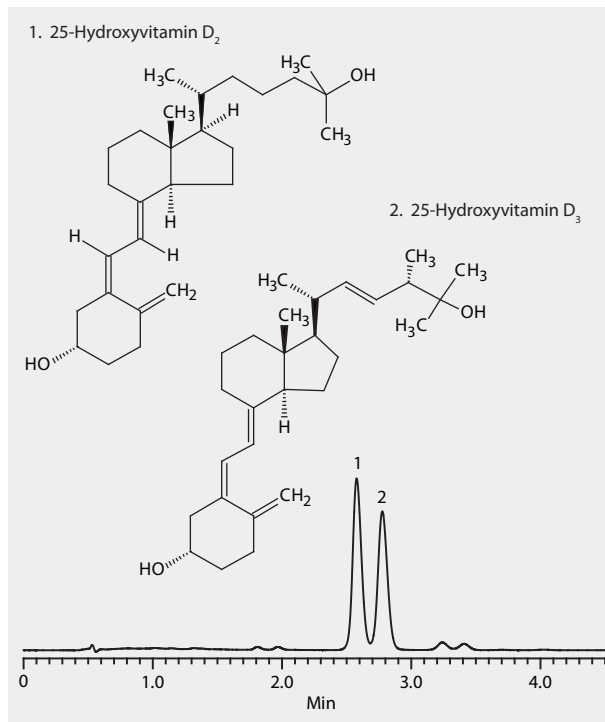
HPLC Analysis of Horn Goat Weed Standards Using Ascentis® Express C18 5 µm

column . . . Ascentis Express C18, 15 cm x 4.6 mm I.D., 5 µm particles (50537-U)
mobile phase . . . (A) 0.1% acetic acid in water; (B) 0.1% acetic acid in acetonitrile;
gradient 5% B held for 0.75 min; to 40% B in 3.75 min;
to 100% B in 3.5 min; 100% B held for 2 min
flow rate 1.5 mL/min
pressure 2120 psi (146 bar)
column temp. 35 °C
detector UV, 250 nm
injection 5.0 µL
sample 50 µg/mL 70:30, water:methanol
Application No. **G006310**



HPLC Analysis of 25-Hydroxyvitamin D3 and 25-Hydroxyvitamin D2 on Ascentis® Express F5

mobile phase (A) 7 mM ammonium formate; (B) methanol; (25:75, A:B)
 flow rate 0.4 mL/min
 column temp. 40 °C
 detector UV, 250 nm
 ESI(+), TIC m/z 100 - 1000
 injection 1 µL
 sample 300 mg/L in 25:75, water:methanol
 column Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 µm particles (53569-U)
 Application No. **G005374**



HPLC Analysis of Isoflavones in Soy Milk on Ascentis® Express RP Amide (Milk Brand 1)

This application demonstrates the separation of seven isoflavones on Ascentis Express RP Amide

column . . . Ascentis Express RP-Amide, 10 cm x 3 mm I.D., 2.7 µm particles (53918-U)
 mobile phase . . . (A) 0.1% formic acid in water; (B) 0.1% formic acid in methanol
 gradient . . . held at 15% B for 1 min; 15 to 100% in 5 min; held at 100% B for 1 min;
 100-15% B in 0.1 min; held at 15% B for 2.9 min

flow rate 0.8 mL/min

pressure 2900 psi (200 bar)

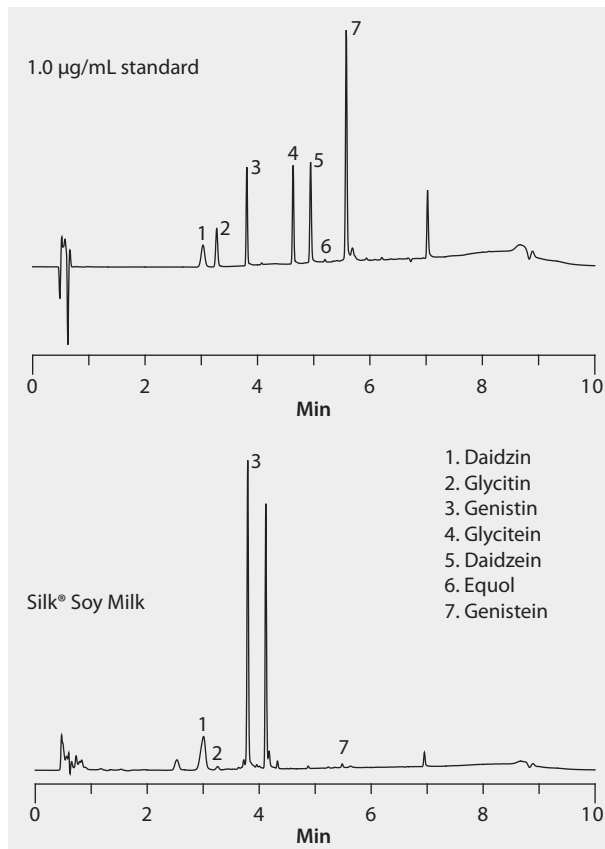
column temp. 30 °C

detector UV, 260 nm

injection 10 µL

sample soy milk, methanol extract (1. Measure 2 mL of each brand of soy milk (6 samples) 2. Add 8 mL of methanol and shake for 1 hour 3. Centrifuge tubes at 10000 rpm for 30 minutes 4. Transfer aliquot to autosampler vial)

Application No. **G005918**



HPLC Analysis of Isoflavones in Soy Milk on Ascentis® Express RP Amide (Milk Brand 2)

This application demonstrates the separation of seven isoflavones on Ascentis Express RP Amide

column . . . Ascentis Express RP-Amide, 10 cm x 3 mm I.D., 2.7 µm particles (53918-U)
 mobile phase . . . (A) 0.1% formic acid in water; (B) 0.1% formic acid in methanol
 gradient . . . held at 15% B for 1 min; 15 to 100% in 5 min; held at 100% B for 1 min;
 100-15% B in 0.1 min; held at 15% B for 2.9 min

flow rate 0.8 mL/min

pressure 2900 psi (200 bar)

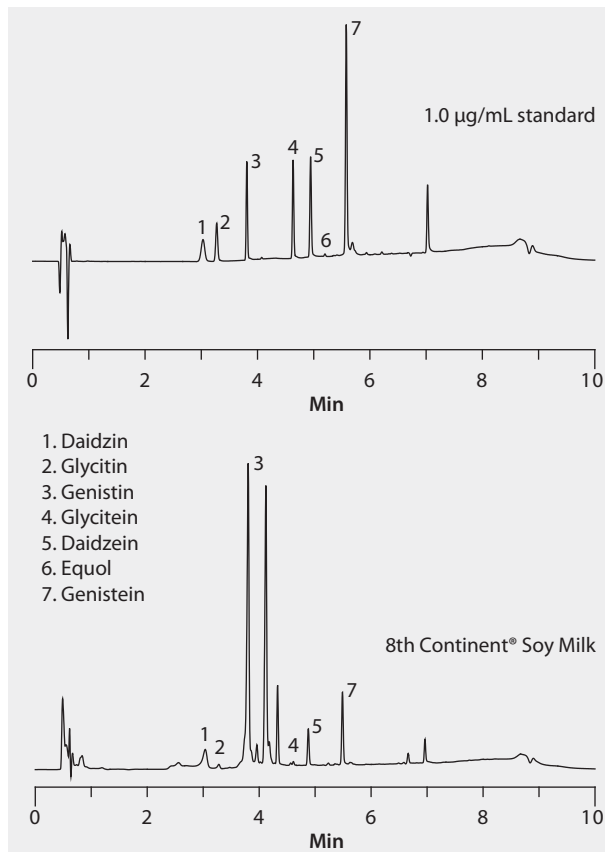
column temp. 30 °C

detector UV, 260 nm

injection 10 µL

sample soy milk, methanol extract (1. Measure 2 mL of each brand of soy milk (6 samples) 2. Add 8 mL of methanol and shake for 1 hour 3. Centrifuge tubes at 10000 rpm for 30 minutes 4. Transfer aliquot to autosampler vial)

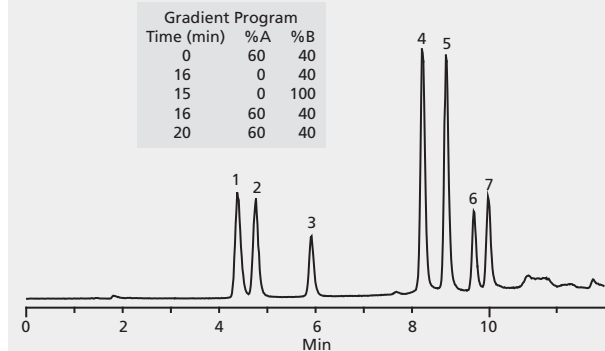
Application No. **G005917**



HPLC Analysis of Isoflavones on Ascentis® Phenyl

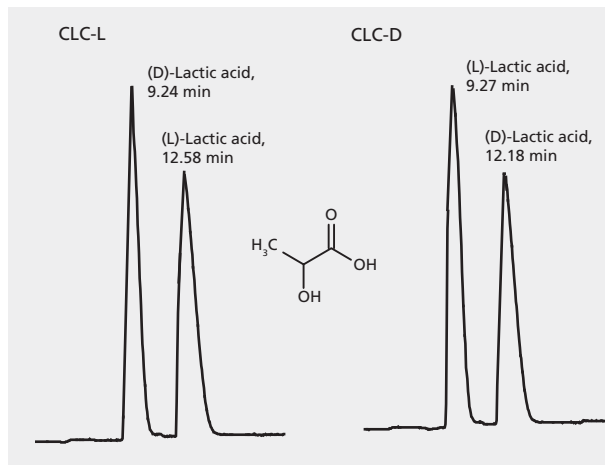
column Ascentis Phenyl, 15 cm × 4.6 mm I.D., 5 µm particles (581616-U)
 mobile phase (A) 10 mM ammonium formate (pH 3.0 with concentrated formic acid), (B) methanol
 flow rate 1 mL/min split to the MS
 column temp. 35 °C
 detector MS, ESI(+) in selected ion recording (SIR) mode
 injection 10 µL
 sample glycitein, genistein at 1 µg/mL, equol at 50 µg/mL and daidzin, glycitin, genistin at 10 µg/mL in 60:40 10 mM ammonium formate (pH 3.0 with concentrated formic acid):methanol
 Application No. **G003868**

1. Daidzin (M+H)+ = 417.11
2. Glycitin (M+H)+ = 447.12
3. Genistin (M+H)+ = 433.10
4. Daidzein (M+H)+ = 255.05
5. Glycitein (M+H)+ = 285.06
6. Equol (M+H)+ = 243.09
7. Genistein (M+H)+ = 271.05



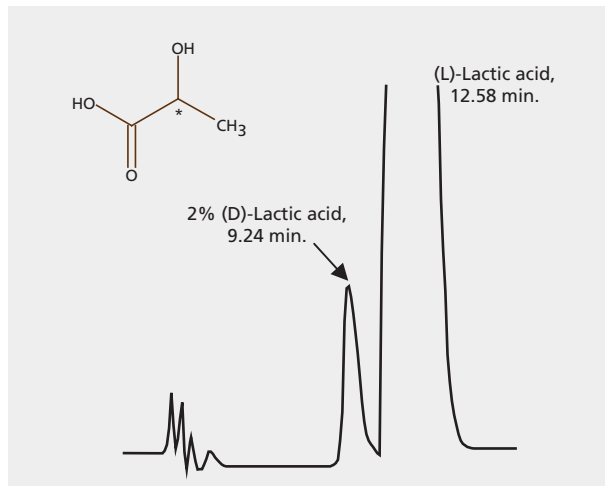
HPLC Analysis of Lactic Acid Enantiomers on Astec® CLC-L and CLC-D

column Astec CLC-L and CLC-D, 15 cm x 4.6 mm I.D.,
5 µm particles (53023AST, 53123AST)
mobile phase 5 mM copper sulfate
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
Application No. **G004399**



HPLC Analysis of Lactic Acid Enantiomers on Astec® CLC-L, Trace Level Detection

column Astec CLC-L, 15 cm x 4.6 mm I.D., 5 µm particles (53123AST)
mobile phase 5 mM copper sulfate
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
sample 5 mg/mL in water
Application No. [G004663](#)



HPLC Analysis of Maté Leaves on Ascentis® Express C18

sample/matrix . . . UAE (Ultrasonic Extraction) maté extract (dried and minced leaves (7.5 g) from maté were extracted with 225 mL of methanol in an ultrasonic bath, thermostated at 75 ± 0.5 °C (potency: 90 W; frequency: 40 kHz))

column . . . Ascentis Express C18, 150 x 4.6 mm I.D., 2.7 µm particles (53829-U)

mobile phase . . . (A) water, pH 3 with formic acid;
(B) acetonitrile, pH 3 with formic acid

gradient . . . 0 to 5% B in 20 min; 5 to 40% B in 30 min

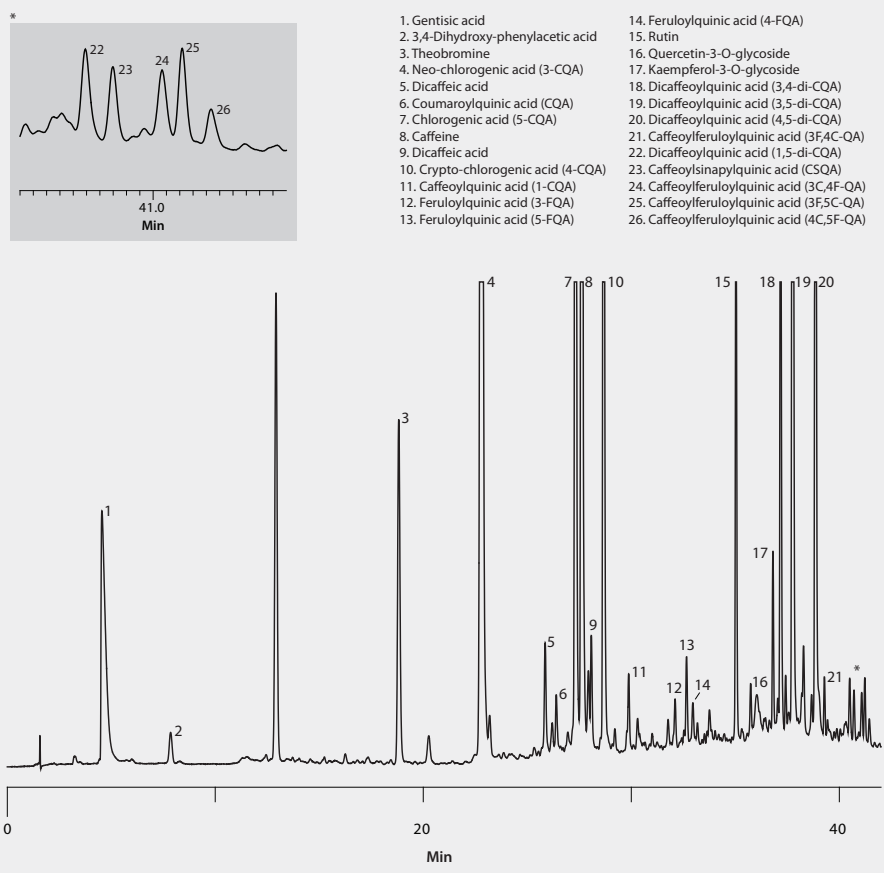
flow rate . . . 1 mL/min

column temp. . . 25 °C

detector . . . PDA: range 215- 420 nm (8 µL detector cell volume, cell temp. 40 °C, sampling rate 12.5 Hz, time constant 0.025 s)

injection . . . 10 µL

Application No. . . . **G005594**

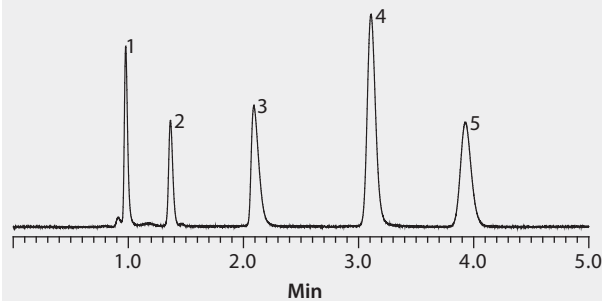


HPLC Analysis of Organic Acids on Ascentis® Express RP-Amide

This application demonstrates the suitability of Ascentis Express RP-Amide for the analysis of organic acids under 100% aqueous conditions.

column Ascentis Express RP-Amide, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53913-U)
mobile phase (A) 0.1% (v/v) TFA in (B) water
flow rate 0.3 mL/min
column temp. 35 °C
detector UV, 210 nm
injection 1 µL
sample 0.2 - 4 g/L in mobile phase
Application No. [G005714](#)

1. L-Tartaric acid
2. Lactic acid
3. Citric acid
4. Acrylic acid
5. Fumaric acid

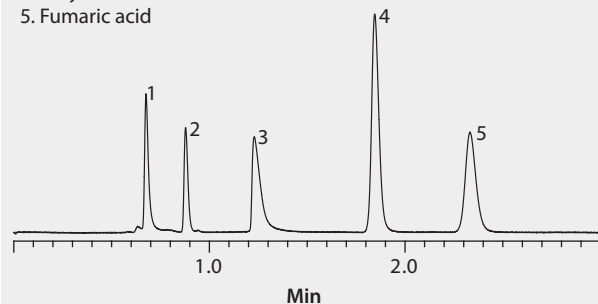


HPLC Analysis of Organic Acids on Ascentis® RP-Amide

This application demonstrates the suitability of Ascentis RP-Amide for the analysis of organic acids under 100% aqueous conditions.

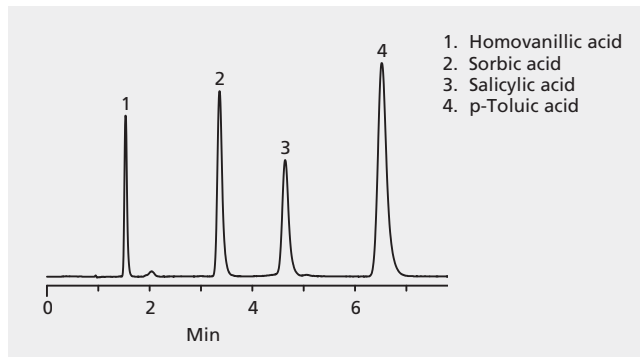
column Ascentis RP-Amide, 10 cm x 2.1 mm I.D., 3 µm particles (565301-U)
mobile phase (A) 0.1% (v/v) TFA in (B) water
flow rate 0.3 mL/min
column temp. 35 °C
detector UV, 210 nm
injection 1 µL
sample 0.2 - 4 g/L in mobile phase
Application No. **G005715**

1. L-Tartaric acid
2. Lactic acid
3. Citric acid
4. Acrylic acid
5. Fumaric acid



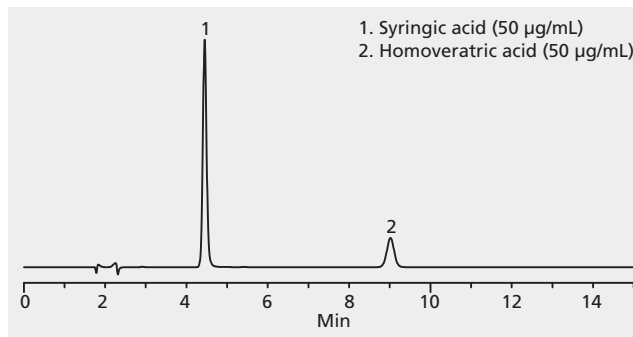
HPLC Analysis of Organic Acids on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase (A) methanol; (B) water, 0.1% TFA (40:60, A:B)
flow rate 1 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 10 µL
sample 1 mg/mL each analyte
Application No. [797-0657](#)



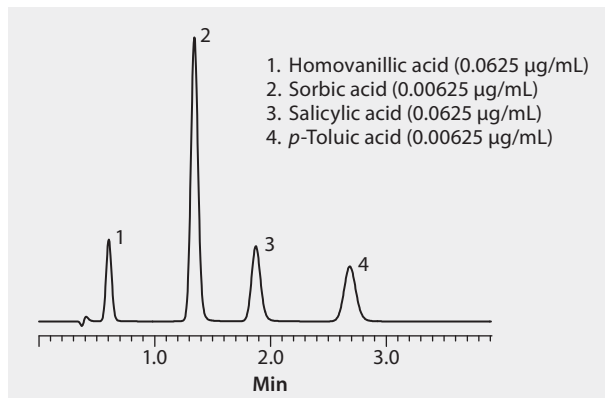
HPLC Analysis of Organic Acids on Ascentis® C8

column Ascentis C8, 15 cm x 4.6 mm I.D., 5 µm particles (581424-U)
mobile phase (A) 10 mM ammonium phosphate monobasic (pH 2.50 with phosphoric acid); (B) acetonitrile; (80:20, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample as indicated in mobile phase
Application No. **G003160**



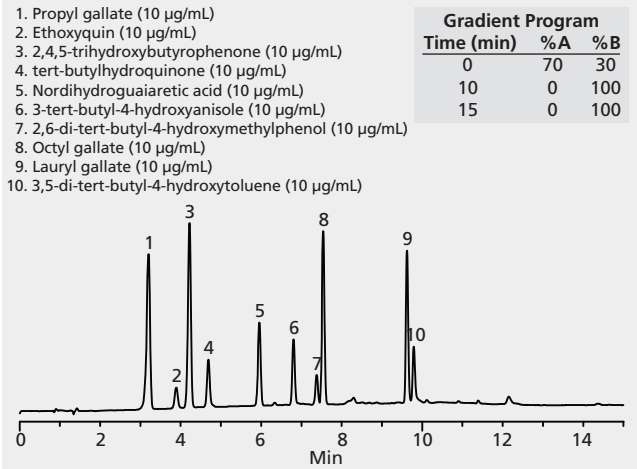
HPLC Analysis of Organic Acids on Discovery® C18

column Discovery C18, 5 cm × 4.6 mm I.D., 5 µm particles (504947)
mobile phase (A) 0.1% TFA in (B) water:methanol; (60:40, A:B)
flow rate 2.0 mL/min
column temp. 20 °C
detector UV, 254 nm
injection 10 µL
Application No. **G001431**



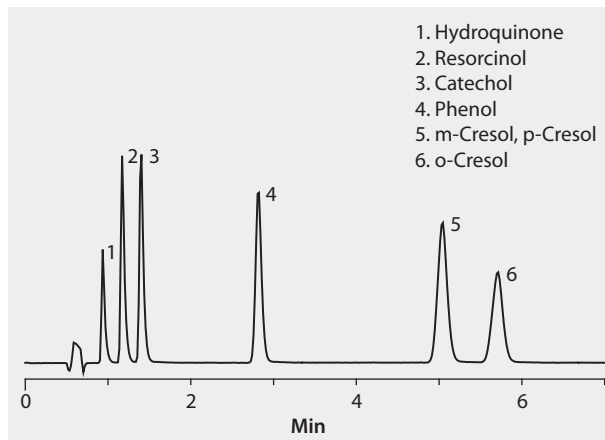
HPLC Analysis of Phenolic Antioxidants on Ascentis® C8

column Ascentis C8, 15 cm x 4.6 mm I.D., 5 µm particles (581424-U)
 mobile phase (A) 5% acetic acid; (B) (50:50) methanol:acetonitrile
 flow rate 2.0 mL/min
 column temp. 30 °C
 detector UV, 280 nm
 injection 10 µL
 sample as indicated in 50:50 acetonitrile:2-propanol
 Application No. [G003054](#)



HPLC Analysis of Phenolic Compounds on Ascentis® Express RP-Amide

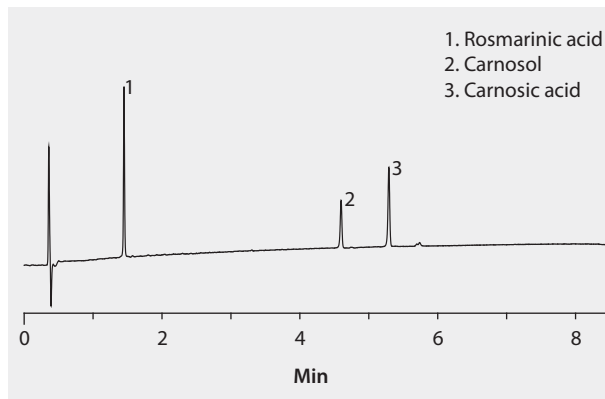
Chromatography of Seven Phenol Compounds on Ascentis Express RPA column Ascentis Express RP-Amide, 10 cm x 4.6 mm I.D., 2.7 µm particles (53929-U)
mobile phase (A) 20 mM phosphoric acid, pH 2; (B) acetonitrile; (75:25, A:B)
flow rate 1.5 mL/min
column temp. 35 °C
detector UV, 270 nm
injection 25 µL
sample 50 mg/L in mobile phase
Application No. **G005719**



HPLC Analysis of Phenolics from Rosemary on Ascentis® Express C8

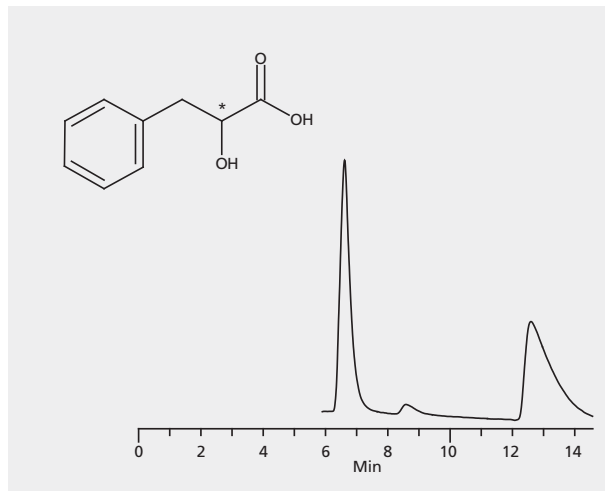
This application demonstrates the suitability of Ascentis Express C8 for the efficient separation of phenolics from rosemary.

column Ascentis Express C8, 5 cm x 3 mm I.D., 2.7 µm particles (53848-U)
mobile phase . . . (A) 0.1% formic acid in water; (B) 0.1% formic acid in acetonitrile
gradient 15 to 100% B in 8.5 min
flow rate 0.6 mL/min
column temp. 35 °C
detector UV, 214 nm
injection 2 µL
sample 100 mg/L in 75 µM EDTA, 1.5 mM ascorbate, 15% acetonitrile
Application No. [G005717](#)



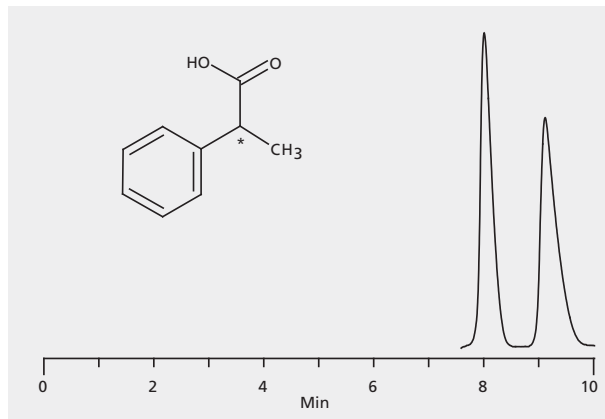
HPLC Analysis of 3-Phenyllactic Acid Enantiomers on Astec® CHIROBIOTIC® R

column CHIROBIOTIC R, 25 cm x 4.6 mm I.D., 5 µm particles (13024AST)
mobile phase 0.1% ammonium acetate in methanol
flow rate 1 mL/min
column temp. 25 °C
detector UV, 230 nm
injection 0.5 µL
sample 1 mg/mL in methanol
Application No. [G004680](#)



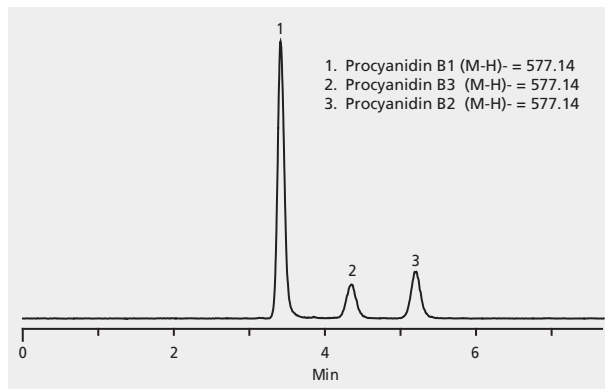
HPLC Analysis of 2-Phenylpropionic Acid Enantiomers on Astec® CYCLOBOND® I 2000 HP-RSP

column CYCLOBOND I 2000 HP-RSP, 25 cm x 4.6 mm I.D.,
5 µm particles (24024AST)
mobile phase . . (A) 10 mM ammonium acetate, pH 4.0; (B) acetonitrile; (75:25, A:B)
flow rate 1 mL/min
column temp. 25 °C
detector UV, 235 nm
injection 1 µL
sample 1 mg/mL in methanol
Application No. **G004717**



HPLC Analysis of Procyanidins on Ascentis® Phenyl

column Ascentis Phenyl, 15 cm × 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase (A) 10 mM ammonium formate,
(pH 3.0 with concentrated formic acid): (B) acetonitrile; (85:15, A:B)
flow rate 1.0 mL/min split to the MS
column temp. 35 °C
detector MS, ESI (-) in Single Ion Recording (SIR) Mode
injection 10 µL
sample 10 mg/mL in 85:15, 10 mM ammonium formate,
(pH 3.0 with concentrated formic acid): acetonitrile
Application No. [G003879](#)

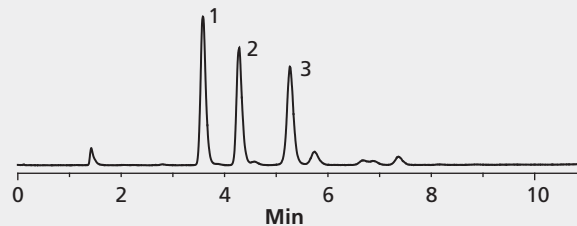


HPLC Analysis of Steroidal Glycosides on Ascentis® Phenyl

column Ascentis Phenyl, 15 cm x 4.6 mm I.D., 5 µm particles (581616-U)
mobile phase (A) 10 mM ammonium formate (pH 3 with formic acid); (B)
methanol
flow rate 1.25 mL/min
column temp. 35 °C
detector ELSD at 45 °C, gain 6, 3.5 bar N2
injection 20 µL
sample as indicated in mobile phase A
Application No. **G003714**

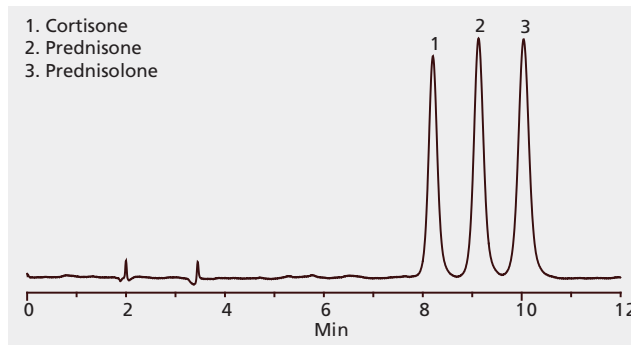
Gradient Program	
Time (min)	%B
0	70
10	90
10.5	70

1. Digoxin (100 µg/mL)
2. Glycyrrhetic acid (100 µg/mL)
3. Digitonenin (200 µg/mL)



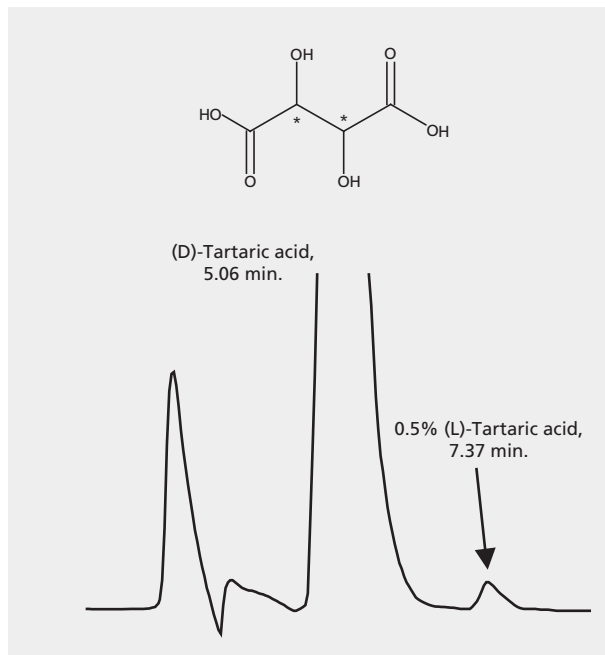
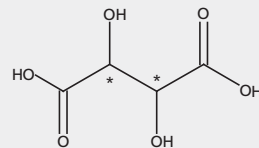
HPLC Analysis of Steroids on Ascentis® Si

column Ascentis Si, 15 cm x 4.6 mm I.D., 5 µm particles (581512-U)
mobile phase (A) hexane; (B) ethanol; (88:12, A:B)
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 245 nm
injection 10 µL
sample 50 µg/mL in 85:15, hexane:2-propanol
Application No. [G003728](#)



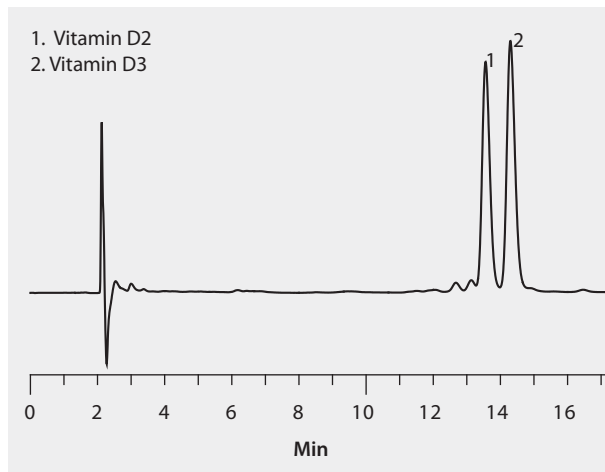
HPLC Analysis of Tartaric Acid Enantiomers on Astec® CLC-D, Trace Level Detection

column Astec CLC-D, 15 cm x 4.6 mm I.D., 5 µm particles (53023AST)
mobile phase 3 mM copper sulfate, pH 3.2
flow rate 1 mL/min
column temp. 25 °C
detector UV, 254 nm
injection 10 µL
sample 5 mg/mL in water
Application No. [G004665](#)



HPLC Analysis of Vitamin D2 and D3 on Ascentis® Express C18

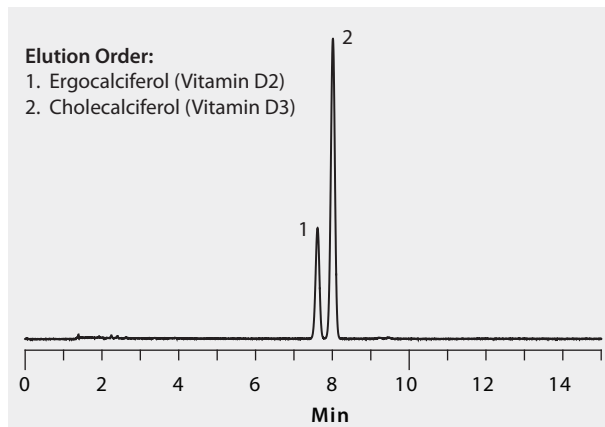
column . . . Ascentis Express C18, 15 cm x 2.1 mm I.D., 2.7 µm particles (53825-U)
mobile phase acetonitrile
flow rate 0.15 mL/min
column temp. 35 °C
detector UV, 290 nm
injection 10 µL
sample 10 mg/L each (vitamins D2 and D3) in methanol
Application No. [G005615](#)



HPLC Analysis of Vitamin D2 and D3 on Ascentis® Express C18 5 µm

This application demonstrates the suitability of the Ascentis Express C18, 5 µm, for the routine analysis of the fat-soluble vitamins D2 and D3. Structures along with the optimized chromatogram obtained on the Ascentis Express C18, 5 µm are presented.

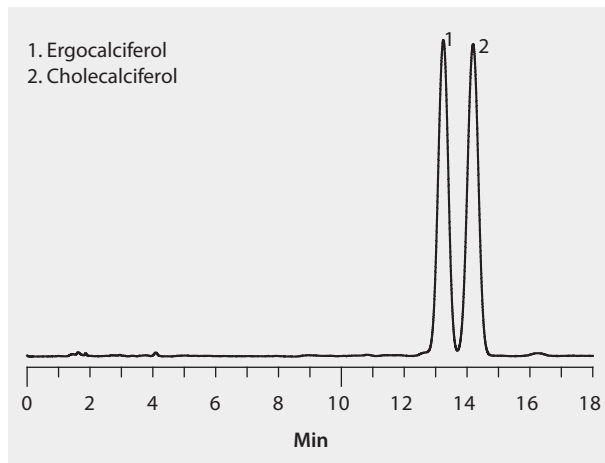
column . . . Ascentis® Express C18, 25 cm x 4.6 mm I.D., 5 µm particles (50538-U)
mobile phase (A) acetonitrile; (B) methanol; (95:5, A:B)
flow rate 1.5 mL/min
pressure 1726 psi (119 bar)
column temp. 35 °C
detector UV, 265 nm
injection 10 µL
sample 50 µg/mL in 90:10, acetonitrile:methanol
Application No. [G005891](#)



HPLC Analysis of Vitamin D2 and Vitamin D3 on Ascentis® C18

This application demonstrates the suitability of the Ascentis C18 for the analysis of the fat-soluble vitamins D2 and D3. Structures along with the optimized chromatogram obtained on the Ascentis C18 are presented.

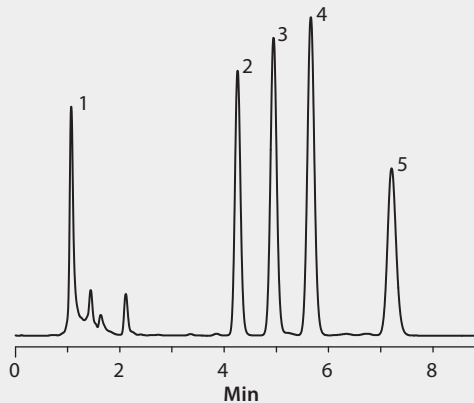
column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase acetonitrile
flow rate 1.0 mL/min
column temp. 35 °C
detector UV, 290 nm
sample 50 µg/mL each in acetonitrile
Application No. [G005614](#)



HPLC Analysis of Vitamins, Fat Soluble (A and E), on Discovery® C8

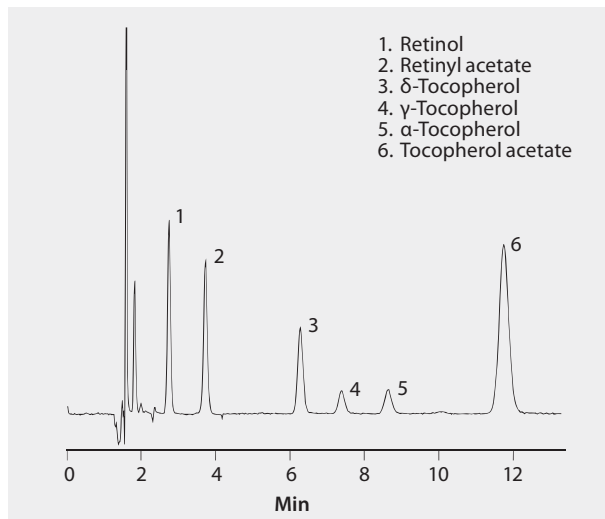
column Discovery C8, 15 cm × 4.6 mm I.D., 5 µm particles (59353-U)
mobile phase (A) acetonitrile: (B) water (90:10 v/v, A:B)
flow rate 2 mL/min
detector UV, 290 nm
injection 10 µL
Application No. **G000912**

1. Retinol acetate (Vitamin A acetate), 50 µg/mL
2. δ-Tocopherol, 165 µg/mL
3. γ-Tocopherol, 200 µg/mL
4. α-Tocopherol (Vitamin E), 292 µg/mL
5. α-Tocopherol acetate (Vitamin E acetate), 405 µg/mL



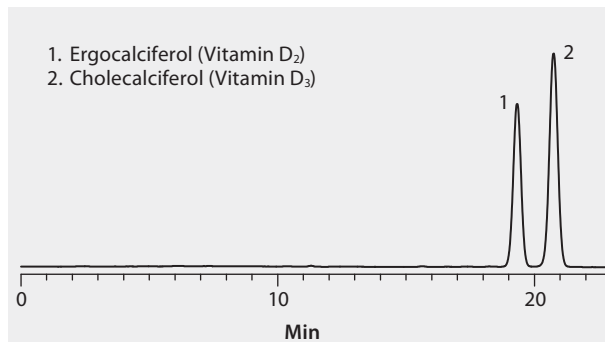
HPLC Analysis of Vitamins, Fat Soluble (A and E), on SUPELCOSIL™ LC-18

column SUPELCOSIL LC-18, 25 cm × 4.6 mm I.D., 5 μm particles (58298)
mobile phase (A) methanol: (B) deionized water (98:2, A:B)
flow rate 2 mL/min
detector UV, 325 nm (retinol, retinyl acetate) or
290 nm (tocopherols, tocopherol acetate)
injection 20 μL
sample 0.2-1 mg/mL each analyte in methanol
Application No. [712-0679](#)



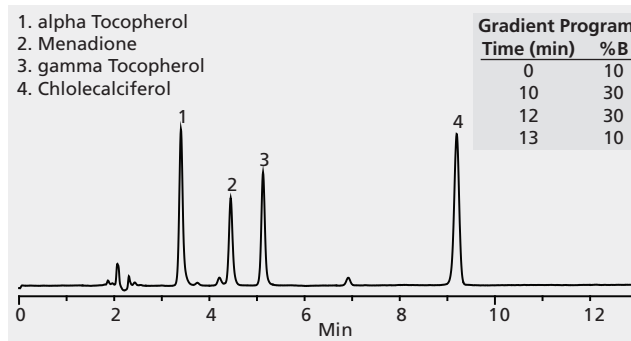
HPLC Analysis of Vitamins, Fat Soluble (D2 and D3), on Discovery® HS C18

column Discovery HS C18, 15 cm × 4.6 mm I.D., 3 µm particles (569252-U)
mobile phase 100% acetonitrile
flow rate 0.8 mL/min
column temp. 30 °C
detector UV, 290 nm
injection 10 µL
sample 50 µg/mL each analyte
Application No. [G001419](#)



HPLC Analysis of Vitamins, Fat Soluble, on Ascentis® Si

column Ascentis Si, 15 cm x 4.6 mm I.D., 5 µm particles (581512-U)
mobile phase (A) hexane; (B) ethylacetate
flow rate 1.0 mL/min
column temp. 30 °C
detector UV, 290 nm
injection 10 µL
sample as indicated in 96:4 (hexane:isopropanol)
Application No. [G003727](#)



HPLC Analysis of B-vitamins in vitamin water using Ascentis® Express RP-Amide and UV detection

The vitamin water drink was filtered using 0.2 µm Nylon filter and injected into UHPLC for B-vitamin analysis

column Ascentis Express RP-Amide, 10 cm x 3.0 mm I.D.,
2.7 µm particles (53918-U)

mobile phase (A) 20 mM potassium phosphate, pH 3; (B) methanol
gradient held at 0.5% B for 1.5 minutes, to 25% B in 1.0 minutes,
held at 25% B for 1.7 minute, held at 0.5% B for 1.2 minutes

flow rate 0.75 mL/min

pressure 5584 psi (385 bar)

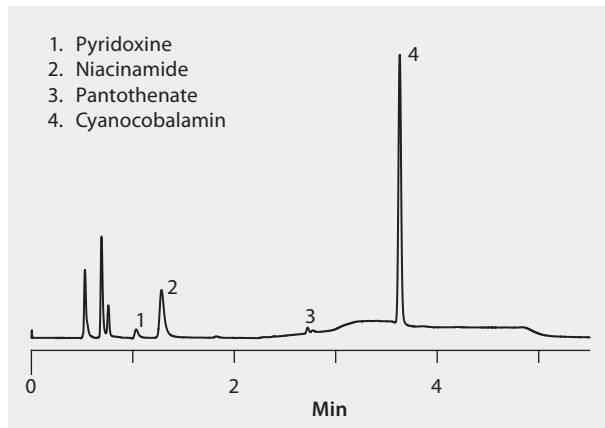
column temp. 30 °C

detector UV, 210 nm

injection 0.5 µL

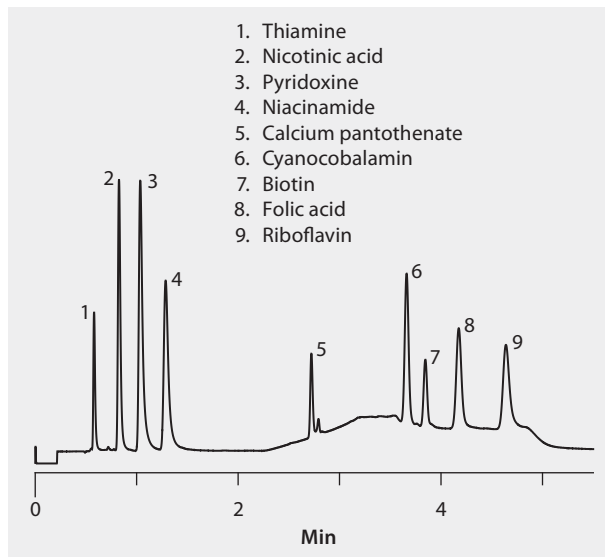
sample vitamin water was filtered through 0.2µm nylon syringe filter

Application No. [G006214](#)



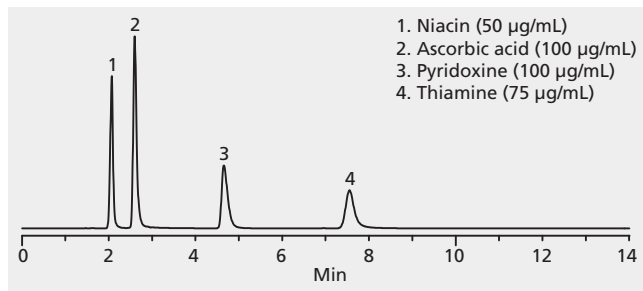
HPLC Analysis of B-vitamins on Ascentis® Express RP-Amide using UV detection

column Ascentis Express RP-Amide, 10 cm x 3.0 mm I.D.,
2.7 µm particles (53918-U)
mobile phase (A) 20 mM potassium phosphate, pH 3; (B) methanol;
gradient 0.5% B held for 1.5 minutes, to 25% B in 1.0 minutes,
held at 25% B for 1.7 minute, held at 0.5% B for 1.2 minutes
flow rate 0.75 mL/min
pressure 5584 psi (385 bar)
column temp. 30 °C
detector UV, 210 nm
injection 0.5 µL
sample 100 ug/mL of all vitamins except 250 ug/mL of
calcium pantothenate, biotin and riboflavin in water
Application No. **G006215**



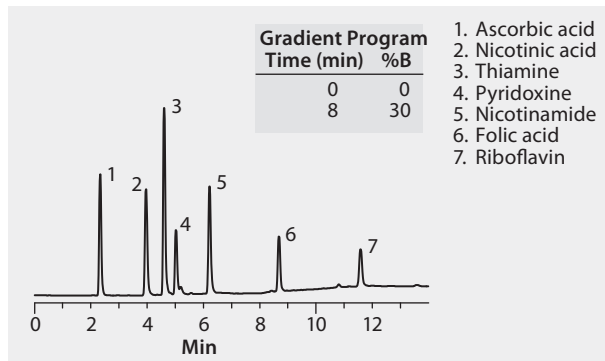
HPLC Analysis of Vitamins, Water Soluble, on Ascentis® RP-Amide

column . . . Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase . . . 25 mM potassium phosphate, dibasic (pH 3.5 with phosphoric acid)
flow rate 1.0 mL/min
column temp. 30 °C
detector UV, 230 nm
injection 10 µL
sample as indicated in 25 mM potassium phosphate,
dibasic (pH 3.5 with phosphoric acid)
Application No. **G003035**



HPLC Analysis of Vitamins, Water Soluble, on Discovery® C8

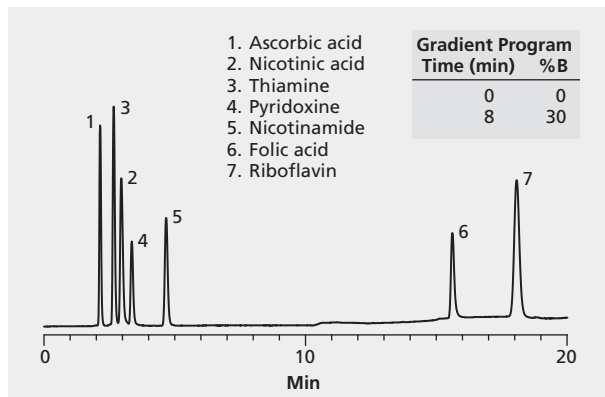
column Discovery C8, 15 cm × 4.6 mm I.D., 5 µm particles (59353-U)
mobile phase . . . (A) 50 mM potassium phosphate, monobasic, pH 4.5 to methanol:
(B) 50 mM potassium phosphate, monobasic, pH 4.(30:70) in 12 min
flow rate 1 mL/min
column temp. 35 °C
detector UV, 254 nm
injection 1 µL
Application No. **G000789**



HPLC Analysis of Vitamins, Water Soluble, on Discovery® RP-Amide C16

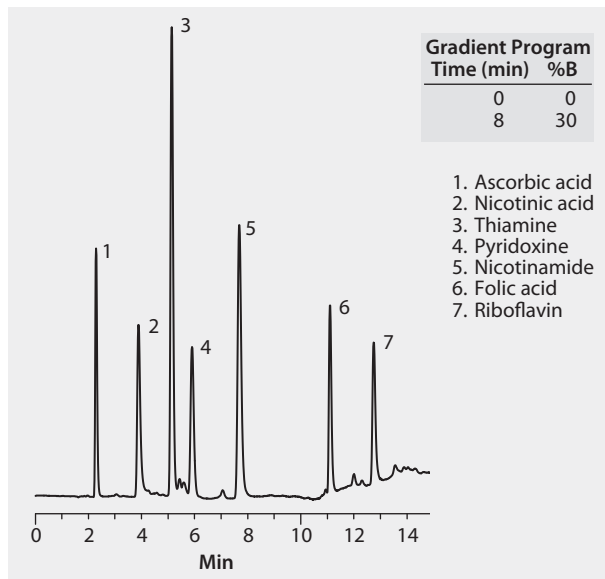
column . . . Discovery RP-Amide C16, 15 cm × 4.6 mm I.D., 5 µm particles (505013)
mobile phase (A) methanol; (B) 50 mM potassium phosphate,
monobasic, pH 4.5 (30:70, A:B)

column temp. 35 °C
detector UV, 220 nm
injection 10 µL
Application No. **G001171**



HPLC Analysis of Vitamins, Water Soluble on Discovery® C18

column Discovery C18, 15 cm × 4.6 mm I.D., 5 µm particles (504955)
mobile phase (A) 50 mM potassium phosphate, dibasic, pH 4.5 to methanol:
(B) 50mM potassium phosphate, dibasic, pH 4.0 (30:70, A:B) in 8 min
flow rate 1 mL/min
column temp. ambient
detector UV, 254 nm
injection 1 µL
Application No. **G000790**



HPLC Analysis of Vitexin and Related Compounds on Ascentis® Express RP-Amide

Vitexin is an apigenin flavone glucoside; a chemical compound found in the passion flower; Vitex agnus-castus (chaste tree or chasteberry) and in the Phyllostachys nigra bamboo leaves.[1] It is also found in the pearl millet (Pennisetum millet).[2] Vitexin is also found in Hawthorn.

Improved peak shape for the conjugates was obtained at higher temperatures. Note that citric acid may not be necessary as it was added as an attempt to improve peak shape at lower temps. It is expected that phosphoric acid or other acids will provide similar results.

column Ascentis Express RP-Amide, 10 cm x 3.0 mm I.D.,
2.7 um particles (53918-U)

mobile phase (A) 10 mM citric acid (B) acetonitrile (85:15, A:B)

flow rate 0.5 mL/min

pressure 1770 psi (122 bar)

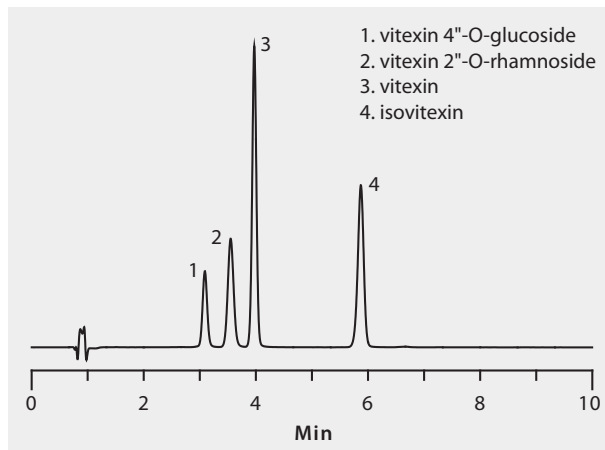
column temp. 55 °C

detector UV, 335 nm

injection 2 µL

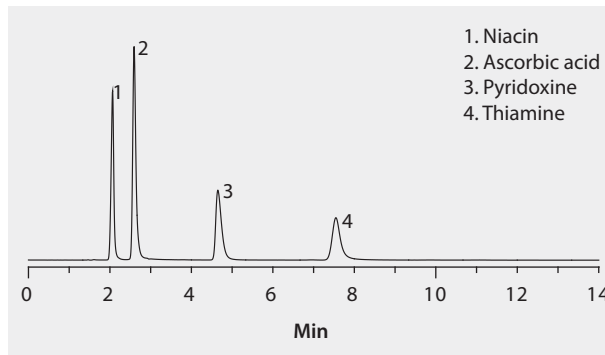
sample 100 ug/mL each in 40% methanol

Application No. **G005903**



HPLC Analysis of Water Soluble Vitamins on Ascentis® RP-Amide

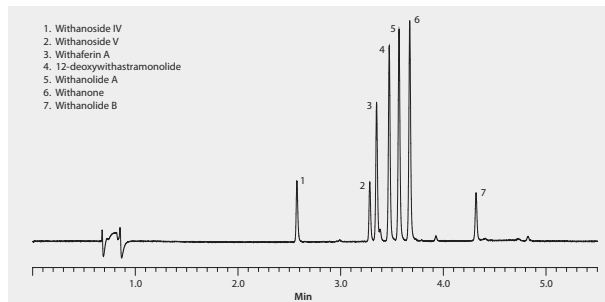
column Ascentis RP-Amide, 15 cm x 4.6 mm I.D., 5 µm particles (565324-U)
mobile phase 25 mM potassium phosphate monobasic, pH 3.5
flow rate 1.0 mL/min
column temp. 30 °C
detector UV, 230 nm
injection 10 µL
Application No. **G005735**



HPLC Analysis of Withania (Aswagandha) Standard on Ascentis® Express F5

This application demonstrates the suitability of Ascentis Express F5 for the efficient separation of withania standards.

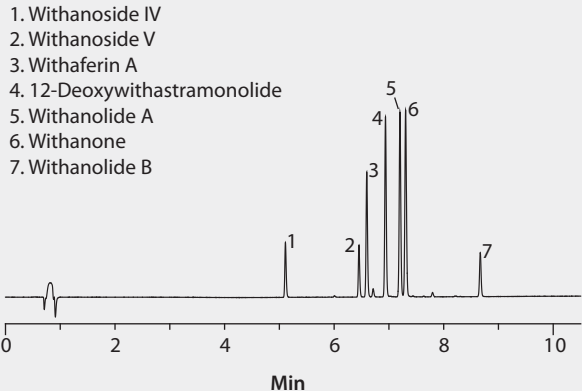
column . . . Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 µm particles (53569-U)
mobile phase (A) water; (B) acetonitrile
gradient 20 to 100% B in 10 min: held at 100% B for 0.5 min
flow rate 0.3 mL/min
pressure 2756 psi (190 bar)
column temp. 35 °C
detector UV, 227 nm
injection 5 µL
sample 20 µg/mL in 80:20, water:methanol
Application No. [G005447](#)



HPLC Analysis of Withania Compounds on Ascentis® Express Phenyl-Hexyl

This application demonstrates the suitability of Ascentis Express Phenyl-Hexyl for the efficient separation of withania standards.

column Ascentis Express Phenyl-Hexyl, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53336-U)
mobile phase (A) water; (B) acetonitrile
gradient 20 to 100% B in 10 min; held at 100% B for 0.5 min
flow rate 0.3 mL/min
pressure 2321 psi (160 bar)
column temp. 35 °C
detector UV, 227 nm
injection 5 µL
sample 20 µg/mL in water: methanol (80:20)
Application No. **G005660**



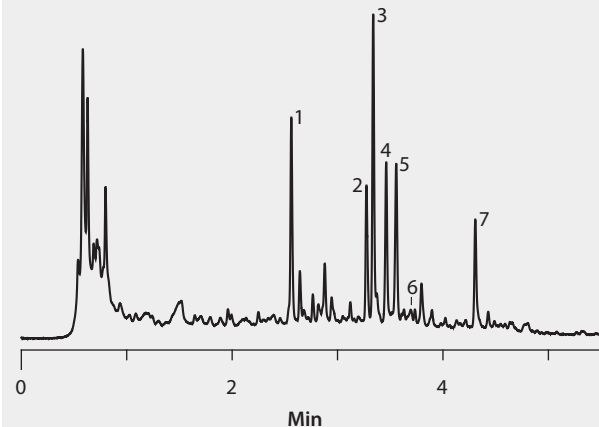
HPLC Analysis of Withania Extract on Ascentis® Express F5

This application demonstrates the suitability of Ascentis Express F5 for the efficient separation of withania extract.

column . . . Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 µm particles (53569-U)
mobile phase (A) water; (B) acetonitrile
gradient 20 to 100% B in 5 min; held at 100% B for 0.5 min
flow rate 0.3 mL/min
pressure 2750 psi (190 bar)
column temp. 35 °C
detector UV, 227 nm
injection 5 µL
sample 20 mg/mL in water:acetonitrile (50:50); sonicate for 15 minutes;
filter 0.45 µm; dilute to water:acetonitrile (80:20)

Application No. **G005613**

1. Withanoside IV
2. Withanoside V
3. Withaferin A
4. 12-Deoxywithasramonolide
5. Withanolide A
6. Withanone
7. Withanolide B



HPLC Analysis of Withania Extract on Ascentis® Express Phenyl-Hexyl

This application demonstrates the suitability of Ascentis Express Phenyl-Hexyl for the efficient separation of withania extract.

column Ascentis Express Phenyl-Hexyl, 10 cm x 2.1 mm I.D.,
2.7 µm particles (53336-U)

mobile phase (A) water; (B) acetonitrile

gradient 20 to 100% B in 10 min; held at 100% B for 0.5 min

flow rate 0.3 mL/min

pressure 160 bar (2320 psi)

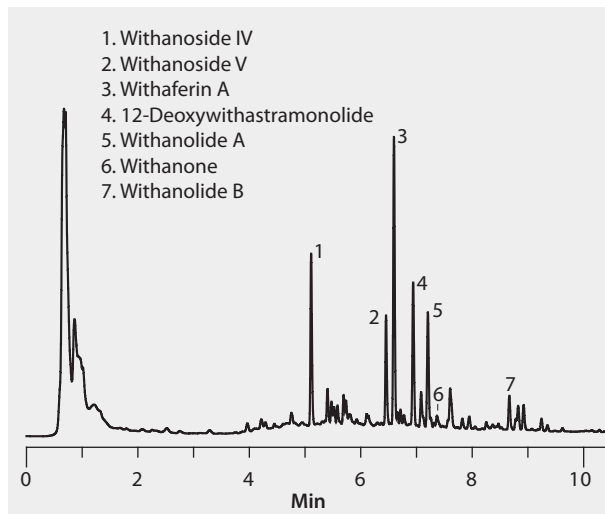
column temp. 35 °C

detector UV, 227 nm

injection 5 µL

sample 20 mg/mL in water:acetonitrile (50:50); sonicate 15 minutes;
filter 0.45 µm; dilute to water:acetonitrile (80:20)

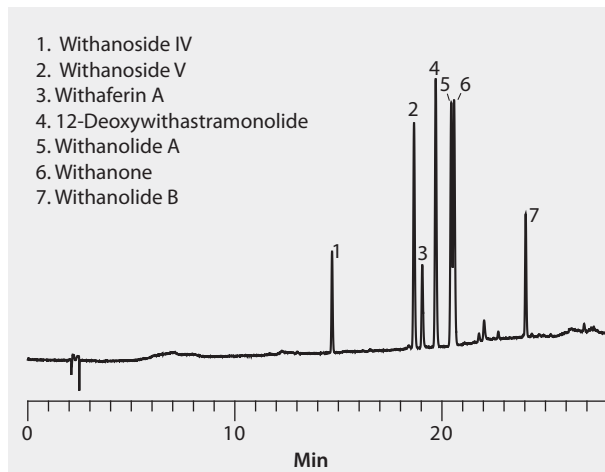
Application No. **G005610**



HPLC Analysis of Withania Standards on Discovery® C18

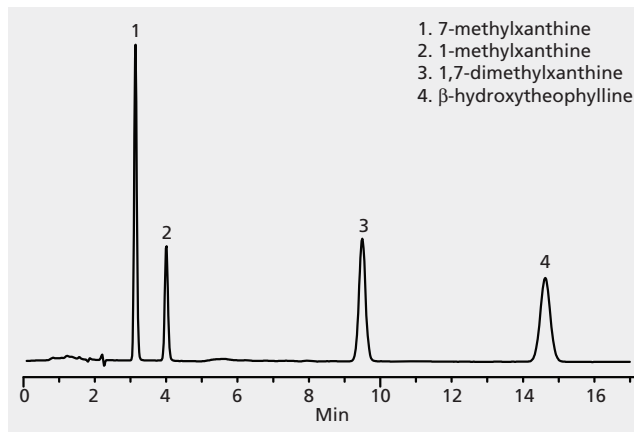
This application demonstrates the suitability of Discovery C18 for the efficient separation of withania standards by the USP monograph.

column Discovery C18, 25 cm x 4.6 mm I.D., 5 µm particles (504971)
mobile phase (A) 1 mM potassium phosphate, monobasic; (B) acetonitrile
gradient 5 to 45% B in 18 min; 45 to 80% B in 7 min; held at 80% B for 3 min
flow rate 1.5 mL/min
pressure 220 bar (3200 psi)
column temp. 27 °C
detector UV, 227 nm
injection 20 µL
sample 20 µg/mL in water: acetonitrile (86:14)
Application No. [G005611](#)



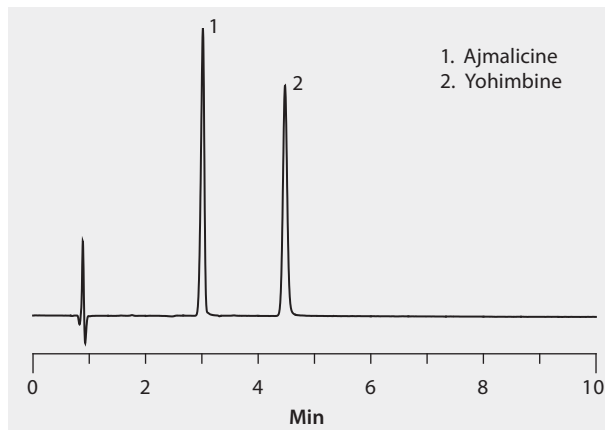
HPLC Analysis of Xanthines on Ascentis® C18

column Ascentis C18, 15 cm x 4.6 mm I.D., 5 µm particles (581324-U)
mobile phase (A) 10 mM monobasic potassium phosphate
(pH 3.0 with phosphoric acid); (B) methanol; (94:6, A:B)
flow rate 1 mL/min
column temp. 35 °C
detector UV, 220 nm
injection 10 µL
sample 50 µg/mL each in mobile phase
Application No. [G002465](#)



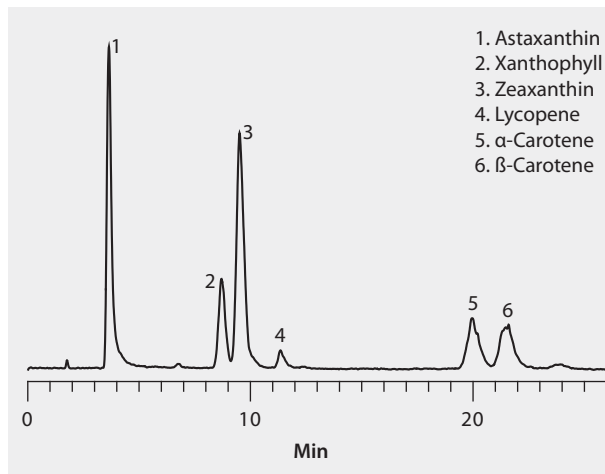
HPLC Analysis of Yohimbe Alkaloids on Ascentis® Express F5, HILIC Mode

column Ascentis Express F5, 3 cm x 3.0 mm I.D., 2.7 µm particles (53574-U)
mobile phase 2 mM ammonium acetate in 10:90 water:acetonitrile,
pH to 6.0 with acetic acid
flow rate 0.5 mL/min
pressure 1100 psi (76 bar)
column temp. 35 °C
detector UV, 275 nm
injection 2 µL
sample 100 ug/mL each in methanol
Application No. **G005904**



LC-MS Analysis of Carotene Compounds on Ascentis® RP-Amide

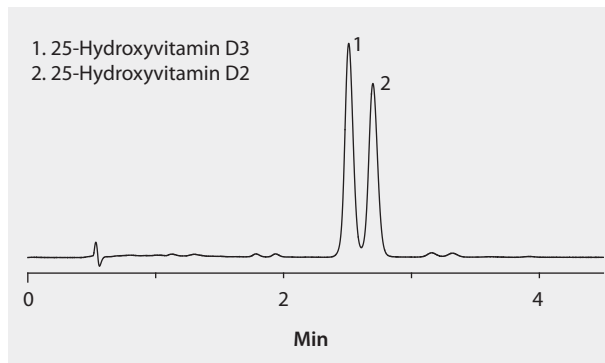
column Ascentis RP-Amide, 15 cm x 2.1 mm I.D., 5 µm particles (565305-U)
mobile phase acetonitrile
flow rate 0.2 mL/min
column temp. 35 °C
detector MS, APCI(+), SIM
injection 5 µL
sample 10 mg/L in acetonitrile
Application No. **G005609**



LC-MS Analysis of 25-Hydroxyvitamin D2 and 25-Hydroxyvitamin D3 on Ascentis® Express F5

The 25-OH forms of the secosteroids vitamin D2 and D3 are indicators of the vitamin D status of an individual. However, because they have different biological activity and clinical interest, they should be distinguishable. The F5 phase was able to resolve the two compounds under highly LC-MS/MS compatible conditions.

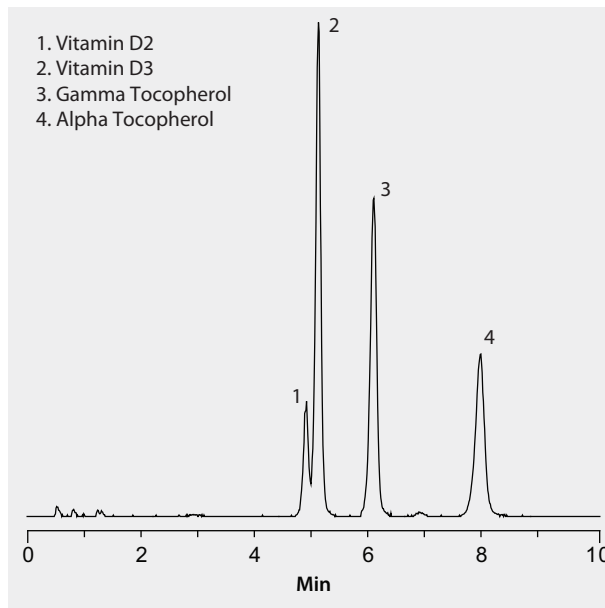
column . . . Ascentis Express F5, 10 cm x 2.1 mm I.D., 2.7 μ m particles (53569-U)
mobile phase . . . (A) 5 mM ammonium formate in (B) 75:25 (v/v) methanol:water
flow rate 0.4 mL/min
column temp. 40 °C
detector UV, 265 nm (MS, ESI(+), m/z 100-1000)
injection 1 μ L
sample 20 μ g/mL in methanol
Application No. [G005858](#)



LC-MS Analysis of Vitamin D2, D3, Gamma- and Alpha-Tocopherol on Ascentis® Express C18

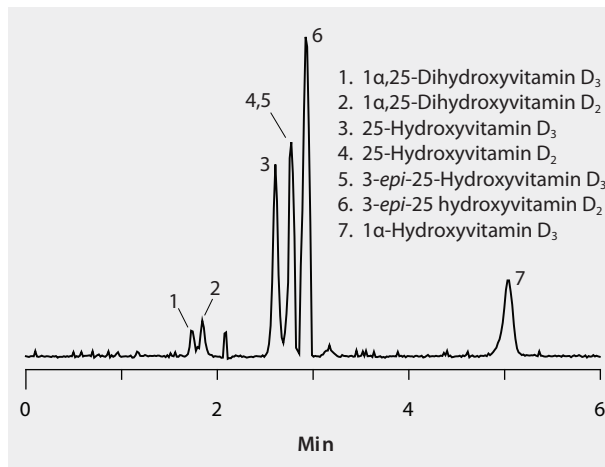
Analysis was conducted using standard solution, detection on LC/MS system.

column . . . Ascentis Express C18, 10 cm x 2.1 mm I.D., 2.7 µm particles (53823-U)
mobile phase (A) water; (B) acetonitrile; (5:95, A:B)
flow rate 0.4 mL/min
column temp. 40 °C
detector MS, ESI+
injection 2 µL
sample 1 µg/mL in acetonitrile
Application No. **G005806**



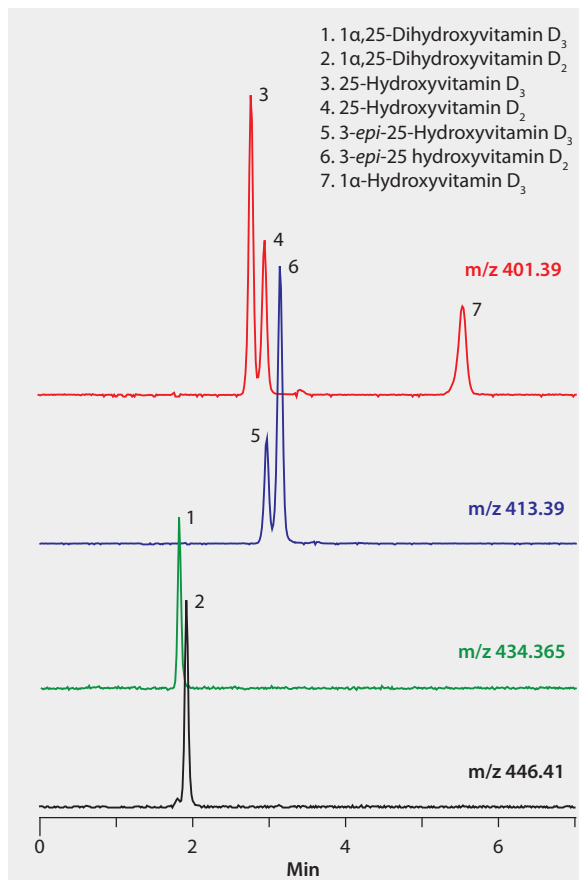
LC-MS/MS Analysis of Vitamin D Metabolites on Ascentis® Express F5

column . . . Ascentis Express F5, 15 cm x 2.1 mm I.D., 2.7 µm particles (53571-U)
mobile phase . . . (A) 5 mM ammonium formate water; (B) methanol; (25:75, A:B)
flow rate 0.4 mL/min
pressure 5178 psi (357 bar)
column temp. 40 °C
detector ESI(+), 100-1000 m/z
injection 2 µL, each compound 300 ng/mL in 40:60 (water:methanol)
Application No. [G005878](#)



LC-MS/MS Analysis of Vitamin D Metabolites on Ascentis® Express F5 (Monitored Ions)

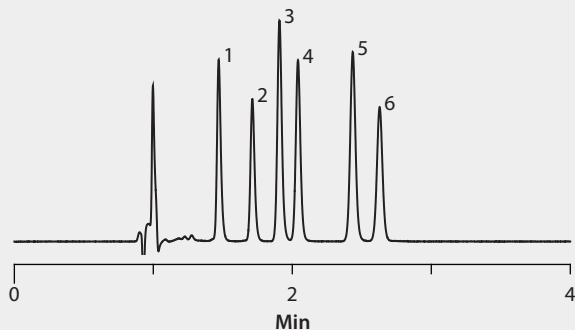
column . . . Ascentis Express F5, 15 cm x 2.1 mm I.D., 2.7 μ m particles (53571-U)
 mobile phase . . . (A) 5 mM ammonium formate water; (B) methanol; (25:75, A:B)
 flow rate 0.4 mL/min
 pressure 5178 psi (357 bar)
 column temp. 40 °C
 detector ESI(+), 100-1000 m/z
 injection 2 μ L, each compound 300 ng/mL in 40:60 (water:methanol)
 Application No. **G005876**



UHPLC Analysis of Boswellic Acids on Ascentis® Express 2.7 μ M Phenyl-Hexyl

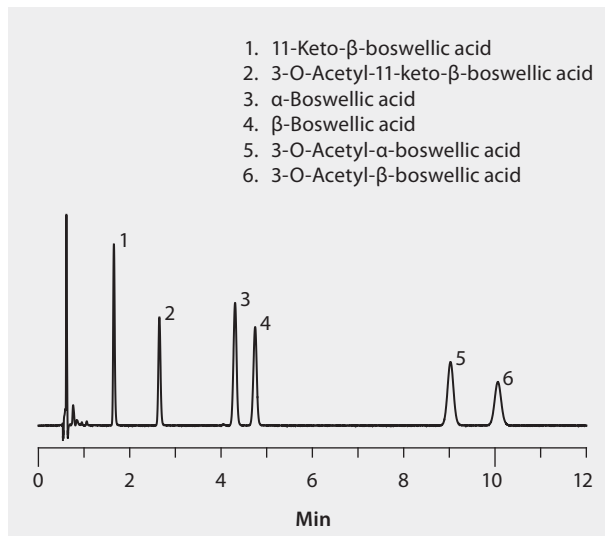
column Ascentis Express Phenyl-Hexyl, 10 cm x 3.0 mm I.D.,
2.7 μ m particles (53345-U)
mobile phase (A) 0.1% phosphoric acid; (B) acetonitrile; (10:90, A:B)
flow rate 0.4 mL/min
pressure 850 psi (59 bar)
column temp. 35 °C
detector UV, 210 nm
injection 2.0 μ L
sample 6 Boswellic Acids 50 μ g/mL in 70:30, water:methanol
Application No. [G006257](#)

1. 11-Keto- β -boswellic acid
2. 3-O-Acetyl-11-keto- β -boswellic acid
3. α -Boswellic acid
4. β -Boswellic acid
5. 3-O-Acetyl- α -boswellic acid
6. 3-O-Acetyl- β -boswellic acid



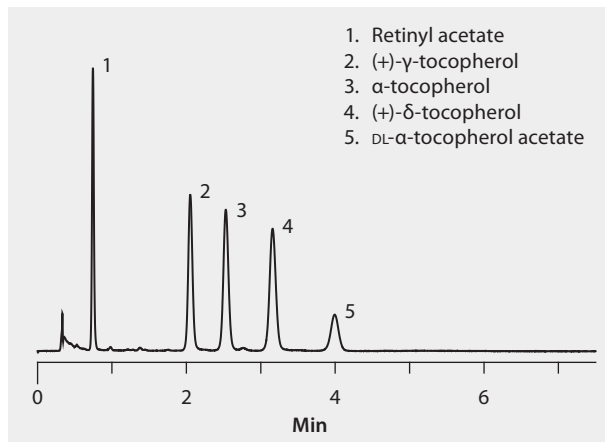
UHPLC Analysis of Boswellic Acids on Titan™ C18

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 μ m particles (577124-U)
mobile phase (A) 0.1% phosphoric acid; (B) acetonitrile; (10:90, A:B)
flow rate 0.4 mL/min
pressure 2450 psi (169 bar)
column temp. 35 $^{\circ}$ C
detector UV, 210 nm
injection 2.0 μ L
sample 6 Boswellic Acids 50 μ g/mL in 70:30, water:methanol
Application No. **G006258**



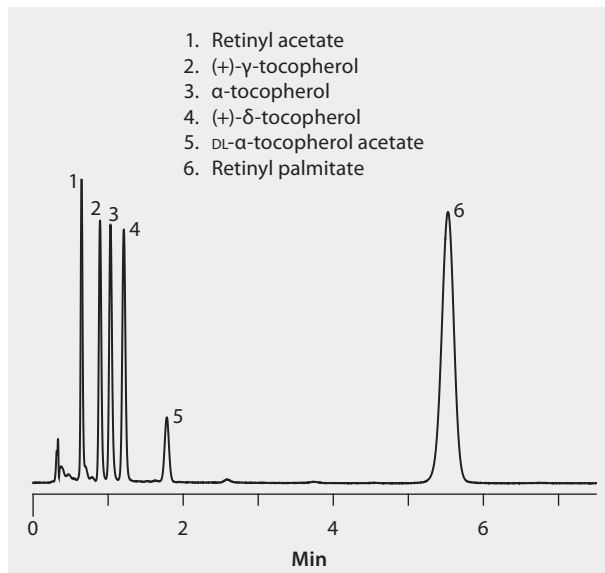
UHPLC Analysis of Fat Soluble Vitamins on Titan™ C18, Acetonitrile Mobile Phase

column TITAN C18, 50 mm x 2.1mm I.D. x 1.9 µm particles (577122-U)
mobile phase 100% acetonitrile
flow rate 0.4 mL/min
pressure 1755 psi (121 bar)
column temp. 30 °C
detector
injection 0.5 µL
sample All compounds at 0.5 mg/mL except
retinyl acetate at 0.05 mg/mL in methanol
Application No. **G006221**



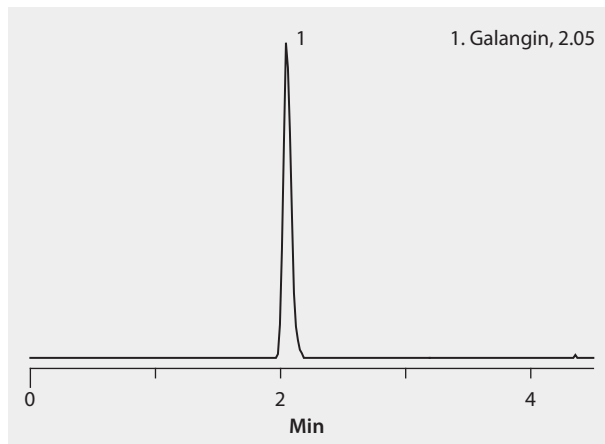
UHPLC Analysis of Fat Soluble Vitamins on Titan™ C18, Methanol Mobile Phase

column Titan C18, 50 mm x 2.1 mm I.D., 1.9 µm particles (577122-U)
mobile phase 100% methanol
flow rate 0.4 mL/min
pressure 2741 psi (189 bar)
column temp. 30 °C
injection UV, 280 nm
injection 0.5 µL
sample All compounds at 0.5 mg/mL except
retinyl acetate at 0.05 mg/mL in methanol
Application No. [G006222](#)



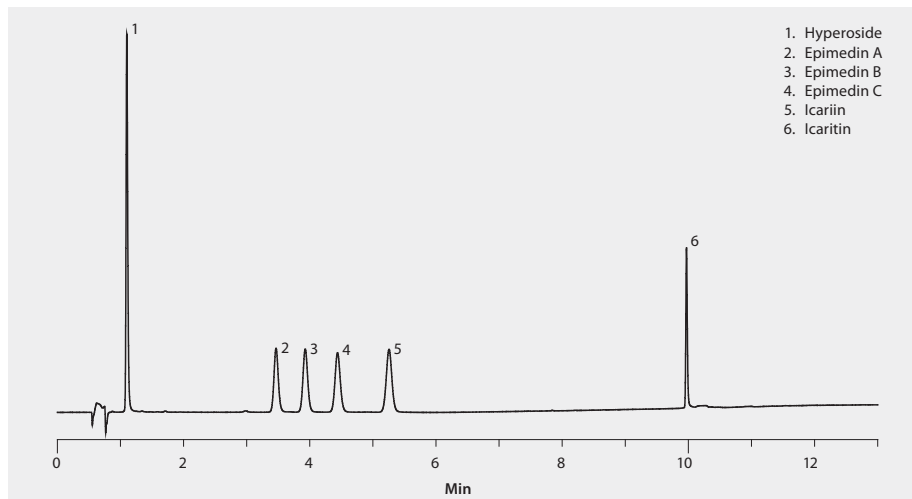
UHPLC Analysis of Galangin on Titan™ C18

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase . . (A) 10 mM ammonium acetate, pH 7.0; (B) acetonitrile (70:30, A:B)
flow rate 0.3 mL/min
column temp. 35 °C
detector MS, XIC m/z 271.05
injection 2 µL
sample 300 ng/mL each in acetonitrile:water (3:1)
Application No. [G006093](#)



UHPLC Analysis of Horn Goat Weed Standards Using Titan™ C18

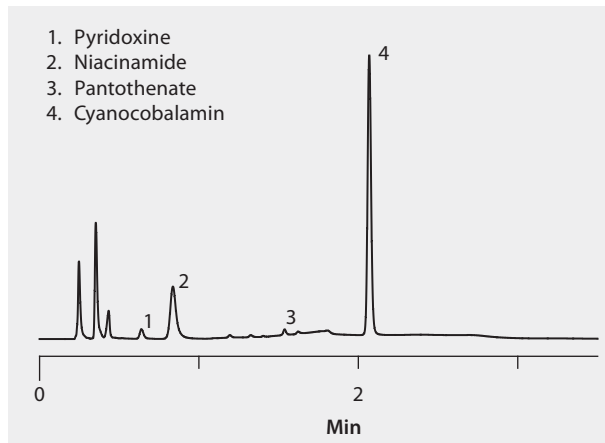
column Titan C18, 10 cm x 2.1 mm I.D., 1.9 µm particles (577124-U)
mobile phase . . . (A) 0.1% acetic acid in water; (B) 0.1% acetic acid in acetonitrile;
gradient . . . 25% B held for 3 min; to 100% B in 6 min; 100% B held for 2 min
flow rate 0.4 mL/min
pressure 5130 psi (354 bar)
column temp. 35 °C
detector UV, 250 nm
injection 5.0 µL
sample 50 µg/mL 70:30, water:methanol
Application No. **G006311**



UHPLC Analysis of B-vitamins in vitamin water on Titan™ C18 using UV detection

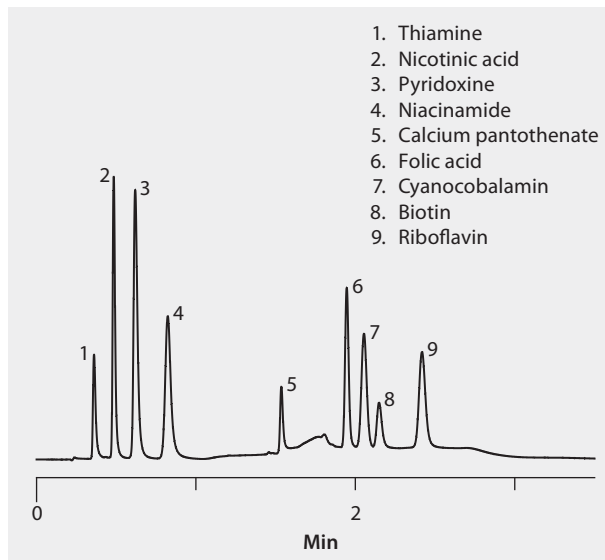
The vitamin water drink was filtered using 0.2 µm Nylon filter and injected into UHPLC for B-vitamin analysis

column TITAN C18, 50 mm x 2.1 mm I.D., 1.9 µm particles (577122-U)
mobile phase (A) 20 mM potassium phosphate, pH 3; (B) methanol
gradient 0.5% B held for 0.5 minutes, to 30% B in 1.3 minutes,
held at 30% B for 1 minute, held at 0.5% B for 0.8 minutes
flow rate 0.5 mL/min
pressure 7977 psi (550 bar)
column temp. 30 °C
detector UV, 210 nm
injection 0.5 µL
sample vitamin water was filtered through 0.2µm nylon syringe filter
Application No. **G006216**



UHPLC Analysis of B-vitamins on Titan™ C18 using UV detection

column TITAN C18, 50 mm x 2.1 mm I.D., x 1.9 µm particles (577122-U)
mobile phase (A) 20 mM potassium phosphate, pH 3; (B) methanol
gradient 0.5% B held for 0.5 minutes, to 30% B in 1.3 minutes,
held at 30% B for 1 minute, held at 0.5% B for 0.8 minutes
flow rate 0.5 mL/min
pressure 7977 psi (550 bar)
column temp. 30 °C
detector UV, 210 nm
injection 0.5 µL
sample 100 ug/mL of all vitamins except 250 ug/mL of
calcium pantothenate, biotin and riboflavin in water
Application No. **G006217**



UHPLC Gradient Analysis of Boswellia Herbal Supplement on Ascentis® Express 2.7 μ m Phenyl-Hexyl

extraction:

1. Weigh 100 mg Boswellia Herbal Supplement
2. Add 10 mL ethanol
3. Sonicate 30 min at 40°C
4. Dilute 100 μ L extract, 400 μ L ethanol, 500 μ L water

column Ascentis Express Phenyl-Hexyl, 10 cm x 3.0 mm I.D.,
2.7 μ m particles (53345-U)

mobile phase (A) 0.1% phosphoric acid; (B) acetonitrile

gradient 50% B for 0.5 min; to 100% B in 4.5 min; held at 100% B for 5 min

gradient 0.6 mL/min

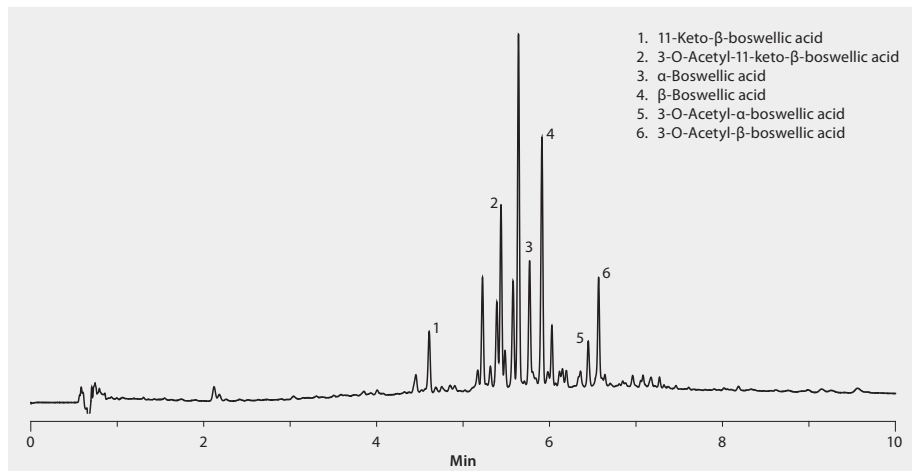
pressure 2390 psi (165 bar)

column temp. 35 °C

detector UV, 210 nm

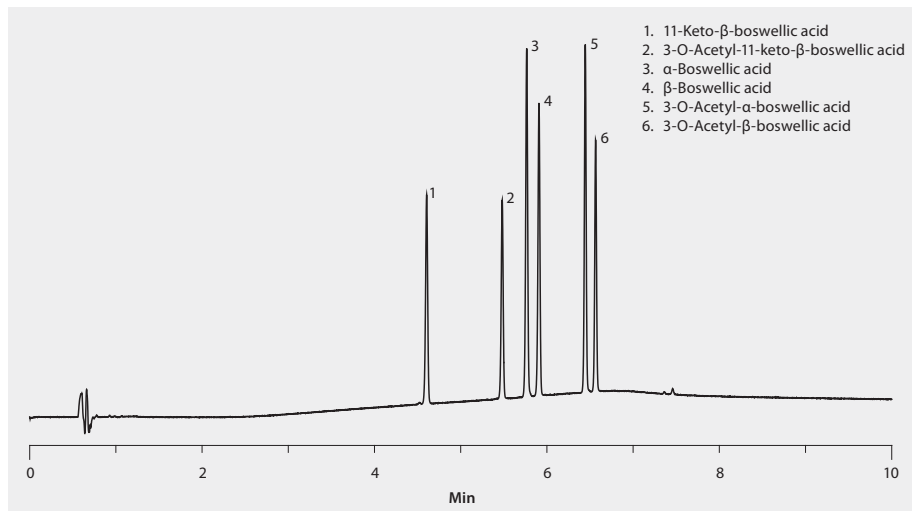
injection 2.0 μ L

Application No. **G006252**



UHPLC Gradient Analysis of Boswellic Acids on Ascentis® Express Phenyl-Hexyl

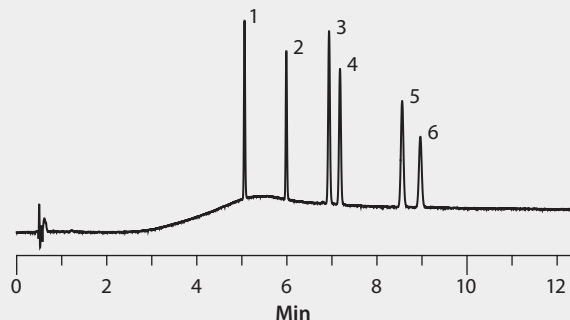
column Ascentis Express Phenyl-Hexyl, 10 cm x 3.0 mm I.D.,
2.7 µm particles (53345-U)
mobile phase (A) 0.1% phosphoric acid; (B) acetonitrile
gradient 50% B for 0.5 min; to 100% B in 4.5 min; held at 100% B for 5 min
flow rate 0.6 mL/min
pressure 2390 psi (165 bar)
column temp. 35 °C
detector UV, 210 nm
injection 2.0 µL
sample 6 Boswellic Acids 50µg/mL in 70:30, water:methanol
Application No. **G006285**



UHPLC Gradient Analysis of Boswellic Acids on Titan™ C18

column Titan C18, 10 cm x 2.1 mm I.D., 1.9 μ m particles (577124-U)
mobile phase (A) 0.1% phosphoric acid; (B) acetonitrile
gradient 40% B for 0.5 min; to 100% B in 2 min; held at 100% B for 10 min
flow rate 0.4 mL/min
pressure 4050 psi (279 bar)
column temp. 35 $^{\circ}$ C
detector UV, 210 nm
injection 2.0 μ L
sample 6 Boswellic Acids 50 μ g/mL in 70:30, water:methanol
Application No. **G006259**

1. 11-Keto- β -boswellic acid
2. 3-O-Acetyl-11-keto- β -boswellic acid
3. α -Boswellic acid
4. β -Boswellic acid
5. 3-O-Acetyl- α -boswellic acid
6. 3-O-Acetyl- β -boswellic acid



SFC

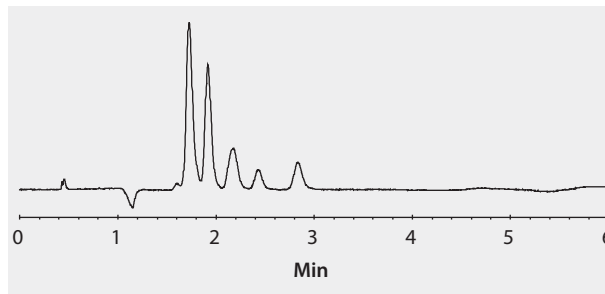
Chemicals and Industrial Polymers

SFC Analysis of Diastereomers on Astec® Cellulose DMP, Methanol Additive

This application shows the ability of Astec Cellulose DMP to separate a mixture of diastereomers. The analytes are proprietary pharmaceutical-type compounds.

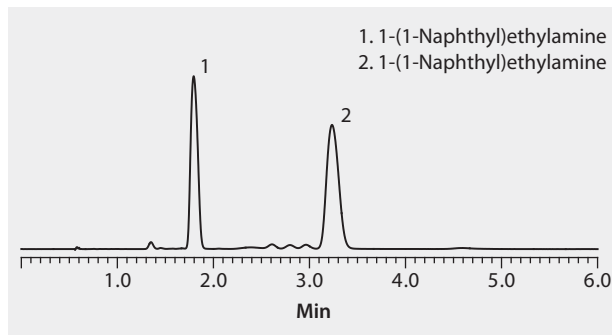
SFC data provided by Dr. Christina Kraml, Lotus Separations, LLC, Princeton, NJ. Instrument was a Berger Analytical SFC system equipped with a dual pump (FCM-1200), autosampler (ALS 3100), column oven (TCM-200) and diode-array detector (DAD-4100); from Mettler Toledo.

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 μ m particles (51098AST)
 mobile phase (A) CO₂; (B) methanol; (80:20, A:B)
 flow rate 3 mL/min
 pressure 1450 psi (100 bar)
 column temp. 35 °C
 detector UV, 220 nm
 injection 5 μ L
 Application No. [G005176](#)



SFC Analysis of 1-(1-Naphthyl)ethylamine Enantiomers on Astec® Cellulose DMP

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase 20% methanol (0.1% MSA, methanesulfonic acid) in CO₂
flow rate 3 mL/min
pressure 1740 psi (120 bar)
column temp. 40 °C
detector UV, 230 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. [G005490](#)

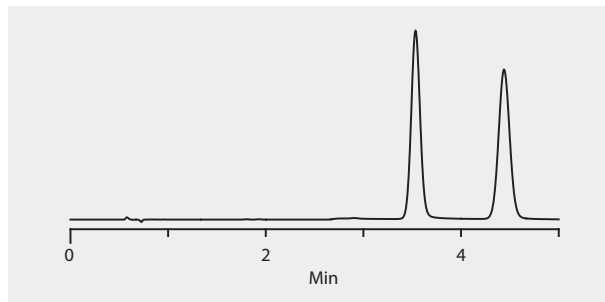


Pharmaceutical (Small Molecule)

SFC Analysis of Aminoglutethimide Enantiomers on Astec® Cellulose DMP

This application demonstrates the ability of the Astec® Cellulose DMP column to separate Aminoglutethimide enantiomers via Supercritical Fluid Chromatography. DMPC-derivatized cellulose is widely used for chiral separations by SFC, both analytical and prep. The Astec® Cellulose DMP works well in SFC mode, providing rapid separations with excellent selectivity.

column . . . Astec Cellulose DMP, 25 cm x 4.6 mm I.D., 5 µm particles (51099AST)
mobile phase . . . (A) CO₂; (B) methanol containing 0.1% DEA in CO₂; (75:25, A:B)
flow rate 3 mL/min
pressure 1740 psi (120 bar)
detector UV, 230 nm
injection 5 µL
sample 2 mg/mL in methanol
Application No. [G005454](#)

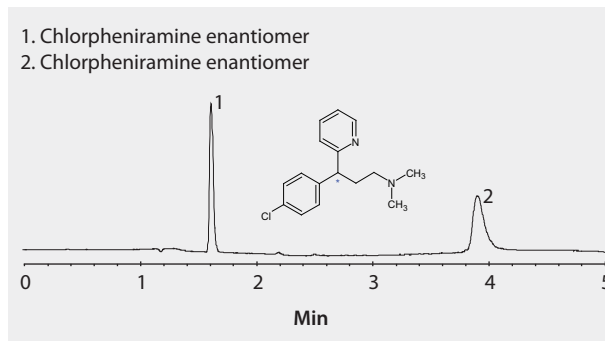


SFC Analysis of Chlorpheniramine Enantiomers on Astec® Cellulose DMP, Methanol Gradient

SFC data provided by Dr. Christina Kraml, Lotus Separations, LLC, Princeton, NJ.

Instrument: Berger Analytical SFC system equipped with a dual pump (FCM-1200), autosampler (ALS 3100), column oven (TCM-200) and diode-array detector (DAD-4100); from Mettler Toledo.

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
gradient Gradient of 5-65% methanol in 3 min, hold for 1 min
mobile phase (A) CO₂; (B) methanol;
flow rate 4 mL/min
pressure 1450 psi (100 bar)
column temp. 35 °C
detector UV, 220 nm
injection 5 µL
sample chlorpheniramine, 2 mg/mL
Application No. [G005175](#)

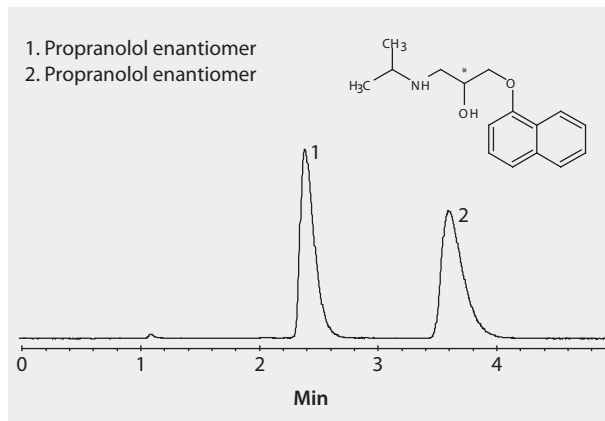


SFC Analysis of Propranolol Enantiomers on Astec® Cellulose DMP, Methanol Additive

SFC data provided by Dr. Christina Kraml, Lotus Separations, LLC, Princeton, NJ.

Instrument: Berger Analytical SFC system equipped with a dual pump (FCM-1200), autosampler (ALS 3100), column oven (TCM-200) and diode-array detector (DAD-4100); from Mettler Toledo.

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A)CO₂; (B) methanol; (80:20, A:B)
flow rate 3 mL/min
pressure 1450 psi (100 bar)
column temp. 35 °C
detector UV, 220 nm
injection 5 µL
sample propranolol, 2 mg/mL
Application No. [G005172](#)

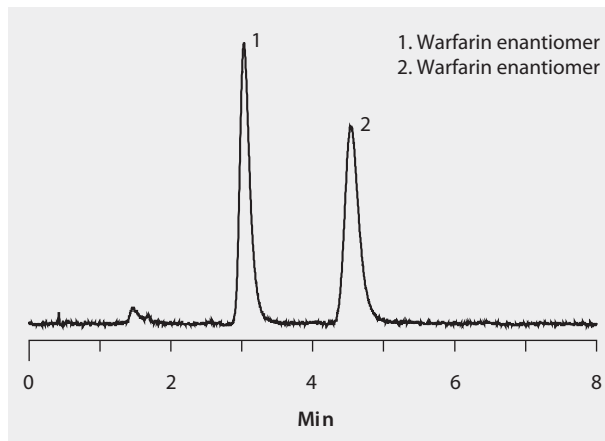


SFC Analysis of Warfarin™ Enantiomers on Astec® Cellulose DMP, Ethanol Additive

SFC data provided by Dr. Christina Kraml, Lotus Separations, LLC,
Princeton, NJ.

Instrument: Berger Analytical SFC system equipped with a dual pump (FCM-1200), autosampler (ALS 3100), column oven (TCM-200) and diode-array detector (DAD-4100); from Mettler Toledo.

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) CO₂; (B) ethanol; (80:20, A:B)
flow rate 3 mL/min
pressure 1450 psi (100 bar)
column temp. 35 °C
detector UV, 220 nm
injection 5 µL
sample warfarin enantiomers, 2 mg/mL
Application No. [G005171](#)

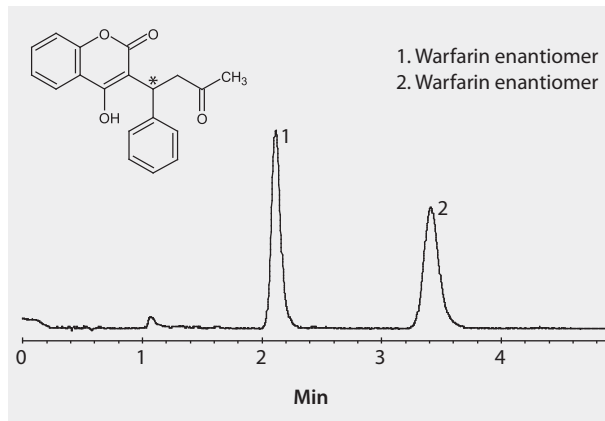


SFC Analysis of Warfarin™ Enantiomers on Astec® Cellulose DMP, Methanol Additive

SFC data provided by Dr. Christina Kraml, Lotus Separations, LLC, Princeton, NJ.

Instrument: Berger Analytical SFCsystem equipped with a dual pump (FCM-1200), autosampler (ALS 3100), column oven (TCM-200) and diode-array detector (DAD-4100); from Mettler Toledo.

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
mobile phase (A) CO₂; (B) methanol; (80:20, A:B)
flow rate 3 mL/min
pressure 1450 psi (100 bar)
column temp. 35 °C
detector UV, 220 nm
injection 5 µL
sample warfarin enantiomers, 2 mg/mL
Application No. [G005170](#)



SFC Analysis of Warfarin™ Enantiomers on Astec® Cellulose DMP, Methanol Gradient

SFC data provided by Dr. Christina Kraml, Lotus Separations, LLC, Princeton, NJ.

Instrument: Berger Analytical SFC system equipped with a dual pump (FCM-1200), autosampler (ALS 3100), column oven (TCM-200) and diode-array detector (DAD-4100); from Mettler Toledo.

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)

mobile phase (A) carbon dioxide; (B) methanol;
Gradient of 5-65% methanol in 3 min., hold for 1 min

flow rate 4 mL/min

pressure 1450 psi (100 bar)

column temp. 35 °C

detector UV, 220 nm

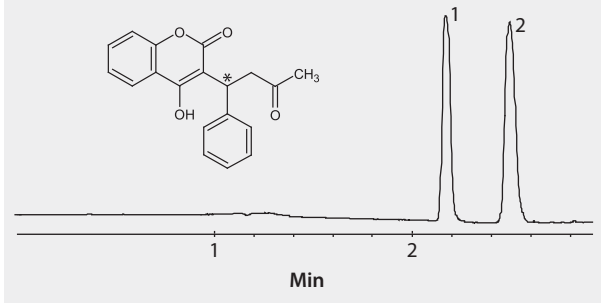
injection 5 µL

sample warfarin

Application No. **G005174**

1. Warfarin enantiomer

2. Warfarin enantiomer



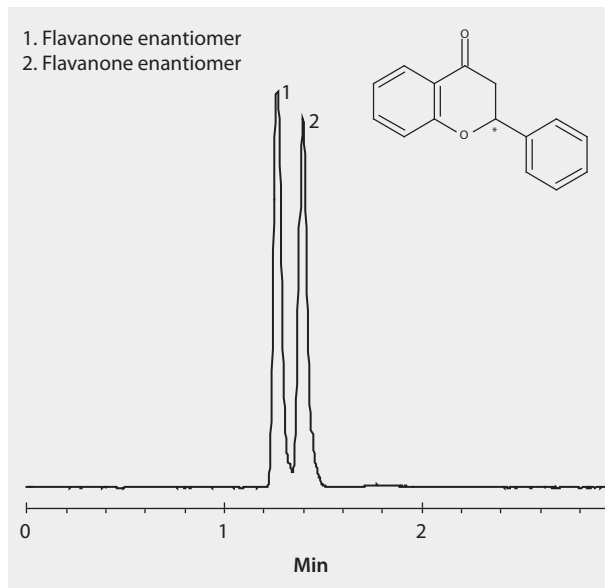
Vitamins, Nutraceuticals, and Natural Products

SFC Analysis of Flavanone Enantiomers on Astec® Cellulose DMP, Methanol Additive

SFC data provided by Dr. Christina Kraml, Lotus Separations, LLC, Princeton, NJ.

Instrument: Berger Analytical SFC system equipped with a dual pump (FCM-1200), autosampler (ALS 3100), column oven (TCM-200) and diode-array detector (DAD-4100); from Mettler Toledo.

column . . . Astec Cellulose DMP, 15 cm x 4.6 mm I.D., 5 µm particles (51098AST)
 mobile phase (A) CO₂; (B) isopropanol; (80:20, A:B)
 flow rate 3 mL/min
 pressure 1450 psi (100 bar)
 column temp. 35 °C
 detector UV, 220 nm
 injection 5 µL
 sample flavanone, 2 mg/mL
 Application No. **G005173**



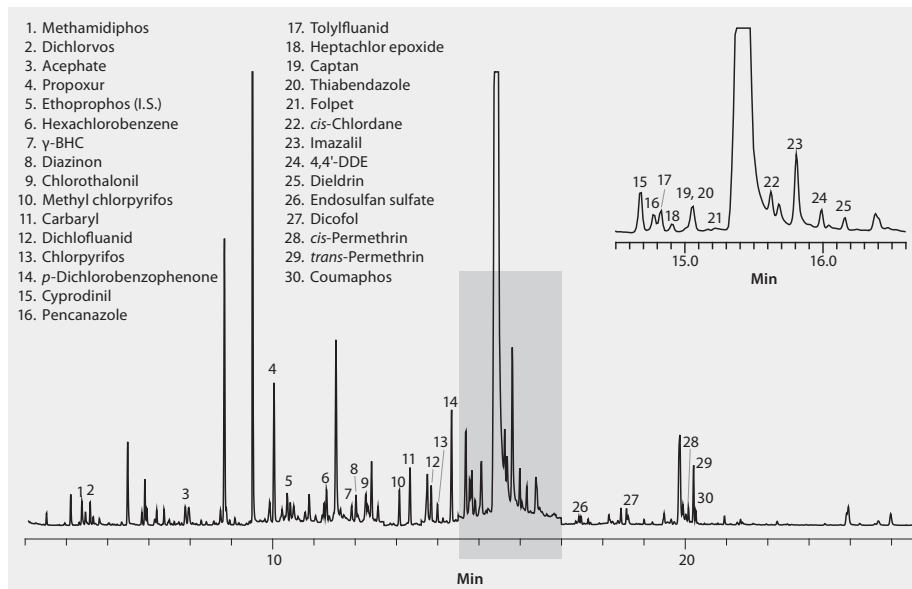
SPE

Agriculture

GC Analysis of Agriculture Pesticides in Orange (Spiked) on SLB®-5ms after QuEChERS Cleanup using Primary-Secondary Amine (PSA)

Chromatograms of the spiked orange samples are presented in the Figure. Several background peaks eluting prior to nine minutes are due to impurities in the toluene. Despite extract cleanup, matrix peaks are also present in the chromatograms. Further sample cleanup may be possible by increasing SPE sorbent weight. Nevertheless, all pesticides were detected. A first order fit was used for calibration. Linearity for the five-point calibration curves was excellent, with 28 of the 29 pesticides having r^2 values >0.995 at a range of 50-500 ppb. Proper calibration of imazalil was not possible due to its presence in the orange blanks.

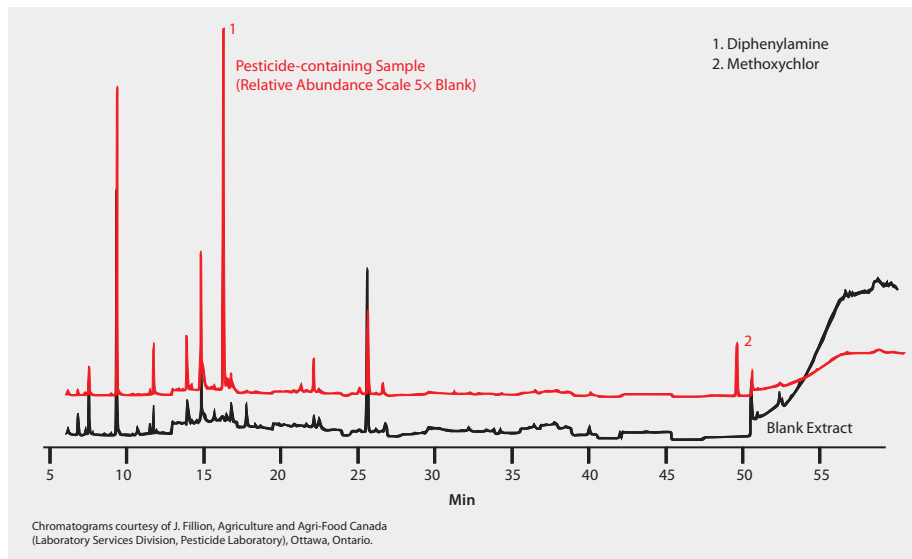
sample preparation SPE (Solid Phase Extraction)
 sample/matrix . . . 15 g of ground-up orange, 75 μ L of the internal standard stock solution (ethoprophos at 20 ppm in methanol),
 75 μ L of the pesticide stock solution (29 pesticides, each at 20 ppm in methanol)
 column SLB-5ms, 30 m x 0.25 mm I.D., 0.25 μ m (28471-U)
 oven 100 $^{\circ}$ C (1 min), 10 $^{\circ}$ C/min to 300 $^{\circ}$ C (5 min)
 inj. temp. 250 $^{\circ}$ C
 MSD interface 300 $^{\circ}$ C
 scan range selected ion monitoring (SIM), 7 monitoring groups used
 carrier gas helium, 1 mL/min constant
 injection 1.0 μ L pulsed (20 psi until 0.20 min), splitless (1.0 min)
 liner 4 mm I.D., single taper
 sample extract of an orange spiked with a 29-component pesticide mix plus 1 internal standard, each at 100 ppb
 Application No. **G003590**



GC Analysis of Diphenylamine and Methoxychlor in Apples on a 14% Cyanopropylphenyl Column after SPE using Supelclean ENVI-Carb

Pesticides in fruits and vegetables

sample preparation	SPE (Solid Phase Extraction)
sample/matrix	homogenize 50 g sample in 100 mL acetonitrile then add 10 g NaCl and homogenize 5 min
SPE tube/cartridge	ENVI-Carb, 500 mg/6 mL
column	14% cyanopropylphenyl polysiloxane, 30 m × 0.25 mm I.D., 0.15 μm (Supelco equivalent, Equity-1701, 28372-U)
oven	70 °C (2 min), 25 °C/min to 130 °C, 2 °C/min to 220 °C, 10 °C/min to 280 °C (4.6 min)
detector	MSD, 285 °C
carrier gas	helium
injection	2 μL splitless
Application No.	796-0129



GC Analysis of Organophosphorus Pesticides (OP-Pest) in Cabbage, Onion, and Mushrooms on SLB-5ms after SPE using Supelclean™ ENVI-Carb™ II/PSA

Sample pretreatment: To a 10 g sample of homogenized food (green onions, apples, Napa cabbage, button mushrooms) was added 10 mL acetonitrile and 4 g magnesium sulfate (that had been heated at 550 °C) and 1 g sodium chloride. After centrifugation, the supernatant was removed and mixed with 1 g magnesium sulfate and centrifuged. 5 mL of the supernatant was removed and evaporated to 1 mL for SPE loading.

Organophosphorus pesticide use in agriculture is widespread due to the fact that they are more amenable to environmental degradation in comparison to organochlorine or organonitrogen compounds. There are a large number of pesticides in the organophosphorus group, and because of their potential health effects, they are of particular concern on produce imported from areas in which they are commonly used. This chromatogram illustrates the separation of 63 of these pesticides by GC on the SLB-5ms using nitrogen phosphorus detection (NPD).

sample preparation SPE (Solid Phase Extraction)
sample/matrix 10 g homogenized food sample (green onions, apples, Napa cabbage, button mushrooms)

SPE tube/cartridge Supelclean ENVI-Carb II/PSA SPE Tube (54067-U)

condition 5 mL acetone:toluene (65:35)

sample addition 1 mL sample extract

elution 10 mL of acetone:toluene (65:35)
eluate post-treatment Evaporate fraction to 0.5 mL then adjust volume to 1 mL with ethyl acetate for GC-NPD analysis

column SLB-5ms, 30 m x 0.25 mm I.D., 0.25 µm (28471-U)

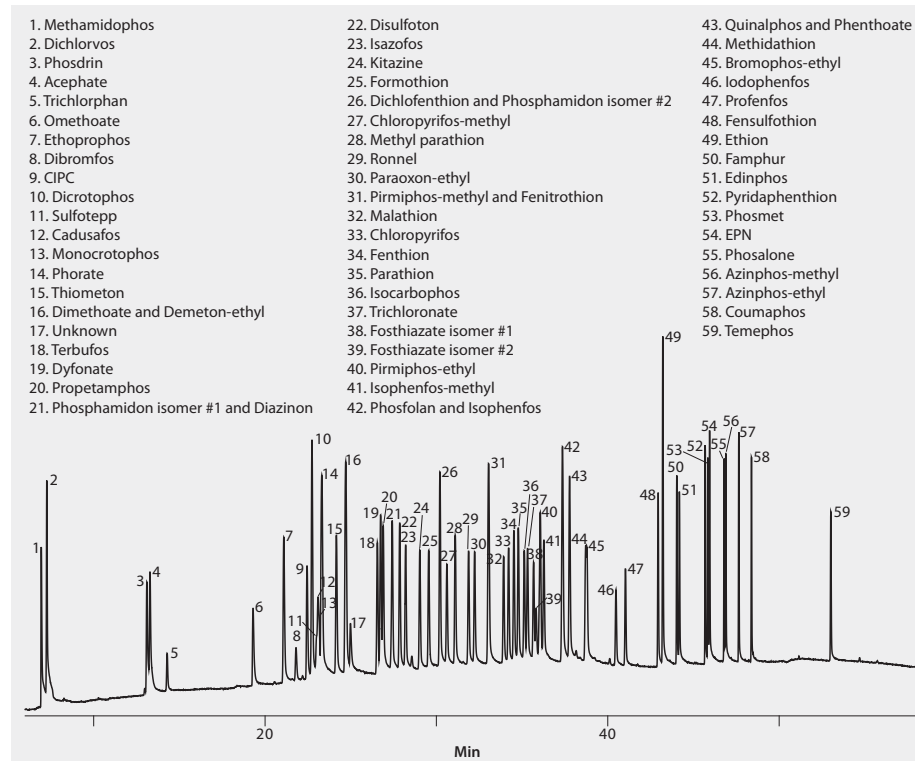
oven 110 °C (2 min), 2.5 °C/min to 205 °C, 10 °C/min to 310 °C (10 min)

inj. temp. 250 °C

detector NPD, 310 °C

carrier gas helium, 0.9 mL/min constant flow

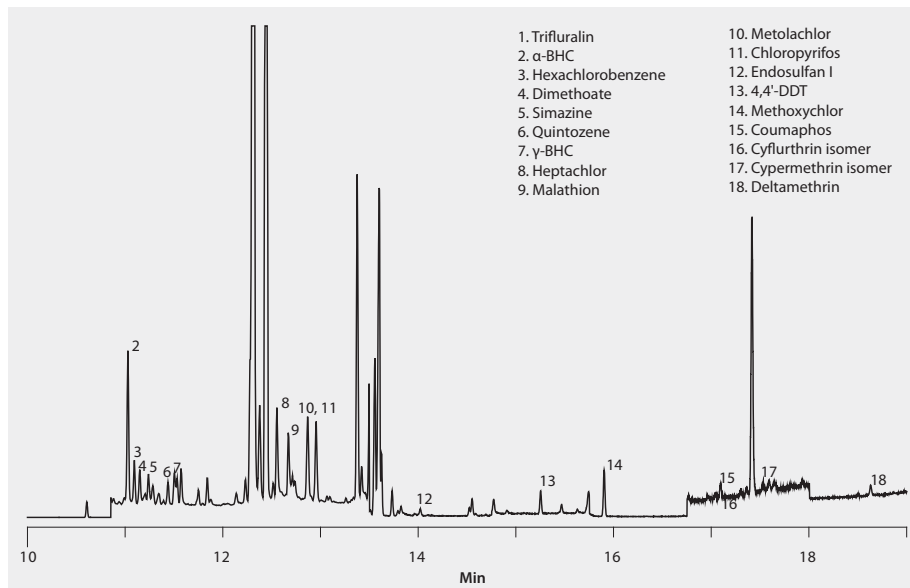
injection 2 µL, splitless
liner 4 mm I.D. dual tapered
Application No. G005815



GC Analysis of Pesticides in Avocado on SLB®-5ms (20 m x 0.18 mm I.D., 0.36 µm) after QuEChERS Cleanup using Supel™ QuE Z-Sep+, Fast GC Analysis

About this analysis: This application demonstrates the use of dispersive SPE for the extraction of pesticides from Avocado. Cleanup is achieved using Z-Sep+ for fat removal. Final analysis of the extracts was done by LVI-GC/MS SIM on an SLB-5ms column.

sample preparation Dispersive (QuEChERS)
 sample/matrix Avocado spiked with pesticides at 20 ng/g
 extraction tube Supel QuE Acetate extraction tube (55234-U)
 extraction process . . . add 25 mL of acetonitrile; shake for 1 minute; add contents of Supel QuE acetate extraction tube; shake immediately for 1 minute; centrifuge at 3200 rpm for 5 minutes
 clean-up tube Supel Que Z-Sep+ cleanup tube (55296-U)
 clean-up process . . . transfer 3 mL of the acetonitrile layer into a Supel Que Z-Sep+ cleanup tube; shake for 1 minute; centrifuge at 3400 rpm for 3 minutes; draw off supernatant for LVI-GCMS analysis
 column SLB-5ms, 20 m x 0.18 mm I.D., 0.36 µm (28576-U)
 oven 70 °C (2 min), 15 °C/min to 325 °C (6 min)
 inj. temp. 60 °C (0.28 min), 600 °C/min to 325 °C (5 min)
 detector MSD
 MSD interface 330 °C
 carrier gas helium, 1 mL/min, constant
 injection PTV solvent vent; 10 µL, injection dispense speed 15000 µL/min
 liner 4 mm I.D. FocusLiner with taper
 sample pesticides spiked at 20 ng/g
 Application No. [G005805](#)

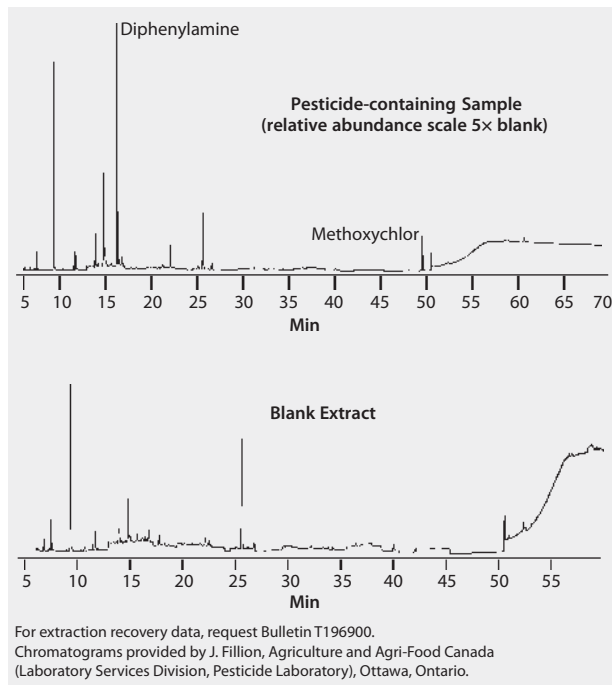


GC Analysis of Pesticides in Fruits and Vegetables on a 14% Cyanopropylphenyl Column after SPE using Supelclean ENVI-Carb™

Sample Pre-treatment:

Homogenize 50 g chopped fruit/vegetable sample in 100 mL acetonitrile. Add 10 g sodium chloride and homogenize 5 min. Transfer 13 mL of acetonitrile layer to clean centrifuge tube. Centrifuge at high speed for 5 min. Evaporate 10 mL aliquot of supernatant to 0.5 mL under Nitrogen at 35°C.

sample preparation SPE (Solid Phase Extraction)
 sample/matrix extract from 50 g homogenized fruit or vegetable sample
 SPE tube/cartridge ENVI-Carb, 500 mg/6 mL (57094)
 sample addition 0.5 mL concentrated sample extract
 elution 20 mL acetonitrile:toluene (3:1)
 eluate post-treatment . . . Concentrate to 2 mL by rotary evaporation. Add 2 x 10 mL acetone concentrating to 2 mL after each acetone addition.
 (Add 50 µL I.S. (500 ng/µL cis-chlordane in acetone) then dilute to 2.5 mL with acetone.)
 column 14% cyanopropylphenyl polysiloxane, 30m x 0.25 mm I.D., 0.15 µm (Supelco equivalent, Equity-1701, 28372-U)
 oven 70 °C (hold 2 min) to 130 °C at 25 °C; 130 °C to 220 °C at 2 °C/min; 220 °C to 280 °C at 10 °C/min and hold 4.6 min
 detector MSD, 285 °C
 carrier gas helium
 injection 2 µL, splitless
 Application No. 796-0128



GC Analysis of Sterols (Silylated Derivatives) in Olive Oil (Free Sterol Fraction) on SLB®-5ms after SPE using Discovery DSC-Si

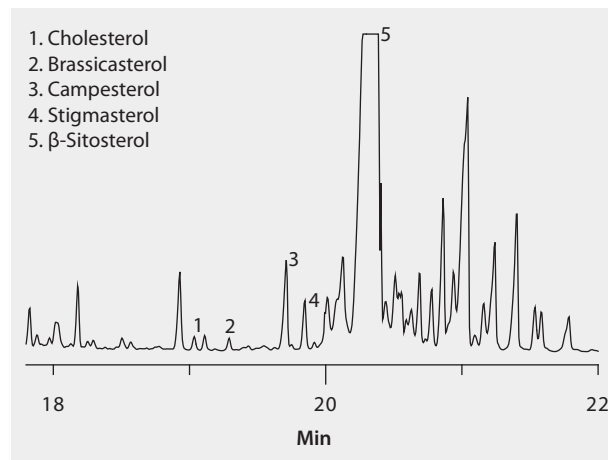
Sample pre-treatment

Weigh 0.25 gm oil into test tube. For spiked sample add 12.5 µL of 65-100 µg/mL mixed sterol std. Add 1 ml of hexane:ethyl acetate (90:10). After SPE fractionation, evaporate solvent from each fraction, add 1 ml of 30% methanolic sodium methoxide:MeOH:MTBE solution (13:27:60), mix and let sit at room temp for 30 min. Add 1 ml of water and 2 mL of n-heptane. Withdraw aqueous phase (bottom) and replace w/ 1 mL of 1% citric acid solution. Withdraw organic phase and dry over anhydrous sodium sulfate. Silylation: Evaporate organic phase to dryness. Add 125 µL of Sylon BFT and 125 µL of pyridine. Heat at 70°C for 20 min. The sample is then ready for GC-MS analysis.

Sterol content is one in a battery of tests used to analyze the composition and determine the grade and authenticity of olive oil. Test results are compared against standards such as those established by the International Olive Oil Council (IOC) and US Dept. of Agriculture. In vegetable oils, sterols exist in the free form, or esterified to fatty acids. In this application, sterols were analyzed in olive oil separately as free and esterified. This was accomplished by taking advantage of the polarity difference between these two groups to fractionate them using silica gel SPE. In place of saponification, the fractions were transesterified to liberate the esterified sterols. The fractions were then silylated, and analyzed by GC-MS. The silylated sterols all contained a significant molecular ion in their mass spectrum, which made it possible to perform peak identification free of matrix interference. The sterols isolated in the free fraction are shown here.

sample preparation SPE (Solid Phase Extraction)
 sample/matrix olive oil spiked with a mixed sterol standard at 5 µg/g
 SPE tube/cartridge Discovery DSC-Si, 1 g/6 mL (52656-U)
 condition 2 x 5 mL hexane
 sample addition 1 mL

elution esters fraction: 2.5 mL of hexane:ethyl acetate (90:10); free sterols fraction; 5 mL of hexane:ethyl acetate (90:10) and 3 mL x 5 of ethanol:diethyl ether:hexane (50:25:25)
 eluate post-treatment Evaporate to dryness and perform silylation as described in the Analysis Note.
 column SLB-5ms, 20 m x 0.20 mm I.D., 0.20 µm (28564-U)
 oven 125 °C (1 min), 10 °C/min to 325 °C (10 min)
 inj. temp. 250 °C
 detector MSD, m/z 500 - 600
 MSD interface 325 °C
 carrier gas helium, 0.6 mL/min, constant
 injection 1 µL, splitless
 liner 4 mm I.D. single taper
 sample Olive oil sample; fractionated, transesterified, and silylated
 Application No. **G005816**



HPLC Analysis of Acidic Herbicides in Water on a Polymeric C18 Column after SPE using Supelclean™ ENVI™-Carb

using Zymark AutoTrace Extraction WorkStation 1.20

sample preparation SPE (Solid Phase Extraction)
sample/matrix Fresh 1 L water samples, dechlorinated with sodium thiosulfate when necessary, at ambient temperature and pH.

SPE tube/cartridge Supelclean ENVI-Carb, 250 mg/6 mL (57092)
condition 10 mL DI water at 20 mL/min
sample addition 0.9 L water sample at 20 mL/min
drying 10 min using clean nitrogen
washing 10 mL DI water at 20 mL/min
elution 10 mL 0.1% phosphoric acid in methylene chloride:acetonitrile (80:20) at 5 mL/min

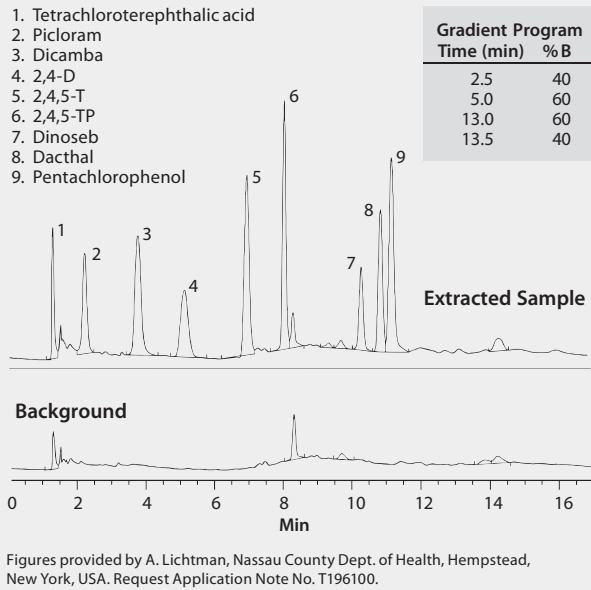
column polymeric-coated silica-based PAH specialty column, 20 cm × 3 mm I.D., 5 μm (Supelco equivalent, SUPELCOSIL LC-PAH, available upon request)

mobile phase gradient, (A): 0.05% phosphoric acid in DI water; (B): acetonitrile
flow rate 0.5 mL/min
column temp. 50 °C

detector photodiode array- peak width: 0.053 min,
sampling interval: 0.320 sec, monitor 210 nm & 225 nm

injection 10 μL of extract (4-5 ppb each analyte in water)

Application No. 796-0150



HPLC Analysis of Paraquat and Diquat on SUPELCOSIL™ LC-18 after SPE using ENVI™-8 DSK

Refer to US EPA Method 549.1 for full details

Sample Pre-treatment:

250 mL drinking water. Adjust water sample to pH to 10.5 ± 0.2 with 10% sodium hydroxide or 10% hydrochloric acid

sample preparation SPE (Solid Phase Extraction)

sample/matrix drinking water adjusted to pH to 10.

SPE tube/cartridge ENVI-8 DSK SPE Disk, 47 mm (57172)

sample preparation ENVI-8 DSK, 47 mm (57172)

condition . . . 10 mL acetonitrile; 2×10 mL reagent water; 10 mL conditioning solvent

A (5 g cetyl trimethyl ammonium bromide and 5 mL conc. ammonium hydroxide in 500 mL DI water, dilute to 1 L);

(2×10 mL reagent water; 10 mL conditioning

solvent B (10 g hexanesulfonic acid, sodium salt and 10 mL conc. ammonium hydroxide in 250 mL DI water, dilute to 500 mL))

sample addition 250 mL water 100 mL/min

elution . . . 0.5-1.0 mL acetonitrile (to cover/solvate disk); 2×4 mL eluting solution (13.5 mL orthophosphoric acid and 10.3 mL diethylamine in 500 mL DI water, dilute to 1 L)

column SUPELCOSIL LC-18, 15 cm \times 4.6 mm I.D., 5 μ m particles (58230-U)

mobile phase . . . 3.5 mL triethylamine and 1.0 g 1-hexane-sulfonic acid, sodium salt to 800 mL DI H₂O add orthophosphoric acid to pH 2.5, dilute to 1 L

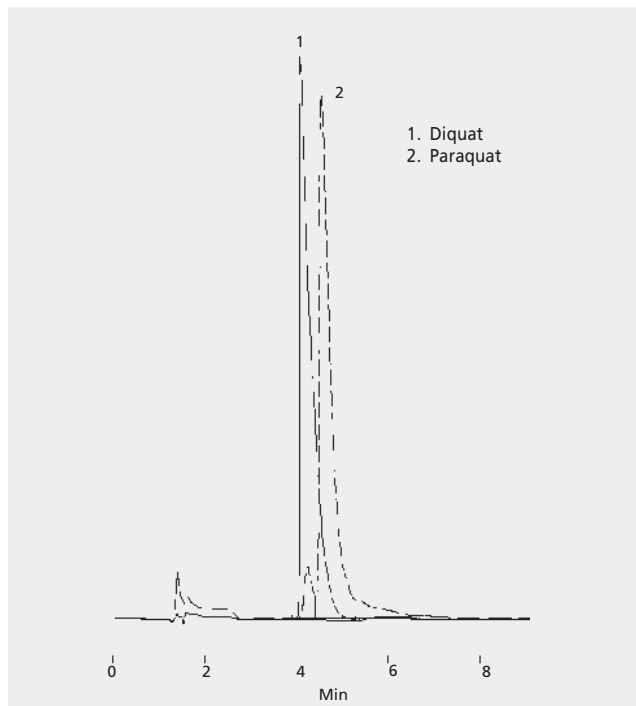
flow rate 1.0 mL/min

column temp. 35 °C

detector photodiode array, diquat - 308 nm, paraquat - 257 nm

injection 100 μ L

Application No. **794-0715**

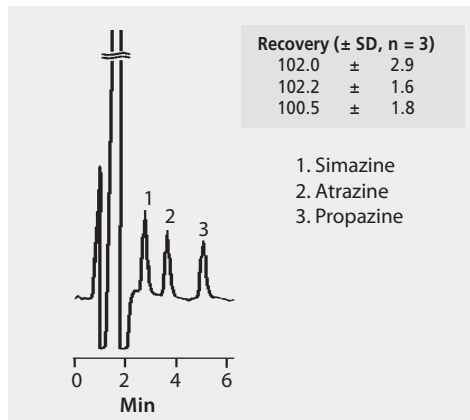


HPLC Analysis of Triazine Herbicides in Grass on SUPELCOSIL™ LC-8-DB after SPE using Supelclean™ LC-SCX

Sample Pre-treatment:

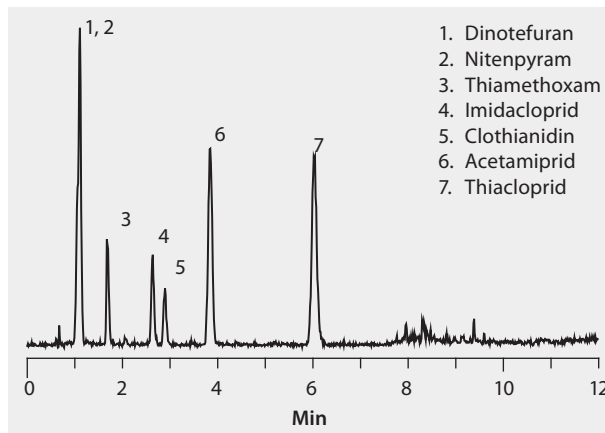
5 g fresh grass clippings spiked with 2 ppm each herbicide. Add 4 g anhydrous sodium sulfate and 20 mL methylene chloride:acetone (80:20). Shake 20 min and allow mixture to stand 1 min.

sample preparation SPE (Solid Phase Extraction)
 sample/matrix fresh grass clippings spiked with herbicides at 2 ppm
 SPE tube/cartridge Supelclean LC-SCX, 500 mg/3 mL (57018)
 condition 1 mL methylene chloride
 sample addition 2 mL grass extract. Wash with 2 x 2 mL acetonitrile.
 drying Dry packing for 5 min. under nitrogen purge
 washing Dry packing for 5 min under nitrogen purge; wash with 2 x 2 mL DI water
 elution 1.5 mL methanol
 eluate post-treatment dilute to 2 mL with DI water
 column SUPELCOSIL LC-8-DB, 15 cm x 4.6 mm I.D.,
 5 µm with guard column (58347)
 mobile phase (A) acetonitrile; (B) water; (45:55, A:B)
 flow rate 1.5 mL/min
 detector UV, 254 nm
 injection 100 µL
 Application No. **84-109**



LC-MS/MS Analysis of Neonicotinoid Pesticides in Dandelion Blossoms on Ascentis® Express C18 after Dispersive SPE (QuEChERS) using Supel™ QuE

sample preparation Dispersive (QuEChERS)
 sample/matrix . . . 3 g pulverized dandelion blossoms, homogenized in 10 mL water
 extraction tube Supel QuE Acetate extraction tube (55234-U)
 extraction process . . . add 25 mL of acetonitrile; add contents of Supel QuE acetate
 extraction tube; shake immediately for 1 minute; centrifuge at 3400 rpm for 5 minutes
 clean-up tube Supel QuE PSA/C18 tube (55288-U)
 clean-up process . . . Transfer 1 mL of the acetonitrile layer into a Supel QuE PSA/C18
 cleanup tube; shake for 1 minute; centrifuge at 3500 rpm for 3 minutes;
 (draw off 700 μ L of supernatant, evaporate to dryness at 50 °C under nitrogen;
 reconstitute in 200 μ L of 50:50 0.1% formic acid:0.1% formic acid in methanol)
 column . . . Ascentis Express C18, 10 cm x 3.0 mm I.D., 2.7 μ m particles (53814-U)
 mobile phase . . . (A) 0.1% formic acid in water; (B) 0.1% formic acid in methanol
 gradient . . . 30% B from 0 to 5 min; to 100% B in 0.2 min; held at 100% B for 5.3
 min; to 30% B in 0.5 min; held at 30% B for 5 min
 flow rate 500 μ L/min
 pressure 3800 psi (262 bar)
 column temp. 25 °C
 detector MS, ESI(+), MRM, m/z 203.2/129.2, 271.2/225.0, 292.1/211.0,
 256.0/175.2, 250.0/132.0, 223.2/126.0, 253.0/125.8
 injection 3 μ L
 Application No. **G006046**

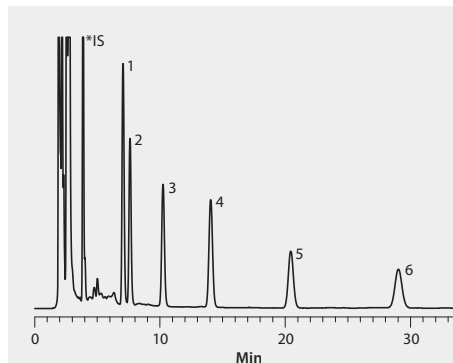


Clinical

HPLC Analysis of Barbiturates in Serum on Discovery® C18 after SPE using Discovery® DSC-18Lt

A Zymark® RapidTrace® SPE Workstation was used for this analysis.

sample preparation	SPE (Solid Phase Extraction)
sample/matrix	0.5 mL porcine serum spiked with 0.5 µg/mL or 1.0 µg/mL each analyte then diluted with 0.5 mL water
SPE tube/cartridge	Discovery DSC-18Lt, 500 mg/3 mL (52613-U)
condition	2 mL methanol; 2 mL DI water
sample addition	1 mL at 0.75 mL/min
washing	2 mL 5% methanol, then vacuum or air dry for 5-10 min
elution	1-2 mL methanol
eluate post-treatment	dry eluate with nitrogen purge (40 °C; 15-20 min), reconstitute in 20 µL mobile phase
column	Discovery C18, 15 cm × 4.6 mm, 5 µm preceded by a 2 cm C18 guard column and 0.5 µm frit filter (504955)
mobile phase	(A) methanol; (B) water (40:60, A:B)
flow rate	1 mL/min
column temp.	30 °C
detector	UV, 214 nm
injection	30 µL, diluted porcine serum extract
Application No.	G001056



Barbiturates from serum using 500 mg/3 mL Discovery DSC-18Lt SPE tubes and Zymark's RapidTrace SPE Workstation.
*IS = Barbital (internal standard).

Sample Info: 0.5 mL porcine serum spike with 0.5 µg/mL or 1.0 µg/mL each analyte then diluted with 0.5 mL water.

Efficiency of Recovery

Compound	Concentration (µg/mL)	%Recovery	%RSD (n=6)
1. Phenobarbital	0.5	96.2	±1.6
	1.0	94.9	±1.7
2. Aprobarrbital	0.5	98.5	±2.1
	1.0	100.8	±0.8
3. Butabarrbital	0.5	97.2	±1.9
	1.0	98.7	±1.8
4. Mephobarbital	0.5	99.7	±2.4
	1.0	101.0	±2.0
5. Pentobarbital	0.5	96.4	±1.7
	1.0	96.4	±1.9
6. Secobarbital	0.5	98.2	±1.7
	1.0	97.7	±1.8

SPE Method For RapidTrace SPE Workstation Application

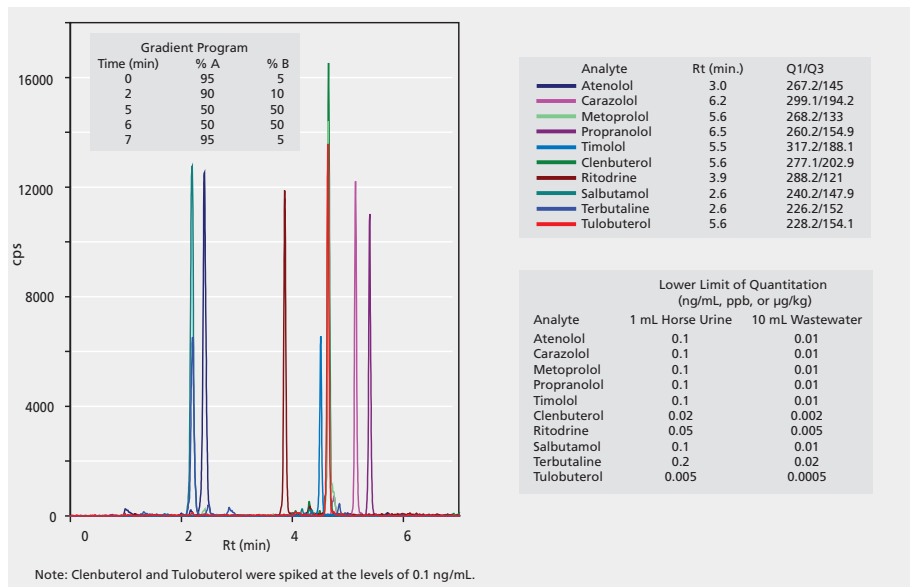
- Condition & equilibrate each tube/well with 2 mL MeOH & 2 mL DI Water
- Load sample
- Wash each tube/well with 2 mL 5% MeOH
- Vacuum or air dry for 5-10 min
This removes any excess water from the sorbent. The presence of water in the final eluent may prolong eluent evaporation.
- Elute with 1-2 mL MeOH
- Dry eluate with nitrogen purge (40 °C; 15-20 min)
- Reconstitute with 200 µL mobile phase
- Quantify against internal or external standards via HPLC analyses

HPLC Analysis of β -Blockers and β -Agonists in Urine and Wastewater on a C18 Column after SPE using SupelMIP® SPE-Beta-Receptor

Sample Pre-treatment:

Horse urine was centrifuged at 3000 g for 10 min, diluted 1:1 (v/v) with DI water, adjusted to pH 7. Wastewater was filtered with 1 μ m filter paper and adjusted to pH 6-7. Samples were spiked with 10 beta-agonists and beta-blockers at the level of 1 ng/mL.

sample preparation SPE (Solid Phase Extraction)
 sample/matrix horse urine or waste water spiked with
 10 beta-agonists and beta-blockers at 1 ng/mL
 SPE tube/cartridge SupelMIP SPE - Beta-Receptor, 25 mg/10 mL (LRC) (53223-U)
 condition 1 mL acetonitrile; 1 mL DI water
 sample addition 1 mL
 washing 3 x 1 mL DI water; 1 mL acetonitrile;
 1 mL 60% acetonitrile/40% DI water;
 apply 2 min of full vacuum to dry the tube after each step
 elution 2 x 1 mL 1% formic acid in acetonitrile
 column C18, 5 cm x 3 mm I.D., 3 μ m particles
 eluate post-treatment evaporate under nitrogen and reconstitute with
 150 μ L 5% acetonitrile in 10 mM ammonium acetate,
 pH 4.6 prior to LC-MS-MS analysis
 mobile phase (A) 10 mM ammonium acetate,
 pH 4.6 (adjusted with acetic acid); and (B) acetonitrile
 flow rate 0.5 mL/min
 column temp. ambient
 detector MS/MS, ESI(+)
 injection 20 μ L
 Application No. **G004059**

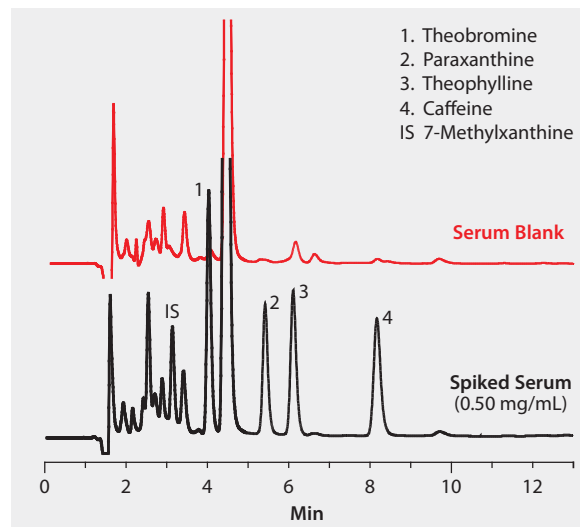


HPLC Analysis of Bronchodilators Theophylline and Other Caffeine Metabolites from Serum on Discovery® RP-AmideC16 after SPE using Discovery® DSC-18

sample preparation SPE (Solid Phase Extraction)
 SPE tube/cartridge Discovery® DSC-18, 500 mg/3 mL (52603-U)
 condition 2 mL methanol, then 2 mL water
 sample preparation 1 mL porcine serum spiked with 0.1 µg/mL, 0.50 µg/mL, or 1.0 µg/mL each analyte
 sample preparation 1 mL methanol; evaporate to dryness with nitrogen stream at room temperature; reconstitute in 200 µL mobile phase containing 0.2 µg/mL or 7-methylxanthine (IS)
 sample preparation 2 mL 5% methanol in water; dry tube 10 min with nitrogen stream
 column Discovery RP-AmideC16, 15 cm × 4.6 mm, 5 µm particles, preceded by a 2 cm RP-AmideC16 guard column and 0.5 µm frit filter (505013)
 mobile phase (A) Methanol; (B) 1% acetic acid (17:38, A:B)
 flow rate 1 mL/min
 column temp. 30 °C
 detector UV, 272 nm
 injection 20 µL reconstituted porcine serum extract
 Application No. **G000594**

Efficiency of Recovery

Compound	Concentration (µg/mL)	% Recovery	% RSD (n=6)
1. Theobromine	0.1	97.4	±6.8
	0.5	96.4	±8.5
	1.0	96.1	±5.0
2. Paraxanthine	0.1	96.2	±8.4
	0.5	95.2	±8.7
	1.0	95.0	±8.7
3. Theophylline	0.1	97.8	±8.5
	0.5	97.8	±8.8
	1.0	98.5	±5.7
4. Caffeine	0.1	98.8	±3.9
	0.5	95.6	±6.7
	1.0	97.6	±5.8

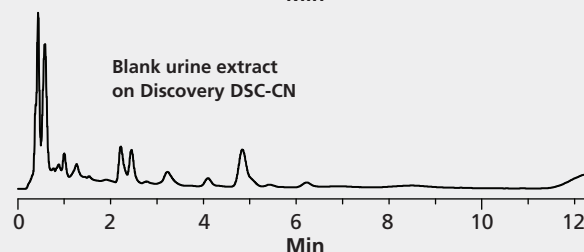
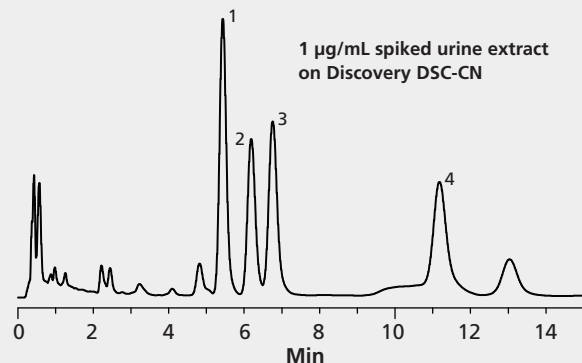


HPLC Analysis of Corticosteroids in Urine on Discovery® HS F5 after SPE using Discovery® DSC-CN

sample preparation SPE (Solid Phase Extraction)
 sample/matrix human urine spiked with corticosteroids at
 0.5 and 1.0 µg/mL and diluted in DI water (1:1, v/v)
 SPE well plate Discovery DSC-CN 96-well SPE, 100 mg/well (575636-U)
 condition 1 mL methanol; 1 mL DI water.
 sample addition 1 mL spiked urine
 washing 1 mL 20% methanol
 elution 1 mL methanol
 eluate post-treatment Evaporate eluate with nitrogen at 30 °C.
 Reconstitute in 200 µL mobile phase.
 column Discovery HS F5, 5 cm x 4.6 mm I.D., 3 µm particles (567504-U)
 mobile phase (A) methanol; (B) DI water; (40:60, A:B)
 flow rate 1.5 mL/min
 column temp. 35 °C
 detector UV, 240 nm
 injection 5 µL
 Application No. **G003763**

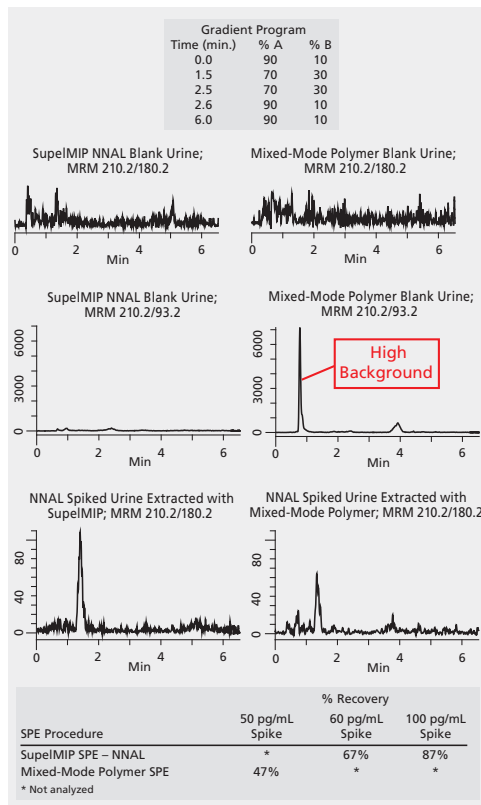
Efficiency of Recovery

Compound	%Recovery ± RSD (n=3)	
	0.5 µg/mL spike level	1.0 µg/mL spike level
1. Hydrocortisone	123.3±1.4%	95.9±1.7%
2. Prednisilone	107.2±1.1%	91.9±1.1%
3. Prednisone	103.2±1.0%	88.4±1.8%



HPLC Analysis of NNAL in Urine on Ascentis® Express C18 after SPE using SupelMIP® SPE-NNAL

sample preparation SPE (Solid Phase Extraction)
 sample/matrix human urine spiked with 60 or 100 pg/mL NNAL
 SPE tube/cartridge SupelMIP SPE - NNAL, 25 mg/10 mL (LRC) (53206-U)
 condition 1 mL dichloromethane; 1 mL methanol; 1 mL DI water
 sample addition 2 mL (60 pg/mL sample), 5 mL (100 pg/mL sample)
 washing 2 x 1 mL DI water, 10 min vacuum; 1 mL toluene; 1 mL toluene:
 dichloromethane (9:1, v/v); 1 mL toluene:dichloromethane (4:1, v/v), 2 min. vacuum
 elution 2 x 1 mL 10% methanol in dichloromethane,
 apply gentle vacuum between each fraction
 eluate post-treatment evaporate under nitrogen and reconstitute
 in 0.15 - 0.25 mL mobile phase
 column Ascentis Express C18, 5 cm x 2.1 mm I.D., 2.7 µm particles (581307-U)
 mobile phase (A) 10 mM ammonium acetate;
 (B) 10 mM ammonium acetate in acetonitrile
 flow rate 0.3 mL/min
 column temp. 35 °C
 detector MS/MS, MRM Transitions, ESI(+) (210.2/180 and 210.2/93.2 m/z)
 injection 20 µL
 Application No. **G004434**



HPLC Analysis of Piroxicam and 2-Aminopyridine in Urine on Discovery® HS F5 after SPE using Discovery® DSC-MCAX

Sample Pre-Treatment:

Piroxicam and 2-aminopyridine (piroxicam's polar metabolite) was spiked into human urine at the levels of 4 and 10 µg/mL, respectively. The urine sample was diluted 1:1 with 10 mM potassium phosphate, pH 3.

sample preparation SPE (Solid Phase Extraction)
sample/matrix human urine spiked with piroxicam (4 µg/mL) and 2-aminopyridine (10 µg/mL)

SPE tube/cartridge Discovery DSC-MCAX, 100 mg/3 mL (52783-U)

condition 1 mL methanol; 1 mL 10 mM potassium phosphate, pH 3

sample addition 1 mL

washing 1 mL 10 mM potassium phosphate, pH 3; 1 mL methanol

elution 1 mL 5% ammonium hydroxide in methanol

eluate post-treatment evaporate to dryness with nitrogen at room temperature, reconstitute in 1 mL mobile phase

column Discovery HS F5, 15 cm x 4.6 mm I.D., 5 µm particles (567516-U)

mobile phase (A) 10 mM potassium phosphate, pH 6; (B) acetonitrile (85:15, A:B)

flow rate 2 mL/min

column temp. 25 °C

detector UV, 220 nm

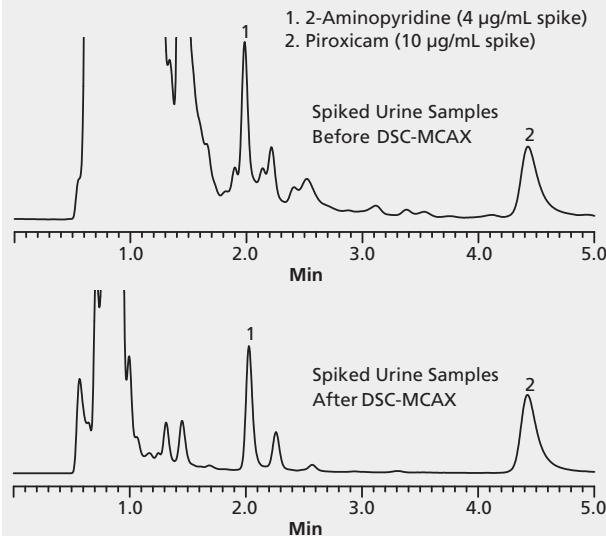
injection 10 µL

Application No. **G003762**

Efficiency of Recovery

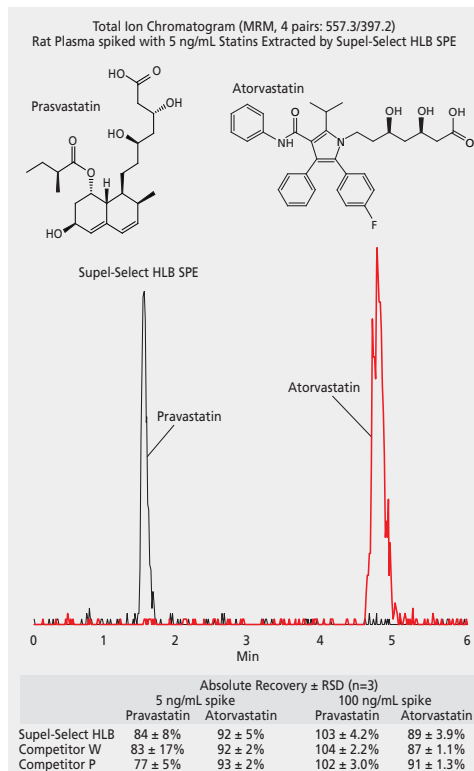
%Recovery ± RSD (n=4)

	2-Aminopyridine	Piroxicam
Discovery DSC-MCAX	102 ± 3.5%	101 ± 1.2%
Leading Competitor	A30 ± 52.5%	98 ± 3.2%
Leading Competitor	B36 ± 24.2%	83 ± 4.3%



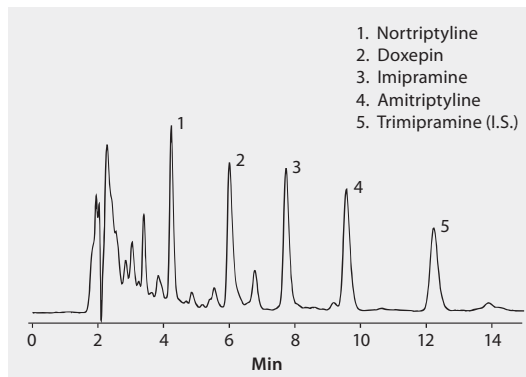
HPLC Analysis of Statins in Rat Plasma on Ascentis® Express C18 after SPE using Supel™-Select HLB

sample preparation SPE (Solid Phase Extraction)
 sample/matrix . . . rat plasma spiked with pravastatin and atorvastatin at 5 and 100 ng/mL
 SPE tube/cartridge Supel-Select HLB SPE, 30 mg/1 mL (54181-U)
 condition 0.5 mL methanol:acetonitrile (1:1, v/v); 0.5 mL DI water
 sample addition 0.5 mL
 washing 0.5 mL 5% methanol
 elution 0.5 mL methanol:acetonitrile (1:1, v/v)
 eluate post-treatment evaporate to dryness with nitrogen at 37 °C,
 reconstitute in 0.5 mL DI water
 column Ascentis Express C18, 5 cm x 2.1 mm, 2.7 µm particles (53822-U)
 mobile phase 0.1% acetic acid diluted in 60% methanol
 flow rate 0.2 mL/min
 column temp. 35 °C
 detector ABI 3200 QT; ESI(+), MRM (423.3/321.3, 423.3/101.0,
 557.3/397.2 and 557.3/453.4)
 injection 5 µL
 Application No. **G004432**



HPLC Analysis of Tricyclic Antidepressants in Serum on Discovery® C18 after SPE using Discovery® DSC-18

sample preparation SPE (Solid Phase Extraction)
 SPE tube/cartridge Discovery DSC-18, 100 mg/1 mL (52602-U)
 column Discovery C18, 15 cm × 4.6 mm, 5 µm preceded by a
 2 cm C18 guard column and 0.5 µm frit filter (504955)
 mobile phase . . . (A) acetonitrile: (B) methanol: (C) 25 mM potassium phosphate,
 monobasic (pH 7 with triethylamine) (45:25:30, A:B:C)
 flow rate 1 mL/min
 column temp. ambient
 detector UV, 254 nm
 injection 50 µL, diluted porcine serum extract
 Application No. G000595



Efficiency of Recovery

Compound	Concentration (µg/mL)	% Recovery	% RSD (n=6)
1. Nortriptyline	0.10	103.6	±4.5
	0.50	97.5	±4.5
2. Doxepin	0.10	102.2	±3.0
	0.50	100.8	±1.8
3. Imipramine	0.10	92.0	±1.5
	0.50	97.5	±1.7
4. Amitriptyline	0.10	93.6	±1.2
	0.50	95.7	±1.4

SPE Procedure, Using Zymark RapidTrace SPE Workstation

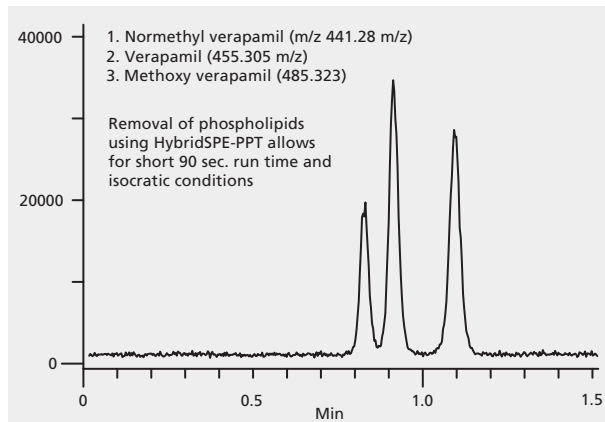
Step	Solvent/Solution	Volume (mL)	Flow Rate (mL/min)	Comments
1. Condition	MeOH	2.0	5.0	conditions sorbent
2. Condition	H ₂ O	2.0	5.0	conditions sorbent
3. Load	spiked porcine serum	2.0 ^A	0.75	applies serum sample
4. Rinse	20% MeOH in H ₂ O	2.0	5.0	washes sorbent
5. Purge-Cannula	H ₂ O	4.0	30.0	cleans sample cannula
6. Rinse	vent	0.1	2.0	positions SPE tube over waste port
7. Dry	N ₂	Time = 10 min		dries sorbent
8. Purge-Cannula	MeOH	4.0	30.0	cleans sample cannula
9. Collect	MeOH	1.0	1.0	elutes analytes into collection vessel
10. Collect	vent	6.0	3.0	pushes residual eluent into vessel ^B
11. Purge-Cannula	H ₂ O	4.0	30.0	cleans sample cannula

^A1 mL porcine serum spiked with 0.1 µg/mL each analyte basified with 3 µL 10 N KOH, then diluted with 1 mL water

^B350 µL water added per mL methanolic eluent before analysis

HPLC Analysis of Verapamil and Metabolites in Rat Plasma on Ascentis® Express C18 after Phospholipid Removal using HybridSPE®-Phospholipid

SPE well plate . . . HybridSPE-Precipitation 96-well Plate, 50 mg/well (575656-U)
 sample preparation SPE (Solid Phase Extraction)
 column . . . Ascentis Express C18, 5 cm x 2.1 mm I.D., 2.7 µm particles (53822-U)
 sample/matrix . . . Rat plasma spiked with verapamil and metabolites at 10 ng/mL
 mobile phase (A) water; (B) acetonitrile,
 pH 2.55 adjust with formic acid (30:70, A:B)
 flow rate 0.6 mL/min
 column temp. 35 °C
 detector TOF/MS
 injection 1 µL
 sample addition 100 µL spiked rat plasma followed
 by 300 µL 1% formic acid in acetonitrile
 elution apply vacuum
 Application No. **G004366**

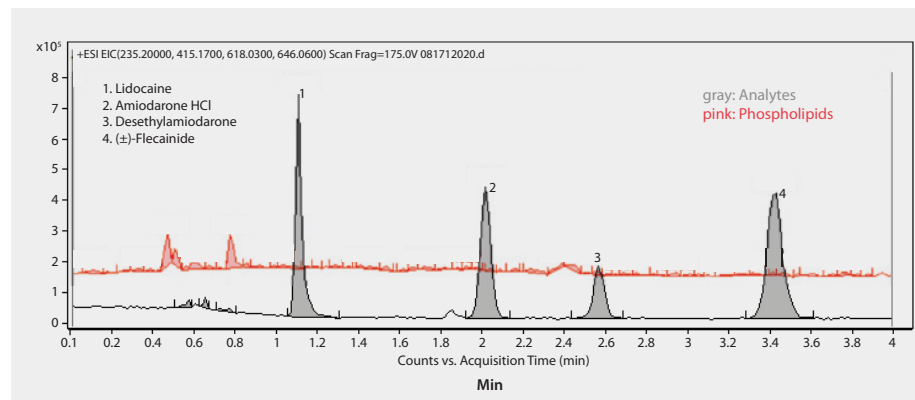


LC-MS Analysis of Antiarrhythmic Drugs and Metabolites in Plasma on Ascentis® Express HILIC following Sample Prep using HybridSPE®-Phospholipid

For efficient therapeutic drug monitoring, it is important for clinicians to have access to fast and robust analytical methods for accurate assessment of drug efficacy. Industrial trends toward highly specific LC/MS applications over traditional ELISA type immunoassay have resulted in the need for high-speed chromatographic assays along with simplified sample preparation methods. Often the limitation of a bioanalytical technique is based upon the effectiveness of the sample preparation technique. Plasma and serum samples are often susceptible to assay irregularities due to matrix-induced interferences. In this study the impact of matrix interference is investigated with respect to precision and accuracy of antiarrhythmic cardiac drugs from plasma samples. A robust bioanalytical method was developed using a combination of fast HILIC chromatography on Ascentis Express along with a selective sample preparation using HybridSPE-Phospholipid. Solvents were LC-MS Ultra CHROMASOLV® and Certified Reference Material grade standards were from Cerilliant.

Endogenous phospholipids can dramatically impact the precision and accuracy of a bioanalytical method. During development, the sample matrix impact on analyte detection should be priority in method validation. Failure to do so can result in inaccuracies in reported levels, thus impacting the assessment of patient health. Eliminating matrix effects in LC/MS is imperative to producing reliable and accurate bioanalytical methods. The targeted phospholipid selectivity of the HybridSPE-Phospholipid technique enables simplified sample processing with no detected phospholipid matrix interference, while exhibiting excellent recovery from plasma and serum samples. This application demonstrates how combining selectivity in both sample preparation and chromatographic separation allows for a simplified and efficient bioanalytical method resulting in a high precision and accurate assay.

sample preparation	SPE (Solid Phase Extraction)
sample/matrix	rabbit plasma, unfiltered K2-EDTA, spiked with each compound at 100 ng/mL (3:1, plasma:1% formic acid in acetonitrile)
SPE tube/cartridge	HybridSPE-Phospholipid, 96-well plate (575656-U)
sample addition	To each well add 100 µL plasma, followed by a 300 µL of 1% formic acid in acetonitrile, agitate on orbital shaker for 4 minutes. Collect filtrate and analyze directly.
column	Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)
mobile phase	(A) 5 mM ammonium formate; (B) 5 mM ammonium formate in acetonitrile, 5:95 (A:B), adjusted to pH 7.0 with formic acid
flow rate	0.4 mL/min
pressure	1305 psi (90 bar)
column temp.	35 °C
detector	ESI+, 100-1000 m/z
injection	0.5 µL
Application No.	G005854



LC-MS Analysis of Clenbuterol In Plasma on Astec® CHIROBIOTIC® T with Phospholipid Removal Using HybridSPE® Phospholipid

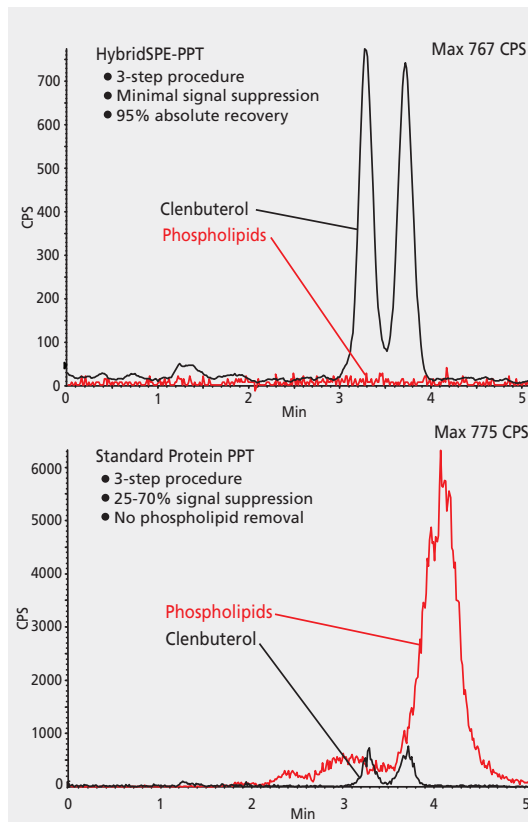
The HybridSPE method provides significant improvement in LC-MS baseline.

sample preparation SPE (Solid Phase Extraction)
 sample/matrix rat plasma spiked with clenbuterol enantiomers at 10 ng/mL
 SPE well plate HybridSPE-Precipitation 96-well Plate, 50 mg/well (575656-U)
 sample addition 100 µL spiked rat plasma followed by 300 µL 1% formic acid in acetonitrile. Mix by vortexing the HybridSPE-PPT plate briefly.

elution apply vacuum
 column CHIROBIOTIC T, 10 cm x 2.1 mm I.D., 5 µm particles (12018AST)
 mobile phase 10 mM ammonium formate in methanol
 flow rate 0.3 mL/min
 column temp. 30 °C

detector ABI 3200 QT; ESI(+), MRM: 184/104 m/z (phospholipids);
 277.2/203.1 m/z (clenbuterol)

injection 10 µL
 Application No. **G004431**



LC-MS Analysis of Omeprazole and Metabolites in Plasma on Ascentis® Express RP Amide after Sample Prep using HybridSPE®-Phospholipid

This application demonstrates the suitability of HybridSPE and the Ascentis Express RP Amide for the analysis of omeprazole metabolites.

Sample was vortexed and centrifuged for 2 minutes at 15000 rpm.

Supernatant was then passed through HybridSPE 96 well plate. Eluent was collected, evaporated and reconstituted in mobile phase.

sample preparation SPE (Solid Phase Extraction)

sample/matrix rat plasma spiked with omeprazole, phenacetin and metabolites at 2 µg/mL

SPE well plate HybridSPE-Phospholipid, 96-well plate, 15 mg/0.8 mL (575656-U)

sample addition 100 µL plasma to each well, followed by 300 µL of 1% formic acid in acetonitrile

elution apply vacuum

eluate post-treatment eluate was collected, evaporated, and reconstituted in mobile phase.

column Ascentis Express RP-Amide, 5 cm x 2.1 mm I.D., 2.7 µm particles (53911-U)

mobile phase (A) water, 10 mM ammonium formate, pH 3.4; (B) methanol, 10 mM ammonium formate, pH 3.4; (65:35, A:B)

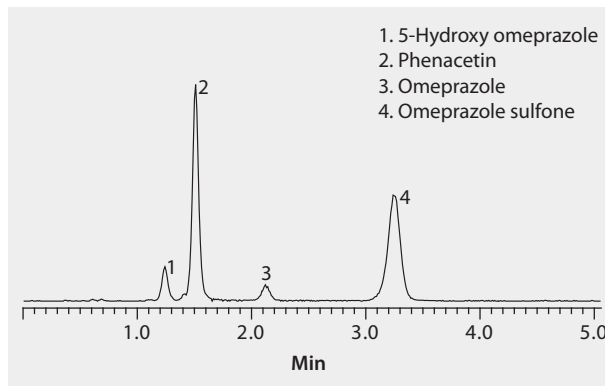
flow rate 0.3 mL/min

column temp. 35 °C

detector ESI(+), m/z = 50-400

injection 1 µL

Application No. [G005711](#)



LC-MS/MS Analysis of Steroid Hormones in Plasma on Ascentis® Express C18 after Sample Prep using HybridSPE®-Phospholipid

Immunoassay approaches for steroid determination are typically hindered due to the lack of specificity of antibodies for the measurement of the particular steroids. With the wide acceptance of LC-MS/MS in the clinical setting, there is a growing trend toward converting traditional IA techniques toward more specific and robust LC-MS/MS approaches. Though LC-MS/MS improves assay specificity and allows of multiplexed analyte assays to be conducted simultaneously, it is not without limitations specifically toward interferences from endogenous sample matrix. Often LC-MS/MS assays can be hindered due to ionization effects due to endogenous matrix from biological samples; this can result in random and arbitrary discrimination in analyte response. The use of HybridSPE-Phospholipid prior to LC-MS/MS analysis removes the endogenous phospholipids and precipitated proteins in one step, enabling high analyte recovery, negligible matrix background and long column lifetime.

SPE tube/cartridge HybridSPE®-Phospholipid, 96-well plate,
50 mg/well (575656-U)

sample addition To each well add 100 µL of plasma followed by 300 µL of
precipitation solvent (1% formic acid or 0.5% citric acid in acetonitrile).
(Agitate via vortex for 4 minute, place on vacuum manifold and
apply 10" Hg vacuum for 4 minutes. Collect filtrate and analyze directly.)

column Ascentis® Express C18, 10 cm x 2.1 mm I.D., 2.7 µm particles (53823-U)

gradient 60% B for 3 min, 60% B to 95% B in 5 min, held at 95% B for 2 min

mobile phase (A) 5 mM ammonium formate pH 4.0 with formic acid; (B) methanol

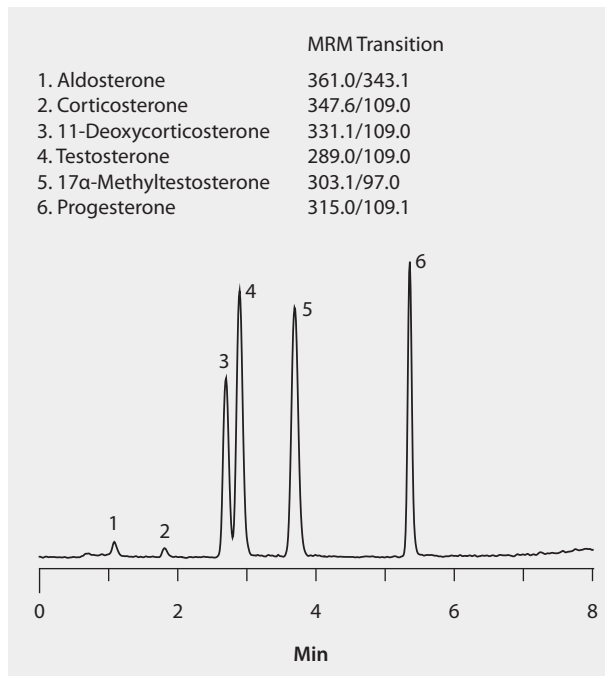
flow rate 0.3 mL/min

column temp. 50 °C

detector ESI+, MRM

injection 2 µL

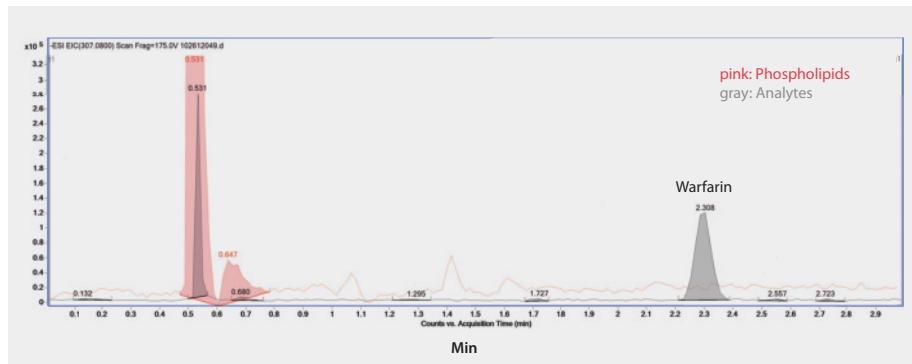
Application No. **G005895**



LC-MS/MS Analysis of Warfarin™ in Plasma on Ascentis® Express C18 after SPE using HybridSPE®-Phospholipid

Warfarin is a widely prescribed oral anticoagulant for treatment and prevention of thrombosis and thromboembolism. The pharmacological effect of warfarin is derived from its ability to inhibit the enzyme vitamin K epoxide reductase, thereby reducing circulating levels of vitamin K which is required in the clotting process. In spite of its popularity, there are some downsides to warfarin, including a relatively narrow therapeutic index, interactions with other clinically important drugs, side effects, genetic variation in warfarin metabolism, frequent migration of blood levels outside the therapeutic range, bleeding events, and variability in time to reach therapeutic levels. These, and the fact that warfarin is the second leading cause of drug-related emergency room visits make it a commonly analyzed compound in the clinical lab. The clinical implications and importance of therapeutic drug monitoring of warfarin necessitate reliable and sensitive analytical methods, like UHPLC-MS/MS, to detect and quantify warfarin and its enantiomers in serum.

sample/matrix rabbit plasma, unfiltered K2-EDTA, spiked with warfarin at 100 ng/mL (3:1, plasma:1% formic acid in acetonitrile)
 SPE tube/cartridge HybridSPE®-Phospholipid, 96-well plate (575656-U)
 sample addition . . . to each well add 100 µL plasma, followed by a 300 µL of 1% formic acid in acetonitrile, agitate on orbital shaker for 4 minutes
 elution to each well add 100 µL plasma, followed by a 300 µL of 1% formic acid in acetonitrile, agitate on orbital shaker for 4 minutes
 column Ascentis® Express C18, 10 cm x 2.1 mm I.D., 2.7 µm particles (53823-U)
 mobile phase (A) 5mM ammonium formate, pH 4.2 with formic acid; (B) 5mM ammonium formate in 95:5 acetonitrile:water, 50:50 (A:B)
 flow rate 0.3 mL/min
 column temp. 35 °C
 detector ESI+, 100-1000 m/z
 injection 2 µL
 Application No. **G005850**



LC-MS/MS Analysis of Warfarin™ Enantiomers in Plasma on Astec® CHIROBIOTIC® V after SPE using HybridSPE®-Phospholipid

Warfarin is a widely prescribed oral anticoagulant for treatment and prevention of thrombosis and thromboembolism. The pharmacological effect of warfarin is derived from its ability to inhibit the enzyme vitamin K epoxide reductase, thereby reducing circulating levels of vitamin K which is required in the clotting process. In spite of its popularity, there are some downsides to warfarin, including a relatively narrow therapeutic index, interactions with other clinically important drugs, side effects, genetic variation in warfarin metabolism, frequent migration of blood levels outside the therapeutic range, bleeding events, and variability in time to reach therapeutic levels. These, and the fact that warfarin is the second leading cause of drug-related emergency room visits make it a commonly analyzed compound in the clinical lab. Warfarin is a chiral compound comprising an equal mixture of (R) and (S) enantiomers. (S)-Warfarin is considerably more potent and pharmacologically active than (R)-warfarin. Astec CHIROBIOTIC V columns resolve warfarin enantiomers under LC-MS conditions and hold up well to biological samples. The clinical implications and importance of therapeutic drug monitoring of warfarin necessitate reliable and sensitive analytical methods, like UHPLC-MS/MS, to detect and quantify warfarin and its enantiomers in serum.

sample/matrix rabbit plasma, unfiltered K2-EDTA, spiked with warfarin at 100 ng/mL (3:1, plasma:1% formic acid in acetonitrile)

SPE tube/cartridge HybridSPE-Phospholipid, 96-well plate (575656-U)

sample addition to each well add 100 µL plasma, followed by a 300 µL of 1% formic acid in acetonitrile, agitate on orbital shaker for 4 minutes

elution to each well add 100 µL plasma, followed by a 300 µL of 1% formic acid in acetonitrile, agitate on orbital shaker for 4 minutes

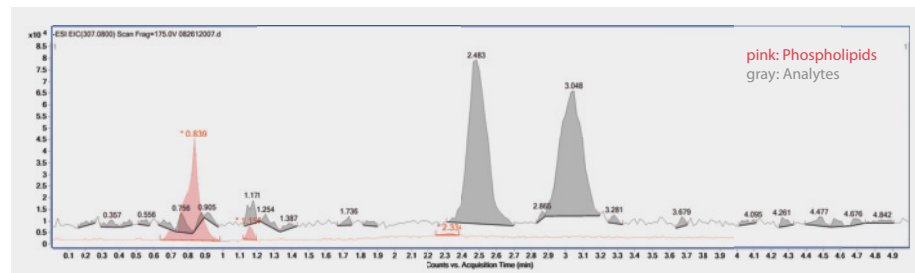
column Astec CHIROBIOTIC® V, 10 cm x 4.6 mm I.D., 5 µm particles (11022AST)

mobile phase (A) 0.1% formic acid (pH unadjusted); (B) acetonitrile, 75:25 (A:B)

flow rate 1 mL/min

column temp. 35 °C

detector ESI+, 100-1000 m/z
injection 2 µL
Application No. G005849



LC-MS (TOF) Analysis of Warfarin™ Enantiomers in Plasma on Astec® CHIROBIOTIC® V after SPE Using HybridSPE®-Phospholipid

This application demonstrates the benefit of using Sigma-Aldrich Analytical (Supelco, Fluka, and Cerilliant) consumables for rapid, accurate, sensitive and reliable MS detection in a clinical or bioanalytical setting.

Warfarin was originally developed as a rodenticide, but soon found medical application as an anticoagulant to prevent the formation of blood clots, especially after heart attacks. At the time of this writing, it is the most widely prescribed oral anticoagulant and is sold under Coumadin and various other brand names. Warfarin is a chiral molecule. The R- and S- forms are cleared by the body via different pathways and have different pharmacokinetic and pharmacodynamic effects. S-warfarin is more potent than the R-warfarin in producing the anticoagulant response.

The Astec® CHIROBIOTIC V column provided rapid resolution of the enantiomers under conditions that are compatible with mass spectrometric (MS) detection. Considering the rise of MS in the clinical laboratory, this is an important consideration. The CHIROBIOTIC family of chiral columns are based on the macrocyclic glycopeptide molecule and affect enantioresolution under mobile conditions that are compatible with reversed-phase and MS conditions. Their durability allows them to stand up to repeated injections of biological extracts.

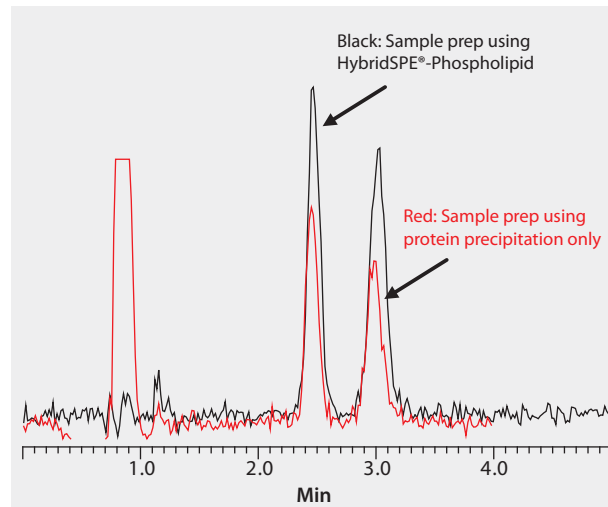
By using HybridSPE-Phospholipid for the sample prep, ion-suppressing phospholipids were removed for improved sensitivity and longer column lifetime. LC-MS Ultra CHROMASOLV solvents were used to supply low background interference and particulate contaminants. Cerilliant reference material grade standards provided reliable quantitation.

system: Agilent 1290, 6210 TOF

sample/matrix Rat plasma stabilized with K2EDTA was acquired from Lampire Biological Laboratories, (Pipersville PA). (Plasma was spiked directly from stock standard to a level of 100 ng/mL in 3:1 (plasma:1% formic acid acetonitrile).)

SPE tube/cartridge Pk1 50 mg/96-Well HybridSPE-Phospholipid Plate (575656-U)

condition Apply 100 µL of plasma to plate, followed by 300 µL of 1% formic acid acetonitrile. Agitate via vortex for 4 min.
 elution Place on vacuum manifold and apply 10" Hg vacuum for 4 minutes. Collect filtrate and analyze directly.
 column CHIROBIOTIC V, 10 cm x 4.6 mm I.D., 5 µm particles (11022AST)
 mobile phase (A) 0.1% formic acid water; (B) acetonitrile, (75:25, A:B)
 flow rate 1 mL/min
 column temp. 35 °C
 detector ESI+, 100-1000 m/z
 injection 2 µL
 Application No. **G005827**



LC-TOF Analysis of Antiarrhythmic Drugs and Metabolites in Plasma on Ascentis® Express HILIC after Sample Prep using HybridSPE®-Phospholipid

The basic characteristics of antiarrhythmic cardiac drugs and associated metabolites make them targets for HILIC chromatographic separation. Because HILIC mobile phases consist of a high composition of acetonitrile, this can also facilitate the direct analysis of precipitated plasma samples without the need for additional sample solvent exchange. In most cases, the high organic mobile phase also facilitates increased analyte response in ESI (+) MS detection. This application used HybridSPE-Phospholipid sample prep to remove phospholipids and precipitated proteins prior to LC-MS analysis on Ascentis Express HILIC. The resulting method was robust and sensitive.

sample/matrix . . . Rat plasma stabilized with K2EDTA was acquired from Lampire Biological Laboratories, (Pipersville PA). Plasma was spiked directly from stock standard to a level of 400 ng/mL

SPE tube/cartridge . . HybridSPE-Phospholipid 96-Well Plate, 50 mg/2 mL (575656-U)

sample addition Apply 100 µL of plasma to plate, followed by 300 µL of 1% formic acid acetonitrile. Agitate via vortex for 4 min
elution Place on vacuum manifold and apply 10" Hg vacuum for 4 minutes. Collect filtrate and analyze directly.

column . . . Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)
mobile phase (A) 5 mM ammonium formate;
(B) 5 mM ammonium formate in acetonitrile; (5:95, A:B, pH 7.0 with formic acid)
(LC-MS CHROMASOLV Ultra grade)

flow rate 0.4 mL/min

pressure 1305 psi (90 bar)

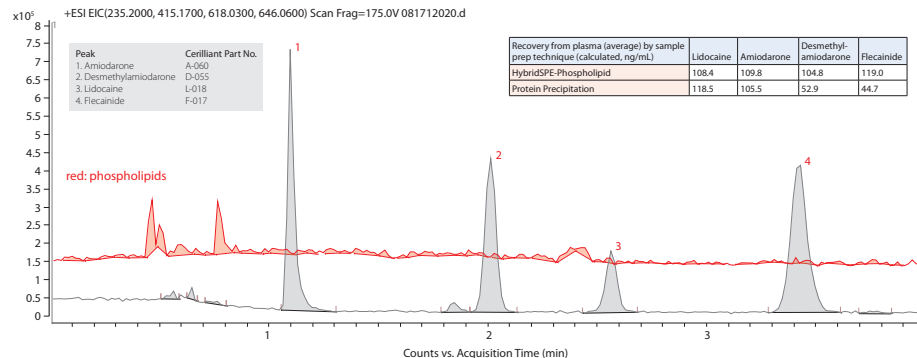
column temp. 35 °C

detector ESI(+), full scan, m/z 100-1000

injection 0.5 µL

sample plasma extract, analyte concentration of final sample work up is equivalent to 100 ng/mL

Application No. **G005818**



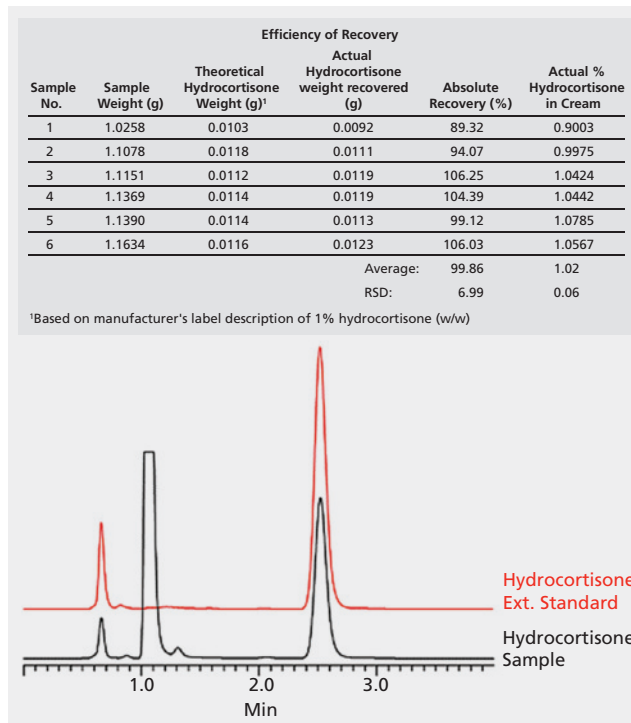
Cosmetics, Personal Care, and Cleaning Products

HPLC Analysis of Hydrocortisone in Topical Cream on Discovery® HS C18 after SPE using Discovery® DSC-Si

Sample Pre-treatment:

Disolve 1 g 1% hydrocortisone topical hand cream in 10 mL ethyl acetate. Dilute 2 mL of ethyl acetate-cream sample with 8 mL hexane:ethyl acetate (2:1, v/v).

sample preparation SPE (Solid Phase Extraction)
 sample addition hydrocortisone topical hand cream in hexane:ethylacetate
 SPE tube/cartridge Discovery DSC-Si, 500 mg/3 mL (52695-U)
 condition 1 mL hexane:ethyl acetate (2:1, v/v)
 sample addition 1 mL
 washing 1 mL hexane:ethyl acetate (2:1, v/v)
 elution 1 mL methanol:DI water (1:1, v/v)
 eluate post-treatment dilute eluate to 2 mL with methanol:DI water (1:1, v/v)
 column Discovery HS C18, 15 cm x 4.6 mm I.D., 5 µm particles (568520-U)
 mobile phase (A) methanol; (B) DI water (1:1, A:B)
 flow rate 1 mL/min
 column temp. 35 °C
 detector UV, 220 nm
 injection 10 µL
 Application No. **G003765**



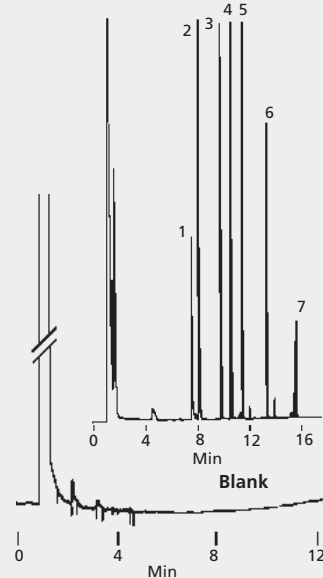
Environmental

GC Analysis of a 7-Component Organochlorine Pesticide Mix in Drinking Water on a 5% Phenyl Column after SPE using Supelclean™ ENVI™-18

sample preparation SPE (Solid Phase Extraction)
 sample/matrix drinking water spiked with pesticides
 SPE tube/cartridge Supelclean ENVI-18, 500 mg/6 mL (57064)
 condition 2 x 6 mL hexane:ethyl ether (1:1); 6 mL methanol; 6 mL DI water
 sample addition 250 mL water sample at 10 mL/min
 drying 10 min with vacuum
 elution 2 x 15 mL hexane:ethyl ether (1:1)
 eluate post-treatment concentrate to 2 mL with nitrogen stream
 column 5% Phenyl Polysiloxane, 30 m × 0.25 mm I.D.,
 0.25 μm (Supelco equivalent, Equity-5, 28089-U)
 oven 150 °C (2 min), 10 °C/min to 275 °C
 detector ECD, 310 °C
 carrier gas helium
 injection 1 μL
 Application No. [713-1192](#)

Analyte	% Recovery (± CV)
1. Hexachlorobenzene	87 ± 11
2. γ-BHC (Lindane)	99 ± 13
3. Heptachlor	96 ± 12
4. Aldrin	94 ± 13
5. Heptachlor epoxide	98 ± 13
6. Endrin	93 ± 11
7. Methoxychlor	110 ± 13

Extracted Pesticides



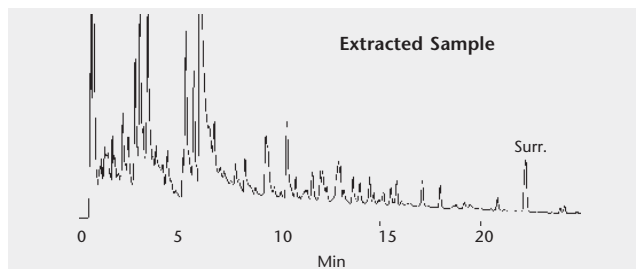
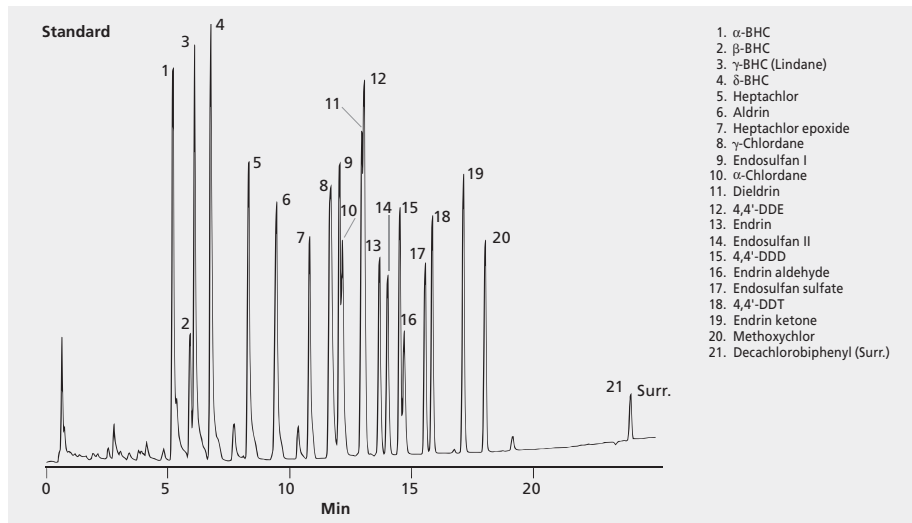
GC Analysis of a 20-Component Organochlorine Pesticide Mix in Water on a 5% Phenyl Column after SPE using Supelclean™ ENVI™-8

Chlorinated pesticides in hazardous waste

Sample Pre-treatment:

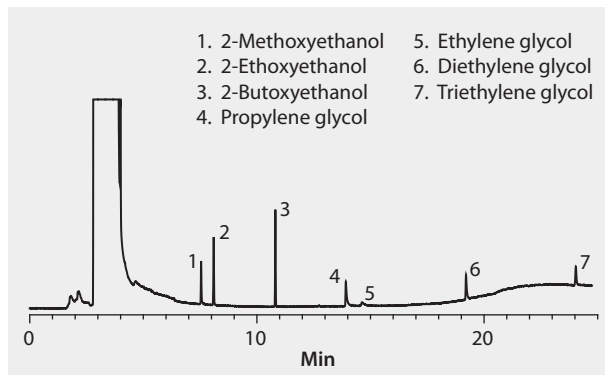
Add 5 mL methanol to 100 mL aqueous hazardous waste. Adjust to pH 5-7 if necessary.

sample preparation SPE (Solid Phase Extraction)
 sample/matrix waste water spiked with pesticides
 SPE tube/cartridge Supelclean ENVI-8, glass hardware,
 500 mg/6 mL (57107 (500 mg/6 mL); 57108 (1 g/6 mL))
 condition 3 mL methanol; h 2 mL 5% methanol in water
 sample addition load sample at 5 mL/min
 drying 2-3 min with nitrogen stream
 elution 2 x 4 mL hexane:acetone (90:10), drop wise. allow to soak into bed
 column 5% Phenyl Polysiloxane, 15 m x 0.53 mm I.D.,
 0.50 µm (Supelco equivalent, Equity-5, 28252-U)
 oven 150 °C (0.5 min) to 275 °C (5 min)
 inj. temp. 200 °C
 detector ECD, 300 °C
 carrier gas helium
 injection 1 µL split/splitless (45 sec delay)
 Application No. 794-0399



GC Analysis of Glycols in Water on SPB®-1000 after SPE using ENVI-Carb™ Plus

sample preparation SPE (Solid Phase Extraction)
 sample/matrix tap water spiked at 2 µg/mL with glycols
 SPE tube/cartridge . . . ENVI-Carb Plus reversible cartridge, 400 mg/ 1mL (54812-U)
 condition . . . 1 mL methylene chloride, 2 x 2 mL methanol, 3 mL deionized water
 (cartridge not allowed to dry during conditioning)
 sample addition 5 mL spiked tap water
 drying 10 min, 10 mm mercury
 elution 2 mL 80:20 methanol:methylene chloride
 column SPB-1000, 30 m x 0.25 mm I.D., 0.25 µm (24313)
 oven 50 °C (1 min), 8 °C/min to 200 °C (7 min)
 inj. temp. 220 °C
 detector FID, 220 °C
 carrier gas helium, 1.5 mL/min. constant
 injection 1 µL, splitless (splitter open at 0.75 min.)
 liner 4 mm I.D. FocusLiner™ inlet liner with taper
 Application No. [G005284](#)



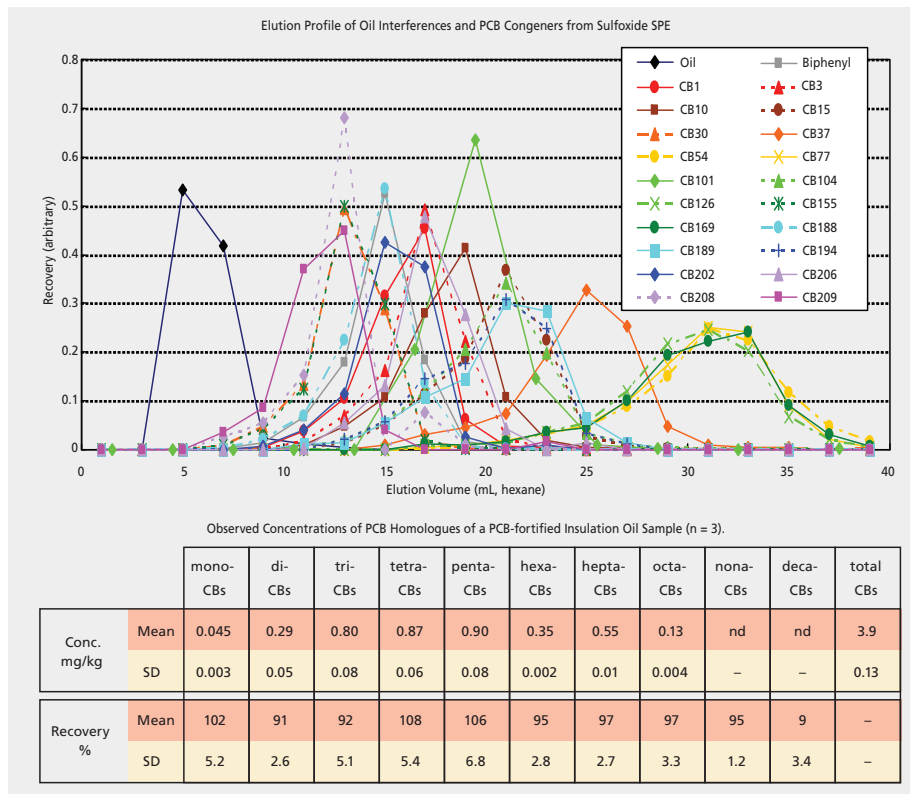
GC Analysis of PCBs in Transformer Oil on a 5% Phenyl Column after SPE using Supelclean™ Sulfoxide

Sample Pre-treatment:

Commercial insulation oil (Japan Industrial Standard JIS C2320-1999, insulating oil, Class 1-2/4, paraffin oil) was spiked with a Kanechlor PCB mix at the total levels of 3.7 ppm (mg/kg) and diluted with hexane (1:1 v/v).

SPE tube/cartridge Supelclean Sulfoxide SPE Tube, Glass 6 g/20 mL (55252-U)
 sample preparation SPE (Solid Phase Extraction)
 column 5% phenyl polysiloxane (Supelco equivalent, SLB-5ms, 28471-U)
 sample addition transformer oil spiked with PCBs
 detector QMS (For full method details, please see reference (1))
 extraction process Sample Pre-treatment: paraffin oil was spiked with a Kanechlor PCB mix at the total levels of 3.7 ppm (mg/kg) and diluted with hexane (1:1 v/v). (Commercial insulation oil (Japan Industrial Standard JIS C2320-1999, insulating oil, Class 1-2/4).)

condition 20 mL acetone; 40 mL of hexane
 sample addition 0.4 mL diluted oil sample
 elution 12 mL hexane (elutes oil interferences); 25 mL hexane (elutes PCBs)
 eluate post-treatment concentrate under nitrogen
 Application No. G004220

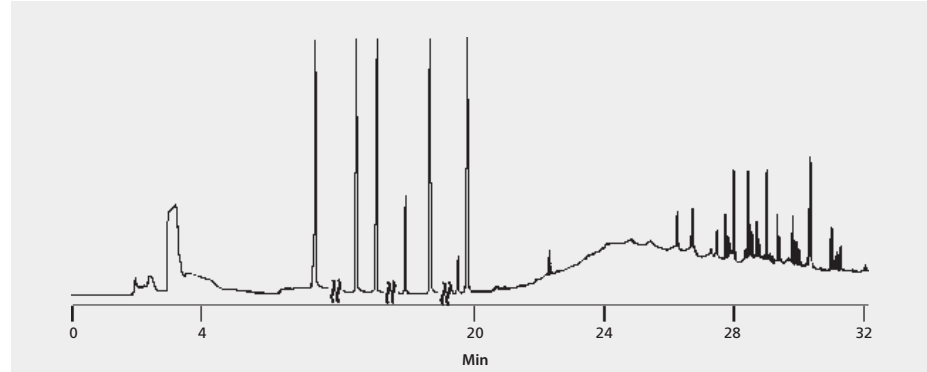


Ref: 1. Numata et al. , *Anal. Chem.* 75, 1450-1457 (2003)

GC Analysis of PCBs in Transformer Oil on SPB®-5 after SPE using Supelclean™ LC-Florisor® and LC-Si

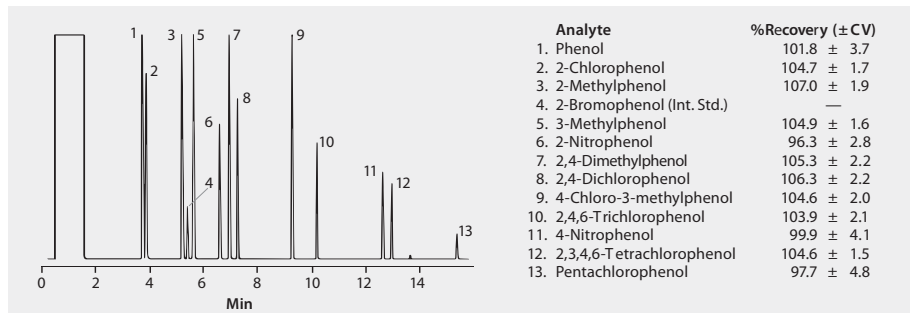
Connect Supelclean LC-Si SPE tube (1 g/6 mL) in series to male luer outlet of Supelclean LC-Florisor SPE tube (1 g/6 mL) using an SPE Tube Adapter (57020-U). Apply up to 0.2 g transformer oil or 0.1 g waste oil to upper frit of Florisor SPE tube. Pass 5 x 2 mL iso-octane through both Florisor and LC-Si SPE tubes. Oil interferences will be retained on SPE tubes whereas PCBs will elute with iso-octane fractions. Collect and combine iso-octane fractions using 10 mL volumetric flask. Analyze iso-octane extract using GC-ECD.

sample preparation SPE (Solid Phase Extraction)
 sample/matrix used transformer oil containing 50 ppb Aroclor 1254.
 SPE tube/cartridge Supelclean LC-Florisor, 1.0 g/6 mL (57057)
 SPE tube/cartridge Supelclean LC-Si, 1.0 g/6 mL (57051)
 condition 0.5 mL iso-octane (Florisor tube)
 sample addition 0.2 g transformer oil or 0.1 g waste oil
 washing 5 x 2 mL iso-octane
 column SPB-5, 30 m x 0.32 mm I.D., 0.25 µm film (24048)
 oven 40 °C (4 min) to 300 °C at 10 °C/min, hold 5 min
 detector ECD
 carrier gas nitrogen
 injection 1 µL, splitless (30 sec delay), then split (50:1)
 Application No. [713-0854](#)



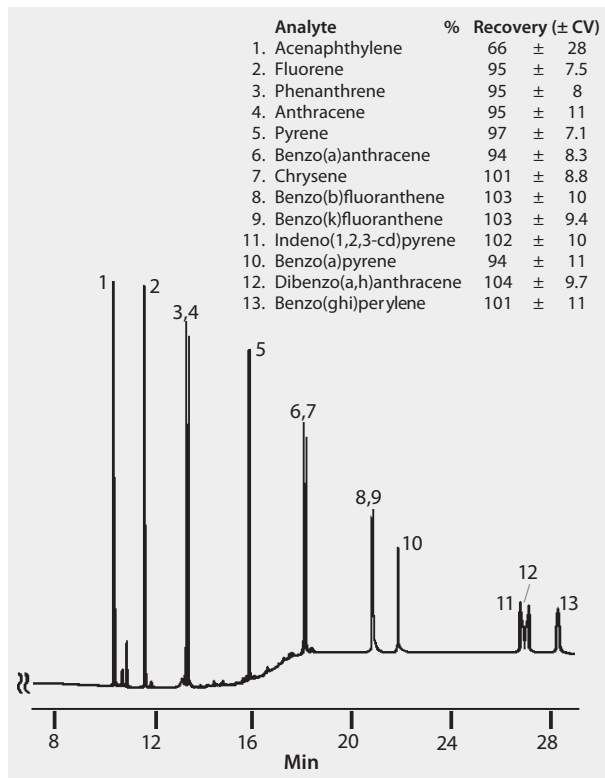
GC Analysis of Phenols in Water on a 5% Phenyl Column after SPE using Supelclean™ ENVI-Chrom P

sample preparation	SPE (Solid Phase Extraction)
sample/matrix	water spiked with phenol compounds
SPE tube/cartridge	Supelclean ENVI-Chrom P, 250 mg/6 mL (57225-U)
condition	6 mL methyl t-butyl or ethyl acetate; 6 mL acetonitrile. Equilibrate with 6 mL DI water
sample addition	100 mL water sample.
drying	10 min using vacuum
elution	5 mL methyl t-butyl ether acetate dropwise allowing initial 2 mL to soak in SPE bed
column	5% Phenyl Polysiloxane, 15 m × 0.53 mm I.D., 0.50 μm (Supelco equivalent, Equity-5, 28252-U)
oven	65 °C, 10 °C/min to 185 °C (1 min), 20 °C/min to 275 °C (5 min)
detector	FID, 300 °C
carrier gas	helium
injection	1 μL, splitless (45 sec hold)
Application No.	712-0073



GC Analysis of Polynuclear Aromatic Hydrocarbons (PAHs) in Water on a 5% Phenyl Column after SPE using Supelclean™ ENVI-18

sample preparation SPE (Solid Phase Extraction)
 sample addition
 SPE tube/cartridge Supelclean ENVI-18, 500 mg/6 mL (57064)
 condition 2 x 6 mL toluene:methanol (10:1); 6 mL methanol; 6 mL DI water
 sample addition 250 mL water sample at 10 mL/min
 drying 10 min under vacuum
 elution 2 x 1 mL toluene:methanol (10:1)
 column 5% phenyl polysiloxane, 30m x 0.25 mm I.D.,
 0.25 µm film (Supelco equivalent, SLB-5ms, 28471-U)
 oven 70 °C (2 min) to 280 °C at 8 °C/min
 detector FID, 310 °C
 carrier gas helium
 injection 1 µL
 Application No. **80-207**



GC Analysis of Semivolatiles in Drinking Water on a 5% Phenyl Column after SPE using ENVI™-18 DSK

Sample Pre-treatment:

Adjust 1 L drinking water to pH <2 with 6 N HCl. Add 5 mL methanol and mix thoroughly

sample preparation SPE (Solid Phase Extraction)

sample/matrix acidified drinking water

SPE tube/cartridge ENVI-18 DSK SPE Disk, 47 mm (57171)

condition 5 mL dichloromethane; 5 mL methanol; 5 mL DI water

sample addition 5 mL water sample

elution 2 x 5 mL acetonitrile rinsing internal chamber of sample reservoir thoroughly

column 5% phenyl polysiloxane, 30 m × 0.25 mm I.D., 0.25 μm (Supelco equivalent, SLB-5ms, 28471-U)

oven 40 °C to 160 °C (3 min), then to 300 °C (3 min) at 6 °C/min

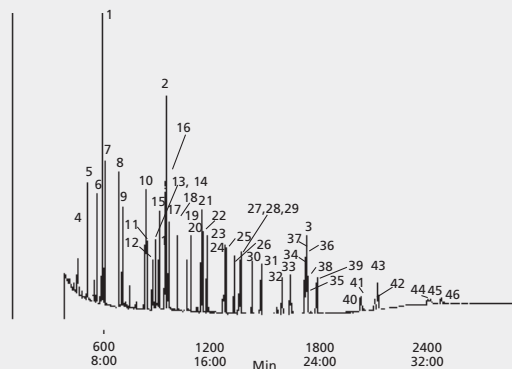
detector MS, scan range m/z = 45-450

carrier gas helium, 33 cm/sec

injection 1 μL split/splitless, 1 min delay

Application No. **749-0798**

	μg/L*		g/L*
1. Acenaphthene-d ₁₀	5.0	24. Heptachlor epoxide	2.0
2. Phenanthrene-d ₁₀	5.0	25. 2,2',3',4,6-Pentachlorobiphenyl	2.0
3. Chrysene-d ₁₂	5.0	26. γ-Chlordane	2.0
4. Hexachlorocyclopentadiene	2.0	27. Pyrene	2.0
5. Dimethylphthalate	2.0	28. α-Chlordane	2.0
6. Acenaphthylene	2.0	29. trans-Nonachlor	2.0
7. 2-Chlorobiphenyl	2.0	30. 2,2',4,4',5,6'-Hexachlorobiphenyl	2.0
8. Diethylphthalate	2.0	31. Endrin	2.0
9. Fluorene	2.0	32. Butylbenzylphthalate	2.0
10. 2,3-Dichlorobiphenyl	2.0	33. di(2-ethylhexyl)Adipate	2.0
11. Hexachlorobenzene	2.0	34. 2,2',3',4,4',6-Heptachlorobiphenyl	2.0
12. Simazine	2.0	35. Methoxychlor	2.0
13. Atrazine	2.0	36. 2,2',3',4,5',6,6'-Octachlorobiphenyl	2.0
14. Pentachlorophenol	8.0	37. Benz(a)anthracene	2.0
15. γ-BHC	2.0	38. Chrysene	2.0
16. Phenanthrene	2.0	39. Di(2-ethylhexyl)phthalate	2.0
17. Anthracene	2.0	40. Benzo(b)fluoranthene	2.0
18. 2,4,5-Trichlorobiphenyl	2.0	41. Benzo(k)fluoranthene	2.0
19. Alachlor	2.0	42. Benzo(a)pyrene	2.0
20. Heptachlor	2.0	43. Perylene-d ₁₂	5.0
21. di-n-Butylphthalate	2.0	44. Indeno(1,2,3-cd)Pyrene	2.0
22. 2,2',4,4'-Tetrachlorobiphenyl	2.0	45. Dibenzo(a,h)anthracene	2.0
23. Aldrin	2.0	46. Benzo(ghi)perylene	2.0



HPLC Analysis of Acidic Herbicides in Water on a Polymeric C18 Column after SPE using Supelclean™ ENVI™-Carb

using Zymark AutoTrace Extraction WorkStation 1.20

sample preparation SPE (Solid Phase Extraction)
sample/matrix Fresh 1 L water samples, dechlorinated with sodium thiosulfate when necessary, at ambient temperature and pH.

SPE tube/cartridge Supelclean ENVI-Carb, 250 mg/6 mL (57092)
condition 10 mL DI water at 20 mL/min
sample addition 0.9 L water sample at 20 mL/min
drying 10 min using clean nitrogen
washing 10 mL DI water at 20 mL/min
elution 10 mL 0.1% phosphoric acid in methylene chloride:acetonitrile (80:20) at 5 mL/min

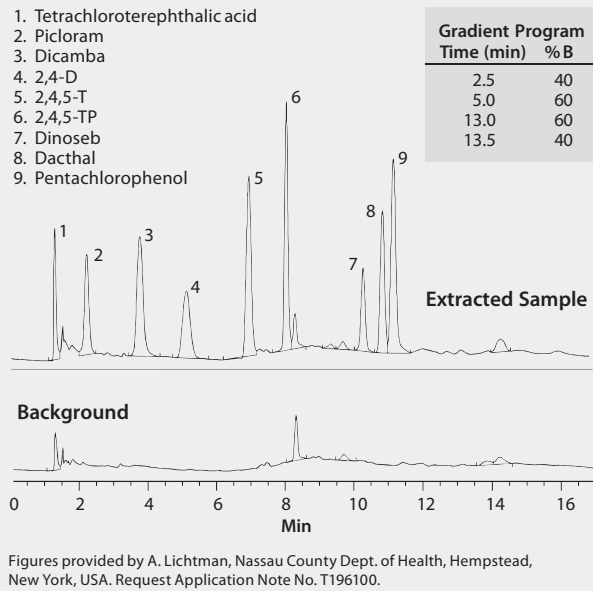
column polymeric-coated silica-based PAH specialty column, 20 cm × 3 mm I.D., 5 μm (Supelco equivalent, SUPELCOSIL LC-PAH, available upon request)

mobile phase gradient, (A): 0.05% phosphoric acid in DI water; (B): acetonitrile
flow rate 0.5 mL/min
column temp. 50 °C

detector photodiode array- peak width: 0.053 min,
sampling interval: 0.320 sec, monitor 210 nm & 225 nm

injection 10 μL of extract (4-5 ppb each analyte in water)

Application No. 796-0150



HPLC Analysis of β -Blockers and β -Agonists in Urine and Wastewater on a C18 Column after SPE using SupelMIP® SPE-Beta-Receptor

Sample Pre-treatment:

Horse urine was centrifuged at 3000 g for 10 min, diluted 1:1 (v/v) with DI water, adjusted to pH 7. Wastewater was filtered with 1 μ m filter paper and adjusted to pH 6-7. Samples were spiked with 10 beta-agonists and beta-blockers at the level of 1 ng/mL.

sample preparation SPE (Solid Phase Extraction)
sample/matrix horse urine or waste water spiked with
10 beta-agonists and beta-blockers at 1 ng/mL

SPE tube/cartridge SupelMIP SPE - Beta-Receptor, 25 mg/10 mL (LRC) (53223-U)
condition 1 mL acetonitrile; 1 mL DI water
sample addition 1 mL

washing 3 x 1 mL DI water; 1 mL acetonitrile;
1 mL 60% acetonitrile/40% DI water; apply 2 min of full
vacuum to dry the tube after each step

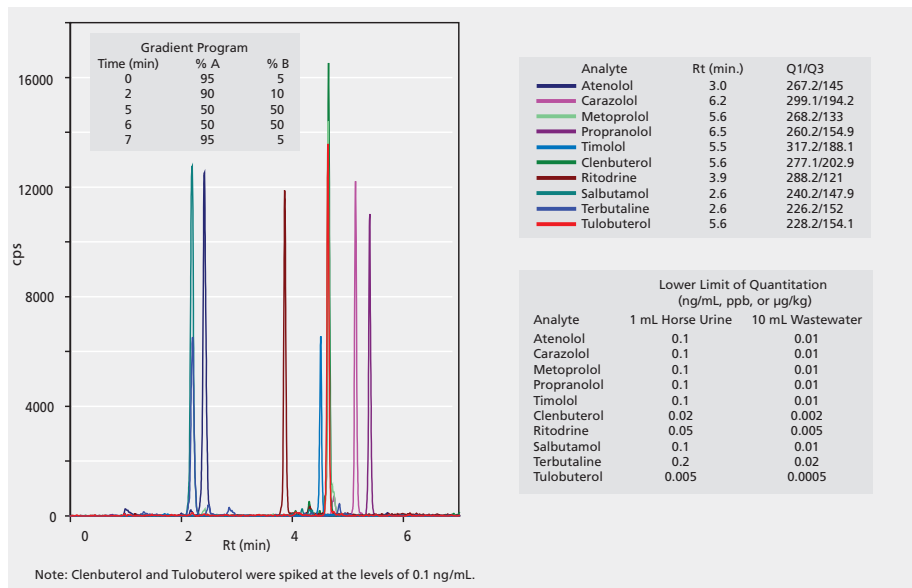
elution 2 x 1 mL 1% formic acid in acetonitrile
eluate post-treatment evaporate under nitrogen and reconstitute with
150 μ L 5% acetonitrile in 10 mM ammonium acetate,
pH 4.6 prior to LC-MS-MS analysis

column C18, 5 cm x 3 mm I.D., 3 μ m particles
mobile phase (A) 10 mM ammonium acetate,
pH 4.6 (adjusted with acetic acid); and (B) acetonitrile

flow rate 0.5 mL/min
column temp. ambient

detector MS/MS, ESI(+)
injection 20 μ L

Application No. **G004059**



HPLC Analysis of Paraquat and Diquat on SUPELCOSIL™ LC-18 after SPE using ENVI™-8 DSK

Refer to US EPA Method 549.1 for full details

Sample Pre-treatment:

250 mL drinking water. Adjust water sample to pH to 10.5 ± 0.2 with 10% sodium hydroxide or 10% hydrochloric acid

sample preparation SPE (Solid Phase Extraction)

sample/matrix drinking water adjusted to pH to 10.

SPE tube/cartridge ENVI-8 DSK SPE Disk, 47 mm (57172)

sample preparation ENVI-8 DSK, 47 mm (57172)

condition . . . 10 mL acetonitrile; 2×10 mL reagent water; 10 mL conditioning solvent

A (5 g cetyl trimethyl ammonium bromide and 5 mL conc. ammonium hydroxide in 500 mL DI water, dilute to 1 L);

(2×10 mL reagent water; 10 mL conditioning solvent B (10 g hexanesulfonic acid, sodium salt and 10 mL conc. ammonium hydroxide in 250 mL DI water, dilute to 500 mL))

sample addition 250 mL water 100 mL/min

elution 0.5-1.0 mL acetonitrile (to cover/solvate disk);

2×4 mL eluting solution (13.5 mL orthophosphoric acid and 10.3 mL diethylamine in 500 mL DI water, dilute to 1 L)

column SUPELCOSIL LC-18, 15 cm \times 4.6 mm I.D., 5 μ m particles (58230-U)

mobile phase . . . 3.5 mL triethylamine and 1.0 g 1-hexane-sulfonic acid, sodium salt to 800 mL DI H₂O add orthophosphoric acid to pH 2.5, dilute to 1 L

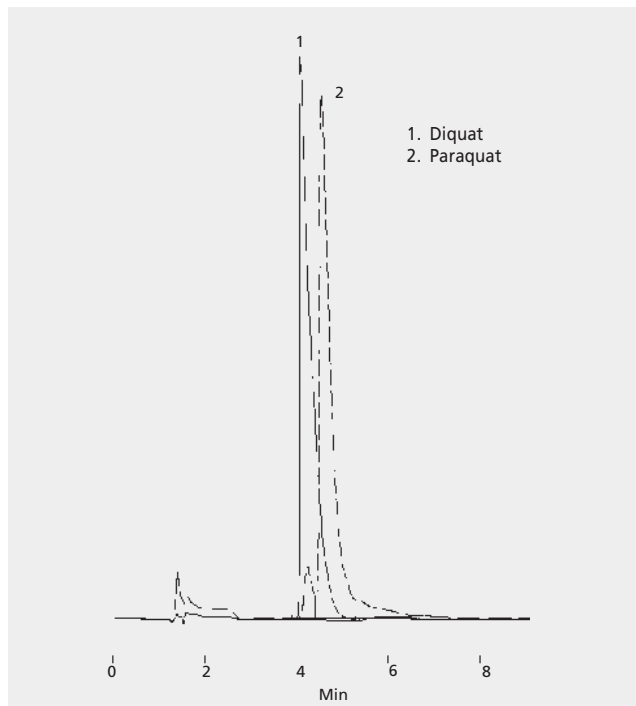
flow rate 1.0 mL/min

column temp. 35 °C

detector photodiode array, diquat - 308 nm, paraquat - 257 nm

injection 100 μ L

Application No. **794-0715**

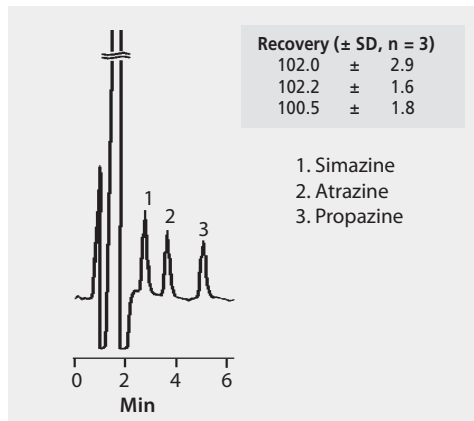


HPLC Analysis of Triazine Herbicides in Grass on SUPELCOSIL™ LC-8-DB after SPE using Supelclean™ LC-SCX

Sample Pre-treatment:

5 g fresh grass clippings spiked with 2 ppm each herbicide. Add 4 g anhydrous sodium sulfate and 20 mL methylene chloride:acetone (80:20). Shake 20 min and allow mixture to stand 1 min.

sample preparation SPE (Solid Phase Extraction)
 sample/matrix fresh grass clippings spiked with herbicides at 2 ppm
 SPE tube/cartridge Supelclean LC-SCX, 500 mg/3 mL (57018)
 condition 1 mL methylene chloride
 sample addition 2 mL grass extract. Wash with 2 x 2 mL acetonitrile.
 drying Dry packing for 5 min. under nitrogen purge
 washing Dry packing for 5 min under nitrogen purge; wash with 2 x 2 mL DI water
 elution 1.5 mL methanol
 eluate post-treatment dilute to 2 mL with DI water
 column SUPELCOSIL LC-8-DB, 15 cm x 4.6 mm I.D.,
 5 µm with guard column (58347)
 mobile phase (A) acetonitrile; (B) water; (45:55, A:B)
 flow rate 1.5 mL/min
 detector UV, 254 nm
 injection 100 µL
 Application No. **84-109**

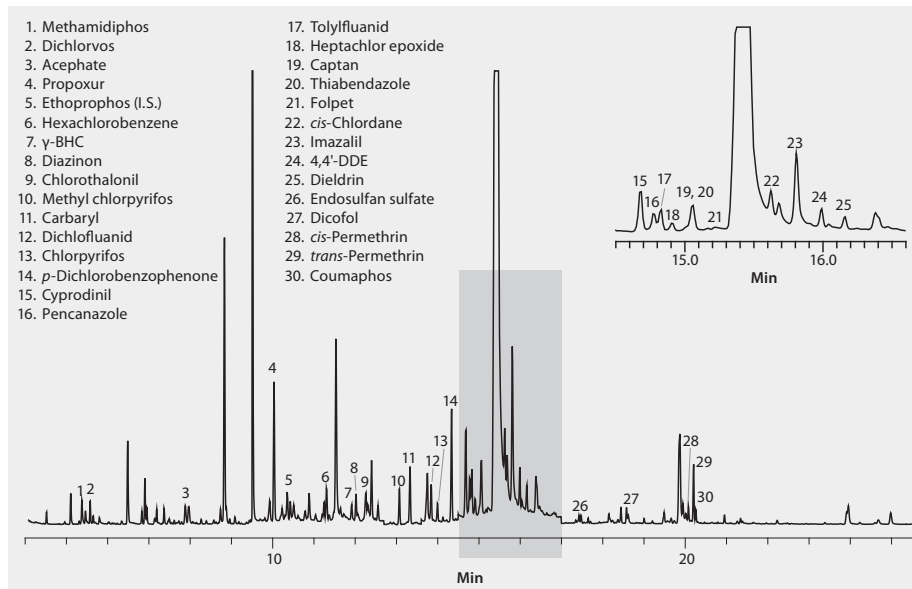


Food and Beverages

GC Analysis of Agriculture Pesticides in Orange (Spiked) on SLB®-5ms after QuEChERS Cleanup using Primary-Secondary Amine (PSA)

Chromatograms of the spiked orange samples are presented in the Figure. Several background peaks eluting prior to nine minutes are due to impurities in the toluene. Despite extract cleanup, matrix peaks are also present in the chromatograms. Further sample cleanup may be possible by increasing SPE sorbent weight. Nevertheless, all pesticides were detected. A first order fit was used for calibration. Linearity for the five-point calibration curves was excellent, with 28 of the 29 pesticides having r^2 values >0.995 at a range of 50-500 ppb. Proper calibration of imazalil was not possible due to its presence in the orange blanks.

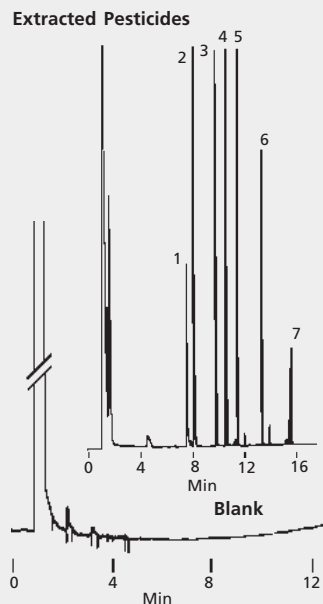
sample preparation SPE (Solid Phase Extraction)
 sample/matrix . . . 15 g of ground-up orange, 75 μ L of the internal standard stock solution (ethoprophos at 20 ppm in methanol), 75 μ L of the pesticide stock solution (29 pesticides, each at 20 ppm in methanol)
 column SLB-5ms, 30 m x 0.25 mm I.D., 0.25 μ m (28471-U)
 oven 100 $^{\circ}$ C (1 min), 10 $^{\circ}$ C/min to 300 $^{\circ}$ C (5 min)
 inj. temp. 250 $^{\circ}$ C
 MSD interface 300 $^{\circ}$ C
 scan range selected ion monitoring (SIM), 7 monitoring groups used
 carrier gas helium, 1 mL/min constant
 injection 1.0 μ L pulsed (20 psi until 0.20 min), splitless (1.0 min)
 liner 4 mm I.D., single taper
 sample extract of an orange spiked with a 29-component pesticide mix plus 1 internal standard, each at 100 ppb
 Application No. **G003590**



GC Analysis of a 7-Component Organochlorine Pesticide Mix in Drinking Water on a 5% Phenyl Column after SPE using Supelclean™ ENVI™-18

sample preparation SPE (Solid Phase Extraction)
 sample/matrix drinking water spiked with pesticides
 SPE tube/cartridge Supelclean ENVI-18, 500 mg/6 mL (57064)
 condition 2 x 6 mL hexane:ethyl ether (1:1); 6 mL methanol; 6 mL DI water
 sample addition 250 mL water sample at 10 mL/min
 drying 10 min with vacuum
 elution 2 x 15 mL hexane:ethyl ether (1:1)
 eluate post-treatment concentrate to 2 mL with nitrogen stream
 column 5% Phenyl Polysiloxane, 30 m × 0.25 mm I.D.,
 0.25 µm (Supelco equivalent, Equity-5, 28089-U)
 oven 150 °C (2 min), 10 °C/min to 275 °C
 detector ECD, 310 °C
 carrier gas helium
 injection 1 µL
 Application No. [713-1192](#)

Analyte	% Recovery (± CV)
1. Hexachlorobenzene	87 ± 11
2. γ-BHC (Lindane)	99 ± 13
3. Heptachlor	96 ± 12
4. Aldrin	94 ± 13
5. Heptachlor epoxide	98 ± 13
6. Endrin	93 ± 11
7. Methoxychlor	110 ± 13



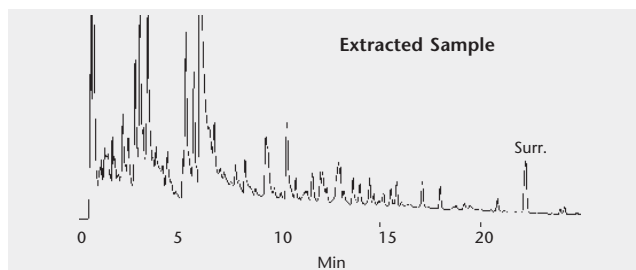
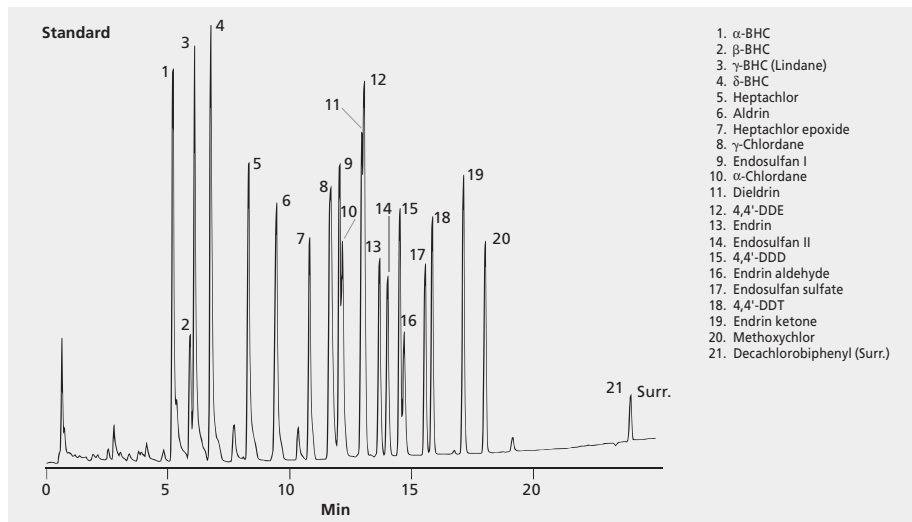
GC Analysis of a 20-Component Organochlorine Pesticide Mix in Water on a 5% Phenyl Column after SPE using Supelclean™ ENVI™-8

Chlorinated pesticides in hazardous waste

Sample Pre-treatment:

Add 5 mL methanol to 100 mL aqueous hazardous waste. Adjust to pH 5-7 if necessary.

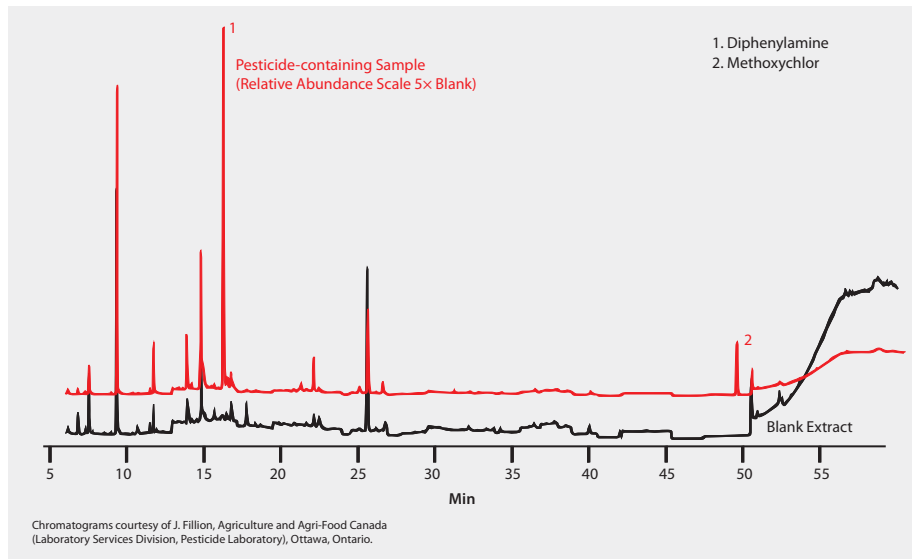
sample preparation SPE (Solid Phase Extraction)
 sample/matrix waste water spiked with pesticides
 SPE tube/cartridge Supelclean ENVI-8, glass hardware,
 500 mg/6 mL (57107 (500 mg/6 mL); 57108 (1 g/6 mL))
 condition 3 mL methanol; h 2 mL 5% methanol in water
 sample addition load sample at 5 mL/min
 drying 2-3 min with nitrogen stream
 elution 2 x 4 mL hexane:acetone (90:10), drop wise. allow to soak into bed
 column 5% Phenyl Polysiloxane, 15 m x 0.53 mm I.D.,
 0.50 µm (Supelco equivalent, Equity-5, 28252-U)
 oven 150 °C (0.5 min) to 275 °C (5 min)
 inj. temp. 200 °C
 detector ECD, 300 °C
 carrier gas helium
 injection 1 µL split/splitless (45 sec delay)
 Application No. 794-0399



GC Analysis of Diphenylamine and Methoxychlor in Apples on a 14% Cyanopropylphenyl Column after SPE using Supelclean ENVI-Carb

Pesticides in fruits and vegetables

sample preparation	SPE (Solid Phase Extraction)
sample/matrix	homogenize 50 g sample in 100 mL acetonitrile then add 10 g NaCl and homogenize 5 min
SPE tube/cartridge	ENVI-Carb, 500 mg/6 mL
column	14% cyanopropylphenyl polysiloxane, 30 m × 0.25 mm I.D., 0.15 μm (Supelco equivalent, Equity-1701, 28372-U)
oven	70 °C (2 min), 25 °C/min to 130 °C, 2 °C/min to 220 °C, 10 °C/min to 280 °C (4.6 min)
detector	MSD, 285 °C
carrier gas	helium
injection	2 μL splitless
Application No.	796-0129



GC Analysis of FAMES in Cookies on SLB®-IL111 after SPE Fractionation using Discovery® Ag-Ion

A sample of commercially purchased cookies were prepared using an acid digestions /alkali hydrolysis followed by methylation as described in AOCS Official Method Ce 1k-09 (1). The resulting extracts were then fractionated using Ag-ion SPE and analyzed by GC/FID on the 100 m SLB-IL111 ionic liquid capillary column.

sample preparation SPE (Solid Phase Extraction)

sample/matrix . . . 1 g of commercially purchased cookies was ground and subjected to acid digestion and alkali hydrolysis followed by methylation as described in AOCS Official Method Ce 1k-09
SPE tube/cartridge Discovery Ag-Ion SPE tubes, 750 mg/6 mL (54225-U)
condition . . . 4 mL of acetone; allow solvent to gravity drip completely through tube; discard eluant; 4 mL of hexane; allow solvent to gravity drip completely through tube; discard eluant

sample addition 1 mL of extract; discard any eluant that drips through tube
elution (Fraction 1) 6 mL of hexane:acetone (96:4); collect eluant in a fresh container with slight vacuum; ((Fraction 2) 4 mL of hexane: acetone (90:10); collect eluant in a fresh container with slight vacuum; (Fraction 3) 4 mL of 100% acetone; collect eluant in a fresh container with slight vacuum)

eluate post-treatment . . . evaporate each fraction at room temperature using nitrogen; reconstitute each fraction to 1 mL of hexane

column SLB-IL111, 100 m x 0.25 mm I.D., 0.20 µm (29647-U)

oven 168 °C

inj. temp. 250 °C

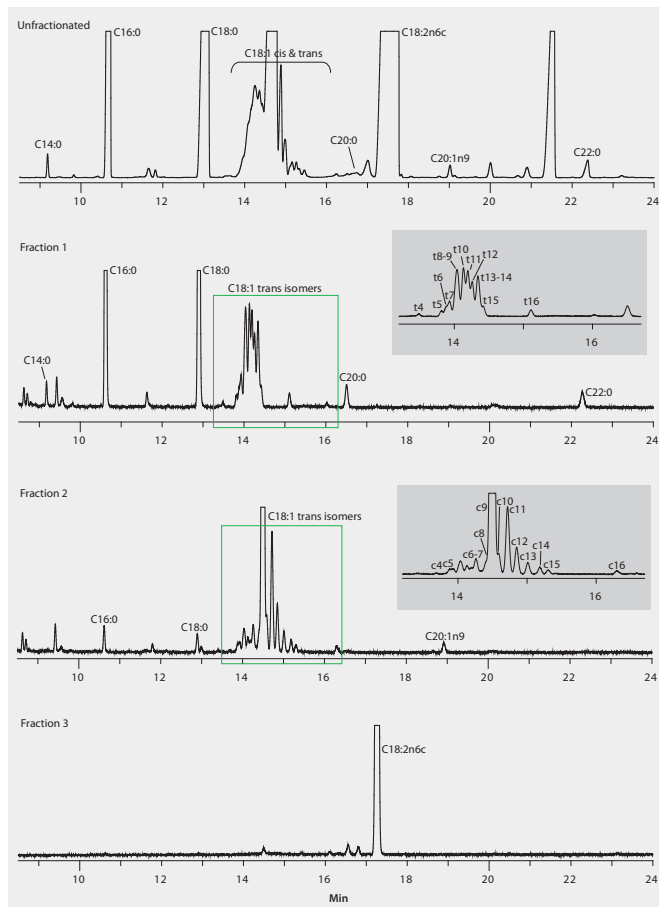
detector FID, 250 °C

carrier gas 1 µL, 10:1 split

injection 1 µL, 10:1 split

liner 4 mm I.D., split type, single taper wool packed FocusLiner™ design

Application No. [G005622](#)



GC Analysis of FAMES in Cookies on SP™-2560 after SPE Fractionation using Discovery® Ag-Ion

A sample of commercially purchased cookies were prepared using an acid digestions /alkali hydrolysis followed by methylation as described in AOCS Official Method Ce 1k-09 (1). The resulting extracts were then fractionated using Ag-ion SPE and analyzed by GC/FID on the 100 m SP-2560 capillary column.

sample preparation SPE (Solid Phase Extraction)

sample/matrix . . . 1 g of commercially purchased cookies was ground and subjected to acid digestion and alkali hydrolysis followed by methylation as described in AOCS Official Method Ce 1k-09

SPE tube/cartridge Discovery Ag-Ion SPE tubes, 750 mg/6 mL (54225-U)

condition . . . 4 mL of acetone; allow solvent to gravity drip completely through tube; discard eluant; 4 mL of hexane; allow solvent to gravity drip completely through tube; discard eluant

sample addition 1 mL of extract; discard any eluant that drips through tube

elution (Fraction 1) 6 mL of hexane:acetone (96:4); collect eluant in a fresh container with slight vacuum; ((Fraction 2) 4 mL of hexane: acetone (90:10); collect eluant in a fresh container with slight vacuum;(Fraction 3) 4 mL of 100% acetone; collect eluant in a fresh container with slight vacuum)

eluate post-treatment . . . evaporate each fraction at room temperature using nitrogen; reconstitute each fraction to 1 mL of hexane

column SP-2560, 100 m x 0.25 mm I.D., 0.20 µm (24056)

oven 180 °C

inj. temp. 250 °C

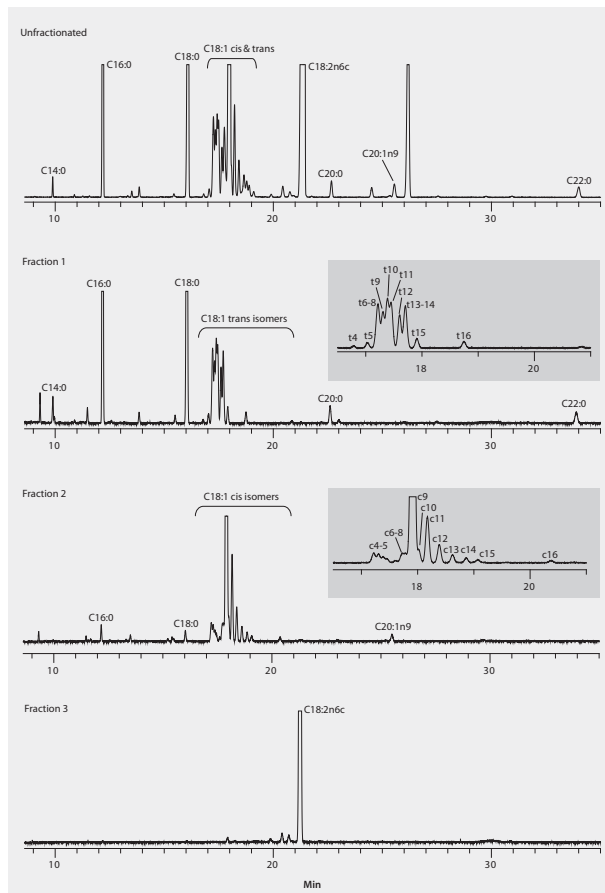
detector FID, 250 °C

carrier gas hydrogen, 1 mL/min

injection 1 µL, 10:1 split

liner 4 mm I.D., split type, single taper wool packed FocusLiner™ design

Application No. **G005621**



GC Analysis of Organophosphorus Pesticides (OP-Pest) in Cabbage, Onion, and Mushrooms on SLB-5ms after SPE using Supelclean™ ENVI-Carb™ II/PSA

Sample pretreatment: To a 10 g sample of homogenized food (green onions, apples, Napa cabbage, button mushrooms) was added 10 mL acetonitrile and 4 g magnesium sulfate (that had been heated at 550 °C) and 1 g sodium chloride. After centrifugation, the supernatant was removed and mixed with 1 g magnesium sulfate and centrifuged. 5 mL of the supernatant was removed and evaporated to 1 mL for SPE loading.

Organophosphorus pesticide use in agriculture is widespread due to the fact that they are more amenable to environmental degradation in comparison to organochlorine or organonitrogen compounds. There are a large number of pesticides in the organophosphorus group, and because of their potential health effects, they are of particular concern on produce imported from areas in which they are commonly used. This chromatogram illustrates the separation of 63 of these pesticides by GC on the SLB-5ms using nitrogen phosphorus detection (NPD).

sample preparation SPE (Solid Phase Extraction)
sample/matrix 10 g homogenized food sample (green onions, apples, Napa cabbage, button mushrooms)

SPE tube/cartridge Supelclean ENVI-Carb II/PSA SPE Tube (54067-U)

condition 5 mL acetone:toluene (65:35)

sample addition 1 mL sample extract

elution 10 mL of acetone:toluene (65:35)
eluate post-treatment Evaporate fraction to 0.5 mL then adjust volume to 1 mL with ethyl acetate for GC-NPD analysis

column SLB-5ms, 30 m x 0.25 mm I.D., 0.25 µm (28471-U)

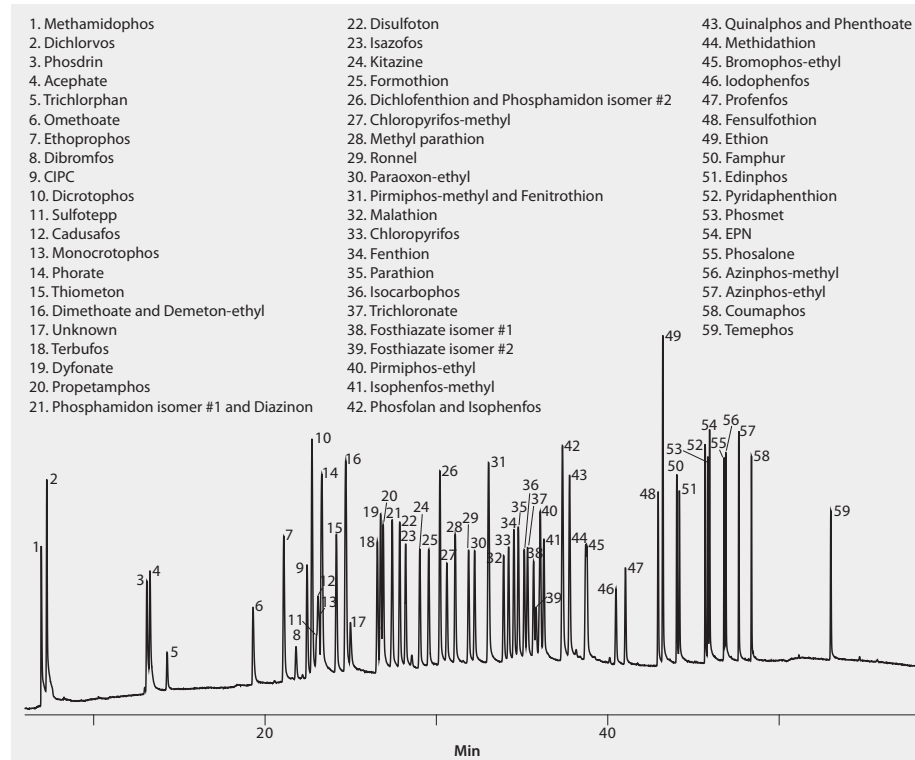
oven 110 °C (2 min), 2.5 °C/min to 205 °C, 10 °C/min to 310 °C (10 min)

inj. temp. 250 °C

detector NPD, 310 °C

carrier gas helium, 0.9 mL/min constant flow

injection 2 µL, splitless
liner 4 mm I.D. dual tapered
Application No. G005815



GC Analysis of PCBs in Whole Cow Milk (Spiked) on SLB®-5ms (20 m x 0.18 mm I.D., 0.18 µm) after QuEChERS Cleanup using Supel™ QuE Z-Sep, Fast GC Analysis

Reference: Stenerson, K; Ye, M.; Halpenny, M., New Analytical Tools for the Determination of Persistent Organic Pollutants (POPs) in Fatty Food and Beverage Matrices Using QuEChERS Extraction/Cleanup and Gas Chromatography (GC) Analysis. Pittcon 2013. Sigma-Aldrich/Supelco publication T413034.

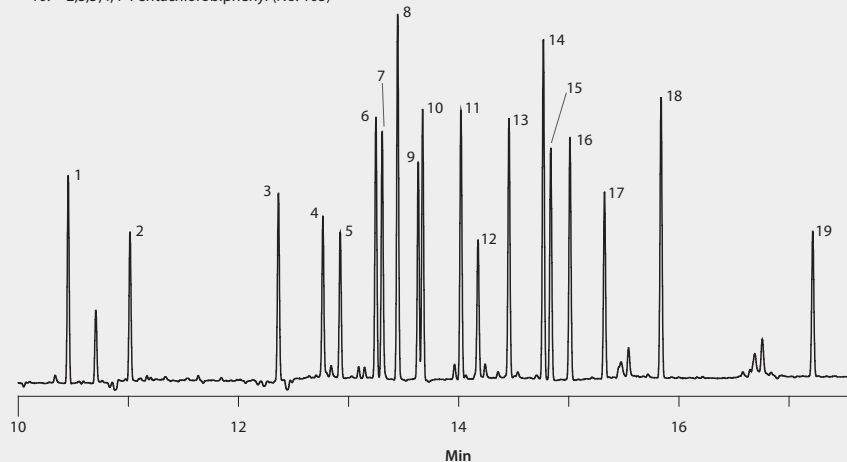
This application demonstrates the use of dispersive SPE or "QuEChERS" for the extraction and cleanup of whole cow's milk for GC-ECD analysis of polychlorinated biphenyl (PCBs). Z-Sep sorbent was used in the cleanup step and found to reduce background and yield recoveries >70% for all PCB congeners evaluated except no. 209, which was recovered at 68%.

Extraction solvent: acetone:hexane (1:1), 20 mL

Clean-up volume: 1 mL

sample preparation SPE (Solid Phase Extraction)
 sample/matrix 10 g whole cow's milk
 extraction tube Supel™ QuE Non-buffered tube (4 g magnesium sulfate, 1 g sodium chloride) (55294-U)
 clean-up tube Supel™ QuE Z-Sep 150 mg, magnesium sulfate (150 mg, part no. 63135) (55299-U)
 column SLB-5ms, 20 m x 0.18 mm I.D., 0.18 µm (28564-U)
 oven 75 °C (1 min), 12 °C/min to 340 °C (10 min)
 inj. temp. 250 °C
 detector µ-ECD, 340 °C
 carrier gas hydrogen, 1.2 mL/min, constant
 injection 1 µL splitless (0.75 min)
 liner 4 mm I.D. FocusLiner™ with taper
 Application No. **G005921**

- | | |
|--|--|
| 1. 2,3,6-Trichlorobiphenyl (No. 28) | 11. 2,2,3,4,4,5'-Hexachlorobiphenyl (No. 138) |
| 2. 2,2,5,5'-Tetrachlorobiphenyl (No. 52) | 12. 3,3,4,4,5-Pentachlorobiphenyl (No. 126) |
| 3. 2,2,4,5,5'-Pentachlorobiphenyl (No. 101) | 13. 2,3,4,4,5,5'-Hexachlorobiphenyl (No. 167) |
| 4. 3,4,4,5-Tetrachlorobiphenyl (No. 81) | 14. 2,3,3,4,4,5-Hexachlorobiphenyl (No. 156) |
| 5. 3,3,4,4'-Tetrachlorobiphenyl (No. 77) | 15. 2,3,3,4,4,5'-Hexachlorobiphenyl (No. 157) |
| 6. 2,3,4,4,5-Pentachlorobiphenyl (No. 123) | 16. 2,2,3,4,4,5,5'-Heptachlorobiphenyl (No. 180) |
| 7. 2,3,4,4,5'-Pentachlorobiphenyl (No. 118) | 17. 3,3,4,4,5,5'-Hexachlorobiphenyl (No. 169) |
| 8. 2,3,4,4,5-Pentachlorobiphenyl (No. 114) | 18. 2,3,3,4,4,5,5'-Heptachlorobiphenyl (No. 189) |
| 9. 2,2,4,4,5,5'-Hexachlorobiphenyl (No. 153) | 19. 2,2,3,3,4,4,5,5',6,6'-Decachlorobiphenyl (No. 209) |
| 10. 2,3,3,4,4'-Pentachlorobiphenyl (No. 105) | |



GC Analysis of Pesticides in Beef Kidney on SLB®-5ms (20 m x 0.18 mm I.D., 0.36 µm) after QuEChERS Cleanup using Supel™ Que Z-Sep+, MS in SIM Mode, Fast GC Analysis

Beef kidney was analyzed for pesticides by GC/MS-SIM after extraction and cleanup. Dispersive SPE was used for both extraction and cleanup. Since beef kidney contains approximately 5% fat, Z-Sep+ was used for cleanup.

sample preparation Dispersive (QuEChERS)

sample/matrix . . . 10 gm homogenized beef kidney spiked at 50 ng/g with pesticides

extraction tube Supel Que Acetate (AC) Tube (55234-U)

extraction process add 10 mL of acetonitrile; shake for 1 minute;

add contents of Supel Que acetate extraction tube (55234-U);

shake immediately for 1 minute; centrifuge at 3200 rpm for 5 minutes;

(Sample Pretreatment: Homogenize 10 gm beef kidney
and spike with pesticides at 50 ng/g.)

clean-up tube Supel QuE Z-Sep+ tube (55296-U)

clean-up process transfer 3 mL of the acetonitrile layer into a

Supel QuE Z-Sep+ cleanup tube (55296-U); shake for 1 minute;

centrifuge at 3400 rpm for 3 minutes;

draw off supernatant for LVI-GCMS analysis

column F.S. CAP. SLB-5MS 20 m x 0.18 mm I.D., 0.36 µm (28576-U)

oven 70 °C (0.5 min), 25 °C/min to 125 °C,

10 °C/min to 200 °C, 5 °C/min to 300 °C/min (1 min)

inj. temp. programmed, 60 °C (0.28 min), 600 °C/min to 325 °C (5 min)

detector MSD

MSD interface 325 °C

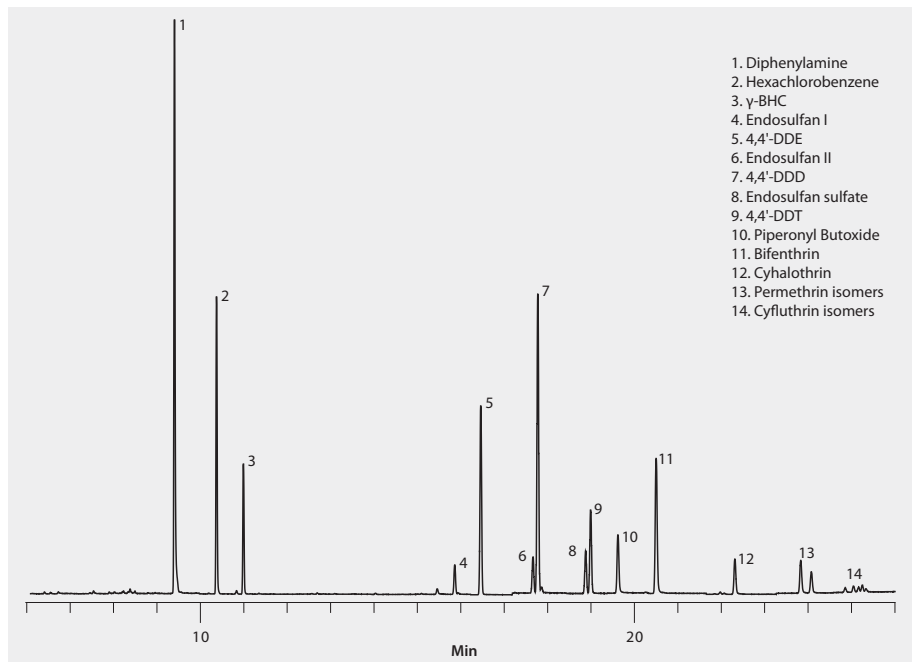
carrier gas helium, 1 mL/min constant flow

injection 10 µL LVI, PTV solvent vent, rapid injection speed

liner 4 mm ID FocusLiner with taper

sample Beef Kidney extract

Application No. **G005799**



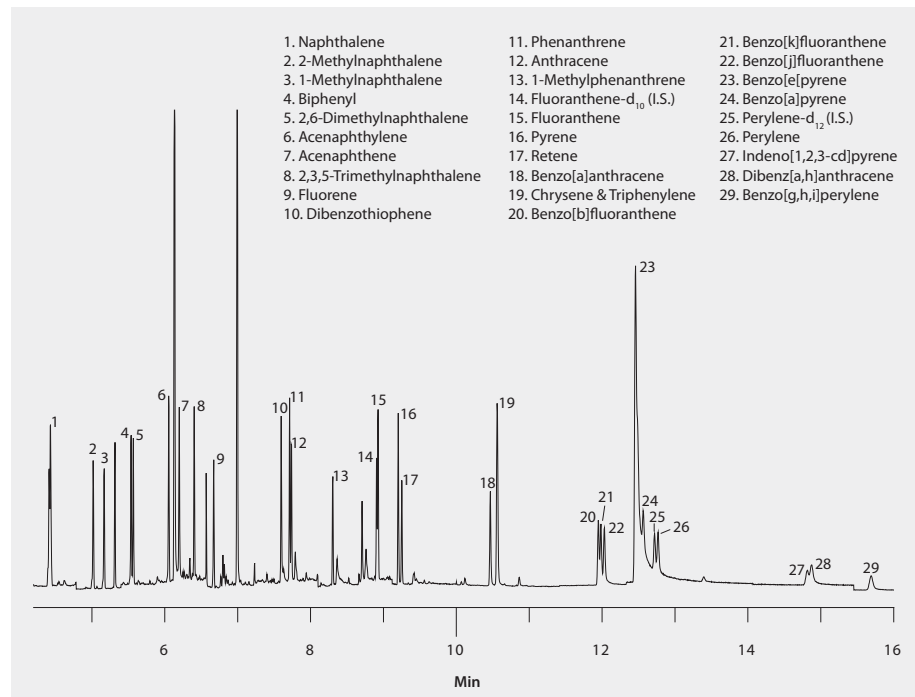
GC Analysis of Polynuclear Aromatic Hydrocarbons (PAHs) in Grilled Hamburger on SPB®-608 (20 m x 0.18 mm I.D., 0.18 µm) after QuEChERS Cleanup using Supel™ QuE Z-Sep, Fast GC Analysis

Sample pretreatment: Place 5 g ground hamburger sample into 50 mL centrifuge tube (55248-U). Spike with 100 ng/g target PAHs and internal standards. Let sit 10 min. Add 5 mL water and homogenize.

This application demonstrates the use of dispersive SPE or QuEChERS for the extraction and cleanup of grilled hamburger for GC-MS analysis of polynuclear aromatic hydrocarbons (PAHs). Z-Sep sorbent was used in the cleanup step and found to reduce background and yield recoveries >80% for a majority of the PAHs tested.

sample preparation Dispersive (QuEChERS)
 sample/matrix grilled hamburger spiked with PAHs at 100 ng/g
 extraction tube Sodium chloride/magnesium sulfate (55294-U)
 extraction process add 25 mL acetonitrile, contents of unbuffered salt tube (55294-U); shake for 5 minutes; centrifuge for 5 minutes at 3200 rpm
 clean-up tube Supel QuE Z-Sep tube (55403-U)
 clean-up process transfer 3 mL of acetonitrile layer into a Supel QuE Z-Sep cleanup tube (55403-U); shake 1 minute; centrifuge for 3 minutes at 3400 rpm; remove 1 mL supernatant for GC-MS analysis
 column SPB-608, 20 m x 0.18 mm I.D. x 0.18 µm
 oven 60 °C (1 min), 25 °C/min to 275 °C, 10 °C/min to 300 °C (13 min)
 inj. temp. 265 °C
 detector MS-SIM
 MSD interface 300 °C
 carrier gas helium, 1.5 mL/min constant flow
 injection 1 µL splitless (1 min.)

liner 4 mm I.D. FocusLiner™ with taper
 sample grilled hamburger extract
 Application No. G005880



GC Analysis of Polynuclear Aromatic Hydrocarbons (PAHs) in Salmon on SPB®-608 (20 m x 0.18 mm I.D., 0.18 µm) after QuEChERS Cleanup using Supel™ QuE Z-Sep, Fast GC Analysis

Extraction solvent: acetonitrile, 25 mL

Clean-up volume: 3 mL

Clean-up tube: Supel™ QuE Z-Sep (500 mg, part no. 55299-U, magnesium sulfate (450 mg, part no. 63135)

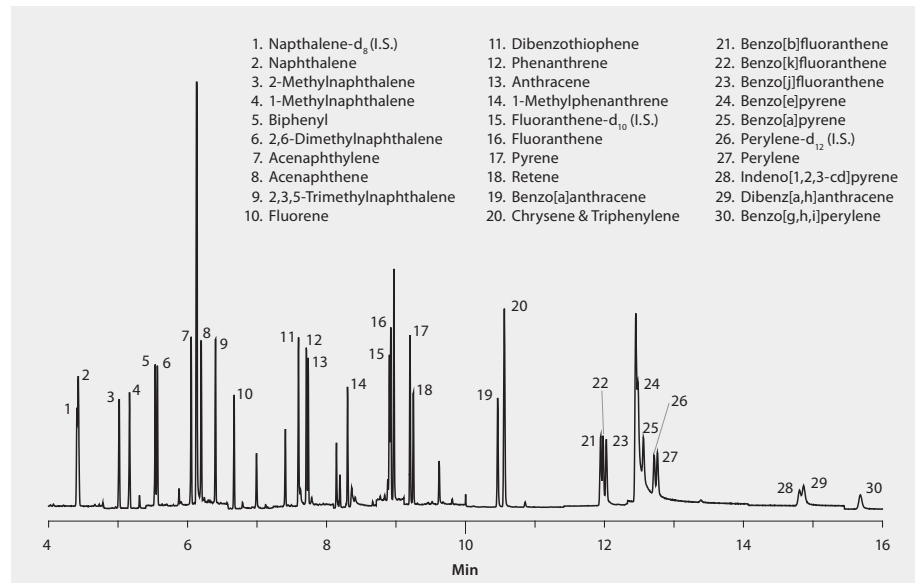
Stenerson, K.; Ye, M.; Halpenny, M., New Analytical Tools for the Determination of Persistent Organic Pollutants (POPs) in Fatty Food and Beverage Matrices Using QuEChERS Extraction/Cleanup and Gas Chromatography (GC) Analysis. Pittcon 2013. Sigma-Aldrich/Supelco publication T413034

Sample pretreatment: Place 5 g ground sample into 50 mL centrifuge tube. Spike with 100 ng/g target PAHs and internal standards. Let sit 30 min. Add 5 mL water and homogenize.

This application demonstrates the use of dispersive SPE or QuEChERS for the extraction and cleanup of raw salmon for GC-MS analysis of polynuclear aromatic hydrocarbons (PAHs). Supel™ QuE Z-Sep sorbent was used in the cleanup step and found to reduce background and yield recoveries >80% for a majority of the PAHs tested.

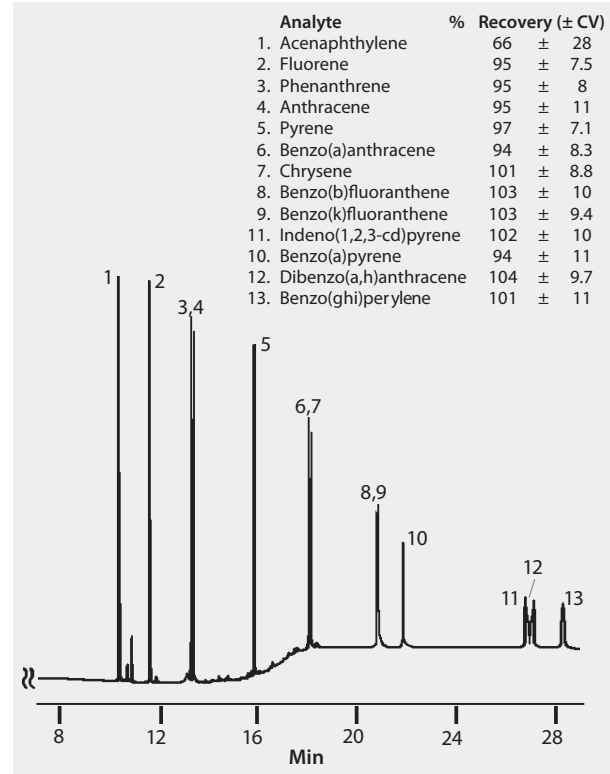
sample preparation Dispersive (QuEChERS)
 sample/matrix raw salmon spiked with PAHs at 100 ng/g
 extraction process add 25 mL acetonitrile and the contents of the Supel™ QuE Non-buffered tube (55294-U); shake for 5 minutes; centrifuge for 5 minutes at 3200 rpm
 extraction tube Supel™ QuE Non-buffered tube, magnesium sulfate/sodium chloride (55294-U)
 clean-up tube .. Supel™ QuE Z-Sep (500 mg, part no. 55299-U), magnesium sulfate (450 mg, part no. 63135) (55299-U, 63135)
 clean-up process .. transfer 3 mL of acetonitrile layer, Supel QuE Z-Sep (500 mg) and MgSO₄ (450 mg) into an extraction tube; (shake 1 minute; centrifuge for 3 minutes at 3400 rpm; remove 1 mL supernatant for GC-MS analysis)

column SPB-608, 20 m x 0.18 mm I.D. x 0.18 µm
 oven 60 °C (1 min), 25 °C/min to 275 °C, 10 °C/min to 300 °C (13 min)
 inj. temp. 265 °C
 detector MS, SIM
 MSD interface 300 °C
 carrier gas helium, 1.5 mL/min, constant
 injection 1 µL, splitless (1 min)
 liner 4 mm I.D. FocusLiner™ with taper
 Application No. G005923



GC Analysis of Polynuclear Aromatic Hydrocarbons (PAHs) in Water on a 5% Phenyl Column after SPE using Supelclean™ ENVI-18

sample preparation SPE (Solid Phase Extraction)
 sample addition
 SPE tube/cartridge Supelclean ENVI-18, 500 mg/6 mL (57064)
 condition 2 x 6 mL toluene:methanol (10:1); 6 mL methanol; 6 mL DI water
 sample addition 250 mL water sample at 10 mL/min
 drying 10 min under vacuum
 elution 2 x 1 mL toluene:methanol (10:1)
 column 5% phenyl polysiloxane, 30m x 0.25 mm I.D.,
 0.25 µm film (Supelco equivalent, SLB-5ms, 28471-U)
 oven 70 °C (2 min) to 280 °C at 8 °C/min
 detector FID, 310 °C
 carrier gas helium
 injection 1 µL
 Application No. **80-207**



GC Analysis of Semivolatiles in Drinking Water on a 5% Phenyl Column after SPE using ENVI™-18 DSK

Sample Pre-treatment:

Adjust 1 L drinking water to pH <2 with 6 N HCl. Add 5 mL methanol and mix thoroughly

sample preparation SPE (Solid Phase Extraction)

sample/matrix acidified drinking water

SPE tube/cartridge ENVI-18 DSK SPE Disk, 47 mm (57171)

condition 5 mL dichloromethane; 5 mL methanol; 5 mL DI water

sample addition 5 mL water sample

elution 2 x 5 mL acetonitrile rinsing internal chamber of sample reservoir thoroughly

column 5% phenyl polysiloxane, 30 m × 0.25 mm I.D., 0.25 μm (Supelco equivalent, SLB-5ms, 28471-U)

oven 40 °C to 160 °C (3 min), then to 300 °C (3 min) at 6 °C/min

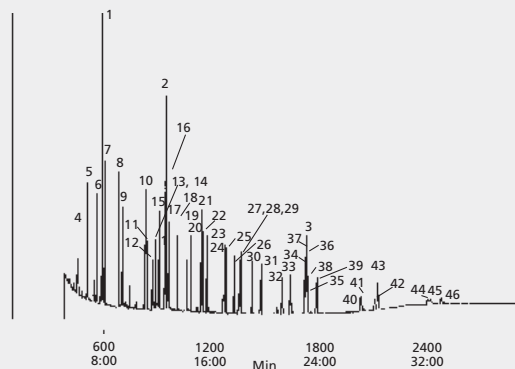
detector MS, scan range m/z = 45-450

carrier gas helium, 33 cm/sec

injection 1 μL split/splitless, 1 min delay

Application No. **749-0798**

	μg/L*		g/L*
1. Acenaphthene-d ₁₀	5.0	24. Heptachlor epoxide	2.0
2. Phenanthrene-d ₁₀	5.0	25. 2,2',3',4,6-Pentachlorobiphenyl	2.0
3. Chrysene-d ₁₂	5.0	26. γ-Chlordane	2.0
4. Hexachlorocyclopentadiene	2.0	27. Pyrene	2.0
5. Dimethylphthalate	2.0	28. α-Chlordane	2.0
6. Acenaphthylene	2.0	29. trans-Nonachlor	2.0
7. 2-Chlorobiphenyl	2.0	30. 2,2',4,4',5,6'-Hexachlorobiphenyl	2.0
8. Diethylphthalate	2.0	31. Endrin	2.0
9. Fluorene	2.0	32. Butylbenzylphthalate	2.0
10. 2,3-Dichlorobiphenyl	2.0	33. di(2-ethylhexyl)Adipate	2.0
11. Hexachlorobenzene	2.0	34. 2,2',3,3',4,4',6-Heptachlorobiphenyl	2.0
12. Simazine	2.0	35. Methoxychlor	2.0
13. Atrazine	2.0	36. 2,2',3,3',4,5',6,6'-Octachlorobiphenyl	2.0
14. Pentachlorophenol	8.0	37. Benz(a)anthracene	2.0
15. γ-BHC	2.0	38. Chrysene	2.0
16. Phenanthrene	2.0	39. Di(2-ethylhexyl)phthalate	2.0
17. Anthracene	2.0	40. Benzo(b)fluoranthene	2.0
18. 2,4,5-Trichlorobiphenyl	2.0	41. Benzo(k)fluoranthene	2.0
19. Alachlor	2.0	42. Benzo(a)pyrene	2.0
20. Heptachlor	2.0	43. Perylene-d ₁₂	5.0
21. di-n-Butylphthalate	2.0	44. Indeno(1,2,3-cd)Pyrene	2.0
22. 2,2',4,4'-Tetrachlorobiphenyl	2.0	45. Dibenzo(a,h)anthracene	2.0
23. Aldrin	2.0	46. Benzo(ghi)perylene	2.0



GC Analysis of Sterols (Silylated Derivatives) in Olive Oil (Free Sterol Fraction) on SLB®-5ms after SPE using Discovery DSC-Si

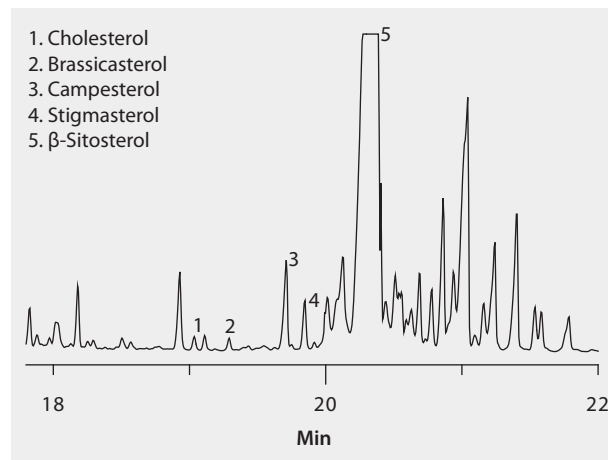
Sample pre-treatment

Weigh 0.25 gm oil into test tube. For spiked sample add 12.5 µL of 65-100 µg/mL mixed sterol std. Add 1 ml of hexane:ethyl acetate (90:10). After SPE fractionation, evaporate solvent from each fraction, add 1 ml of 30% methanolic sodium methoxide:MeOH:MTBE solution (13:27:60), mix and let sit at room temp for 30 min. Add 1 ml of water and 2 mL of n-heptane. Withdraw aqueous phase (bottom) and replace w/ 1 mL of 1% citric acid solution. Withdraw organic phase and dry over anhydrous sodium sulfate. Silylation: Evaporate organic phase to dryness. Add 125 µL of Sylon BFT and 125 µL of pyridine. Heat at 70°C for 20 min. The sample is then ready for GC-MS analysis.

Sterol content is one in a battery of tests used to analyze the composition and determine the grade and authenticity of olive oil. Test results are compared against standards such as those established by the International Olive Oil Council (IOC) and US Dept. of Agriculture. In vegetable oils, sterols exist in the free form, or esterified to fatty acids. In this application, sterols were analyzed in olive oil separately as free and esterified. This was accomplished by taking advantage of the polarity difference between these two groups to fractionate them using silica gel SPE. In place of saponification, the fractions were transesterified to liberate the esterified sterols. The fractions were then silylated, and analyzed by GC-MS. The silylated sterols all contained a significant molecular ion in their mass spectrum, which made it possible to perform peak identification free of matrix interference. The sterols isolated in the free fraction are shown here.

sample preparation SPE (Solid Phase Extraction)
 sample/matrix olive oil spiked with a mixed sterol standard at 5 µg/g
 SPE tube/cartridge Discovery DSC-Si, 1 g/6 mL (52656-U)
 condition 2 x 5 mL hexane
 sample addition 1 mL

elution esters fraction: 2.5 mL of hexane:ethyl acetate (90:10); free sterols fraction; 5 mL of hexane:ethyl acetate (90:10) and 3 mL x 5 of ethanol:diethyl ether:hexane (50:25:25)
 eluate post-treatment Evaporate to dryness and perform silylation as described in the Analysis Note.
 column SLB-5ms, 20 m x 0.20 mm I.D., 0.20 µm (28564-U)
 oven 125 °C (1 min), 10 °C/min to 325 °C (10 min)
 inj. temp. 250 °C
 detector MSD, m/z 500 - 600
 MSD interface 325 °C
 carrier gas helium, 0.6 mL/min, constant
 injection 1 µL, splitless
 liner 4 mm I.D. single taper
 sample Olive oil sample; fractionated, transesterified, and silylated
 Application No. **G005816**



HPLC Analysis of Acrylamide in Fried Potato Chips on Discovery® HS F5 after SPE using Discovery® DSC-MCAX and DSC-18

sample preparation SPE (Solid Phase Extraction)

sample/matrix Finely grind 2.0 g of potato chips, place in 20 mL vial and add 10 mL water. Mix using vortex until mixture forms a thick paste. (Place sample in centrifuge tubes and centrifuge at 16.1 rcf for 5 min. Extract aqueous portion of sample leaving oil layer and solids.)

SPE tube/cartridge Discovery DSC-MCAX, 300 mg/3 mL (52784-U)

SPE tube/cartridge Discovery DSC-18, 1g/6mL (52606-U)

condition connect a Discovery DSC-MCAX SPE tube to the top of a Discovery DSC-18 SPE tube using an SPE tube adapter, pass 1 mL methanol, then 1 mL DI water through both SPE tubes until the tubes are dry

sample addition 1 mL of aqueous extract

washing 1 mL DI water

elution removing upper MCAX SPE tube, pass 2 mL methanol through lower DSC-18 SPE tube

eluate post-treatment evaporate to dryness with nitrogen at 30 °C, reconstitute in 0.5 mL DI water

column Discovery HS F5, 15 cm x 4.6 mm I.D., 3 µm particles (567507-U)

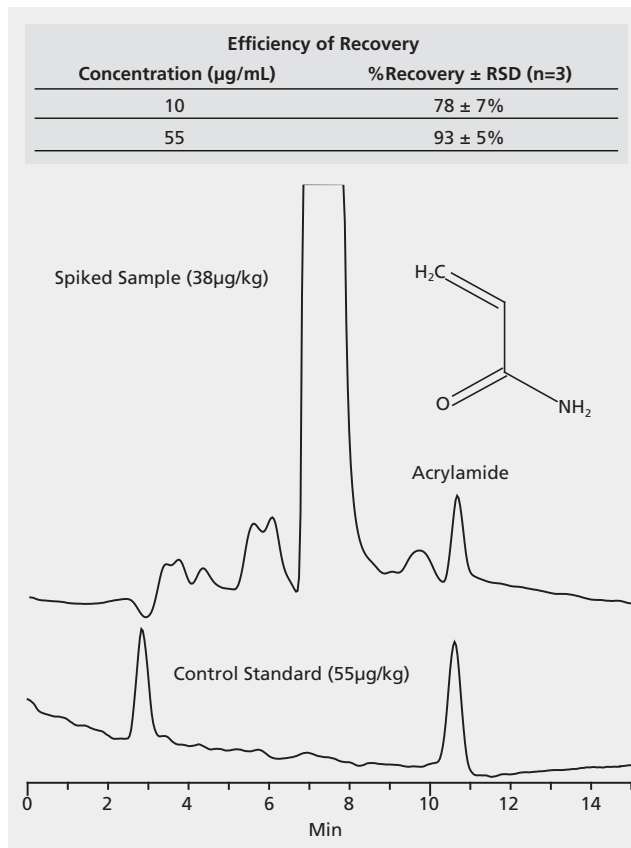
mobile phase 100% ultra-pure water

column temp. 35 °C

detector ESI+

injection 5 µL

Application No. **G003759**



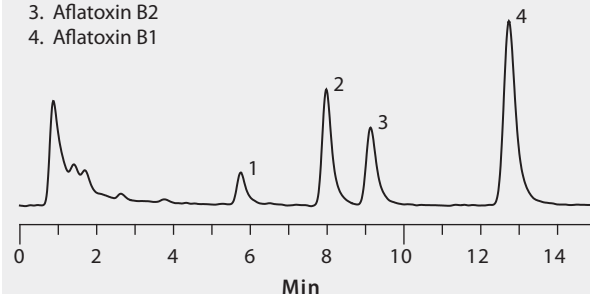
HPLC Analysis of Aflatoxins in Wheat on Ascentis® Express C18 after SPE using Supel™ Tox AflaZea

Sample/matrix:

Weigh 25 grams of wheat meal into a 500 mL Erlenmeyer flask. Add 100 mL of 84:16 acetonitrile:water, seal, and place on an orbital shaker at med-high speed for 90 minutes. Filter the sample through a #2 qualitative filter. Spike sample at 2 mg/mL using analytical standards.

sample preparation SPE (Solid Phase Extraction)
 sample/matrix 25 g wheat meal spiked with pesticide standards
 SPE tube/cartridge Supel™Tox AflaZea, 6 mL (55314-U)
 sample addition 2 mL
 elution collect eluate in 5 mL silanized culture tubes
 eluate post-treatment combine 200 µL of sample eluate and
 880 µL of DI water in a 2 mL autosampler vial
 column Ascentis Express C18, 10 cm x 2.1 mm I.D., 2.7 µm particles (53823-U)
 mobile phase (A) water; (B) methanol; (C) acetonitrile;
 (720:120:120, A:B:C) containing 0.780 g/L potassium bromide,
 230 µL/L nitric acid
 flow rate 0.400 mL/min
 pressure 4568 psi (315 bar)
 column temp. 35 °C
 detector FLD 360 ex; 440 em
 injection 20 µL
 derivatization via KOBRA electrochemical cell, 50 µA
 Application No. **G005907**

1. Aflatoxin G2
2. Aflatoxin G1
3. Aflatoxin B2
4. Aflatoxin B1



HPLC Analysis of Aflatoxins on Ascentis® Express C18

Aflatoxins are a complex of closely related toxins produced as secondary metabolites of fungi. They are found in grains and nuts such as corn, wheat, or peanuts. They are produced by *aspergillus flavus* and *a. Parasiticus*. Members of the group include aflatoxin b1, aflatoxin b2, aflatoxin g1, aflatoxin g2, aflatoxin m1, and aflatoxin m2.

column . . . Ascentis Express C18, 10 cm x 2.1 mm I.D., 2.7 µm particles (53823-U)
mobile phase (A) water; (B) methanol; (C) acetonitrile; (720:120:120, A:B:C)
containing 0.780 g/L potassium bromide, 230 µL/L nitric acid

flow rate 0.400 mL/min

pressure 4568 psi (315 bar)

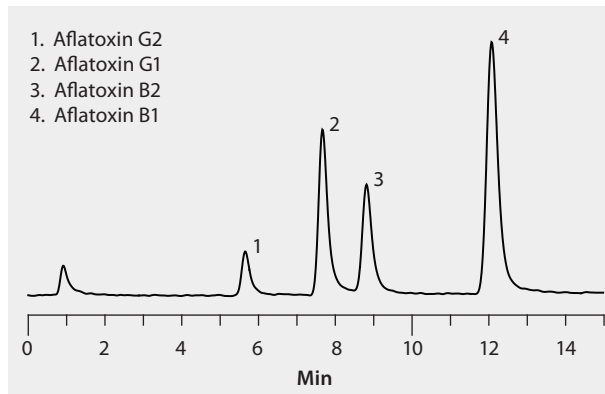
column temp. 35 °C

detector FLD excitation = 360 nm, emission = 440 nm

injection 20 µL

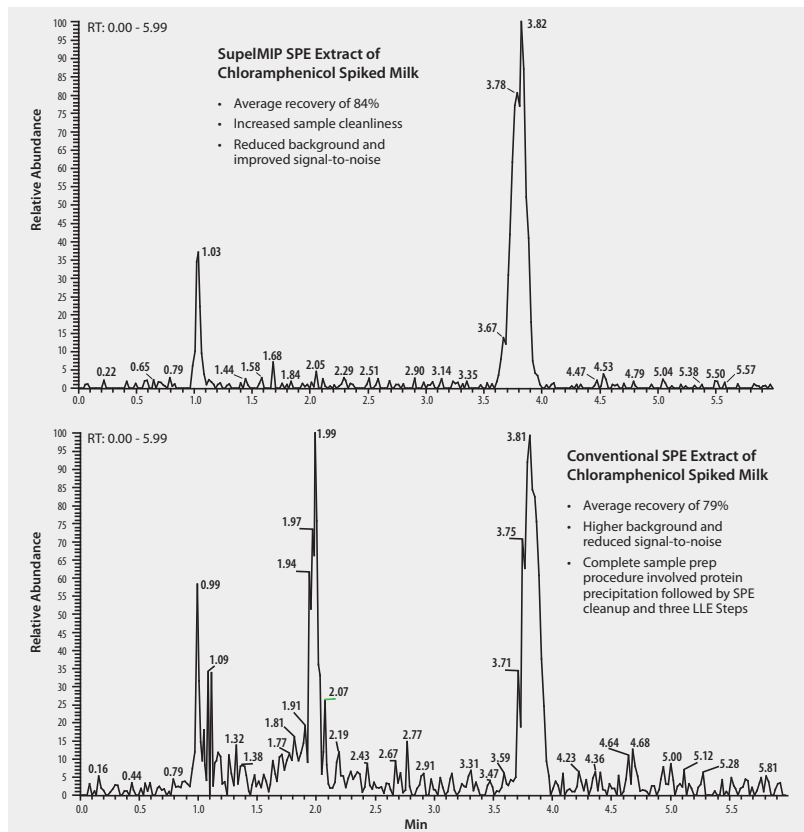
sample 200 µL spiked 84:16 acetonitrile:di water in 880 µL di water, Spike concentrations: B1 = 16 ppb; B2 = 4 ppb; G1 = 16 ppb; B2 = 4 ppb

Application No. [G005908](#)



HPLC Analysis of Chloramphenicol in Milk on Ascentis® C18 after SPE using SupelMIP® SPE-Chloramphenicol

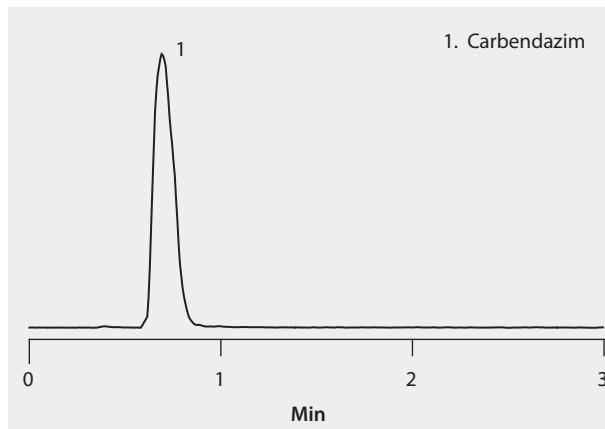
sample preparation SPE (Solid Phase Extraction)
 sample addition whole pasteurized milk spiked with chloramphenicol at 15 ng/mL and 38 ng/mL
 SPE tube/cartridge . . . SupelMIP SPE - Chloramphenicol, 25 mg/10mL (LRC) (53210-U)
 condition 1 mL methanol; 1 mL DI water
 sample addition 1 mL
 washing 2 x 1 mL MS-grade water, 1 mL 5% acetonitrile in 0.5% acetic acid, 2 x 1 mL MS-grade water, 1 mL 20% acetonitrile in 1% ammonium hydroxide. (dry SPE tubes for 15 min. under gentle vacuum; 3 x 1 mL dichloromethane; dry SPE tubes for 1 min. under gentle vacuum)
 elution elute chloramphenicol with 2 x 1 mL methanol:acetic acid:MS-grade water (89:1:10, v/v/v)
 eluate post-treatment evaporate combined eluate to dryness at 50 °C under nitrogen. reconstitute in 150 mL LC mobile phase prior to LC-MS analysis
 column Ascentis C18, 2.1 mm x 10 cm I.D., 3 µm particles (581301-U)
 mobile phase (A) 100 mM ammonium acetate: (B) MS-grade water: (C) acetonitrile (10:60:30, A:B:C)
 flow rate 0.2 mL/min
 column temp. 35 °C
 detector MS, ESI(-), 320-323 m/z range
 injection 5 µL
 Application No. **G004433**



LC-MS/MS Analysis of Carbendazim in Orange Juice (Spiked) on Ascentis® Express C18 after Supel™ QuE PSA/C18 QuEChERS Cleanup

Simple and fast extraction and analytical method were developed for analysis of fungicide carbendazim in orange juice samples. QuEChERS extraction method was used with PSA/C18 cleanup. Ascentis Express C18 column chromatography was coupled to MS/MS detection with limits of detection at 0,1 ppb.

sample preparation Dispersive (QuEChERS)
 sample/matrix orange juice spiked with carbendazim at 1 ppb
 extraction tube Supel™ QuE Citrate (EN) Tube (55227-U)
 extraction process add 10 mL of orange juice with pulp to a 50 mL empty extraction tube (55248-U); add carbendazim at 1 ppb; add 10 mL acetonitrile; (shake for 1 minute; add contents of citrate extraction tube (55227-U); shake for 1 min; centrifuge at 3200 rpm for 5 minutes)
 clean-up tube Supel-Q™ PSA/C18 (55288-U)
 clean-up process transfer 0.7 mL of the acetonitrile layer to the PSA/C18 cleanup tube (55288-U); shake 1 minute; (centrifuge for 3 minutes at 3400 rpm; remove 0.25 mL of the supernatant; mix with 0.25 mL water for LC-MS analysis)
 column Ascentis Express C18, 5 cm x 2.1 mm I.D., 2.7 µm particles (53822-U)
 mobile phase A) 10 mM ammonium acetate in water; (B) 10 mM ammonium acetate in methanol
 gradient 0-1 min: 30% B; 1.5-3.5 min: 100% B; 3.5-7 min: 30% B
 flow rate 0-1 min: 0.3 mL/min; 1.5-7 min: 0.5 mL/min
 column temp. 30 °C
 detector MS, ESI(+), MRM, m/z 192/160, 192/132
 injection 5 µL
 Application No. **G005619**



LC-MS/MS of Pesticides in Oranges on Ascentis® Express C18 after Sample Prep using Supel™ Que Z-Sep/C18 QuEChERS sorbent

Sample pretreatment: 10 g of pureed oranges homogenized with rind; spike at 50 ppb by adding 16.75 µL of a pesticide mix containing each analyte at 30 µg/mL

This demonstrates the application of the Z-Sep/C18 sorbent to the cleanup of fruits in the LC-MS-MS analysis of polar pesticides including organo-phosphates, carbamates and benzoylureas

sample preparation Dispersive (QuEChERS)
sample/matrix . . . 10 g of pureed oranges (homogenized with rind); spike at 50 ppb (add 16.75 µL of a custom made pesticide mix, each analyte at 30 µg/mL)

extraction tube Supel™ QuE Citrate (EN) Tube (55227-U)
extraction process . . . add 10 mL acetonitrile; shake for 1 minute; add contents of a

Supel QuE citrate extraction tube (55227-U);
shake immediately for 1 minute; centrifuge at 3200 rpm for 5 minutes

clean-up tube Supel-Q™ PSA/C18 (55284-U)

clean-up process transfer 0.7 mL of the acetonitrile layer into a
Supel QuE Z-Sep/C18 cleanup tube (55284-U); shake for 1 minute;
centrifuge at 5000 rpm for 5 minutes; (transfer 0.2 mL of the supernatant
into an empty 1.5 mL centrifuge tube; add 0.2 mL of water;
centrifuge at 5000 rpm for 2 minutes.)

column . . . Ascentis Express C18, 5 cm x 2.1 mm I.D., 2.7 µm particles (53822-U)

mobile phase (A) 10 mM ammonium acetate in water;
(B) 10 mM ammonium acetate in acetonitrile

gradient Hold at 30% B for 1 min; 30% to 80% B in 2 min; hold at 80% B
for 4 min; hold at 100% B for 3 min; hold at 30% B for 3 min

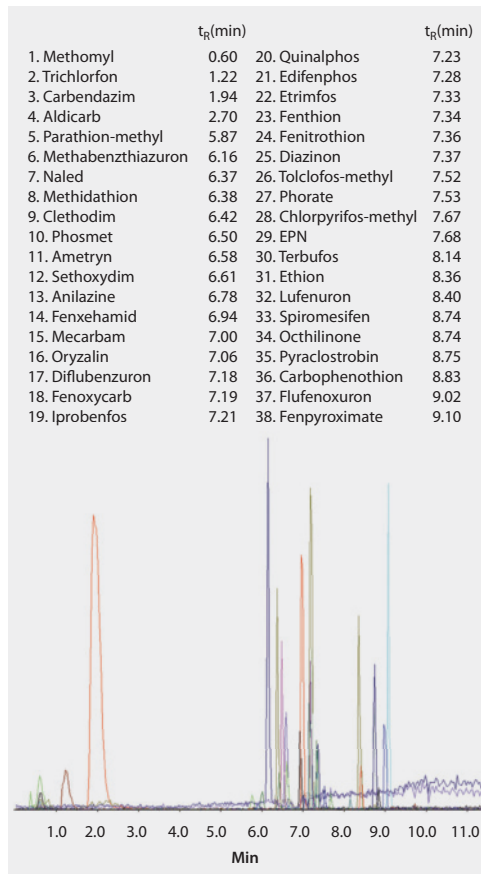
flow rate 0.3 mL/min

pressure 2730 psi (188 bar)

column temp. 30 °C

detector MS/MS, ESI positive

Application No. **G005645**



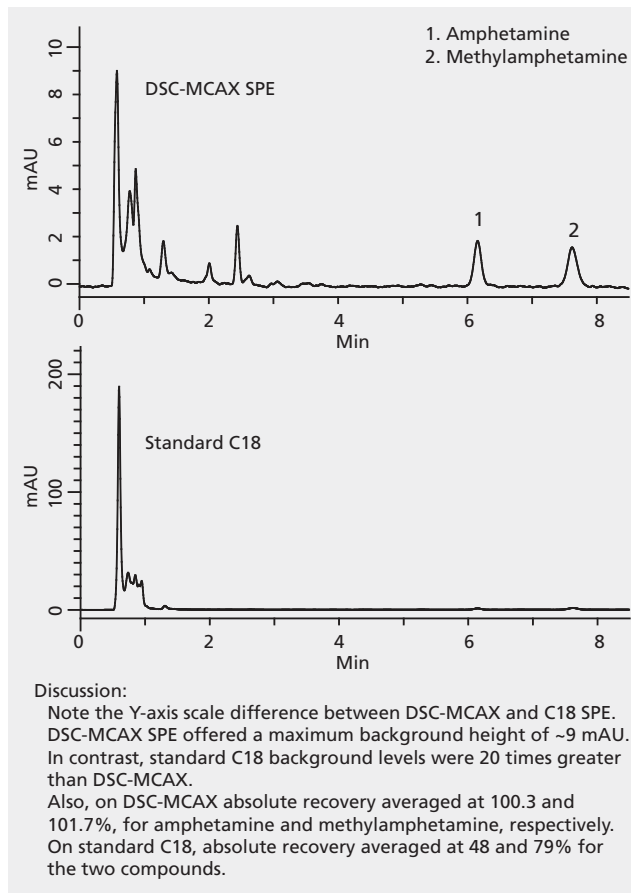
Forensics and Toxicology

HPLC Analysis of Amphetamines in Urine on Discovery® HS F5 after SPE using Discovery® DSC-MCAX and Standard C18

Sample Pre-Treatment:

1 mL human urine was spiked with 2 mg/mL amphetamine and methylamphetamine. The spiked sample was diluted 1:1 with 1:1 with 50 mM ammonium acetate, pH 6.0.

sample preparation	.....	SPE (Solid Phase Extraction)
sample/matrix	.....	human urine spiked amphetamine and methylamphetamine at with 2 mg/mL
SPE tube/cartridge	.....	Discovery DSC-MCAX, 100 mg/3mL (52783-U)
condition	..	DSC-MCAX SPE tube: 1 mL methanol; 1 mL 50 mM ammonium acetate, pH 6.0; C-18 SPE tube: 1 mL methanol; 1 mL DI water
sample addition	.....	1 mL
washing	.....	DSC-MCAX SPE tube: 1 mL 50 mM ammonium acetate, pH 6.0; 1 mL 1M acetic acid; 1mL methanol; C-18 SPE tube: 1 mL DI water; 1 mL 20% methanol
elution	.....	DSC-MCAX SPE tube: 1 mL 5% ammonium hydroxide in methanol; C-18 SPE tube: 1 mL methanol
eluate post-treatment	..	evaporate to dryness with nitrogen at room temperature, reconstitute in mobile phase
column	.....	Discovery HS F5, 15 cm x 4.6 mm I.D., 5 µm particles (567516-U)
mobile phase	..	(A) 10 mM ammonium acetate, pH 4.5; (B) methanol; (35:65, A:B)
flow rate	.....	2 mL/min
column temp.	.....	40 °C
detector	.....	UV, 210 nm
injection	.....	10 µL
Application No.	.....	G003761



HPLC Analysis of 3-Methylpyrazole and 4-Methylpyrazole in Urine on Discovery® C18 after SPE using Discovery® DSC-SCX

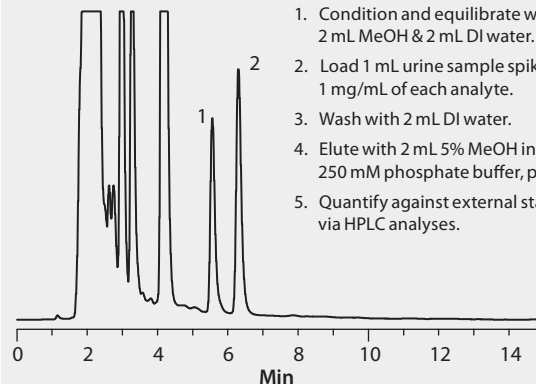
sample preparation SPE (Solid Phase Extraction)
 sample/matrix urine spiked with 3- and 4-methylpyrazole at 1 mg/mL
 SPE tube/cartridge Discovery DSC-SCX, 500 mg/3 mL (52686-U)
 condition 2 mL methanol; 2 mL DI water
 sample addition 1 mL
 washing 2 mL DI water
 elution 2 mL 5% methanol in 250 mM potassium phosphate buffer, pH 7.4
 column Discovery C18, 15 cm × 4.6 mm, 5 µm preceded by a
 2 cm guard column and 0.5 µm frit filter (504955)
 mobile phase MeOH:5 mM phosphate buffer, pH 6 (20:80)
 flow rate 1 mL/min
 column temp. 30 °C
 detector UV, 220 nm
 injection 25 µL, dilute urine extract
 Application No. **G001635**

Efficiency of Recovery

Compound (mg/mL)	Discovery DSC-SCX (n=3)		Leading Competitor SCX (n=2)	
	% Recovery	%RSD	%Recovery	%RSD
1. 3-methylpyrazole (1.0)	89.4	±10.2%	67.1	±20%
2. 4-methylpyrazole (1.0)	79.4	±6.8%	50.5	±30%

SPE Procedure

1. Condition and equilibrate with 2 mL MeOH & 2 mL DI water.
2. Load 1 mL urine sample spiked with 1 mg/mL of each analyte.
3. Wash with 2 mL DI water.
4. Elute with 2 mL 5% MeOH in 250 mM phosphate buffer, pH 7.4.
5. Quantify against external standards via HPLC analyses.

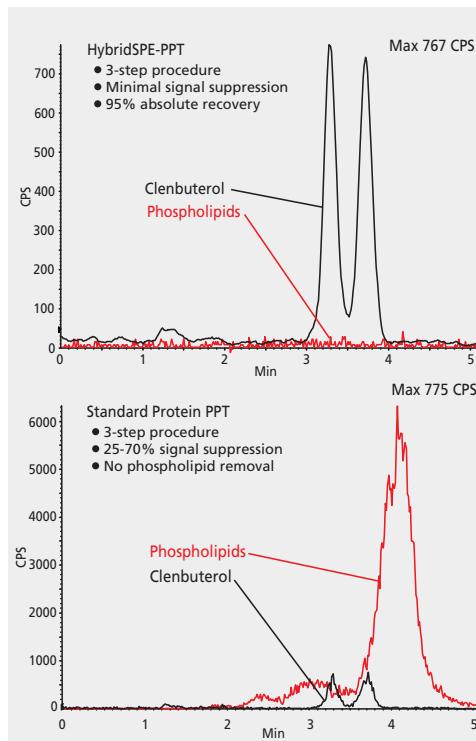


LC-MS Analysis of Clenbuterol In Plasma on Astec® CHIROBIOTIC® T with Phospholipid Removal Using HybridSPE® Phospholipid

The HybridSPE method provides significant improvement in LC-MS baseline. sample preparation SPE (Solid Phase Extraction) sample/matrix rat plasma spiked with clenbuterol enantiomers at 10 ng/mL SPE well plate HybridSPE-Precipitation 96-well Plate, 50 mg/well (575656-U) sample addition 100 µL spiked rat plasma followed by 300 µL 1% formic acid in acetonitrile. Mix by vortexing the HybridSPE-PPT plate briefly.

elution apply vacuum column CHIROBIOTIC T, 10 cm x 2.1 mm I.D., 5 µm particles (12018AST) mobile phase 10 mM ammonium formate in methanol flow rate 0.3 mL/min column temp. 30 °C detector ABI 3200 QT; ESI(+), MRM: 184/104 m/z (phospholipids); 277.2/203.1 m/z (clenbuterol)

injection 10 µL Application No. **G004431**



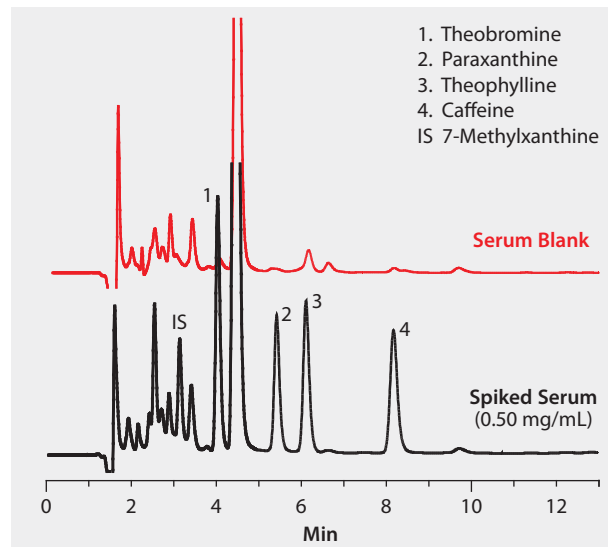
Pharma and Biopharma

HPLC Analysis of Bronchodilators Theophylline and Other Caffeine Metabolites from Serum on Discovery® RP-AmideC16 after SPE using Discovery® DSC-18

sample preparation SPE (Solid Phase Extraction)
 SPE tube/cartridge Discovery® DSC-18, 500 mg/3 mL (52603-U)
 condition 2 mL methanol, then 2 mL water
 sample preparation 1 mL porcine serum spiked with 0.1 µg/mL, 0.50 µg/mL, or 1.0 µg/mL each analyte
 sample preparation 1 mL methanol; evaporate to dryness with nitrogen stream at room temperature; reconstitute in 200 µL mobile phase containing 0.2 µg/mL or 7-methylxanthine (IS)
 sample preparation 2 mL 5% methanol in water; dry tube 10 min with nitrogen stream
 column Discovery RP-AmideC16, 15 cm × 4.6 mm, 5 µm particles, preceded by a 2 cm RP-AmideC16 guard column and 0.5 µm frit filter (505013)
 mobile phase (A) Methanol; (B) 1% acetic acid (17:38, A:B)
 flow rate 1 mL/min
 column temp. 30 °C
 detector UV, 272 nm
 injection 20 µL reconstituted porcine serum extract
 Application No. **G000594**

Efficiency of Recovery

Compound	Concentration (µg/mL)	% Recovery	% RSD (n=6)
1. Theobromine	0.1	97.4	±6.8
	0.5	96.4	±8.5
	1.0	96.1	±5.0
2. Paraxanthine	0.1	96.2	±8.4
	0.5	95.2	±8.7
	1.0	95.0	±8.7
3. Theophylline	0.1	97.8	±8.5
	0.5	97.8	±8.8
	1.0	98.5	±5.7
4. Caffeine	0.1	98.8	±3.9
	0.5	95.6	±6.7
	1.0	97.6	±5.8

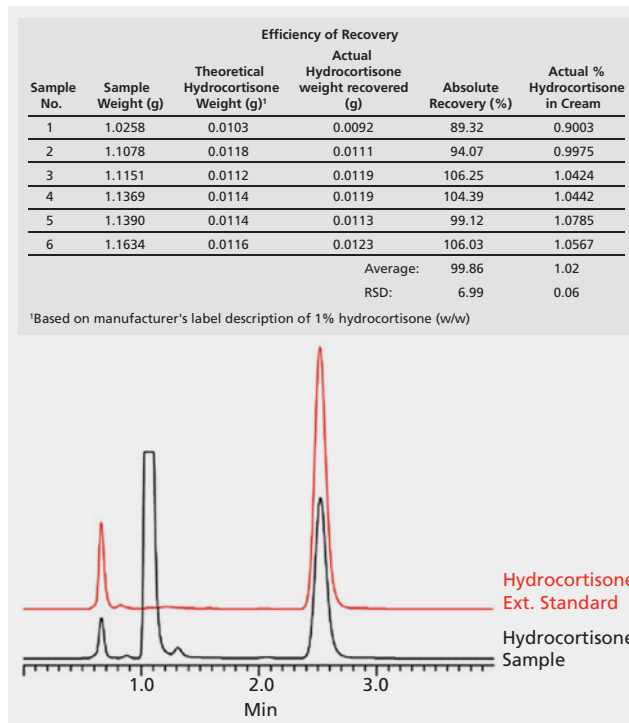


HPLC Analysis of Hydrocortisone in Topical Cream on Discovery® HS C18 after SPE using Discovery® DSC-Si

Sample Pre-treatment:

Disolve 1 g 1% hydrocortisone topical hand cream in 10 mL ethyl acetate. Dilute 2 mL of ethyl acetate-cream sample with 8 mL hexane:ethyl acetate (2:1, v/v).

sample preparation SPE (Solid Phase Extraction)
 sample addition hydrocortisone topical hand cream in hexane:ethylacetate
 SPE tube/cartridge Discovery DSC-Si, 500 mg/3 mL (52695-U)
 condition 1 mL hexane:ethyl acetate (2:1, v/v)
 sample addition 1 mL
 washing 1 mL hexane:ethyl acetate (2:1, v/v)
 elution 1 mL methanol:DI water (1:1, v/v)
 eluate post-treatment dilute eluate to 2 mL with methanol:DI water (1:1, v/v)
 column Discovery HS C18, 15 cm x 4.6 mm I.D., 5 µm particles (568520-U)
 mobile phase (A) methanol; (B) DI water (1:1, A:B)
 flow rate 1 mL/min
 column temp. 35 °C
 detector UV, 220 nm
 injection 10 µL
 Application No. **G003765**



Analyte Index

Page number groupings in this index indicate the appearance of applications within multiple techniques/market focus groups. Additionally, you can activate the **Text Select** tool (bottom menu bar) and highlight the desired analyte. Right-click to copy the analyte name and paste it into the Search bar. Results for the active volume will appear on the left side of the window, allowing you to browse the results. Because this index spans all three volumes, use the footer links to open a different volume to search for additional results.

— 1 —

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<i>cis</i> -8,11,14-Eicosatrienoic acid methyl ester (C20:3n6) at 2 wt %	1822,1922,2254
<i>cis</i> -5,8,11,14,17-Eicosapentaenoic acid methyl ester (C20:5n3) at 2 wt %	1822,1922,2254
<i>cis</i> -11,14,17-Eicosatrienoic acid methyl ester (C20:3n3) at 2 wt %	1822,1922,2254

— A —

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A14 (Polynucleotide)	1096,691
A15 (Polynucleotide)	1096,691
A16 (Polynucleotide)	1096,691
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3- <i>O</i> -Acetyl- β -boswellic acid	1325,1326,1334,1335,1336,1337

6-Acetylcodeine solution	264,484	Active amyl alcohol	2026,2027
¹⁵ N-Acetyl- α -cysteine	2729,498	Adenine	684,765
3-Acetyldeoxyrnivalenol	12,358,17,394	Adenosine	685,687,688,689,690,769
15-Acetyldeoxyrnivalenol	17,394	Adenosine diphosphate	690
15-Acetyldeoxyrnivalenol solution	12,358	Adenosine diphosphoribose	690
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2-Acetyl-furan	2056,2439	Adrenomedullin rat	738
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<i>N</i> -Acetyl- α -methionine	2730,499	Aflatoxin B ₁ solution	1414,327
2-Acetyl-1-methylpyrrole	2056,2439	Aflatoxin B ₂	1415,328,330,1416,329,331
6-Acetylmorphine, 1.0 mg/mL solution	264,484	Aflatoxin B ₂ solution	1414,327
<i>N</i> -Acetylphenylalanine	2731,500	Aflatoxin G ₁	1415,328,330,1416,329,331
<i>N</i> -Acetylprocainamide	1121	Aflatoxin G ₁ solution	1414,327
<i>N</i> -Acetyl-4 <i>H</i> -pyridine	2056,2439	Aflatoxin G ₂	1415,328,330,1416,329,331
2-Acetylpyrrole	2056,2439	Aflatoxin G ₂ solution	1414,327
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ac-GGGLGGAGGLK-amide	532,707	Ajmalicine	1316
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ac-KYALKALKGLK-amide	532,707	β -Alanine	810
ac-KYGLGGAGGLK-amide	532,707	α -Alanine (AQC derivatives)	2738,517
ac-RGAGGLGLGK-amide	771	α -Alanine (t-BOC derivatives)	2751,533
ac-RGGGGLGLGK-amide	771	α -Alanine, Fmoc derivatives	2773,588
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Acrolein	21,2326	Albumin from chicken egg white	207,738,761,762
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Aminocarb	1,295,294	Ammelide	117,318,397,2078,2079,2080,2081
		Amobarbital	1200,269,485,1201,270,486

Amoxicillin	1009,1041	Anthracene	2375,310,311,1388,1411,1482,2028,1408,2010,1409,2011,1451,1936,1480,2013, 1481,2014,1483,2029,2365,2420,1506,2075,1507,2076,1517,1518,1524,1540,1541,1552,1553,1554,1555,1556,1557,1558,1560,1561,1562, 1563,1564,1567,1587
Amphetamine	189,448	Antibiotics	882
(-)-Amphetamine	2718,409	Antibody, monoclonal	677
Amphetamine	411,412,480,2234,2285,2457,2460	Antihistamines	891
D-Amphetamine hemisulfate salt solution	432	Antihypertensives	131
(+)-Amphetamine	2718,409,458	Antioxidants	1898,2182
D-Amphetamine	2195,2231,2282,2621,2711,2847	Antiretrovirals	911
L-Amphetamine	2195,2231,2282,2621,2711,2847	Apigen 7-glucoside	1276
dl-Amphetamine (AQC derivatives)	2719,413	Apigenin 6,8-di-C-glucoside	353
D-Amphetamine (N-TFA derivative)	2196,2232,2283,2622,2712,2848,2197,2233,2284,2623,2713,2849	Apigenin 7-glucoside	1266,1288
d,l-Amphetamine (N-TFA derivatives)	2235,2286,2458,2461	Apimaysin	1246
Ampicillin	1009,1041	Apo-hemoglobin, carboxymethylated, tryptic digest	542
Ampicillin Sodium	1230	Aprobarbital	414,925,416,927,417,929,418,930,928
n-Amyl acetate	1675,1725	Aprotinin	742,748,749,750,751,752
n-Amyl acetate isomers	1726,1727	Aprotinin from bovine lung	762
n-Amyl alcohol	2210	aqpZ	663
n-Amyl alcohol	2211	Aquaporin Z	663
n-Amyl alcohol	2212,2452,2213,2214,2453	Arabinose	383,386
β-Amylase from sweet potato	744	D-(–)-Arabinose	379
Amylbenzene	33	Arabitol	386,2036,2037
tert-Amyl methyl ether	1594,1721,1722	Arachidic acid	1808,1908,2244
Amyloid β-protein fragment 10-35	511	Arachidic acid methyl ester (C20:0)	1637,1815,1915,2247,1817,1917,2249,1818,1918,2250,1819,1919,2251, 1836,1945,1837,1954,1839,1959,1840,1960,1842,1962,1844,1964
(+)-Anabasine hydrochloride solution	245	Arachidic acid methyl ester (C20:0) at 4 wt %	1822,1922,2254
Ancymidol	2477,3,18,2486	Arachidonic acid methyl ester (C20:4n6)	1815,1915,2247
5-α-Androstane (I.S.)	1526	Arachidonic acid methyl ester (C20:4n6)	1817,1917,2249,1818,1918,2250,1819,1919,2251
(E)-Anethole	2161	Arachidonic acid methyl ester (C20:4n6) at 2 wt %	1822,1922,2254
Angelicin	1262	Aramite #1	1552
Angiotensin	513,873	Aramite #2	1552
Angiotensin I	126,512,513,873,874,1188	D-Arginine	2745,524
Angiotensin (1-7) amide	788	L-Arginine	2745,524
Angiotensin II	126,512,513,873,708,719,788,874,1188	DL-Arginine hydrochloride	2744,523
Angiotensin III trifluoroacetate salt hydrate	126,512,513,873,874,1188	DL-Arginine, Fmoc derivatives	2774,589
Anilazine	1419,406,1445,1679,1826,1931	Argon	1745
Aniline	32,492,1484,2030,2366,2421, 1550,1551,1552,1553,1554,1555,1556,1557,1558,1655,1672,1673	Arg ⁸ -vasopressin	709,720,710,721
Anilines	1655	Aroclor 1016	1533,1534,1535,1537
Anilofos	1885,2064	Aroclor 1248	1538
o-Anisidine	1673		
Anisole	2210,2211,2212,2452,2213,2214,2453		

Aroclor 1254	1539
Aroclor 1260	1533,1534,1535,1537
Aromadendrene	2131
Arotinolol	2871,920
L-Ascorbic acid	122,1234,1301,1302,1303,1304,1309
Asparagine	819
D-Asparagine	2747,527
L-Asparagine	508,509,2747,527,727,1897,2304
D,L-Asparagine monohydrate	2746,526
D,L-Asparagine, FMOc derivatives	2775,590
Aspartame	346,347,348,349
Aspartic acid	509,819
D-Aspartic acid	2748,528
L-Aspartic acid	2748,528,727,1897,2304
D,L-Aspartic acid	2749,529
D,L-Aspartic acid potassium salt	2872,921
D,L-Aspartic acid, FMOc derivatives	2776,591,2777,592
Aspirin	1105,183
Aspon	1542,1543,1544,1545
Asp-Phe	788
Asp-Phe methyl ester	339,340
Astaxanthin	1239,344,1241,1242,1243,1317
Atenolol	130,893,139,943,140,2633,2720,419,2873,923,941,942
Atorvastatin	1148,194,964
Atraton	1506,2075,1507,2076
Atrazine	5,110,15,111,16,20,1391,305,1357,1393,315,316, 1388,1411,1482,2028,1466,1740,1858,1989,2356,2384,2392,2406,1467,1990,2357,2407,1489,1788,1877,2039,2369,2391,2397,2425, 1506,2075,1507,2076,1544,1545,1564,1886,2065
Atrazine-desethyl	5,110,15,111,16
Atrazine-desethyl-desisopropyl-2-hydroxy	397,2078,2079,2080,2081
Atrazine-desisopropyl	110,15,111,16
D,L-Atrolactic acid hemihydrate	2568,34,2569,35
Atropine	2874,924
Aviation gasoline pattern	1599
Azaconazole	1886,2065
Azametiphos	1890,2069
D,L-7-Azatryptophan hydrate	2750,530
3'-Azido-3'-deoxythymidine	911
Azinphos-ethyl	1350,1401,1860,1995,1542,1543,1890,2069

Azinphos-methyl	1350,1401,1860,1995,1449,1683,1830,1935,1542,1543,1885,2064,2004,2413
Azobenzene	1524,1552,1553,1554,1555,1556,1557,1558,1564,1673
Azoxystrobin	1430,1641,1796,1892,1446,1680,1827,1932,1886,2065

— B —

Baccatin III	1104,1153,1154,1220
Bacitracin A	395,1109
Baicalein	352
Balan	1467,1990,2357,2407
Barban	1,295,294,302,2374,303
Barbital	1200,269,485,1201,270,486,414,925,416,927,417,929,418,930,928
Beclomethasone	898
Behenic acid	1808,1908,2244
Behenic acid methyl ester	1818,1918,2250,1819,1919,2251
Behenic acid methyl ester (C22:0)	1815,1915,2247
Behenic acid methyl ester (C22:0)	1817,1917,2249,1840,1960,1842,1962
Behenic acid methyl ester (C22:0) at 4 wt %	1822,1922,2254
Benalaxyl	1449,1683,1830,1935,1888,2067
Bendroflumethiazide	2875,933
Benfluralin	1430,1641,1796,1892,1886,2065
Benfuracarb	1446,1680,1827,1932
Benfuresate	1890,2069
Benoxaprofen	2876,934
Benzaldehyde	21,2326,1491,1581,2319,2331,1564,1574,2328, 1878,2044,2398,2430,1879,2046,2399,2431,1880,2048,2400,2432,1881,2052,2349,2352,1882,2053,2401,2436,1883,2054,2402,2437, 1896,2403
Benzaldehyde-2,4-dinitrophenylhydrazone	22,2334,23,2335
Benzaldehyde-2,4-DNPH	2337
Benzaldehyde (2,4-DNPH derivative)	2336,24
Benzalkonium chloride	277,994,1114,1195
Benzamide	492
Benz[a]anthracene	2375,310,1387,1410,1479,2012,1388,1411,1482,2028,1483,2029,2365,2420,1484,2030,2366,2421,1506,2075, 1507,2076,1524,1552,1553,1554,1555,1556,1557,1564,1795,1891
Benz[a]anthracene solution	311,1451,1936
Benzene	36,841,554,1117,1118,1493,2057,2370,2440, 1494,2058,2371,2441,1497,2061,1498,2062,2373,2444,1500,1586,2321,2343,1502,2071,1503,2072,1504,2073,1505,2074,1519,1520, 1522,1527,1528,1529,1530,1546,1547,1548,1549,1565,1566,1568,1588,2322,2344,1569,1589,2323,2345,1592,1593,1594,1595,1596,1597, 1600,1658,1601,1667,1602,1668,1610,1611,1612,1621,1640,1676,1725,1726,1727,1794,2200,2201,2202,2448,2203,2204,2449,2224, 2226,2456

Benzene-d ₆	36,841	Benzo[a]pyrene	2375,310,311,1388,1411,1482,2028,1408,2010, 1409,2011,1434,1435,1451,1936,1480,2013,1481,2014,1483,2029,2365,2420,1506,2075,1507,2076,1517,1518,1524,1540,1541,1552,1553, 1554,1555,1556,1557,1558,1560,1561,1562,1563,1564,1567,1587,1795,1891
Benzidine	1524,1552,1553,1554,1555,1556,1557,1558,1673	Benzo[e]pyrene	1408,2010,1409,2011,1567,1587
Benzo[a]anthracene	1408,2010,1409,2011,1480,2013,1481,2014,1517,1518,1540	Benzo[a]pyrene-d ₁₂	1795,1891
Benzo[a]anthracene	1541	Benzoylecgonine	427,464
Benzo(a)anthracene	1558	Benzoylecgonine solution	481
Benzo[a]anthracene	1560,1561,1562,1563,1567,1587	Benzyl acetate	2111,2184,2183,2446
Benzoate	338	Benzyl alcohol	1484,2030,2366,2421, 1550,1551,1552,1553,1554,1555,1556,1557,1558,1564
Benzocaine	125,872	Benzyl benzoate	1478,1769,2009,2192
Benzo[b]fluoranthene	2375,310,311,1388,1411,1482,2028, 1408,2010,1409,2011,1434,1435,1451,1936,1480,2013,1481,2014,1483,2029,2365,2420,1506,2075,1507,2076,1517,1518,1524,1540, 1541,1552,1553,1554,1555,1556,1557,1558,1560,1561,1562,1563,1564,1567,1587,1795,1891	Benzyl butyl phthalate	1483,2029,2365,2420,1507,2076,1556,2191
Benzo[j]fluoranthene	1408,2010,1409,2011,1451,1936,1540,1541,1795,1891	Benzyl chloride	1568,1588,2322,2344
Benzo[k]fluoranthene	2375,310,311,1388,1411,1482,2028,1408,2010, 1409,2011,1434,1435,1451,1936,1480,2013,1481,2014,1483,2029,2365,2420,1506,2075,1507,2076,1517,1518,1524,1540,1541,1552,1553, 1554,1555,1556,1557,1558,1560,1561,1562,1563,1564,1567,1587,1795,1891	Benzyl 4-hydroxybenzoate	284
Benzoic acid	37,1105,183,279,280	Benzylisoeugenol	2111,2184
Benzoic acid	334,332,335,339,340,346,347,348,349, 910,1236,1552,1553,1554,1555,1556,1557,1558,1564	4-Benzyl-2-oxazolidinone	2570,39
Benzoic acid, 0.7%	1993	Benzylparaben	282,283,286
Benzoin	2877,38,939,2878,940	Benzyl salicylate	2183,2446
Benzoin methyl ether	1237,3029	<i>α</i> -cis-Bergamotene	2050,2434,2096,2131
Benzo[ghi]perylene	2375,310	<i>α</i> -trans-Bergamotene	2050,2434
Benzo[ghi]perylene	311	<i>trans-α</i> -Bergamotene	2096
Benzo[ghi]perylene	1388,1411,1482,2028	<i>α</i> -trans-Bergamotene	2096
Benzo[ghi]perylene	1408,2010,1409,2011,1429,1434,1435,1451,1936	<i>trans-α</i> -Bergamotene	2099,2105
Benzo[<i>g,h,i</i>]perylene	1480,2013,1481,2014	<i>α</i> -trans-Bergamotene	2106,2120
Benzo[ghi]perylene	1483,2029,2365,2420	<i>trans-α</i> -Bergamotene	2121
Benzo[ghi]perylene	1506,2075	<i>β</i> -trans-Bergamotene	2096,2138
Benzo[ghi]perylene	1507,2076,1517,1518	Bergamot oil	2113
Benzo[ghi]perylene	1524	Bergapten	1262
Benzo[ghi]perylene	1540,1541	Beta blockers	139,943
Benzo[ghi]perylene	1552,1553,1554,1555	beta-Lactoglobulin A	744
Benzo[ghi]perylene	1556	Betamethasone	169
Benzo[ghi]perylene	1557	beta-Pinene	2047,2175,2351,2353
Benzo[ghi]perylene	1558,1560,1561,1562,1563	Betaxolol	1114,1195
Benzo[ghi]perylene	1564	BHA	1898,2182
Benzo[ghi]perylene	1567,1587	<i>α</i> -BHC	1382,1396,1439,1925,1469,1994,2359,2409,1506,2075,1513,1524,1532,1571,1591,2325,2347,1604,1694,1835,1941,2296,2693
Benzo[ghi]perylene	1795,1891	<i>β</i> -BHC	1382,1396,1439,1925,1466,1740,1858,1989,2356,2384,2392,2406,1469,1994,2359,2409, 1506,2075,1507,2076,1512,1513,1514,1516,1524,1532,1571,1591,2325,2347,1604,1889,2068
Benzophenone	840	<i>γ</i> -BHC	1381,1395,1438,1924,1382,1396,1439,1925,1388,1411,1482,2028,1466,1740,1858,1989,2356,2384,2392,2406, 1469,1994,2359,2409,1513,1516,1524,1532,1571,1591,2325,2347,1604

δ-BHC	1382,1396,1439,1925,1466,1740,1858,1989,2356,2384,2392,2406, 1469,1994,2359,2409,1506,2075,1507,2076,1512,1513,1514,1516,1532,1604,1889,2068
BHT	1898,2182,1942
Bicycdoelemene	2050,2434,2124,2131
Bicyclogermacrene	2050,2434,2131,2137,2138,2142,2170
Bifenazate	1889,2068
Bifenox	1886,2065
Bifenthrin	1404,2001,1886,2065
Bilirubin	142
Biliverdin	142
1,1'-Binaphthyl-2,2'-diyl hydrogenphosphate	2571,41
Bioallethrin-1	1887,2066
Bioallethrin-2	1887,2066
Biogenic amines	145
Biotin	1238,3030,1300,1306,1307,1308,1333
2,2'-Biphenol	492
Biphenyl	842,845,1408,2010, 1409,2011,1441,1927,1442,1928,1443,1929,1564,1889,2068
4-Biphenylacetic acid	1174
(E)-α-Bisabolene	2050,2434,2096
(Z)-α-Bisabolene	2096,2121
β-Bisabolene	2050,2434,2096,2099,2105,2106,2120,2121
(E)-γ-Bisabolene	2050,2434,2096,2120
(Z)-γ-Bisabolene	2096,2120
α-Bisabolol	2050,2434,2096,2120
epi-β-Bisabolol	2096
Bis(2-butoxyethyl) phthalate	1478,1769,2009,2192
Bis(2-n-butoxyethyl) phthalate	1865,2008,2394,2416,2191
Bis(2-chloroethoxy)methane	1524,1552,1553,1554,1555,1556,1557,1558,1564
Bis(2-chloroethyl) ether	1524,1552,1553,1554,1555,1556,1557,1558,1564
Bis-(2-chloroisopropyl) ether	1524,1552,1553,1554,1555,1556,1557,1558,1564
3,6-Bis(2-chlorophenyl)-1,2,4,5-tetrazine	1889,2068
Bisdemethoxycurcumin	1331
Bis(2-ethoxyethyl) phthalate	1478,1769,2009,2192,1865,2008,2394,2416,2191
Bis(2-ethylhexyl) adipate	1506,2075,1507,2076
Bis(2-ethylhexyl) phthalate	1478,1769,2009,2192, 1483,2029,2365,2420,1506,2075,1507,2076,1524,1552,1553,1554,1555,1556,1557,1558,1564,1865,2008,2394,2416,2191
7,12-Bis(hydroxymethyl)benz[<i>a</i>]anthracene	175,304,438
Bis(2-methoxyethyl) phthalate	1865,2008,2394,2416

Bis(4-Methyl-2-pentyl) phthalate	1478,1769,2009,2192
Bis(4-methyl-2-pentyl) phthalate	1865,2008,2394,2416,2191
(1 <i>R</i>)-2,2'-Bis[(<i>S</i>)-(4-methylphenyl)sulfinyl]-1,1'-binaphthalene	42
(1 <i>S</i>)-2,2'-Bis[(<i>S</i>)-(4-methylphenyl)sulfinyl]-1,1'-binaphthalene	42
Bisphenol A	299,341,300
Bitertanol	1448,1682,1829,1934,1889,2068
Bivalirudin	820
Blood alcohols	2293
Bolstar	1544,1545
Bolstar (Sulprofos)	1542,1543
Bombesin	709,710,720,721
Borneol	2105,2106,2120
(-)-Bornyl acetate	2111,2184
Bornyl acetate	2131
α-Boswellic acid	1325,1326,1334,1335,1336,1337
β-Boswellic acid	1325,1326,1334,1335,1336,1337
β-Bourbonene	2095,2136,2137,2138,2167
(B) Bovine serum albumin (BSA)	1185,808
Bovine serum albumin (BSA)	829
Bovine serum albumin (BSA) dimer, 132 kD	735
Bradykinin	709,710,720,721,788
Bradykinin, fragment 1-5	709,720
Brassicasterol	1354,1412,1875,2034
Bromacil	2478,6,2879,945,1467,1990,2357,2407,1506,2075,1507,2076,1889,2068
4-Bromoacetanilide	492
Bromobenzene	1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074,1546,1547,1548,1549
2-Bromobutane	1706,2217,2514,2854
Bromobutide	1886,2065
α-Bromo-γ-butyrolactone	1656,2496
Bromochloromethane	1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074,1546,1547,1548,1549,1565,1566
Bromodichloromethane	1494,2058,2371,2441,1497,2061, 1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074,1519,1520,1522,1546,1547,1548,1549,1565,1566,1568,1588,2322,2344
4-Bromo-2,5-dimethoxyphenethylamine hydrochloride solution	1424,457,483
4-Bromodiphenyl ether	1556,1558
(<i>R</i>)-(-)-Bromo-DragonFLY hydrochloride solution	228,1424,457,483
4-Bromofluorobenzene	1504,2073,1519,1520
4-Bromofluorobenzene	1546
4-Bromofluorobenzene	1547,1548,1549,1565,1566

Bromoform	1494,2058,2371,2441,1497,2061,1498,2062,2373,2444,1502,2071,1503,2072, 1504,2073,1505,2074,1519,1520,1522,1546,1547,1548,1549,1565,1566,1568,1588,2322,2344
2-Bromohexadecanoic acid	2755,538
Bromomethane	1494,2058,2371,2441,1496,1497,2061,1498,2062,2373,2444,1502,2071,1503,2072, 1504,2073,1505,2074,1519,1520,1522,1546,1547,1548,1549,1565,1566,1569,1589,2323,2345
2-Bromo-3-methylbutyric acid	2572,43
1-Bromo-2-nitrobenzene (I.S.)	1544,1545
2-Bromooctanoic acid methyl ester	1657,2497
2-Bromopentane	1706,2217,2514,2854
2-Bromophenol	1359,1386,1407,1475,1755,2005,1531
4-Bromophenyl phenyl ether	1524,1552,1553,1554,1555,1557,1564
Bromophos	1440,1677,1824,1926,1886,2065
Bromophos-ethyl	1350,1401,1860,1995,1447,1681,1828,1933
Bromopropylate	1886,2065
Brompheniramine	890,891
Bromuconazole-1	1889,2068
Bromuconazole-2	1889,2068
BSA (bovine serum albumin)	758
BSA carboxyamidomethylated tryptic digest	541
BSA dimer	734
Buphedrone	434,2049,2433
Buphedrone hydrochloride solution	243,468,434,472,476
Buphedrone ephedrine metabolite hydrochloride solution	470,474
Bupirimate	1887,2066
Bupivacaine hydrochloride monohydrate	2880,947,2881,948,2882,949,2198,2850
Buprenorphine solution	692
Buprenorphine glucuronide solution	692
Buprofezin	1886,2065
Bupropion hydrochloride	132,907,1189,231
Buspirone	914,918
Buspirone hydrochloride	1202
Butabarbital	414,925,415,926,417,929,418,930,928
Butachlor	1506,2075,1507,2076,1888,2067
1,3-Butadiene	1568,1588,2322,2344,1665,1723
Butafencil	1888,2067
Butalbital	1200,269,485,1201,270,486,415,926
Butamifos	1430,1641,1796,1892,1885,2064
Butanal	1969
Butane	1610,1611,1612

<i>n</i> -Butane	1592,1665
<i>n</i> -Butane	1723
<i>n</i> -Butane	1751
<i>n</i> -Butane (215 ng on column)	1752
1,4-Butanediol	1703,1975,2185,1704,1976,2186,1705,1977,2187
2,3-Butanediol	1703,1975,2185,1704,1976,2186,1705,1977,2187,2060,2443
2,3-Butanedione	2056,2439
Butanetriol	1638
(S)-(-)-1,2,4-Butanetriol	1632
Butanetriol (I.S.)	1631,1633,1634
Butanoic acid	1971,2405
Butanol	1490,1580,2318,2330,1969
<i>n</i> -Butanol	2211
<i>n</i> -Butanol	2212,2452
iso-Butanol	2210,2211,2212,2452,2213,2214,2453
sec-Butanol	1644
sec-Butanol	1676
sec-Butanol	1725,1726,1727,1969,2211
sec-Butanol	2212,2452,2213,2214,2453
tert-Butanol	1644,1721,1722
1-Butanol	1431,1572,1644,1666,1676,1725,1726,1727,1895,2210
1-Butanol solution	2213,2214,2453
2-Butanol	1507,2076,1593,1895,2292,2464,2294
<i>R</i> -(-)-2-Butanol	1661,2500
<i>S</i> -(+)-2-Butanol	1661,2500
<i>R</i> -(-)-2-Butanol (O-Acetyl derivative)	1659,2498
<i>S</i> -(+)-2-Butanol (O-Acetyl derivative)	1659,2498
<i>R</i> -(-)-2-Butanol (O-TFA derivative)	1660,2499
<i>S</i> -(+)-2-Butanol (O-TFA derivative)	1660,2499
sec-Butanone	2210
2-Butanone	1504,2073,1525,1546,1547,1548,1549, 1565,1566,1568,1588,2322,2344,1676,1726,1727,2056,2439,2210,2211,2212,2452,2213,2214,2453
2-Butanone-2,4-dinitrophenylhydrazone	22,2334,23,2335
2-Butanone (2,4-DNPH derivative)	2336,24
1-Butene	1665,1723
<i>cis</i> -2-Butene	1612,1665,1723
<i>trans</i> -2-Butene	1665,1723
3-Butenone	2056,2439
l-Buthionine sulfoximine	121

Butorphanol	2883,950,2884,951
2-Butoxyethanol	1703,1975,2185
2-Butoxyethanol (butyl Cellosolve®)	1704,1976,2186
2-(2-Butoxyethoxy)ethanol	1703,1975,2185
2-(2-Butoxyethoxy)ethanol (butyl CARBITOL™)	1704,1976,2186
Butyl acetate	1676,1876,2035,2396,2423,1969,2210,2211,2212,2452,2213,2214,2453
<i>n</i> -Butyl acetate	1431,1572,1675,1725,1726,1727,1780
<i>sec</i> -Butyl acetate	1780
<i>n</i> -Butyl alcohol	1780
<i>sec</i> -Butyl alcohol	1780
Butylamine	1776
<i>sec</i> -Butylamine	1650,2491
<i>N</i> -Butylaniline	32
Butylate	1506,2075,1890,2069
Butylbenzene	33,1546,1547,1548,1549
<i>n</i> -Butylbenzene	1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074,1612,2300,2467
<i>iso</i> -Butylbenzene	1610
<i>sec</i> -Butylbenzene	1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074,1546,1547,1548,1549
<i>sec</i> -Butylbenzene	1610
<i>sec</i> -Butylbenzene	1612
<i>tert</i> -Butylbenzene	1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074,1546,1547,1548,1549
<i>N</i> -Butylbenzene	1610
Butylbenzyl phthalate	1388,1411,1482,2028,1478,1769,2009,2192,1506,2075,1524,1552,1553,1554,1555,1557,1558,1564,1865,2008,2394,2416
Butyl cellosolve	1725,1726,1727,1780
Butylcyclohexane	1528,1530
2- <i>sec</i> -Butyl-4,6-dinitrophenol	1477,1757,2007,2364,2389,2415,1531
<i>tert</i> -Butyl ethyl ether	1721
Butyl hexanoate	1876,2035,2396,2423,1971,2405
<i>tert</i> -Butylhydroquinone	276,337,1282,292,1898,2182
<i>tert</i> -Butylhydroxyanisole	276,337
3- <i>tert</i> -Butyl-4-hydroxyanisole	1282,292
Butyl 4-hydroxybenzoate	1748,1998,2190,2223,2387,2412,2447,2454
<i>tert</i> -Butylhydroxytoluene	276,337
(±)-Butyl-γ-lactone	1729,2118,2529,2676
Butyl 2-methylbutanoate	1876,2035,2396,2423
<i>tert</i> -Butyl methyl ether	1504,2073,1527,1565,1566,1568,1588,2322,2344,2210,2211,2212,2452,2213,2214,2453
Butylone hydrochloride	2049,2433
Butylone hydrochloride solution	243,468,434,470,475

Butylparaben	284
Butyl paraben	282,283,286
Butylparaben	289
Butyl paraben	290,291,1106
Butylone	435
Butyraldehyde	21,2326
Butyraldehyde-2,4-dinitrophenylhydrazone	22,2334,23,2335
Butyraldehyde-2,4-DNPH	2337
Butyraldehyde (2,4-DNPH derivative)	2336,24
Butyric acid	1808,1908,2244,1809,1909,2245,1873,2031,2278,1969,1970,2404
Butyric acid, 0.7%	1993
Butyric acid methyl ester (C4:0)	1815,1915,2247,1817,1917,2249,1818,1918,2250,1819,1919,2251
Butyric acid methyl ester (C4:0) at 4 wt %	1822,1922,2254
β-Butyrolactone	322,1662,2501,1663,2502,1664,2503
γ-Butyrolactone	2056,2439

— C —

C1	718
C10:0	1823,1923,2255,1951,1955,1956,2258,1958,2261
C10:1	1951,1955,1956,2258,1958,2261
C11:0	1823,1923,2255,1951,1955,1956,2258,1958,2261
C12:0	1823,1923,2255,1951,1955,1956,2258,1958,2261
C13:0	1823,1923,2255,1951,1955,1956,2258,1958,2259
C13:0 iso	1951,1955,1958
C13:0 anteiso	1951,1955,1958
C14:0	1823,1923,2255,1870,2021,1872,2023,2277,1942,1943,1951,1952,1953,1955,1956,2258,1958,2259,2261
C14:0 iso	1951,1955,1956,2258,1958
C14:1	1823,1923,2255,1951,1955,1956,2258,2261
C14:1n9c	1958
C14:0 methyl ester	1947
C15:0	1823,1923,2255,1951,1955,1956,2258,1958,2261
C15:0 iso	1951,1955,1956,2258,1958,2261
C15:1	1823,1923,2255
C15:0 anteiso	1951,1955,1956,2258,1958,2261
C15:0 methyl ester	1947
C16:0	1823,1923,2255,1870,2021,1872,2023,2277,1942,1943,1951,1952,1953,1955,1956,2258,1958,2259,2261
C16:0 iso	1951,1955,1956,2258,1958
C16:1	1823,1923,2255
C16:1ω7	2259

C16:1n10t 1958
 C16:1n7 1870,2021,1942,1943,1952,1953
 C16:1n7c 1958
 C16:1n7 methyl ester 1947
 C16:1n9c 1951,1955,1956,2258,1958,2261
 C16:1n9t 1951,1955
 C16:2n4 1870,2021,1942,1943,1952,1953
 C16:3n4 1870,2021,1942,1943,1952,1953
 C16:0 methyl ester 1947
 C17:0 1823,1923,2255,1951,1955,1956,2258,1958,2261
 C17:0 iso 1951,1955,1956,2258,1958,2261
 C17:1 1823,1923,2255,1951,1955,1956,2258,1958
 C17:1n9c 2261
 C17:0 anteiso 1951,1955,1956,2258,1958,2261
 C18:0 1823,1923,2255,1870,2021,1872,2023,2277,1942,1943,1951,1952,1953,1955,1956,2258,1958,2259,2261
 C18:0 iso 1951,1955,1956,2258,1958,2261
 C18:1 2259
 C18:1 D 11c 1801,1901,2243
 C18:1 Δ 11c 1799,1899,2241
 C18:1 Δ 11t 1799,1899,2241
 C18:1 D 12c 1801,1901,2243
 C18:1 Δ 12c 1799,1899,2241
 C18:1 Δ 12t 1799,1899,2241
 C18:1 D 13c 1801,1901,2243
 C18:1 Δ 13c 1799,1899,2241
 C18:1 Δ 13t 1799,1899,2241
 C18:1 Δ 6c 1799,1899,2241
 C18:1 Δ 6t 1799,1899,2241
 C18:1 Δ 7c 1799,1899,2241
 C18:1 Δ 7t 1799,1899,2241
 C18:1 D 9c 1801,1901,2243
 C18:1 Δ 9c 1799,1899,2241
 C18:1 Δ 9t 1799,1899,2241
 C18:2 2259
 C18:2 D 9c, 12c 1801,1901,2243
 C18:2 Δ 9c,12c 1799,1899,2241
 C18:2 D 9c, 12t 1801,1901,2243
 C18:2 Δ 9c,12t 1799,1899,2241
 C18:2 D 9t, 12c 1801,1901,2243

C18:2 Δ 9t,12c 1799,1899,2241
 C18:2 D 9t, 12t 1801,1901,2243
 C18:2 Δ 9t,12t 1799,1899,2241
 C18:3 2259
 C18:3ω6 2259
 C18:3 D 9c, 12c, 15c 1801,1901,2243
 C18:3 Δ 9c,12c,15c 1799,1899,2241
 C18:3 Δ 9c,12c,15t 1799,1899,2241
 C18:3 D 9c, 12t, 15c 1801,1901,2243
 C18:3 Δ 9c,12t,15c 1799,1899,2241
 C18:3 Δ 9c,12t,15t 1799,1899,2241
 C18:3 D 9t, 12c, 15c 1801,1901,2243
 C18:3 Δ 9t,12c,15c 1799,1899,2241
 C18:3 D 9t, 12c, 15t 1801,1901,2243
 C18:3 Δ 9t,12c,15t 1799,1899,2241
 C18:3 D 9t, 12t, 15c 1801,1901,2243
 C18:3 Δ 9t,12t,15c 1799,1899,2241
 C18:3 D 9t, 12t, 15t 1801,1901,2243
 C18:3 Δ 9t,12t,15t 1799,1899,2241
 C18:4 2259
 C18:1n10c 1958
 C18:1n10t 1951,1955,1956,2258,1958
 C18:1n11c 1951,1955,1956,2258,1958,2261
 C18:1n11t 1951,1955,1956,2258,1958,2261
 C18:1n12c 1951,1955,1956,2258,1958,2261
 C18:1n12t 1955,1956,2258
 C18:1n13c 1951,1955,1956,2258,1958,2261
 C18:1n13t 1955
 C18:1n14c 1951,1955,1958,2261
 C18:1n14t 1955
 C18:1n15c 1951,1955
 C18:1n15t 1955
 C18:1n16t 1951,1955,1956,2258,1958
 C18:1n5c 1955,1958
 C18:1n5t 1951
 C18:1n6c 1955,1956,2258,1958
 C18:1n6t 1951,1955,1958,2261
 C18:1n7 1870,2021,1942,1943,1952,1953
 C18:1n7c 1955,1956,2258

C18:1n7 methyl ester	1947
C18:1n7t	1951,1955,1956,2258,1958,2261
C18:1n8c	1955
C18:1n8t	1951,1955,1956,2258,2261
C18:1n9	1870,2021,1872,2023,2277,1942,1943,1952,1953
C18:1n9c	1823,1923,2255,1951,1955,1956,2258,1958,2261
C18:1n9 methyl ester	1947
C18:1n9t	1823,1923,2255,1951,1955,1956,2258,1958,2261
C18:2n6	1870,2021,1872,2023,2277,1942,1943,1952,1953
C18:2n6c	1823,1923,2255
C18:2n6 methyl ester	1947
C18:2n6t	1823,1923,2255
C18:2n9c,11t	1951,1955,1956,2258,1958,2261
C18:2n9c,12c	1951,1955,1956,2258,1958,2261
C18:2n9c,12t	1951,1955,1956,2258,2261
C18:2n9t,12c	1951,1956,2258,2261
C18:3n3	1823,1923,2255,1942,1951,1952,1955,1956,2258,1958,2261
C18:3n3 (ALA)	1870,2021,1943,1953
C18:3n3 methyl ester	1947
C18:3n4	1870,2021,1942,1943,1952,1953
C18:3n6	1823,1923,2255,1942,1951,1955,1956,2258,2261
C18:4n3	1870,2021,1872,2023,2277,1942,1943,1952,1953
C18:4n3 methyl ester	1947
C18:3 D 9c, 12t, 15t and C18:3 D 9c, 12c, 15t	1801,1901,2243
C18:1 D 12t, C18:1 D 6c, C18:1 D 7c and C18:1 D13t	1801,1901,2243
<i>cis</i> -C18:1 FAME isomers	1802,1902,1805,1905
<i>trans</i> -C18:1 FAME isomers	1802,1902,1805,1905
C18:0 methyl ester	1947
C19:1	1958
C2	718
C20:0	1823,1923,2255,1872,2023,2277,1951,1955,1958,2259,2261
C20:2	1823,1923,2255
C20:4ω6	2259
C20:1n9	1823,1923,2255,1870,2021,1872,2023,2277,1942,1943,1952,1953,1958,2261
C20:1n9c	1956,2258
C20:1n9 methyl ester	1947
C20:2n6	1956,2258,2261
C20:3n3	1823,1923,2255,1870,2021,1942,1943,1952,1953,2261
C20:3n6	1823,1923,2255,1956,2258,1958,2261
C20:4n3	1870,2021,1942,1943,1952,1953
C20:4n6	1823,1923,2255,1870,2021,1942,1956,2258,1958,2261
C20:5n3	1823,1923,2255,1872,2023,2277,1942,1951,1952,1956,2258,1958,2261
C20:5n3 (EPA)	1870,2021,1943,1953
C20:5n3 methyl ester	1947
C21:0	1823,1923,2255,1956,2258,1958
C21:5n3	1872,2023,2277
C22:0	1823,1923,2255,1872,2023,2277,1958
C22:2	1823,1923,2255
C22:5ω3	2259
C22:6ω3	2259
C22:1LyLn	324
C22:1n9	1823,1923,2255
C22:1n9 methyl ester	1947
C22:4n6	1951,2261
C22:5n3	1823,1923,2255,1870,2021,1872,2023,2277,1942,1943,1952,1953,1956,2258,1958,2261
C22:5n3 methyl ester	1947
C22:6n3	1823,1923,2255,1872,2023,2277,1942,1951,1952,1956,2258,2261
C22:6n3 (DHA)	1870,2021,1943,1953
C22:6n3 methyl ester	1947
C23:0	1823,1923,2255,1872,2023,2277,1958
C23:1	1958
C24:0	1823,1923,2255,1872,2023,2277,1958
C24:1LyLn	324
C24:1n9	1823,1923,2255,1872,2023,2277,1958,2261
C25:0	1958
C26:0	1956,2258,2261
C3	718
C4	718
C4:0	1823,1923,2255,1951,1955,1958,2261
C40-C46 esters	1884,2063
C5-C11 alkanes	1596
C5-C11 hydrocarbons	1593
C5-C9 alkanes	1597
C6+	1628
C6:0	1823,1923,2255,1951,1955,1956,2258,1958,2261
C7:0	1958
C8:0	1823,1923,2255,1951,1955,1956,2258,1958,2261
C9:0	1951,1955,1958

Cadaverine	143
β-Cadinene	2103
γ-Cadinene	2131
δ-Cadinene	2050,2434,2096,2124,2131,2142,2161,2166
(+)-δ-Cadinene	2170
Cadin-4-en-10-ol	2095,2131
Cadusafos	1350,1401,1860,1995
Cadusafos-1	1885,2064
Cadusafos-2	1885,2064
Cafenstrole	1886,2065
Caffeic acid	376,1259
Caffeine	130,893,1362,1427,148,946,149,1105,183,334,335,339,340,342,343,346,347,348,349,850,1119,1275,2288,2289
Caffeoylferuloylquinic acid (3C,4F-QA)	1275
Caffeoylferuloylquinic acid (3F,4C-QA)	1275
Caffeoylferuloylquinic acid (3F,5C-QA)	1275
Caffeoylferuloylquinic acid (4C,5F-QA)	1275
Caffeoylquinic acid (1-CQA)	1275
Caffeoylsinapyloquinic acid (CSQA)	1275
Caftaric acid	376,377
α-Calacorene	2124
Calcium pantothenate	1299,1300,1306,1307,1308,1332,1333
Calphostin C	151,539
Campesterol	1354,1412,1875,2034
Campesterol solution	1874,2033
Camphene	2050,2434,2095,2096,2099,2103,2105,2106,2111,2184,2120,2121,2131,2137,2138,2142,2166,2170
Campherenol	2050,2434,2096,2120
Camphor	1670,1910,2085,2199,2504,2665,2691,2851,2096,2103,2120,2166
Cannabidiol	421,459
Cannabidiol solution	487
Cannabinol	421,459
Cannabinol solution	487
Capric acid methyl ester	1818,1918,2250,1819,1919,2251
Capric acid methyl ester (C10:0)	1815,1915,2247,1817,1917,2249
Capric acid methyl ester (C10:0) at 4 wt %	1822,1922,2254
Caproic acid	1808,1908,2244,1873,2031,2278
Caproic acid methyl ester	1818,1918,2250,1819,1919,2251
Caproic acid methyl ester (C6:0)	1815,1915,2247
Caproic acid methyl ester (C6:0)	1817,1917,2249
Caproic acid methyl ester (C6:0) at 4 wt %	1822,1922,2254

Caprolactam	1564
Caprylic acid	1808,1908,2244
Caprylic acid methyl ester	1818,1918,2250,1819,1919,2251
Caprylic acid methyl ester (C8:0)	1815,1915,2247,1817,1917,2249
Caprylic acid methyl ester (C8:0) at 4 wt %	1822,1922,2254
Captafol	1448,1682,1829,1934
Captan	1347,1394,1798,1894,1430,1641,1796,1892,1571,1591,2325,2347,1797,1893,1889,2068
Captafol	1889,2068
Captopril	123,849,129,892,896
Carbamazepine	851
Carbamazepine solution	1228
Carbaryl	1347,1394,1798,1894,1445,1679,1826,1931,1797,1893
Carbazole	1524,1540,1541,1552,1553,1554,1555,1556,1557,1558,1564
Carbendazim	110,15,111,16,1418,404,1419,406
Carbetamide	1890,2069
S-(−)-Carbidopa	162,2634,163,2635
Carbinoxamine	890
Carbofuran	1,295,294,302,1391,305,1445,1679,1826,1931
Carbon dioxide	1622,1628,1639,1747,1749,1750,1751,1753
Carbon dioxide (215 ng on column)	1752
Carbon disulfide	1504,2073,1565,1566,1568,1588,2322,2344,1582,2332,1685,1686,2381,1687,2382,1871,2022,2395,2417
Carbon disulfide (1 ppm)	1783
Carbon disulfide (solvent)	1486,1487
Carbonfenthion	1887,2066
Carbonic anhydrase	742,748,749,750,751,752
Carbonic Anhydrase from bovine erythrocytes	738,744
Carbon monoxide	1639,1749,1750,1753
Carbon Monoxide	1754
Carbon monoxide (215 ng on column)	1752
Carbon tetrachloride	1494,2058,2371,2441,1497,2061,1498,2062,2373,2444,1502,2071, 1503,2072,1504,2073,1505,2074,1519,1520,1522,1546,1547,1548,1565,1566,1568,1588,2322,2344,1569,1589,2323,2345,1674,1676,1725, 1726,1727,2200,2201,2202,2448,2203,2204,2449,2224
Carbonyl sulfide	1686,2381,1687,2382
Carbonyl sulfide (1 ppm)	1783
Carbophenothion	1419,406,1542,1543,1544,1545
Carboxin	1466,1740,1858,1989,2356,2384,2392,2406,1471,1746,1861,1997,2361,2386,2393,2411,1506,2075
Carboxine	1507,2076
Cardiac drugs	954
2-Caren-10-al	2047,2175,2351,2353

3-Carene	2099,2170	Cephapirin	882,956
γ-3-Carene	2111,2184	Cetuximab ERBITUX®	549
δ-3-Carene	2050,2434,2120,2131,2142	Chenodeoxycholic acid	234
Carfentrazone-ethyl	1888,2067	Chenodeoxycholic acid	141,234
(±)-Carnitine hydrochloride	2756,547	Chinomethionate	1889,2068
Carnosic acid	1284	Chlormethoxyfen	1890,2069
Camosol	1284	Chloramphenicol	127,877,320,403,879
α-Carotene	1239,344,1240,1317	DL-threo-Chloramphenicol-d ₅	320,403
β-Carotene	1239,344,1240,1317	Chlorbenzilate	1888,2067
Carotenoids	1243	cis-Chlordane	1347,1394,1798,1894
cis-Carveol	2103,2131,2166	cis-Chlordane	1432,1671,1811,1911,2469,2505,2657,2692,1458,1707,1851,1979,2470,2515,2658,2694
trans-Carveol	2095,2167	cis-Chlordane	1797,1893
trans-Carveol acetate	2167	α-Chlordane	1382,1396,1439,1925,1388,1411,1482,2028,1469,1994,2359,2409,1506,2075,1507,2076,1512,1513,1514,1516,1532,1604
Carvone	322,2096,2103,2120,2138,2166,2167	γ-Chlordane	1382,1396,1439,1925,1388,1411,1482,2028,1469,1994,2359,2409,1506,2075,1507,2076,1512,1513,1514,1516,1532,1604
D-Carvone	2086,2666,2087,2667,2090,2670,2091,2671,2092,2672,2093,2673,2094,2674	Chloridiazepoxide	915,916,917,919
L-Carvone	2088,2668,2089,2669,2090,2670,2091,2671,2092,2672,2093,2673,2094,2674	Chloreneb	1448,1682,1829,1934
(E)-Caryophyllene	2050,2434	Chlorfenapyr	1886,2065
(-)-trans-Caryophyllene	2105	Chlorfenson	1886,2065
(E)-Caryophyllene	2120	Chlorfenvinphos	1542,1543,1545
(-)-trans-Caryophyllene	2170	Chlorfenvinphos-Z	1885,2064
(E)-Caryophyllene	2095,2096,2121,2124,2131,2137,2138,2161,2166,2167	Chlorfenviphos-E	1885,2064
β-Caryophyllene	2099,2103,2106,2111,2184,2136,2142	Chlorhexidine	281,957
9-epi-(E)-Caryophyllene	2131	Chloridazon	1890,2069
Caryophyllene oxide	2124,2131,2137,2138,2142,2161	Chlorimipramine	2279,2303,2459,2468
Catalase from bovine liver	744	Chlormefos	1890,2069
Catechin	1244	Chlorneb	1506,2075
(+)-Catechin	376	Chloroacetonitrile	1504,2073
(+)-Catechin hydrate	1259	p-Chloroamphetamine	1172,213
Catechin gallate	1244	2-Chloroaniline	1655,1672
Catecholamine Mix 1 (Epinephrines) solution	271	3-Chloroaniline	1564
Catecholamine Mix 2 (Metanephrines) solution	271	4-Chloroaniline	1484,2030,2366,2421,1552,1553,1554,1555,1556,1557,1558,1673
Cedrol	2111,2184	Chlorobenzene	1493,2057,2370,2440,1494,2058,2371,2441,1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074,1519,1520,1522,1546,1547,1548,1549,1565,1566,1568,1588,2322,2344,1569,1589,2323,2345,1676,1725,1726,1727,1794,2205,2206,2207,2450,2208,2209,2451
Cedryl acetate	2111,2184	Chlorobenzene-d ₅	1500,1586,2321,2343,1519,1520,1523
Cefadroxil	882,956	Chlorobenzene-d ₅	1546
Cefsulodin	882,956	Chlorobenzene-d ₅	1547
Celecoxib	898	Chlorobenzene-d ₅	1548,1549,1565,1566
Cellobiose	383	Chlorobenzilate	1506,2075,1507,2076,1509,1510,1511,1550,1551
Cellosolve acetate	1780		
Cephalomannine	1104,1153,1154,1220		

2-Chlorobiphenyl	1388,1411,1482,2028,1506,2075,1507,2076
1-Chlorobutane	1504,2073
2-Chlorobutane	1706,2217,2514,2854
Chlorodibromomethane	1498,2062,2373,2444,1502,2071,1503,2072,1505,2074,1523
4-Chlorodiphenyl ether	1556,1558
Chloroethane	1494,2058,2371,2441,1496,1497,2061, 1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074,1519,1520,1522,1546,1547,1548,1549,1565,1566,1568,1588,2322,2344
2-Chloroethyl vinyl ether	1494,2058,2371,2441,1519,1520,1521,1522,1523
3-Chloro-4-fluoroaniline	1655,1672
Chloroform	1494,2058,2371,2441,1497,2061,1498,2062,2373,2444,1502,2071,1503,2072, 1504,2073,1505,2074,1519,1520,1522,1546,1547,1548,1549,1565,1566,1568,1588,2322,2344,1569,1589,2323,2345,1674,1676,1725,1726, 1727,2205,2206,2207,2450,2208,2209,2451,2226,2456
Chlorofos	1430,1641,1796,1892
Chlorogenic acid (5-CQA)	1275
Chloromethane	1494,2058,2371,2441,1496,1497,2061,1498,2062,2373,2444,1502,2071,1503,2072, 1504,2073,1505,2074,1519,1520,1522,1546,1547,1548,1549,1565,1566,1569,1589,2323,2345
3-Chloro-4-methylaniline	1672
4-Chloro-2-methylaniline	1673
4-Chloro-4-methylaniline	1655
4-Chloro-3-methylphenol	90,1359,1386,1407,1475,1755,2005,1476,1756,2006,2363,2388,2414, 1477,1757,2007,2364,2389,2415,1524,1531,1552,1553,1554,1555,1556,1557,1558,1564
3-(Chloromethyl)pyridine	1673
2-Chloronaphthalene	1524,1552,1553,1554,1555,1556,1557,1558,1564
Chloroneb	1430,1641,1796,1892,1449,1683,1830,1935,1507,2076,1509,1510,1511
4-Chloro-2-nitroaniline	1655,1672
2-Chlorophenol	90,1359,1386,1407,1475,1755,2005, 1476,1756,2006,2363,2388,2414,1477,1757,2007,2364,2389,2415,1524,1531,1552,1553,1554,1555,1556,1557,1558,1564
2-Chlorophenol-3,4,5,6-d ₄	1556
2-Chlorophenol-d ₄	1524,1550,1551,1552,1553,1554,1555,1557,1564
2-chlorophenol-d ₄	1558
2-(2-Chlorophenoxy)propionic acid	2479,7,2481,8
2-(4-Chlorophenoxy)propionic acid	2482,9,2480
p-Chlorophenylalanine	1172,213
4-Chloro- α -phenylalanine	2758,552,2290,2462
2-Chloro- α -phenylalanine	2757,551
4-Chlorophenyl phenyl ether	1524,1552,1553,1554,1555,1557,1564
3-Chloropropane	1497,2061
Chloropropylate	1509,1510,1511
Chloropyrifos	1350,1401,1860,1995,1351,1403,1862,2000,1506,2075,1544,1545,1885,2064

Chloropyrifos-methyl	1885,2064,2004,2413
Chloropyrifos-methyl	1447,1681,1828,1933
Chloroquine diphosphate salt	2885,958
Chlorothalonil	1347,1394,1798,1894,1430,1641,1796,1892, 1506,2075,1507,2076,1509,1510,1511,1571,1591,2325,2347,1797,1893
o-Chlorotoluene	1504,2073,1547
p-Chlorotoluene	1504,2073,1547
2-Chlorotoluene	1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1505,2074,1546,1548,1549
4-Chlorotoluene	1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1505,2074,1546,1548,1549
Chlorotoluron	5
Chlorpheniramine	850,858,859,871,890,912,971,1145
(\pm)-Chlorpheniramine	891
(\pm)-Chlorpheniramine maleate salt	2886,959,1341,3024
Chlorpirophos-methyl	1446,1680,1827,1932
Chlorpromazine	165,578
Chlorpropham	1,295,294,302,2374,303,1506,2075,1507,2076,1886,2065
Chlorpropylate	1889,2068
Chlorpyrifos	308,1347,1394,1798,1894,1430,1641,1796,1892,1507,2076,1542,1543,1585,2342,1797,1893
Chlorpyrifos-methyl	1419,406,1542,1543
Chlorthal-dimethyl	1507,2076,1887,2066
Chlorthalidone	851,2887,960,2888,961,2889,962
Chlorthalonil	1889,2068
Chlorthiophos	1890,2069
Chlortoluron	110,15,111,16
Chlorzoxazone	963
Cholecalciferol	1293,217,420
Cholecalciferol (D3)	1292,216,1294,218,1297,219,1251,1252,1255,1256,1253,1298
5 α -Cholestone	1874,2033
Cholesterol	1354,1412,1875,2034
Cholic acid	141,234
Chysene	2375,310,311,1388,1411,1482,2028,1408,2010,1409,2011,1451,1936,1480,2013,1481,2014, 1483,2029,2365,2420,1506,2075,1507,2076,1517,1518,1524,1540,1541,1552,1553,1554,1555,1556,1557,1558,1560,1561,1562,1563,1564, 1567,1587,1795,1891
Chysene-d ₁₂	1388,1411,1482,2028,1483,2029,2365,2420,1506,2075, 1507,2076,1524,1550,1551,1552,1553,1554,1555,1556,1557,1564
Chysene-d ₁₂	1567,1587
Chysene-d ₁₂ (I.S.)	1558
Chysin	352
α -Chymotrypsin	754,755,756

Chymotrypsinogen A	759
α -Chymotrypsinogen A	739
β -Chymotrypsinogen	754,755,756
Cihalothrin	1447,1681,1828,1933
Cimetidine	1173
1,4-Cineole	2105,2106
1,8-Cineole	2111,2184,2136,2142
Cinmethylin	1890,2069
Cinnamic alcohol	2111,2184
Cinnamyl alcohol	492,2180,2181
Cinnamyl cinnamate, mixture of isomers	2111,2184
Cinoxacin	1005,356,1199
CIPC	1350,1401,1860,1995
Ciprofibrate	2890,965
Ciprofloxacin	1004,355,1005,356,878,880,881,1013
Citalopram hydrobromide	2891,966
Citric acid	68,1277,368,85,1278,369,86
Citronella	2103
Citronellal	2050,2434,2096,2120,2142,2166
Citronellal	2099
(R)-(+)-Citronellal	2170
(\pm)-Citronellal	2183,2446
Citronellol	2096,2103,2112,2120,2166,2180,2181,2183,2446
Citronellyl acetate	2050,2434,2096,2099,2120,2131,2166
Citronellyl formate	2112
Citronyllyl acetate	2103
α -Citrulline	2759,553
α -Citrulline, FMOc derivatives	2778,593
Clenbuterol hydrochloride	140,2633,2720,419,1192,235,2647,2725,460,2894,422,969,2892,967,2893,968
Clethodim	1419,406
Clobazam	1190,232
Clobetasol propionate	167
Clomeprop	1886,2065
Clomipramine	1164,210
Clonazepam	128,887,135,935,136,936,137,937,138,938,1191,233,875,876,888,889,2291,2463
Clorazepate	128,887,888,889
Clothianidin	1358,19,1890,2069
Cloxacillin	1009,1041
Clozapine	908,909

Cocaethylene	462,464
Cocaethylene solution	1203,488
Cocaine	462,464,2289,2290,2462,2291,2463,2295,2465
Cocaine solution	454
Cocaine hydrochloride	432,1203,488,2288
Cocapropylene	2295,2465
Codeine	30,124,868,153,423,154,424,407,853,427,428,429,1233,854,871,912,1119,2288,2289,2290,2462,2291,2463
Codeine solution	264,484,481,490,692
Codeine β - D -glucuronide	153,423,154,424
Codeine-6- β - D -glucuronide solution	692
Cod liver oil	1946
Conalbumin	740
Conalbumin from chicken egg white	761
α -Copaene	2103,2124,2161,2166
(-)- α -Copaene	2170
β -Copaene	2170
Coronene	1567,1587
Corticosterone	169,1204,272
Corticosterone solution	1374,257
Cortisone	1290,204,1204,272
Cortisone 21-acetate	203,1204,272,453
Cotinine	246
Coumachlor	2574,46,2895,972
Coumafuryl	2575,47
Coumaphos	1347,1394,1798,1894,1350,1401,1860,1995,1351,1403,1862,2000,1542,1543,1544,1545,1797,1893
<i>p</i> -Coumaric acid	376,1205,1259
Coumarin	2111,2184,2181
Coumaroylquinic acid (CQA)	1275
Courmarin	2180
CP-47,497 C8 homolog (1,1-Dimethyloctyl-2-[(1R,3S)-3-hydroxycyclohexyl]-5-(2-methyloctan-2-yl)phenol)	449,452
CP-47,497 (2-[(1R,3S)-3-Hydroxycyclohexyl]-5-(2-methyloctan-2-yl)phenol)	449
CP-47,497 (2-[(1R,3S)-3-Hydroxycyclohexyl]-5-(2-methyloctan-2-yl)phenol)	452
Creatine Kinase	556
<i>o</i> -Cresol	48,1283,1556,1558,1676,1726,1727,1794
<i>m</i> -Cresol	48,1676,1726,1727,1794
<i>p</i> -Cresol	48,1283,1556,1558,1676,1726,1727,1794
Crimidine	1890,2069
Crotonaldehyde	21,2326
Crotonaldehyde-2,4-dinitrophenylhydrazone	22,2334,23,2335

Crotonaldehyde (2,4-DNPH derivative)	2336,24
Crotyxyphos	1542,1543,1544,1545
Crufomate (Ruelene)	2576,49
Crypto-chlorogenic acid (4-CQA)	1275
α -Cubebene	2124,2161
β -Cubebene	2124,2161,2170
Cubanol	2124
Cumene	1492,1583,2320,2333,1493,2057,2370,2440,1546,1547, 1548,1549,1565,1566,1612,1621,1640,2210,2212,2452,2213,2214,2453
Cuminic aldehyde	2047,2175,2351,2353
α -Curcumene	2096
Curcumin	1331
Cyanazine	5,110,15,111,16,1391,305,316, 1444,1678,1825,1930,1466,1740,1858,1989,2356,2384,2392,2406,1489,1788,1877,2039,2369,2391,2397,2425,1506,2075,1507,2076, 1886,2065
Cyanidin 3-(6-acetylglucoside)	336
Cyanidin chloride	1320,1321
Cyanidin 3-glucoside	336
Cyanocobalamin	742,748,751
Cyanocobalamin (B12)	1299,1300,1306,1307,1308,1332,1333
Cyanofenphos	1887,2066
Cyanophos	1885,2064
Cyanuric acid	117,318,2078,2079,2080,2081
Cycloate	1448,1682,1829,1934,1506,2075,1507,2076
Cyclobarbitol	1200,269,485,1201,270,486
Cyclodecane	1491,1581,2319,2331
Cyclodextrin	360,66
β -Cyclodextrin	367
Cyclohexane	1565,1566,1568,1588,2322,2344,1592,1612,2205,2206,2207,2450,2208,2209,2451
<i>trans</i> -1,2-Cyclohexanediol	1688,2506
Cyclohexanol	1676,1725,1726,1727
Cyclohexanone	1613,1614,1615,1616,1617,1618,1624,1625,1626,1780
3-Cyclohexene-1-carbonitrile	1582,2332
Cyclopentane	1592
Cyclopenta[cd]pyrene	1795,1891
Cyclopentene	1612
Cyclophosphamide monohydrate	2896,973
Cyclopropane	1665,1723
Cyflufenamid	1886,2065

Cyfluthrin-1	1886,2065
Cyfluthrin-2	1886,2065
Cyfluthrin-3	1886,2065
Cyfluthrin-4	1886,2065
Cyfluthrin isomers	1351,1403,1862,2000,1404,2001
Cyhalofop-butyl	1886,2065
Cyhalothrin	1404,2001
Cyhalothrin-1	1887,2066
Cyhalothrin-2	1887,2066
Cylert	974
Cymene	2047,2175,2351,2353
<i>o</i> -Cymene	2131
<i>p</i> -Cymene	1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1505,2074, 1546,1547,1548,1549,2050,2434,2056,2439,2095,2096,2099,2103,2105,2106,2120,2121,2124,2131,2136,2137,2138,2142,2166,2167,2170
<i>p</i> -Cymen-8-ol	2131,2142
Cypermethrin-1	1887,2066
Cypermethrin-2	1887,2066
Cypermethrin-3	1887,2066
Cypermethrin-4	1887,2066
Cypermethrin isomer	1351,1403,1862,2000,1449,1683,1830,1935
Cyproconazole-1	1888,2067
Cyproconazole-2	1888,2067
Cyprodinil	1347,1394,1798,1894,1797,1893,1888,2067
<i>D</i> -Cysteine	2760,557
<i>L</i> -Cysteine	2760,557,1897,2304
α -Cysteine	2761,558
<i>L</i> -Cystine	1897,2304
Cytidine	686,687,688,689,769
Cytochrome c	739
Cytochrome c (bovine)	560
Cytochrome c from chicken heart	704,732,733,738,762
Cytochrome c from equine heart	1130,746,747,1184,805
Cytochrome c, species variants	540,759
Cytochrome c (equine)	560
Cytochrome c (rabbit)	560
Cytochrome c, tryptic digest	562
Cytosine	684,685,765

— D —

2,4-D	1355,1389,2,298,306,307	10-Deacetyl-7-(β-xylosyl)paclitaxel	1154
(R,R)-DACH-ACR (N-(2-acryloylamino-(1R,2R)-cyclohexyl)-acrylamide)	2577,50	10-Deacetyl-7-(β-xylosyl)paclitaxel C	1154
(S,S)-DACH-ACR (N-(2-acryloylamino-(1R,2R)-cyclohexyl)-acrylamide)	2577,50	Decachlorobiphenyl	1382,1396,1439,1925,1441,1927,1442,1928,1443,1929,1469,1994,2359,2409, 1512,1513,1514,1516,1532,1533,1534,1535,1538,1539,1604
Dacthal	1355,1389,2,298,1506,2075	2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl (No. 209)	1402,1999
Dacthal (dimethyl)	1509,1510,1511	Decachlorobiphenyl (surr.)	1537
DAG32 1:2	1849,1974	(E,E)-2,4-Decadienal	2103,2166
DAG32 1:3	1849,1974	Decanal	1431,1572,1490,1580,2318,2330,1491,1581,2319,2331, 1492,1583,2320,2333,1878,2044,2398,2430,1879,2046,2399,2431,1880,2048,2400,2432,1881,2052,2349,2352,1882,2053,2401,2436, 1883,2054,2402,2437,1971,2405,2045,2350,2050,2434,2096,2099,2103,2105,2106,2111,2184,2120,2166,2170
DAG34 1:2	1849,1974	Decane	1431,1572,1486,1487,1526,1528,1530,1595,1597,1601,1667,1602,1668
DAG34 1:3	1849,1974	<i>n</i> -Decane	1612,2311,2312
DAG36 1:2	1849,1974	<i>n</i> -decane	2313
DAG36 1:3	1849,1974	<i>n</i> -decane	2314
Daidzein	1270,361,1271,362,1272	Decane (C10)	1636
Daidzin	1270,361,1271,362,1272	Decanoic acid	1873,2031,2278,1970,2404
Dalapon	306,307	δ-Decanolactone enantiomers	1690,2104,2508,2675
DAMME	166,583	<i>trans</i> -2-Decenal	2170
Danofloxacin	1004,355,1013	Decylamine	1776
Dansyl-DL-glutamic acid bis(cyclohexylammonium) salt	2762,563	DEF (from oxidation of Merphos in the injection port)	1544,1545
Dansyl-DL-leucine cyclohexylammonium salt	2763,564	(L)-Dehydroascorbic acid	1234
Dansyl-DL-methionine cyclohexylammonium salt	2764,565,2765,566	Dehydrocholic acid	141
Dansyl-DL-norleucine cyclohexylammonium salt	2766,567	<i>cis</i> -Dehydrolinalool oxide	2131
Dansyl-DL-phenylalanine cyclohexylammonium salt	2767,568	3,4-Dehydro-DL-proline	2769,570
Dansyl-DL-valine cyclohexylammonium salt	2768,569	Delphinidin 3-(6-acetylglucoside)	336
Dazomet isomer	1446,1680,1827,1932	Delphinidin chloride	1320,1321
2,4-DB	306,307	Delphinidin 3-glucoside	336
2,4-DB methyl ester	306,307	Deltamethrin	1351,1403,1862,2000,1449,1683,1830,1935
3,4'-DDD	1466,1740,1858,1989,2356,2384,2392,2406	Deltamethrin-1	1886,2065
4,4'-DDD	1382,1396,1439,1925,1469,1994,2359,2409,1506,2075,1513,1516,1524,1532,1604	Deltamethrin-2	1886,2065
4,4'-DDE	1347,1394,1798,1894,1404,2001,1507,2076,1512,1514,1797,1893	Demeclocycline	1157
2,4'-DDT	1795,1891	Demethoxycurcumin	1331
4,4'-DDT	1351,1403,1862,2000,1382,1396,1439,1925,1404,2001,1466,1740,1858,1989,2356,2384,2392,2406,1469,1994,2359,2409, 1506,2075,1507,2076,1512,1513,1514,1516,1524,1532,1571,1591,2325,2347,1604,1795,1891	Demeton-O	1542,1543,1544,1545
10-Deacetylpaclitaxel	1153	Demeton S	1542,1543
10-Deacetylbaaccatin III	1154	Demeton-ethyl	1350,1401,1860,1995
10-Deacetyl-7-epipaclitaxel	1153,1154	Demeton- <i>s</i> -methyl	1444,1678,1825,1930
10-deacetyl-7-epipaclitaxel	1220	Demeton-S-methyl	1887,2066
10-Deacetylpaclitaxel	1104,1154	Demeton- <i>s</i> -methylsulfon	1444,1678,1825,1930
10-deacetyl paclitaxel	1220	Demoxepam	1190,232,916

2'-Deoxyadenosine monohydrate	572,688	Diacetal	1969
5'-Deoxyadenosine	689	Diacetone alcohol	1725
Deoxycholic acid	141,234	Dialifor	1444,1678,1825,1930
Deoxycholic acid-2,2,4,4-d ₄	234	Dialifos	1890,2069
11-Deoxycorticosterone solution	1374,257	Diallate-1	1550
2'-Deoxycytidine	572	Diallate-2	1550
2'-Deoxycytidine hydrate	687,688,689	Diallate isomer	1551
Deoxydenosine	687	1,4-Diaminobutane	143
(±)-Deoxyephedrine hydrochloride	427,458	2,6-Diamino-4-chloropyrimidine (I.S.)	2078,2079,2080
2'-Deoxyguanosine monohydrate	572,687,688	2,6-Diamino-4-chloropyrimidine (I.S.)	2081
3'-Deoxyguanosine	689	4,4'-Diaminodiphenylmethane	1673
Deoxynivalenol	12,358,17,394,331	2,4-Diaminotoluene	1655
Deoxyribonucleosides	572	Diamyl phthalate	1478,1769,2009,2192
12-Deoxywithastramonolide	1235,1310,1311,1312,1313,1314	<i>o</i> -Dianisidine	1673
S-(+)-Deprenyl	2215,2256,2624,2852	Diastereomeric compounds, proprietary	1338
<i>R</i> -(-)-Deprenyl hydrochloride	905	Diazepam	128,887,135,935,136,936,137,937,138,938,1190,232, 1207,273,489,842,875,876,888,889,916,2288,2289,2290,2462,2291,2463
<i>R</i> -(-)-Deprenyl (Selegiline)	2215,2256,2624,2852	Diazepam solution	490,833,1228
Dermorphin	425	Diazepam-d ₅ solution	833
<i>N</i> -Desethylamiodarone hydrochloride solution	1370,229,230,1378,266,267,1379,268	Diazinon	1419,406,1347,1394,1798,1894,1350,1401,1860,1995,1430,1641,1796,1892,1447,1681,1828,1933, 1466,1740,1858,1989,2356,2384,2392,2406,1489,1788,1877,2039,2369,2391,2397,2425
Desethyl atrazine	1466,1740,1858,1989,2356,2384,2392,2406,1489,1788,1877,2039,2369,2391,2397,2425	1585,2342,1797,1893,1885,2064,2004,2413	
Desipramine	1164,210,1166,211,1167,212,1165,1169,1170,2289	Dibenz[<i>a,h</i>]acridine	1540,1541,1550
Desipramine hydrochloride	1206,2288	Dibenz[<i>a,j</i>]acridine	1540,1541,1551
Desisopropyl atrazine	1466,1740,1858,1989,2356,2384,2392,2406,1489,1788,1877,2039,2369,2391,2397,2425	Dibenz[<i>a,h</i>]anthracene	2375,310
Desmediphan	1888,2067	Dibenz[<i>a,h</i>]anthracene	311
32-Desmethoxyrapamycin	188	Dibenz[<i>a,h</i>]anthracene	1387,1410,1479,2012,1388,1411,1482,2028
<i>N</i> -Desmethylchloridiazepoxide	916	Dibenz[<i>a,h</i>]anthracene	1408,2010
Desmethyl diazepam	136,936,137,937,138,938,1207,273,489,875,876	Dibenz[<i>a,h</i>]anthracene	1409,2011,1483,2029,2365,2420,1506,2075,1507,2076
<i>N</i> -Desmethyl diazepam	135,935,915,916	Dibenz[<i>a,h</i>]anthracene	1517
Desmethyl diltiazem	896	Dibenz[<i>a,h</i>]anthracene	1524,1552,1553,1554,1555,1556,1557,1564,1795,1891
Desmethyl doxepin	1167,212,1169,1170	Dibenzo[<i>a,h</i>]anthracene	1434,1435
<i>N</i> -Desmethyl nefopam (nefopam metabolite)	2898,976	Dibenzo[<i>a,h</i>]anthracene	1451,1936
<i>N</i> -Desmethyl tamoxifen	1152	Dibenzo[<i>a,h</i>]anthracene	1480,2013,1481,2014,1518,1540
Desmethyl venlafaxine	132,907,1189,231	Dibenzo[<i>a,h</i>]anthracene	1541
Devrinol	10,2483	Dibenzo[<i>a,h</i>]anthracene	1558
Dexamethasone	169	Dibenzo[<i>a,h</i>]anthracene	1560,1561,1562,1563,1567,1587
Dexamisole	455,456,454	7H-Dibenzo[<i>c,g</i>]carbazole	1540
Dextromethorphan	971	7H-Dibenzo[<i>c,g</i>]carbazole	1541
Dextromethorphan hydrobromide	2899,977		
Dextrose	387		

Dibenzofuran	1484,2030,2366,2421,1552,1553,1554,1555,1556,1557,1558,1564	1,2-Dichlorobenzene	1494,2058,2371,2441,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073, 1505,2074,1519,1520,1522,1523,1524,1546,1547,1548,1549,1552,1553,1554,1555,1556,1557,1558,1564,1565,1566,1568,1588,2322,2344, 1569,1589,2323,2345,1725,1726,1727
Dibenzo[<i>a,e</i>]pyrene	1540	1,2-Dichlorobenzene- <i>d</i> ₄	1498,2062,2373,2444,1504,2073, 1505,2074,1524,1550,1551,1552,1553,1554,1555,1556,1557
Dibenzo[<i>a,e</i>]pyrene	1541,1795,1891	1,3-Dichlorobenzene	1494,2058,2371,2441,1497,2061,1498,2062,2373,2444,1502,2071,1503,2072, 1504,2073,1505,2074,1519,1520,1522,1524,1546,1547,1548,1549,1552,1553,1554,1555,1556,1557,1558,1564,1565,1566, 1568,1588,2322,2344,1569,1589,2323,2345
Dibenzo[<i>a,h</i>]pyrene	1540,1541,1795,1891	1,4-Dichlorobenzene	1494,2058,2371,2441,1497,2061,1498,2062,2373,2444,1502,2071,1503,2072, 1504,2073,1505,2074,1519,1520,1522,1524,1546,1547,1548,1549,1552,1553,1554,1555,1556,1557,1558,1564,1565,1566, 1568,1588,2322,2344,1569,1589,2323,2345,1676,1794
Dibenzo[<i>a,i</i>]pyrene	1540,1541,1795,1891	1,4-Dichlorobenzene- <i>d</i> ₄	1493,2057,2370,2440,1519,1520,1524
Dibenzo[<i>a,l</i>]pyrene	1795,1891	1,4-Dichlorobenzene- <i>d</i> ₄	1546
Dibenzothiophene	1408,2010,1409,2011	1,4-Dichlorobenzene- <i>d</i> ₄	1547
<i>N,N</i> -Dibenzyl- <i>DL</i> -tartaric diamide	2578,51	1,4-Dichlorobenzene- <i>d</i> ₄	1548,1549,1550,1551,1552,1553,1554,1555,1556,1557,1564,1567,1587
1,5-di- <i>epi</i> - β -Bourbonene	2138,2167	1,4-dichlorobenzene- <i>d</i> ₄ (I.S.)	1558
Dibrom [®]	1419,406,1544,1545,1887,2066	1,2-dichlorobenzene- <i>d</i> ₄ (surr.)	1558
Dibromfos	1350,1401,1860,1995	3,3'-Dichlorobenzidine	1524,1552,1553,1554,1555,1556,1557,1558,1564,1655,1672,1673
Dibromochloromethane	1494,2058,2371,2441,1497,2061,1504,2073,1519,1520,1522,1546,1547,1548,1549,1565,1566, 1568,1588,2322,2344	2,6-Dichlorobenzonitrile	1887,2066
Dibromochloropropane	1509,1510,1511	<i>p</i> -Dichlorobenzophenone	1347,1394,1798,1894,1797,1893
1,2-Dibromo-3-chloropropane	1497,2061,1498,2062,2373,2444,1502,2071, 1503,2072,1504,2073,1505,2074,1546,1547,1548,1549,1565,1566	2,3-Dichlorobiphenyl	1388,1411,1482,2028,1506,2075,1507,2076
1,2-Dibromoethane	1497,2061,1498,2062,2373,2444,1502,2071,1503,2072, 1505,2074,1548,1549,1565,1566,1568,1588,2322,2344,1569,1589,2323,2345	2,6-Dichlorobiphenyl	1441,1927,1442,1928
Dibromofluoromethane	1519,1520,1546,1547,1548,1549	2,6-dichlorobiphenyl	1443,1929
Dibromomethane	1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074,1546,1547,1548,1549	3,3'-Dichlorobiphenyl	1501
1,2-Dibromomethane	1504,2073,1546,1547	3,4'-Dichlorobiphenyl	1501
3,5-Dibromo- <i>p</i> -tyrosine	2770,573	3,4-Dichlorobiphenyl	1501
2,6-Di- <i>tert</i> -butyl-4-hydroxymethylphenol	1282,292	3,5-Dichlorobiphenyl	1501
3,5-Di- <i>tert</i> -butyl-4-hydroxytoluene	1282,292	4,4'-Dichlorobiphenyl	1441,1927,1442,1928
<i>m</i> -Dibutylnitrosoamine	1484,2030,2366,2421	4,4'-dichlorobiphenyl	1443,1929
Dibutyl phthalate	1478,1769,2009,2192,1507,2076,1556,1865,2008,2394,2416,2191	4,4'-Dichlorobiphenyl	1501
Di- <i>n</i> -butyl phthalate	1388,1411,1482,2028,1483,2029,2365,2420, 1506,2075,1524,1552,1553,1554,1555,1557,1558,1564	1,1-Dichloro-2,2-bis(4-chlorophenyl)ethane	1404,2001,1507,2076,1512,1514
Dicafeic acid	1275	1,1-Dichloro-2,2-bis(4-chlorophenyl)ethene	1382,1396,1439,1925,1466,1740,1858,1989,2356,2384,2392,2406, 1469,1994,2359,2409,1506,2075,1513,1516,1524,1532,1571,1591,2325,2347,1604
Dicafeoylquinic acid (1,5-di-CQA)	1275	1,4-Dichlorobutane	1494,2058,2371,2441
Dicafeoylquinic acid (3,4-di-CQA)	1275	<i>cis</i> -1,4-Dichloro-2-butene	1546,1547,1548,1549
Dicafeoylquinic acid (3,5-di-CQA)	1275	<i>trans</i> -1,4-Dichloro-2-butene	1504,2073,1546,1547,1548,1549
Dicafeoylquinic acid (4,5-di-CQA)	1275	Dichlorodifluoromethane	1496,1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1505,2074
Dicamba	1355,1389,2,298	1,1-Dichloroethane	1494,2058,2371,2441,1497,2061,1498,2062,2373,2444,1502,2071,1503,2072, 1504,2073,1505,2074,1519,1520,1521,1522,1523,1524,1546,1547,1548,1549,1565,1566,1568,1588,2322,2344,1569,1589,2323,2345,1674,1676, 1725,1726,1727
Dichlolfenthion	1350,1401,1860,1995,1885,2064		
Dichlolfuanid	1347,1394,1798,1894,1449,1683,1830,1935,1797,1893,1889,2068,2004,2413		
Dichlolfuanid metabolite	1889,2068		
3,4-Dichloroaniline	1655,1672		
2,6-Dichlorobenzamide	1890,2069		

Diethyl sulfide	1685	Dimethoate	1350,1401,1860,1995,1351,1403,1862,2000,1466,1740,1858,1989,2356,2384,2392,2406,1470,1996,2360,2410, 1471,1746,1861,1997,2361,2386,2393,2411,1542,1543,1544,1545,1550,1551,1885,2064
2,5-Diethyltetrahydrofuran	2137,2138,2167	Dimethomorph-1	1890,2069
Difenoconazole-1	1886,2065	Dimethomorph-2	1890,2069
Difenoconazole-2	1886,2065	Di-6,6'-Methoxy-bi(2-naphthol)	2580,53
Diflubenzuron	1419,406	(S)-(6,6'-Dimethoxybiphenyl-2,2'-diyl)bis[bis(3,5-di- <i>tert</i> -butylphenyl)phosphine]	106,2612
Diflunisal	899	(±)-2,5-Dimethoxy-4-bromoamphetamine hydrochloride solution	228,1424,457
Difluorobenzene	1523	1,2-Dimethoxyethane	2205,2206,2207,2450,2208,2209,2451
1,4-Difluorobenzene	1565,1566	(±)-2,5-Dimethoxy-4-iodoamphetamine hydrochloride solution	228,1424,457
Digitonin	1289	2,5-Dimethoxy-4-(<i>n</i>)-propylthiophenethylamine hydrochloride solution	1424,457,483
Digitoxin	263	2,5-Dimethoxytetrahydrofuran	1692,2509,1693,2510
Digoxin	256,263,1289	2,5-Dimethoxytetrahydrofuran, meso-isomer	1693,2510
Dihexyl phthalate	1865,2008,2394,2416,2191	Dimethylacetamide	2205,2206,2207,2450,2208,2209,2451
Di- <i>n</i> -Hexyl phthalate	1478,1769,2009,2192	Dimethyl adipate	1691
1,6-Dihydrocarveol	2167	Dimethylamine	1648,2379,1649,2380,2225,2455
Dihydrocarveyl acetate	2167	Dimethylaminoazobenzene	1673
(Z)-Dihydrocarvone	2167	4-Dimethylaminoazobenzene	1550,1551
(E)-Dihydrocarvone	2167	<i>N,N</i> -Dimethylaniline	32,842,1655,1672
2,3-Dihydrofarnesol	2131	2,4-Dimethylaniline	1673
2,3-Dihydro-5-methylfuran	2056,2439	2,6-Dimethylaniline	1655,1672,1673,2311,2312,2313,2314,2316,2317
5 α -Dihydrotestosterone (DHT) solution	258	Dimethyl azelate	1691
5 α -Dihydrotestosterone glucuronide	258	2,5-Dimethylbenzaldehyde	21,2326
3,4-Dihydroxybenzylamine	955	7,12-Dimethylbenz[<i>a</i>]anthracen- <i>trans</i> -8,9-diol	175,304,438
4,4'-Dihydroxybiphenyl	492	7,12-Dimethylbenz[<i>a</i>]anthracene	175,304,438,1550,1551
3,4-Dihydroxy- α -phenylalanine	2900,980,2901,981	7,12-Dimethylbenz[<i>a</i>]anthracene- <i>trans</i> -10,11-diol	175,304,438
3,4-Dihydroxy-phenylacetic acid	1275	7,12-Dimethylbenz[<i>a</i>]anthracen-2-ol	175,304,438
3,4-Dihydroxy- ρ -phenylalanine	162,2634,163,2635	7,12-Dimethylbenz[<i>a</i>]anthracen-3-ol	175,304,438
3,4-Dihydroxy- <i>l</i> -phenylalanine	145,162,2634,163,2635	7,12-Dimethylbenz[<i>a</i>]anthracen-4-ol	175,304,438
3,4-Dihydroxyphenylglycol	180	3,3'-Dimethylbenzidine	1552,1553,1554,1555,1557
2,3-Dihydroxy-3-phenylpropionic acid	2579,2902,52,982	7,8-Dimethylbenzo[<i>g</i>]pteridine-2,4-(1H,3H)-dione, Compound A	1219,274
1 α ,25-Dihydroxyvitamin D2 solution	1323,260,1324,261	1,1-Dimethylbiguanide hydrochloride	398
1 α ,25-Dihydroxyvitamin D3 solution	1323,260,1324,261	Dimethyl-bisphenol A	299,341
Diisobutyl phthalate	1478,1769,2009,2192,1865,2008,2394,2416	2,2-Dimethylbutane	1592,1610,1612
Diisopropyl phthalate	1478,1769,2009,2192	2,3-Dimethylbutane	1592,1610,1611,1612
Diltiazem	896	Dimethylcyclohexanol	2045,2350
Dimepiperate	1888,2067	1,1-Dimethylcyclopentane	1592
Dimethametryn	1888,2067	<i>trans</i> -1,2-Dimethylcyclopentane	1592
Dimethenamid	1888,2067	<i>cis</i> -1,3-Dimethylcyclopentane	1592
Dimethipin	1886,2065	<i>trans</i> -1,3-Dimethylcyclopentane	1592
Dimethoat	1448,1682,1829,1934		

2,2-Dimethyl-3-decene	1491,1581,2319,2331	3,7-Dimethyl-2,6-octadienyl acetate	2050,2434,2105,2106,2113,2120,2170
Dimethyl disulfide	1685,1686,2381,1687,2382,1871,2022,2395,2417,2051,2435	2,2-Dimethylpentane	1592
1,2-Dimethyl-4-ethylbenzene	1610,1612	2,3-Dimethylpentane	1592,1610,1612
1,3-Dimethyl-4-ethylbenzene	1610,1612	2,4-Dimethylpentane	1431,1572,1592,1610,1611,1612
1,3-Dimethyl-5-ethylbenzene	1612	3,3-Dimethylpentane	1592
1,4-Dimethyl-2-ethylbenzene	1610,1612	α,α -Dimethylphenethylamine	1550,1551
Dimethylformaldehyde	2056,2439	2,4-Dimethylphenol	90,1359,1386,1407,1475,1755,2005,1476,1756,2006,2363,2388,2414, 1477,1757,2007,2364,2389,2415,1524,1531,1552,1553,1554,1555,1556,1557,1558,1564
Dimethylformamide	1676,1725,1726,1727,2205,2206,2207,2450,2208,2209,2451,2224	2,6-Dimethylphenol	2311,2312,2313,2314,2316,2317
2,5-Dimethylfuran	2056,2439	5,5-Dimethyl-4-phenyl-2-oxazolidinone	2581,54
Dimethyl glutarate	1691	Dimethyl phthalate	492,1388,1411,1482,2028,1478,1769,2009,2192,1483,2029,2365,2420, 1506,2075,1507,2076,1524,1552,1553,1554,1555,1556,1557,1558,1564,1691,1865,2008,2394,2416,2191
2,2-Dimethylheptane	1592,1612	Dimethyl pimelate	1691
2,3-Dimethylheptane	1592	2,3-Dimethylpyrazine	1871,2022,2395,2417,2056,2439
2,4-Dimethylheptane	1592	2,5-Dimethylpyrazine	1871,2022,2395,2417,2056,2439
2,5-Dimethylheptane	1592	2,6-Dimethylpyrazine	1871,2022,2395,2417,2056,2439
2,6-Dimethylheptane	1592	2,5-Dimethylpyrrole	2056,2439
3,3-Dimethylheptane	1592	2,5-Dimethylresorcinol	152,44
3,4-Dimethylheptane	1592	Dimethyl sebacate	1691
3,5-Dimethylheptane	1592	Dimethyl styrene	1490,1580,2318,2330
2,4-Dimethylheptanen	1612	Dimethyl suberate	1691
2,6-Dimethylheptanen	1612	Dimethyl succinate	1691
2,2-Dimethylhexane	1592	Dimethyl sulfide	1685,1686,2381
2,3-Dimethylhexane	1592,1610,1611,1612	Dimethyl sulfide (1 ppm)	1783
2,4-Dimethylhexane	1592,1610,1611,1612	Dimethyl sulfoxide	2210,2211,2212,2452,2213,2214,2453,2225,2455
2,5-Dimethylhexane	1592,1610,1611,1612	Dimethyl terephthalate	1691
3,3-Dimethylhexane	1592	6,7-Dimethyl-8-[(2S,3S,4R)-2,3,4,5-tetrahydroxypentyl]pteridine-2,4(3H,8H)-dione, Compound C	1219,274
3,4-Dimethylhexane	1592,1612	2,3-Dimethyltyrosine	2771,574
3,4-Dimethyl-1-hexene	1612	1,3-Dimethyluric acid	150
3,4-Dimethyl- <i>trans</i> -2-hexene	1612	1,7-Dimethyluric acid	149
3,4-Dimethyl-1-hexenen	1612	Dimethylvinphos-E	1885,2064
Dimethyl isophthalate	1691	Dimethylvinphos-Z	1885,2064
Dimethyl malonate	1691	1,7-Dimethylxanthine	1362,1427,148,946,149,150,1315,802
3,4-Dimethylmethcathinone hydrochloride solution	471	Dimetridazole	906
2,6-Dimethylnaphthalene	1408,2010,1409,2011	Diconazole	1890,2069
Dimethylnaphthalenes	1610,1611	1,3-Dinitrobenzene	296,465,1455,1695,2297,2354,2383,2466, 1456,1696,2298,1550,1551
4,4-Dimethyl-2-neopentyl-1-pentene	1721	1,4-Dinitrobenzene	1550,1551
1,3-Dimethyl-2-nitrobenzene	1506,2075,1507,2076	2,4-Dinitrophenol	90,1476,1756,2006,2363,2388,2414,1477,1757,2007,2364,2389,2415,1524,1531,1552,1553,1554,1555,1556,1557
4,8-Dimethyl-1,3-(E),7-nonatriene	2096		
4,8-Dimethyl-(3E)-1,3,7-nonatriene	2131		
<i>cis</i> -3,7-Dimethyl-2,6-octadien-1-ol	2096,2099,2103,2111,2184,2120		

2,4-dinitrophenol	1558
2,4-Dinitrophenol	1564
2,4-Dinitrotoluene	296,465,1455,1695,2297,2354,2383,2466,1456,1696,2298, 1506,2075,1507,2076,1524,1552,1553,1554,1555,1556,1557,1558,1564
2,6-Dinitrotoluene	297,1455,1695,2297,2354,2383,2466,1456,1696,2298, 1506,2075,1507,2076,1524,1552,1553,1554,1555,1556,1557,1558,1564
Dinonyl phthalate	1865,2008,2394,2416,2191
Di- <i>n</i> -Nonyl phthalate	1478,1769,2009,2192
Dinoseb	1355,1389,2,298,1476,1756,2006,2363,2388,2414,1550,1551
Dinotefuran	1358,19
Diocetyl phthalate	1865,2008,2394,2416
Di- <i>n</i> -octyl phthalate	1434
Di- <i>n</i> -octyl phthalate	1435
Di- <i>n</i> -Octyl phthalate	1478,1769,2009,2192
Di- <i>n</i> -octyl phthalate	1483,2029,2365,2420,1524,1552,1553,1554,1555
Di- <i>n</i> -octyl phthalate	1556
Di- <i>n</i> -octyl phthalate	1557
Di- <i>n</i> -octyl phthalate	1558
Di- <i>n</i> -octyl phthalate	1564,2191
Diolin	1633
Dioleoylglycerol	1632
Diols	1703,1975,2185
Diosmetin 6,8-di- <i>C</i> -glucoside	353
Dioxabenzofos	1885,2064
1,4-Dioxane	1550,1568,1588,2322,2344,1640,1675,1676,1725,1726,1727,2205,2206,2207,2450,2208,2209,2451,2226,2456
Dioxathion	1544,1545,1890,2069
Dioxibrossinin	1250,3031
Dioxin	1436,1575,1812,1912
Dipentyl phthalate	1865,2008,2394,2416,2191
Diperodon hydrochloride	2903,983,2904,984
Diphenamid	1506,2075,1507,2076,1888,2067
Diphenhydramine	67,846,2289
Diphenhydramine hydrochloride	2288
Diphenylamine	1404,2001,1550,1551,1673,1888,2067
Diphenyl phthalate	1865,2008,2394,2416,2191
Dipropylene glycol	1703,1975,2185,1704,1976,2186,1705,1977,2187
Dipyridamole	931
Diquat	13,1356,1392,312

Disulfoton	308,1350,1401,1860,1995,1466,1740,1858,1989,2356,2384,2392,2406,1470,1996,2360,2410, 1471,1746,1861,1997,2361,2386,2393,2411,1506,2075,1507,2076,1542,1543,1544,1545,1550,1551,1887,2066
Ditalimfos	1890,2069
Ditalimphos	1445,1679,1826,1931
Diterpenes	1884,2063
Dithiopyr	1430,1641,1796,1892,1886,2065
Diuretics	985
Diuron	1,295,5,110,15,111,16,294,302,1391,305,314,375,317
DMB-NANA	575,987
DMB-NGNA	575,987
DMT-2'- <i>O</i> -TC-r(g) Phosphoramidite	686
DMT-2'- <i>O</i> -TC-rU Phosphoramidite	686
<i>cis</i> -13,16-Docosadienoic acid methyl ester (C22:2)	1815,1915,2247, 1817,1917,2249,1818,1918,2250,1819,1919,2251
<i>cis</i> -13,16-Docosadienoic acid methyl ester (C22:2) at 2 wt %	1822,1922,2254
<i>cis</i> -4,7,10,13,16,19-Docosahexaenoic acid methyl ester	1814,1914,2246,1816,1916,2248,1867,2018,2274,1868,2019,2275, 1869,2020,2276,2262
<i>cis</i> -4,7,10,13,16,19-Docosahexaenoic acid methyl ester (C22:6n3)	1815,1915,2247,1817,1917,2249,1818,1918,2250,1819,1919,2251
<i>cis</i> -4,7,10,13,16,19-Docosahexaenoic acid methyl ester (C22:6n3) at 2 wt %	1822,1922,2254
Docosane	1526,1637
Docosane (C22)	1636
(<i>E,Z</i>)-2,6-Dodecadienal	2103,2166
Dodecanal	1971,2405,2103,2106,2166
Dodecane	1431,1572,1486,1487,1491,1581,2319,2331,1526,1596,1597,1601,1667,1602,1668,1637
<i>n</i> -Dodecane	2311,2312
<i>n</i> -dodecane	2313,2314
Dodecane (C12)	1636
Dodecane (I.S.)	2308
Dodecanoic acid	1873,2031,2278,1970,2404
Dodecanone	1971,2405
(<i>E</i>)-2-Dodecenal	2103
2-(<i>E</i>)-Dodecenal	2166
5-Dodecene	1582,2332
Dodecyl gallate	276,337
Dopamine	144,955
Dopamine hydrochloride	145
Dopamine hydrochloride solution	271
Dorzolamide	2905,988
Dothiepin	2906,989

Dotriacontane	1486,1487
Doxepin	1368,209,1164,210,1166,211,1167,212,1165,1169,1170
Doxylamine	858,859,871,890,912,971
Drugs of abuse	2289
Dual	1467,1990,2357,2407
Durene	1431,1572,1595,1596,1597,1610,1612,1613,1614,1615,1616,1617,1618,1624,1625,1626
Dyfonate	1350,1401,1860,1995

— E —

Eberconazole	112,2614
EDDP (2-Ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine)	2723,439,464,479
Edifenphos	1419,406,1885,2064
Edimphos	1350,1401,1860,1995
<i>cis</i> -11,14-Eicosadienoic acid methyl ester (C20:2)	1815,1915,2247,1817,1917,2249,1818,1918,2250,1819,1919,2251
Eicosane	1486,1487,1526,2316,2317
Eicosane (C20)	1636,1637
Eicosanoate (C20:0)	1636
Eicosanoic acid	1873,2031,2278
<i>cis</i> -5,8,11,14,17-Eicosapentaenoic acid methyl ester (C20:5n3)	1815,1915,2247,1817,1917,2249,1818,1918,2250,1819,1919,2251
<i>cis</i> -8,11,14-Eicosatrienoic acid methyl ester	1814,1914,2246,1816,1916,2248,1867,2018,2274,2262
<i>cis</i> -11,14,17-Eicosatrienoic acid methyl ester	1814,1914,2246,1816,1916,2248
<i>cis</i> -11,14,17-Eicosatrienoic acid methyl ester (C20:3n3)	1815,1915,2247,1817,1917,2249,1818,1918,2250,1819,1919,2251
<i>cis</i> -8,11,14-Eicosatrienoic acid methyl ester (C20:3n6)	1815,1915,2247,1817,1917,2249,1818,1918,2250,1819,1919,2251
<i>cis</i> -11-Eicosenoic acid methyl ester	1818,1918,2250,1819,1919,2251,1837,1954,1840,1960
<i>cis</i> -13-Eicosenoic acid methyl ester	1868,2019,2275
<i>cis</i> -11-Eicosenoic acid methyl ester (C20:1)	1836,1945,1839,1959,1842,1962,1844,1964
<i>cis</i> -11-Eicosenoic acid methyl ester (C20:1n9)	1815,1915,2247,1817,1917,2249
<i>cis</i> -11-Eicosenoic acid methyl ester (C20:1n9) at 2 wt %	1822,1922,2254
Elaidic acid	357
Elaidic acid methyl ester (C18:1n9t)	1815,1915,2247
Elaidic acid methyl ester (C18:1n9t)	1817,1917,2249,1818,1918,2250,1819,1919,2251
Elaidic acid methyl ester (C18:1n9t) at 2 wt %	1822,1922,2254
Elastase	582
β -Elemene	2096,2142
+ β -Elemene	2170
<i>cis</i> - β -Elemene	2131
δ -Elemene	2096,2131,2142,2161
α -Elemol	2161
EMDP (2-Ethyl-5-methyl-3,3-diphenylpyrroline)	479

Enalapril	123,849,129,892
Enantiomers	1694,1835,1941,2296,2693
β - Endorphin	788
Endosulfan I	1351,1403,1862,2000,1382,1396,1439,1925,1466,1740,1858,1989,2356,2384,2392,2406, 1469,1994,2359,2409,1506,2075,1513,1516,1524,1532,1604,1886,2065
α -Endosulfan	1507,2076,1512,1514
β -Endosulfan	1507,2076,1512,1514
Endosulfan II	1382,1396,1439,1925,1404,2001,1466,1740,1858,1989,2356,2384,2392,2406, 1469,1994,2359,2409,1506,2075,1513,1516,1524,1532,1604,1886,2065
Endosulfan sulfate	1347,1394,1798,1894,1382,1396,1439,1925,1404,2001,1466,1740,1858,1989,2356,2384,2392,2406, 1469,1994,2359,2409,1506,2075,1507,2076,1512,1513,1514,1516,1524,1532,1604,1797,1893
Endotoxifen (I)	1152
Endotoxifen (II)	1152
Endrin	1381,1395,1438,1924,1382,1396,1439,1925,1388,1411,1482,2028,1466,1740,1858,1989,2356,2384,2392,2406, 1469,1994,2359,2409,1506,2075,1507,2076,1512,1513,1514,1516,1524,1532,1604
Endrin aldehyde	1382,1396,1439,1925, 1466,1740,1858,1989,2356,2384,2392,2406,1469,1994,2359,2409,1506,2075,1507,2076,1512,1513,1514,1516,1532,1604
Endrin ketone	1382,1396,1439,1925,1466,1740,1858,1989,2356,2384,2392,2406, 1469,1994,2359,2409,1506,2075,1507,2076,1512,1513,1514,1516,1532,1604
Enilconazol (Imazail)	11,2484,2582,112,2614
Enrofloxacin	1004,355,1005,356,1013
Ephedrine	992,2234,2285,2457,2460
(\pm)-Ephedrine	441
(\pm)-Ephedrine hydrochloride	2908,993
Epicatechin	1244
(-)-Epicatechin gallate	1244
Epigallocatechin	1244
(-)-Epigallocatechin gallate	1244
Epimedin A	1330
Epimedin B	1330
Epimedin C	1330
Epimedin A (PHY80586)	1267
Epimedin B (PHY80587)	1267
Epimedin C (PHY80588)	1267
Epinastine	994
(-)-Epinephrine	144,145
Epinephrine	254,955,994
7-Epi-paclitaxel	1104,1153,1154
7-epipaclitaxel	1220

Epitestosterone	197,198,200,201	Ethafluralin	1887,2066
EPN	1419,406,1350,1401,1860,1995,1542,1543,1544,1545,1885,2064	Ethane	1628,1639,1665,1723,1724,1749,1750,1751
Eptam®	1467,1990,2357,2407	Ethane (430 ng on column)	1752
EPTC	1506,2075,1890,2069	Ethaneethiol	1685,1687,2382
Eptifibatide	820	Ethanol	1431,1572,1568,1588,2322,2344,1593,1596,1629,1630,1676,1725,1726,1727,1780,1969, 2026,2027,2060,2443,2111,2184,2210,2211,2212,2452,2213,2214,2453,2226,2456,2292,2464,2293,2294
(±)-Equl	1270,361,1271,362,1272	Ethanol denatured	1525,1595,1597
Erbixux (Cetuximab)	782	2-Ethenyl-5-methylpyrazine	1871,2022,2395,2417
Erectile Dysfunction Drugs	996	2-Ethenyl-6-methylpyrazine	1871,2022,2395,2417
Ergocalciferol	1293,217	Ethion	1419,406,1350,1401,1860,1995,1440,1677,1824,1926,1542,1543,1544,1545,1885,2064
Ergocalciferol (D2)	1292,216,1294,218,1297,219,1255,1256,1253	Ethofenprox	1430,1641,1796,1892
Eriocitrin	353,359	Ethoprop	1506,2075,1542,1543
Erioglaucine disodium salt	388	Ethoprophos	308,1350,1401,1860,1995,1449,1683,1830,1935,1507,2076,1544,1545,1885,2064
Erucic acid methyl ester (C22:1)	1842,1962	Ethoprophos (I.S.)	1347,1394,1798,1894,1797,1893
Erucic acid methyl ester (C22:1n9)	1815,1915,2247	2-Ethoxyethanol	1383,1457,1703,1975,2185,1725,2205,2206,2207,2450,2208,2209,2451
Erucic acid methyl ester (C22:1n9)	1817,1917,2249,1818,1918,2250,1819,1919,2251	2-Ethoxyethanol (Cellosolve®)	1726,1704,1976,2186,1727
Erucic acid methyl ester (C22:1n9) at 2 wt %	1822,1922,2254	2-(2-Ethoxyethoxy)ethanol	1703,1975,2185
Erythromycin	1194	2-(2-Ethoxyethoxy)ethanol (CARBITOL™)	1704,1976,2186
Erythromycin C	1194	2-Ethoxyethyl acetate	1725,1726,1727
Erythromycin estolate	1194	Ethoxyquin	1282,292,1898,2182
Erythromycin ethyl succinate	1194	Ethylchlorate	1890,2069
Erythropoietin, main peak	584	Ethyl acetate	1431,1572,1485,1778,2032,2367,2390,2422,1568,1588,2322,2344,1675,1676,1725,1726, 1727,1780,1895,1969,2026,2027,2056,2439,2060,2443,2111,2184,2210,2211,2212,2452,2213,2214,2453,2224
Erythrosin B sodium salt	388	Ethyl alcohol	2056,2439
Esfenvalerate	1890,2069	<i>N</i> -Ethylaniline	32
Esprocarb	1888,2067	Ethyl azinphos	1544,1545
α-Estradiol	155,555,196,202,2257	Ethyl behenate	2111,2184
β-Estradiol	155,555,196,202,1186	Ethylbenzene	102,1493,2057,2370,2440,1494,2058,2371,2441,1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073, 1505,2074,1519,1520,1521,1522,1527,1528,1529,1530,1546,1547,1548,1549,1565,1566,1569,1589,2323,2345,1592,1593,1594,1595,1596, 1597,1600,1658,1601,1667,1602,1668,1610,1611,1612,1613,1614,1615,1616,1617,1618,1621,1624,1625,1626,1640,1676,1725,1727,1780, 1794,2300,2467
17β-Estradiol	2257	3-Ethylbenzene	1431,1572
β-Estradiol 3,17-disulfate	155,555	4-Ethylbenzene	1431,1572
β-Estradiol 3-(β-D-glucuronide)	155,555	2-Ethyl-1-butanol	1666
β-Estradiol 17-β-D-glucuronide	155,555	Ethyl <i>tert</i> -butyl ether	1722
β-Estradiol 3-(β-D-glucuronide) 17-sulfate	155,555	Ethyl butyrate	1969,2060,2443
β-Estradiol 3-sulfate	155,555	<i>N</i> -Ethylcathinone hydrochloride solution	472,476
Estrilol	155,555,196,202,2257	Ethyl cellosolve	1780
Estrilol 3-(β-D-glucuronide)	155,555	Ethyl chloride	1569,1589,2323,2345
Estrilol 3-sulfate	155,555		
Estrogenic compounds	2257		
Estrone	155,555,196,202,1186,2257		
Estrone 3-(β-D-glucuronide)	155,555		
Estrone 3-sulfate	155,555		

Ethylcyclohexane	1612
Ethylcyclopentane	1592
3-Ethylcyclopentane	1612
2-Ethyl-3,5-dimethylpyrazine	1871,2022,2395,2417
3-Ethyl-2,5-dimethylpyrazine	1871,2022,2395,2417
5-Ethyl- <i>N,N</i> -dipropylthiocarbamate	1507,2076
Ethylene	1639,1665,1723,1724,1734,1749,1750,1751
Ethylene (430 ng on column)	1752
Ethylene glycol	1383,1457,1703,1975,2185,1704,1976,2186,1705,1977,2187,2205,2206,2208,2225,2455
Ethylene glycol butyl ether	1383,1457,1676
Ethylene glycol monophenyl ether	284
Ethylene sulfide	1492,1583,2320,2333
Ethyl formate	1675,1676,1725,1726,1727,1780,2210,2211,2212,2452,2213,2214,2453
Ethyl gallate	376
Ethyl geranoate	2131
Ethyl- β - <i>D</i> -glucuronide	467
3-Ethylheptane	1592,1612
4-Ethylheptane	1592
3-Ethylhexane	1592
Ethyl hexanoate	2060,2443
2-Ethylhexanoic acid	1694,1835,1941,2296,2693,1970,2404
2-Ethyl-1-hexanol	1492,1583,2320,2333
2-Ethylhexyl alcohol	1728
<i>N</i> -(2-Ethylhexyl)-5-norbornene-2,3-dicarboximide	1507,2076
Ethyl 4-hydroxybenzoate	37,279,284,1236,1748,1998,2190,2223,2387,2412,2447,2454
Ethyl isobutyrate	1969
Ethyl isocyanate	2338
Ethyl lactate	1895
(\pm)-Ethyl- γ -lactone	1729,2118,2529,2676
Ethyl mercaptan	1686,2381
Ethyl mercaptan (1 ppm)	1783
Ethyl methacrylate	1504,2073
Ethyl methanesulfonate	1550,1551
1-ethyl-4-methylbenzene	1568,1588,2322,2344
<i>cis</i> -1,2-Ethylmethylcyclopentane	1592
<i>trans</i> -1,2-Ethylmethylcyclopentane	1592
<i>cis</i> -1,3-Ethylmethylcyclopentane	1592
<i>trans</i> -1,3-Ethylmethylcyclopentane	1592
3-Ethyl-3-methylpentane	1612

2-Ethyl-3-methylpyrazine	1871,2022,2395,2417
2-Ethyl-5-methylpyrazine	1871,2022,2395,2417,2056,2439
2-Ethyl-6-methylpyrazine	1871,2022,2395,2417,2056,2439
Ethyl methyl sulfide	1685
Ethyl octanoate	2060,2443
Ethylone	435,2049,2433
Ethylone hydrochloride	243,468,434,470,475
Ethylparaben	282,283
Ethyl paraben	286
Ethylparaben	289,290,291,1106
Ethyl parathion	1440,1677,1824,1926,1470,1996,2360,2410
3-Ethylpentane	1592
Ethyl propionate	1969
2-Ethylpyrazine	1871,2022,2395,2417,2056,2439
3-Ethylpyridine	2056,2439
Ethyl stearate	2111,2184
Ethyltoluene	1621
2-Ethyltoluene	1431,1572
Ethylxylene	1621
Etobenzanid	1888,2067
Etobenzanid metabolite	1888,2067
Etodolac	898,2909,997
Etofenprox	1888,2067
Etoazole	1888,2067
Etoazole metabolite	1888,2067
Etridiazole	1430,1641,1796,1892,1506,2075,1507,2076,1509,1510,1511,1887,2066
Etrifos	1419,406,1440,1677,1824,1926,1885,2064
Eucalyptol	2121,2124,2137,2138,2167
Eugenol	2180,2181,2183,2446

— F —

F(ab') ₂	675,676,678
Famophos	1466,1740,1858,1989,2356,2384,2392,2406,1471,1746,1861,1997,2361,2386,2393,2411
Famotidine	1173
Famoxadone	1889,2068
Famphos	1470,1996,2360,2410
Famphur	1350,1401,1860,1995,1470,1996,2360,2410,1542,1543,1544,1545,1550,1551
(<i>E,E</i>)-Famesal	2131
(2 <i>E,6Z</i>)-Famesal	2131

α -Farnesene	1876,2035,2396,2423,2105	Fensulfothion	1350,1401,1860,1995,1542,1543,1544,1545,1885,2064
<i>trans</i> - α -Farnesene	2106	Fentanyll	427,1003,2289
(E,E)- α -Farnesene	2095,2096,2103,2131,2142,2166	Fentanyll solution	481
<i>trans</i> - β -Farnesene	2170	Fentanyll citrate salt	2288
(E)- β -Farnesene	2096,2121,2131,2142,2167	Fenthion	1419,406,1350,1401,1860,1995,1445,1679,1826,1931,1542,1543,1544,1545,1885,2064
(Z)- β -Farnesene	2096	Fenuron	1,295,294,302,314,375,317
(Z,E)-Farnesol	2166,2103	<i>t</i> -Fenvalerate	1447,1681,1828,1933
(Z,Z)-Farnesol	2131	Fenvalerate-1	1886,2065
Farnesyl acetate	2131	Fenvalerate-2	1886,2065
Fast Green FCF	388	Fenvalerate isomer	1448,1682,1829,1934
Fatty acids	1808,1908,2244	Fermizone	1890,2069
Fd'	768	Ferredoxin-NADP ⁺ Reductase from <i>Spinacia oleracea</i> (spinach)	586
Fenamiphos	1447,1681,1828,1933,1466,1740,1858,1989,2356,2384,2392,2406, 1471,1746,1861,1997,2361,2386,2393,2411,1506,2075,1507,2076,1885,2064	Ferritin	742,750,752
Fenarimol	1506,2075,1507,2076,1886,2065	Feruloylquinic acid (3-FQA)	1275
Fenazaquin	1446,1680,1827,1932	Feruloylquinic acid (4-FQA)	1275
Fenbuconazole	1889,2068	Feruloylquinic acid (5-FQA)	1275
Fenchlorphos	1449,1683,1830,1935,1886,2065	Fexofenadine	1160
Fenchlorvos	308	Fipronil	2583,57,1446,1680,1827,1932,1886,2065
Fenchyl alcohol	2131	Flavanone	1257,3032,1258,3033,1346,3042
α -Fenchyl alcohol	2106	Flavone	352
(1 <i>R</i>)- <i>endo</i> -(+)-Fenchyl alcohol	2105	Flavonoids	1259
Fenfluramine	1172,213	(\pm)-Flecainide solution	1370,229,230,1378,266,267,1379,268
Fenhexamid	1419,406	Fluacrypyrim	1887,2066
Fenitrothion	1419,406,1350,1401,1860,1995,1430,1641,1796,1892,1447,1681,1828,1933,1542,1543,1544,1545,1885,2064	Fluazifop- <i>p</i> -butyl	1446,1680,1827,1932
Fenofibric Acid	2910,999	Fluconazole solution	831,832
Fenoldopam	1191,233	Flucythrinate-1	1886,2065
Fenoprofen	1000,2911	Flucythrinate-2	1886,2065
Fenoprofen methyl ester	1001,2912	Fludioxonil	1889,2068
Fenoprop (2-(2,4,5-Trichlorophenoxy)propionic acid)	1119	Flufenoxuron	1419,406
Fenoterol hydrobromide	1002,2913	Flumethasone	167
Fenothiocarb	1888,2067	Flumioxazin	1888,2067
Fenoxanil-1	1888,2067	Flunitrazepam solution	490,833
Fenoxanil-2	1888,2067	Flunitrazepam- <i>d</i> ₇	833
Fenoxaprop-ethyl	1889,2068	Fluometuron	1,295,294,302,314,375
Fenoxycarb	1419,406,1888,2067	Fluoranthene	2375,310,311,1408,2010,1409,2011,1451,1936, 1480,2013,1481,2014,1517,1518,1524,1540,1541,1552,1553,1554,1555,1556,1557,1558,1560,1561,1562,1563,1564,1567,1587
Fenpropathrin	1886,2065	Fluoranthene- <i>d</i> ₁₀	1409,2011
Fenpropimorph	1447,1681,1828,1933,1890,2069	Fluoranthene- <i>d</i> _{10M} (I.S.)	1408,2010
Fenpyroximate	1419,406	Fluoranthrene	1483,2029,2365,2420

Fluorene	2375,310,311,1388,1411,1482,2028,1408,2010,1409,2011,1451,1936,1480,2013,1481,2014, 1483,2029,2365,2420,1506,2075,1507,2076,1517,1518,1524,1540,1541,1552,1553,1554,1555,1556,1557,1558,1560,1561,1562,1563,1564, 1567,1587,1795,1891
Fluorene-d ₁₀	1567,1587
2-Fluoroadenine-9-β-D-arabinofuranoside	168,587
(±)-2-Fluoroamphetamine hydrochloride solution	466,1426
4-Fluoroamphetamine	458
(±)-4-Fluoroamphetamine hydrochloride solution	466,1426
Fluorobenzene	1498,2062,2373,2444,1504,2073,1505,2074,1519,1520,1546
Fluorobenzene	1547
Fluorobenzene	1548,1549
2-Fluorobiphenyl	1517,1518,1524,1540
2-Fluorobiphenyl	1541
2-Fluorobiphenyl	1550,1551,1552,1553,1554,1555,1556,1557,1558,1564
5-Fluorocytosine	168,587
5-Fluoro-2'-deoxyuridine	168,587
(±)-2-Fluoromethamphetamine hydrochloride solution	466,1426
(±)-4-Fluoromethamphetamine hydrochloride solution	466,1426
3-Fluoromethcathinone	2049,2433
3-Fluoromethcathinone hydrochloride solution	243,468,434,471,473
4-Fluoromethcathinone	2049,2433
4-Fluoromethcathinone hydrochloride solution	243,468,434,471,473
1-Fluoronaphthalene	1517,1518,1540,1541
2-Fluorophenol	1524,1550,1551,1552,1553,1554,1555,1556,1557,1558,1564
p-Fluorophenyl methyl sulfoxide	2584,58
6-Fluorotryptophan	1172,213
5-Fluorouracil	168,587
Fluoxetine	67,157,239,811,2216,2264,2299,2625,2715,2853
Fluoxetine hydrochloride	837,1006,2914,1007,2915,1008,1010
Fluoxetine hydrochloride solution	1223
Fluoxetine (Prozac®)	846,931
Fluphenazine dihydrochloride	132,907,1189,231
Fluquinconazole	1886,2065
Flurazepam solution	833
Flurbiprofen	1011,2916,1012,2917
Fluridon	1507,2076
Flusilazole	1888,2067
Flusilazole metabolite	1888,2067
Fluthiacet-methyl	1890,2069

Fluticasone propionate	167
Flutolanil	1886,2065
Flutriafol	1444,1678,1825,1930
Fluvalinate-1	1886,2065
Fluvalinate-2	1886,2065
Fluvastatin	1148,194,964
Fluvoxamine	157
2C-B-FLY hydrochloride solution	228,1424,457,483
Folic acid	863,864,1300,1302,1303,1304,1306,1307,1308,1333
Folinic acid calcium salt hydrate	1260,3034,1261,3035
Folpet	1347,1394,1798,1894,1449,1683,1830,1935,1797,1893,1889,2068
Fonofos	1448,1682,1829,1934,1885,2064
Fonophos	1542,1543,1544,1545
Formaldehyde	21,2326
Formaldehyde solution	1584,2341
Formaldehyde-2,4-dinitrophenylhydrazone	22,2334,23,2335
Formaldehyde-2,4-DNPH	2337
Formaldehyde (2,4-DNPH derivative)	2336,24
Formaldehyde (~38 %)	1699
Formamide	2205,2206,2208
Formoterol fumarate dihydrate	1208
Formothion	1350,1401,1860,1995,1887,2066
Fosthiazone	1350,1401,1860,1995
Fosthiazone-1	1885,2064
Fosthiazone-2	1885,2064
Free fatty acids	1808,1908,2244
Freon® 11	1698
Freon 12	1697
Freon® 12	1698
Freon® 21	1698
Freon 22	1697
Freon® 22	1698
Freon® 113 solution	2224
Freon 114	1697
Freon® 114	1698
Freon 114a	1697
Freon® 114a (impurity)	1698
Fructose	333,381,387
D-(–)-Fructose	380

Fucitol	2036,2037
Fumaric acid	1277,368,85,1278,369,86
Fumonisin B ₁ solution	331
Fumonisin B ₂ solution	331
2-Furaldehyde	1896,2403
Furaltadone	127,877,879,906
Furametryr	1889,2068
Furametryr metabolite	1889,2068
Furan	1436,1575,1812,1912
Furazolidone	906
Furfural	59,60,1878,2044,2398,2430,1879,2046,2399,2431,1880,2048,2400,2432,1881,2052,2349,2352,1882,2053,2401,2436, 1883,2054,2402,2437,1969,2056,2439
Furfuryl acetate	2056,2439
Furfuryl alcohol	59,60,1895,2056,2439
Furfuryl ether	2056,2439
Furfuryl formate	2056,2439
2-Furfurylfuran	2056,2439
2-Furfuryl-5-methyl sulfide	2056,2439
Furfurylpyrrole	2056,2439
Furoin	2585,61
Furosemide	985,986,1014
1-(2-Furyl)-3-butanone	2056,2439
2-Furyl methyl ketone	59,60
— G —	
Gabapentin solution	836
Galactitol	2036,2037
Galactose	383
D-(+)-Galactose	379
β-Galactosidase from <i>Escherichia coli</i>	761
Galangin	1329
Gallic acid	376,1259
Gallocatechin	1244
(-)-Gallocatechin gallate	1244
(G) gamma-Globulin	1185,808
Gasoline	1627
Genistein	1270,361,1271,362,1272
Genistin	1270,361,1271,362,1272
Gensenoside Rb ₁	1265

Gensenoside Rb ₂	1265
Gensenoside Rc	1265
Gensenoside Rd	1265
Gensenoside Re	1265
Gensenoside Rf	1265
Gensenoside Rg ₁	1265
Gentisic acid	869,1275
(±)-Geosmin	1488,2038,2368,2424,1499,2070,2376,2445
Geranial	2050,2434,2099,2103,2105,2106,2120,2121,2131,2142,2166,2170,2180,2181
Geranic acid methyl ester	2142
Geraniol	2050,2434,2099,2103,2112,2120,2131,2142,2166
Geranium oil	2112
Geranyl acetate	2096,2099,2103,2121,2131,2142,2166
Geranyl acetone	2131
Geranyl butyrate	2112
Geranyl formate	2112,2131
(E,E)-Geranyl linalool	2131
Geranyl propanoate	2131
Geranyl propionate	2050,2434
Geranyl tiglate	2112
Germacrene D	2095,2096,2103,2131,2137,2138,2161,2166,2167,2170
Germacrene D	2050,2434,2136
Ginsenoside Rb ₁	1245,1263
Ginsenoside-Rb ₁ from <i>Panax ginseng</i> (Korean ginseng) root	1264
Ginsenoside Rb ₂	1245,1263
Ginsenoside Rb ₂	1264
Ginsenoside Rc	1245,1263
Ginsenoside-Rc from <i>Panax ginseng</i> (Korean ginseng) root	1264
Ginsenoside Rd	1245,1263,1264
Ginsenoside Re	1245,1263
Ginsenoside-Re from <i>Panax ginseng</i> (Korean ginseng) root	1264
Ginsenoside Rf	1245,1263,1264
Ginsenoside Rg ₁	1245,1263
Ginsenoside Rg ₁	1264
γ-Globulin	207,757,826
γ-Globulin bovine blood (150 kDa)	493
γ-Globulins from human blood	1129,187,825
Globulol	2131
Glucitol	2036,2037

Glucose	333,367,381,383,384,385
D-(+)-Glucose	379,382
D-(+)-Glucose monohydrate	380
Glucose-6-phosphate Dehydrogenase from baker's yeast (<i>S. cerevisiae</i>)	737
Glucose-6-phosphate Dehydrogenase from <i>Leuconostoc mesenteroides</i>	744
Glutamic acid	819
D-Glutamic acid	2794,612
L-Glutamic acid	508,509,2794,612,727,1897,2304
DL-Glutamic acid monohydrate	2793,611
DL-Glutamic acid (FMOC derivatives)	2779,594
L-Glutamic Dehydrogenase solution from bovine liver	761
Glutamine	508,509,819
D-Glutamine	2796,614
L-Glutamine	2796,614,727,1897,2304
DL-Glutamine	2795,613
Glutamine derivative	1897,2304
DL-Glutamine (FMOC derivatives)	2780,595
Glutathione S-Transferase from equine liver	615
DL-Glutethimide	1015,2721,431
Glycerin	1633,1638
Glycerol	1632,1705,1977,2187
Glyceryl tridecanoate	1632
Glyceryl trilinoleate	390,391,392,393
Glyceryl trioleate	390,391,392,393,1632
(R)-(+)-Glycidol	1700,2511
(S)-(-)-Glycidol	1700,2511
R-(+)-Glycidol	1701,2512,1702,2513
S-(-)-Glycidol	1701,2512,1702,2513
Glycine	1897,2304
Glycine-leucine-alanine	2831,783
Glycitein	1270,361,1271,362,1272
Glycitin	1270,361,1271,362,1272
Glycocholic acid	237,238
Glycocholic acid hydrate	234
Glycodeoxycholic acid monohydrate	234
Glycodeoxycholic-2,2,4,4-d ₄ acid	234
Glycolithocholic acid	234
Glycols	1703,1975,2185
Glycoursoxycholic acid	234

Glycyrhretinic acid	1289
Gly-Phe	719
Gly-Tyr	708
Goal	1467,1990,2357,2407
Grepafloxacin	880,881
Guaiacol glyceryl ether carbamate	1059,2946
Guaia-6,9-diene	2112
Guanine	684,765
Guanosine	687,688,689,769
Guanosine diphosphate	690
Guanosine triphosphate	690
Guthion®	308

— H —

Halfenprox	1886,2065
Halocarbon 11	1569,1589,2323,2345
Halocarbon 12	1569,1589,2323,2345
Halocarbon 113	1569,1589,2323,2345
Halocarbon 114	1569,1589,2323,2345
Haloperidol	834,837,931,1212
Haloperidol chloro analog	837
Haloperidol metabolite II	834,837
Haptoglobin Human, Phenotype 1-1	761
α-HCH (α-hexachlorocyclohexane)	1462,1711,1855,1983,2474,2519,2662,2698
α-HCH (α-hexachlorocyclohexane) enantiomers	1458,1707,1851,1979,2470,2515,2658,2694, 1459,1708,1852,1980,2471,2516,2659,2695,1460,1709,1853,1981,2472,2517,2660,2696,1461,1710,1854,1982,2473,2518,2661,2697, 1463,1712,1856,1984,2475,2520,2663,2699,1464,1713,1857,1985,2476,2521,2664,2700
Heliotropine	2111,2184,2183,2446
Hemocyanin	749
Hemoglobin human	617
Hemoglobin S	619
Hemoglobin A ₀	619
Hemoglobin A ₂	619
Hemoglobin S (human)	618
Heneicosane (C21)	1636
Heneicosanoic acid methyl ester (C21:0)	1815,1915,2247,1817,1917,2249,1818,1918,2250,1819,1919,2251
Heneicosanoic acid methyl ester (C21:0) at 2 wt %	1822,1922,2254
2,2',3,4,4',5',6-Heptabromodiphenyl ether solution	1450,1684

Heptachlor	1351,1403,1862,2000,1381,1395,1438,1924,1382,1396,1439,1925,1388,1411,1482,2028, 1466,1740,1858,1989,2356,2384,2392,2406,1469,1994,2359,2409,1506,2075,1507,2076,1512,1513,1514,1516,1524,1532, 1571,1591,2325,2347,1604	3,3',4,4',5,5'-Hexachlorobiphenyl	1441,1927,1442,1928
Heptachlor epoxide	1347,1394,1798,1894,1381,1395,1438,1924,1382,1396,1439,1925,1388,1411,1482,2028,1469,1994,2359,2409, 1506,2075,1513,1516,1524,1532,1571,1591,2325,2347,1604,1797,1893	3,3',4,4',5,5'-hexachlorobiphenyl	1443,1929
Heptachlor exo-epoxide	1507,2076,1512,1514	3,3',4,4',5,5'-Hexachlorobiphenyl	1501
Heptachlor epoxide	1466,1740,1858,1989,2356,2384,2392,2406	2,2',3,4,4',5'-Hexachlorobiphenyl (No. 138)	1402,1999
2,2',3,3',4,4',6'-Heptachlorobiphenyl	1388,1411,1482,2028,1506,2075,1507,2076	2,2',4,4',5,5'-Hexachlorobiphenyl (No. 153)	1402,1999
2,2',3,4',5,6,6'-Heptachlorobiphenyl	1441,1927,1442,1928	2,3,3',4,4',5'-Hexachlorobiphenyl (No. 156)	1402,1999
2,2',3,4',5,6,6'-heptachlorobiphenyl	1443,1929	2,3,3',4,4',5'-Hexachlorobiphenyl (No. 157)	1402,1999
2,3,3',4,4',5,5'-Heptachlorobiphenyl	1441,1927,1442,1928	3,3',4,4',5,5'-Hexachlorobiphenyl (No. 169)	1402,1999
2,3,3',4,4',5,5'-Heptachlorobiphenyl (No. 189)	1402,1999	Hexachlorobutadiene	1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073, 1505,2074,1524,1546,1547,1552,1553,1554,1555,1557,1558,1564,1569,1589,2323,2345
2,2',3,4,4',5,5'-Heptachlorobiphenyl (No. 180)	1402,1999	Hexachloro-1,3-butadiene	1548,1549,1556,1568,1588,2322,2344
Heptadecane	1637,2316,2317	α -1,2,3,4,5,6-Hexachlorocyclohexane	1351,1403,1862,2000,1466,1740,1858,1989,2356,2384,2392,2406, 1507,2076,1512,1514,1516,1889,2068
Heptadecane (C17)	1636	Hexachlorocyclopentadiene	1388,1411,1482,2028,1506,2075, 1507,2076,1524,1552,1553,1554,1555,1556,1557,1558,1564
Heptadecanoic acid methyl ester (C17:0)	1815,1915,2247,1817,1917,2249,1818,1918,2250,1819,1919,2251	Hexachloroethane	1504,2073,1552,1553,1554,1555,1556,1557,1558,1564
Heptadecanoic acid methyl ester (C17:0) at 2 wt %	1822,1922,2254	Hexachloropropene	1550,1551
<i>cis</i> -10-Heptadecenoic acid methyl ester (C17:1)	1815,1915,2247,1817,1917,2249,1818,1918,2250,1819,1919,2251	Hexachlorothane	1524
<i>cis</i> -10-Heptadecenoic acid methyl ester (C17:1) at 2 wt %	1822,1922,2254	Hexaconazole	1889,2068
Heptanal	1971,2405,2099	Hexacosane	1526
Heptane	1431,1572,1486,1487,1595,1601,1667,1602,1668,1610,2210,2211,2212,2452,2213,2214,2453	Hexadecane	1431,1572,1486,1487,1526,1637,2316,2317
<i>n</i> -Heptane	1529,1568,1588,2322,2344,1592,1611,1612,1629,1630	Hexadecane (C16)	1636
Heptanoic acid	1808,1908,2244,1809,1909,2245,1873,2031,2278,1970,2404,1971,2405	Hexadecanoate (C16:0)	1636
Heptanol	1490,1580,2318,2330	Hexadecanoic acid	1873,2031,2278
1-Heptanol	1895	Hexadecanolide	2111,2184
Heptanone	1971,2405	<i>cis</i> -11-Hexadecenal	1896,2403
4-Heptanone	2056,2439	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1456,1696,2298
Heptenophos	1449,1683,1830,1935	Hexaldehyde-2,4-dinitrophenylhydrazone	22,234,23,2335
<i>n</i> -Heptyl acetate	2096	Hexaldehyde-2,4-DNPH	2337
Heptylamine	1776	Hexaldehyde (2,4-DNPH derivative)	2336,24
Heroin	428,432,2288,2289,2290,2462,2291,2463	Hexamethylene diisocyanate	2340,27,2338
Heroin solution	490	Hexamethyl phosphoramide (HMPA)	1544,1545
Hesperidin	353,354,359	Hexanal	21,2326,1490,1580,2318,2330,1491,1581,2319,2331,1492,1583,2320,2333,1971,2405,2045,2350,2051,2435,2056,2439
2,3',4,4',5,5'-Hexachlorobiphenyl (No. 167)	1402,1999	Hexane	1431,1572,1486,1487,1595, 1601,1667,1602,1668,1610,1611,1612,1676,1725,1726,1727,2111,2184,2205,2206,2207,2450,2208,2209,2451,2224
Hexachlorobenzene	1347,1394,1798,1894,1351,1403,1862,2000,1381,1395,1438,1924,1388,1411,1482,2028, 1404,2001,1506,2075,1507,2076,1524,1552,1553,1554,1555,1556,1557,1558,1564,1571,1591,2325,2347,1797,1893	<i>n</i> -Hexane	1568,1588,2322,2344,1592
2,2',4,4',5,6'-Hexachlorobiphenyl	1388,1411,1482,2028,1506,2075,1507,2076	1,2-Hexanediol	1646,2489
2,2',4,4',6,6'-Hexachlorobiphenyl	1441,1927,1442,1928	1,2-Hexanediol (O-TFA derivatives)	1647,2490
2,2',4,4',6,6'-hexachlorobiphenyl	1443,1929	2,3-Hexanedione	2056,2439

3,4-Hexanedione	2056,2439	1,2,3,4,6,7,8-HpCDD	1436,1575,1812,1912,1437,1576,1813,1913
<i>N,N'</i> -1,6-Hexanediyldis(4-(2-pyridinyl)-1 piperazinecarboxamide)	25	1,2,3,4,6,7,8-HpCDF	1436,1575,1812,1912,1437,1576,1813,1913
Hexanoic acid	1970,2404,1971,2405,2045,2350	1,2,3,4,7,8,9-HpCDF	1436,1575,1812,1912,1437,1576,1813,1913
Hexanol	1876,2035,2396,2423,1969,2060,2443,2142	HU-210, HU-211 ((6a,10a)- 9-(Hydroxymethyl)-6,6-dimethyl-3-(2-methyloctan-2-yl)- 6a,7,10,10a-tetrahydrobenzo [c]chromen-1-ol)	449
<i>n</i> -Hexanol	2131	HU-210, HU-211 ((6a,10a)-9-(Hydroxymethyl)-6,6-dimethyl-3-(2-methyloctan-20-yl)-6a,7,10,10a-tetrahydrobenzo[c]chromen-1-ol)	452
1-Hexanol	1895	Human Growth Hormone human	628
2-Hexanone	1504,2073,1546,1547,1548,1549,1565,1566,1676,1725,1726,1727	α -Humulene	2050,2434,2096,2099,2103,2124,2131,2142,2161,2166,2170
3-Hexanone	2056,2439	1,2,3,4,7,8-HxCDD	1436,1575,1812,1912,1437,1576,1813,1913
Hexatriacontane	1486,1487	1,2,3,6,7,8-HxCDD	1436,1575,1812,1912,1437,1576,1813,1913
Hexazinone	5,1467,1990,2357,2407,1506,2075,1507,2076	1,2,3,7,8,9-HxCDD	1436,1575,1812,1912,1437,1576,1813,1913
(2E)-Hexenal	2131	1,2,3,4,7,8-HxCDF	1436,1575,1812,1912,1437,1576,1813,1913
(E)-2-Hexenal	2142	1,2,3,6,7,8-HxCDF	1436,1575,1812,1912,1437,1576,1813,1913
<i>cis</i> -2-Hexene	1612	1,2,3,7,8,9-HxCDF	1436,1575,1812,1912,1437,1576,1813,1913
(Z)-2-Hexenol	2142	2,3,4,6,7,8-HxCDF	1436,1575,1812,1912,1437,1576,1813,1913
(Z)-3-Hexenol	2142	Hyaluronidase	801
(2E)-Hexenyl acetate	2131	Hydrobenzoin	2586,64,2587,65
(E)-2-Hexenyl acetate	2142	Hydrocarbons	1592
(Z)-3-Hexenyl acetate	2142	Hydrochlorothiazide	130,893,851
(3Z)-Hexenyl butanoate	2131	Hydrocodone	427,429
Hexobarbital	415,926,2287,2714,843	Hydrocodone solution	264,484,481,692
Hexyl acetate	1876,2035,2396,2423,2060,2443,2096	Hydrocortisone	199,205,1204,272
Hexylamine	1776	Hydrocortisone 21-acetate	203,453
Hexylcinnamaldehyde	2180,2181	Hydrogen	1639
<i>o</i> -Hexylcinnamaldehyde	2183,2446	Hydrogen sulfide	1687,2382
Hexyl 2-ethylhexyl phthalate	1478,1769,2009,2192	Hydrogen sulfide (1 ppm)	1783
Hexyl hexanoate	1876,2035,2396,2423	Hydromorphone	429
Hexyl 2-methylbutanoate	1876,2035,2396,2423	Hydromorphone solution	264,484,692
Hippuric acid	170,433	Hydromorphone- β -D-glucuronide	692
Histamine	143	Hydroquinidine	67,1209
<i>D</i> -Histidine	2797,620	Hydroquinidine hydrochloride	1218
<i>L</i> -Histidine	2797,620,1897,2304	Hydroquinone	1283
α -Histidine	2798,621	4-Hydroxybenzoic acid	37,279,1236
HMX	296,465	(2S,3S)-Hydroxybupropion hydrochloride	132,907,1189,231
α -Homatropine	1016,2918,1017,2919	3-Hydroxybutyric acid methyl ester	1714,2265,2522,2626
α -Homophenylalanine	2799,622	2-Hydroxycaproic acid methyl ester	1715,2266,2523,2627
Homovanillic acid	1279,370,87,1281,372,89	HYDROXYCHLOROQUINE	1019,2920
Homoveratric acid	1280,371,88	6-Hydroxychloroxazone	963
Hotrienol	1878,2044,2398,2430,1879,2046,2399,2431,1880,2048,2400,2432,1881,2052,2349,2352,1882,2053,2401,2436,1883,2054,2402,2437		

25-Hydroxycholecalciferol	1318,241
Hydroxycitronellal	2180,2181
<i>trans</i> -3'-Hydroxycotinine	246
2-Hydroxy-7,12-dimethylbenz[<i>a</i>]anthracene (t-diol)	175,304,438
β-(Hydroxyethyl)theophylline	149
5-Hydroxyflavone	352
7-Hydroxyflavone	352
L-α-Hydroxyglutaric acid	240
D-α-Hydroxyglutaric acid disodium salt	255,2649,2843,3041,821
DL-α-Hydroxyglutaric acid disodium salt	240
L-α-Hydroxyglutaric acid methyl ester	255,2649,2843,3041,821
5-Hydroxyindoleacetic acid	190,191,192
17β-Hydroxy-17-methylandrosta-1,4-dien-3-one	195
2-Hydroxy-2-methyl butyric acid ethyl ester	1716,2267,2524,2628
2-Hydroxy-2-methyl butyric acid methyl ester	1717,2268,2525,2629
5-Hydroxymethyl-2-furaldehyde	59,60
3-Hydroxy-5-methylisoxazole	1890,2069
7-Hydroxymethyl-12-methylbenz[<i>a</i>]anthracene	175,304,438
7-Hydroxymethyl-12-methylbenz[<i>a</i>]anthracene- <i>trans</i> -3,4-diol	175,304,438
7-Hydroxymethyl-12-methylbenz[<i>a</i>]anthracene- <i>trans</i> -8,9-diol	175,304,438
7-Hydroxymethyl-12-methylbenz[<i>a</i>]anthracene- <i>trans</i> -10,11-diol	175,304,438
7-Hydroxymethyl-12-methylbenz[<i>a</i>]anthracene-2-ol	175,304,438
7-Hydroxymethyl-12-methylbenz[<i>a</i>]anthracen-3-ol	175,304,438
7-Hydroxymethyl-12-methylbenz[<i>a</i>]anthracen-4-ol	175,304,438
8-(Hydroxymethyl)-7-methyl-10-[(2S,3S,4R)-2,3,4,5-tetrahydroxypentyl]benzo[<i>g</i>]pteridine-2,4(3H,10H)-dione, Compound D	1219,274
4-Hydroxy-4-methyl-2-pentanone	1492,1583,2320,2333,1676,1726,1727
2-(Hydroxymethyl)piperidine	1584,2341
Hydroxymetoprolol	894,1020
2-Hydroxyoctanoic acid methyl ester	1718,2269,2526,2630
5-Hydroxyomeprazole	1372,247,248,249,250
4-Hydroxyphenclidine	867
4-Hydroxyphenol arsonic acid	4
L-4-Hydroxyproline	1897,2304
Hydroxyrisperidon	132,907,1189,231
<i>N</i> -Hydroxysuccinimide	494
4-Hydroxytamoxifen (I)	1152
4-Hydroxytamoxifen (II)	1152
6β-Hydroxytestosterone solution	258
β-Hydroxytheophylline	1315,802

2-Hydroxy-2-trifluoromethyl propionic acid ethyl ester	1719,2527
2-Hydroxy-2-trifluoromethyl propionic acid methyl ester	1720,2528
5-Hydroxytryptophan	190,191,192
5-Hydroxy-L-tryptophan	467
1α-Hydroxyvitamin D ₃	1323,260,1324,261
3- <i>epi</i> -25-Hydroxyvitamin D ₃	1247,159,1248,160,1249,161,1269,172,1323,260,1324,261
25-Hydroxyvitamin D ₂	1318,241
25-Hydroxyvitamin D ₂ solution	1247,159,1248,160,1249,161,1268,171,1319,242,1323,260
25-Hydroxyvitamin D ₃ solution	1247,159,1248,160,1249,161,1268,171,1269,172,1319,242,1323,260,1324,261
3- <i>epi</i> -25-Hydroxyvitamin D ₂ solution	1323,260,1324,261
Hydroxyzine dihydrochloride	1021,2921
Hyperoside	1267,1330
Hypoxanthine	690



Ibuprofen	850,851,899,1022,2922,1093,1094
(<i>R</i>)-(-)-Ibuprofen	2218,2270,2631,2855
(<i>S</i>)-(+)-Ibuprofen	2218,2270,2631,2855
Icaritin (PHY89714)	1267
Icaritin	1330
Icaritin (PHY80478)	1267
Icarrin	1330
Ifofamide	1023,2923
Imazalil	1347,1394,1798,1894,1797,1893
Imidacloprid	1358,19,319
Imidan	2004,2413
Imipramine	1368,209,1164,210,1166,211,1167,212,239,811,1165,1168,1169,1170,2279,2303,2459,2468
Imipramine hydrochloride	1206
Imiquimod	133,913,1214
Immunoglobulin G	675,676,678
Immunoglobulin G (human)	494
Impurity	1446,1680,1827,1932,1447,1681,1828,1933,1448,1682,1829,1934
Indan	1612,1621
Indane	1610
Indanofan	1890,2069
Indapamide	985,986,1014,1024,2924,1025,2925
Indeno[1,2,3- <i>cd</i>]pyrene	2375,310,311,1387,1410,1479,2012,1388,1411,1482,2028
Indeno[1,2,3- <i>cd</i>]pyrene	1408,2010,1409,2011,1480,2013,1481,2014
Indeno[1,2,3- <i>cd</i>]pyrene	1483,2029,2365,2420,1506,2075,1507,2076,1517,1518,1524

Indeno[1,2,3-cd]pyrene	1540
Indeno[1,2,3-cd]pyrene	1541,1552,1553,1554,1555,1556,1557
Indeno(1,2,3-cd)pyrene	1558
Indeno[1,2,3-cd]pyrene	1560,1561
Indeno[1,2,3-cd]pyrene	1562
Indeno[1,2,3-cd]pyrene	1563
Indeno[1,2,3-cd]pyrene	1564
Indeno[1,2,3-cd]pyrene	1567,1587
Indeno[1,2,3-cd]pyrene	1795,1891
Indeno[1,2,3-c,d]pyrene solution	1434,1435,1451,1936
Indigo carmine	388
Indomethacin	899,900,901
Indoprofen	1026,2926
Indoxacarb	1445,1679,1826,1931,1888,2067
Inhibin α -Subunit Fragment 1-32 human	632
Inhibin α -Subunit Fragment 1-32 porcine	633
Inosine	686,690
Inosine monophosphate	690
Inositol	2036,2037
Insulin from bovine pancreas	1028,636,1031,639
Insulin human	635,1028,636,1031,639
Insulin from porcine pancreas	1028,636,1031,639
Insulin, bovine	559,1030,638
Insulin, human	1029,637,1030,638
Insulin, porcine	1029,637,1030,638
2-Iodobutane	1706,2217,2514,2854
Iodomethane	1546,1547,1548,1549
Iodophenos	1350,1401,1860,1995
α -Ionone	322,2111,2184
Ionox 100	276,337,1898,2182
Ipratropium	119
Ipratropium bromide monohydrate	1134
Iprobenfos	1419,406,1888,2067
Iprodione	1430,1641,1796,1892,1444,1678,1825,1930
Iprodione metabolite	1889,2068
Isazofos	1350,1401,1860,1995
Isazophos	1885,2064
Isoamyl acetate	1725,1780,1876,2035,2396,2423,1969
Isoamyl alcohol	1725,2026,2027,2060,2443

Isobergapten	1262
Isobornyl acetate	2050,2434,2096
Isobutanal	1969
Isobutane	1592
Isobutanol	1725,1969,2026,2027,2060,2443
Isobutyl acetate	1675,1676,1725,1726,1727,1780,1969,2210,2211,2212,2452,2213,2214,2453
Isobutyl alcohol	1780
Isobutylbenzene	1612
2-Isobutyl-3-methoxypyrazine	1488,2038,2368,2424,1499,2070,2376,2445
Isobutyl 2-methylbutenoate	1876,2035,2396,2423
Isobutyric acid	1808,1908,2244,1809,1909,2245,1873,2031,2278,1969,1970,2404
Isocaproic acid	1808,1908,2244,1809,1909,2245,1873,2031,2278
Isocarbophos	1350,1401,1860,1995,1887,2066
Isocyanic acid	2338
Isodrin	1550,1551
Isofenphos	1430,1641,1796,1892,1444,1678,1825,1930,1885,2064
Isopleptospermonone	2124
D-Isoleucine	2801,641
L-Isoleucine	2801,641,1897,2304
DL-Isoleucine	2800,640
DL-allo-Isoleucine	2737,507
DL-Isoleucine (Fmoc derivatives)	2781,596
(-)-Isomenthol	2126,2189,2655,2678
(+)-Isomenthol	2126,2189,2655,2678
Isomenthone	2112
d-Isomenthone	2136
α -Isomethylionone	2181
Isooctane (solvent)	1613,1614,1615,1616,1617,1618,1624,1625,1626
Isopentanal	1969
Isopentane	1592,1721
Isopentanol	2060,2443
Isopentyl acetate	1675,1676,1726,1727,1895
Isophenos	1350,1401,1860,1995
Isophenos-methyl	1350,1401,1860,1995
Isophorone	1506,2075,1507,2076,1524,1552,1553,1554,1555,1556,1557,1558,1564
Isophorone diisocyanate (isomer 1)	2338
Isophorone diisocyanate (isomer 2)	2338
Isopinocampheol	1642,2487
Isopromethazine	1032,2927

Isopropamide iodide	1134
Isopropanol	1431,1572,1648,2379,1725,1969,2224,2226,2456,2293
Isopropyl acetate	1675,1676,1725,1726,1727,2210,2211,2212,2452,2213,2214,2453
Isopropyl alcohol	1780
4-Isopropylaniline	1655,1672
Isopropylbenzene	1493,2057,2370,2440,1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074
Isopropylbenzene (Cumene)	1613,1614,1615,1616,1617,1618,1624,1625,1626
2-Isopropyl-3-methoxypyrazine	1488,2038,2368,2424,1499,2070,2376,2445
<i>p</i> -Isopropyltoluene	1504,2073
(±)-Isoproterenol hemisulfate salt	1033,2928
Isoprothiolane	1430,1641,1796,1892,1886,2065
Isoproturon	5,110,15,111,16,314,375
Isoquercitrin	376,377
Isosafrole	1550,1551
Isosafrole-2	1550
Isosilybin A	1266,1276,1288
Isosilybin B	1266,1276,1288
Isovaleraldehyde	21,2326
Isovaleric acid	1808,1908,2244,1809,1909,2245,1873,2031,2278,1970,2404
isovitexin (PHY89233)	1305
Isoxathion	1887,2066
Itraconazole solution	831,832
IVYIHR	531,932

— J —

Jacobsen Catalyst (<i>N,N</i> -Bis(3,5-di- <i>tert</i> -butylsalicylidene)-1,2-cyclohexanediaminomanganese(III) chloride)	2588,69,2589,70
(Z)-Jasmone	2167
<i>cis</i> -Jasmone	2111,2184
(E)-Jasmone	2131
(Z)-Jasmone	2137,2138
Jet fuel	1622
JMH-081	1226
JMH-122	1226
JWH-015 (328.18 m/z)	1227,839
JWH-018	1226
JWH-018 solution	450,451,449,482
JWH-018 4-hydroxypentyl metabolite	450
JWH-018 4-Hydroxypentyl metabolite	1225,838,1226
JWH-018 4-Hydroxypentyl metabolite solution	451

JWH-018 5-Hydroxypentyl metabolite solution	1225,838,1226
JWH-018 (Naphthalen-1-yl-(1-pentylindol-3-yl)methanone)	452
JWH-018 5-Pentanoic acid metabolite solution	450,451,1225,838,1226
JWH-019	1226
JWH-073	1226
JWH-073 solution	450,451,449,482
JWH-073 (328.18 m/z)	1227,839
JWH-073 4-Butanoic acid metabolite solution	450,451,1225,838,1226
JWH-073 3-hydroxybutyl metabolite	450,451
JWH-073 3-Hydroxybutyl metabolite	452
JWH-073 3-Hydroxybutyl metabolite	1225,838
JWH-073 3-Hydroxybutyl metabolite	1226
JWH-073 3-Hydroxybutyl metabolite solution	449,482
JWH-073 4-Hydroxybutyl metabolite solution	1225,838,1226
JWH-073 (Naphthalen-1-yl-(1-butylindol-3-yl)methanone)	452
JWH-122 4-Hydroxypentyl metabolite solution	1225,838
JWH-122 5-Hydroxypentyl metabolite solution	1225,838
JWH-200 (1-(2-Morpholin-4-ylethyl)indol-3-yl)-naphthalen-1-ylmethanone)	449
JWH-200 ((1-(2-Morpholin-4-ylethyl)indol-3-yl)-naphthalen-1-ylmethanone)	452,482
JWH-203 (340.164 m/z)	1227,839
JWH-210 (370.23 m/z)	1227,839
JWH-210 4-Hydroxypentyl metabolite solution	1225,838
JWH-210 5-Hydroxypentyl metabolite solution	1225,838
JWH-250 4-Hydroxypentyl metabolite	1225,838
JWH-250 5-Hydroxypentyl metabolite	1225,838
JWH-250 (2-(2-Methoxyphenyl)-1-(1-pentylindol-3-yl)ethanone)	449
JWH-250 (2-(2-Methoxyphenyl)-1-(1-pentylindol-3-yl)ethanone)	452,482

— K —

Kaempferol-3-O-glycoside	1275
40 kDa PEG molecule attached to protein identified as peak 1	777
Kepona	1550
Kerosene	1620
(±)-Ketamine hydrochloride	1034,2929,436
11-Keto-β-boswellic acid	1325,1326,1334,1335,1336,1337
Ketoconazole	112,2614,157,1036,2931
Ketoconazole solution	831,832
Ketoprofen	173,2636,2722,437,899,1037,2932,1038,2933,1093,1094
Ketorolac tris salt	1039,2934

Kitazine	1350,1401,1860,1995
Krypton	1745
KVVIHPI	531,932

— L —

Labetalol	131
Labetalol hydrochloride	1040,2935
α -Lactalbumin from bovine milk	744
Lactic acid	1273,2590,3036,71,1277,368,85,1278,369,86
D-(–)-Lactic acid	244,2648
L-(+)-Lactic acid	244,2648
α -Lactic acid	68,1274,2591,2706,3037,363,72
L-Lactic Dehydrogenase from rabbit muscle	761
β -Lactoglobulin (bovine), carboxymethylated, tryptic digest	642
β -Lactoglobulin tryptic digest	812
Lactones	1729,2118,2529,2676
Lactose	380,387
α -Lactose	384,385
Lamivudine	911
Lansoprazole	1042,1043,2936,1173
Lasalocid A	215,1174
Lauric acid methyl ester	1818,1918,2250,1819,1919,2251
Lauric acid methyl ester (C12:0)	1815,1915,2247,1817,1917,2249,1836,1945,1837,1954,1839,1959
Lauric acid methyl ester (C12:0)	1844,1964
Lauric acid methyl ester (C12:0) at 4 wt %	1822,1922,2254
Lauric aldehyde	2099,2105,2170
Lauryl gallate	1282,292
Lavandulol	2111,2184
LC	768
Lecithinase-A	704
Lemon oil	2120
Lenacil	1890,2069
Leptophos	1542,1543,1544,1545,1890,2069
Leptospermon	2124
D-Leucine	2803,644
L-Leucine	2803,644,1897,2304
α -Leucine	2802,643
α -Leucine (FMOC derivatives)	2782,597
Leu-Enk	788

Leu-enkephalin	709,710,720,721
[Leu ⁵]-Enkephalin	719
Levamisol hydrochloride	455,456
Levamisole	2290,2462,2291,2463
(–)-Levamisole hydrochloride solution	454
Levofloxacin	880,881
Levothyroxine sodium hydrate	174
Lidocaine	125,872,1187,2288,2289
Lidocaine solution	1370,229,230,1378,266,267,1379,268
Lignoceric acid methyl ester	1818,1918,2250,1819,1919,2251
Lignoceric acid methyl ester (C24:0)	1815,1915,2247,1817,1917,2249,1842,1962
Lignoceric acid methyl ester (C24:0) at 4 wt %	1822,1922,2254
Lime oil	2106
Limonene	1574,2328,2047,2175,2351,2353,2095,2096,2103,2121,2131,2137,2138,2142,2166,2167,2180
(R)-(+)-Limonene	1431,1572,1491,1581,2319,2331,2050,2434,2056,2439,2112,2120,2170,2181,2183,2446
d-Limonene	2106
l-Limonene	2136
δ -Limonene	2099,2105
cis-Limonene epoxide	2170
trans-Limonene epoxide	2170
Limonene oxide	1730,1986,2125,2188,2530,2654,2677,2701
cis-Limonene oxide	2050,2434,2096,2103,2120,2166
trans-Limonene oxide	2096,2103,2120,2131,2166
l-cis Limonene oxide	1730,1986,2125,2188,2530,2654,2677,2701
l-trans Limonene oxide	1730,1986,2125,2188,2530,2654,2677,2701
Linalol	2103
Linalool	2050,2434,2056,2439,2095,2096,2099,2105,2106,2112,2120,2121,2124,2131,2136,2137,2138,2142,2161,2166,2167,2170,2180,2181,2183,2446
α -Linalool	1878,2044,2398,2430,1879,2046,2399,2431,1880,2048,2400,2432,1881,2052,2349,2352,1882,2053,2401,2436,1883,2054,2402,2437
cis-Linalool oxide	2131,2142
Linalyl acetate	2056,2439,2096,2111,2184,2131,2142,2183,2446
Linalyl isobutanoate	2120
Linalyl propionate	2096,2131,2142
Lindane	1347,1394,1798,1894,1351,1403,1862,2000,1381,1395,1438,1924,1382,1396,1439,1925,1404,2001,1797,1893,1889,2068
Lindane solution	1507,2076,1512,1514
Linoleate (C18:2)	1636
Linoleic acid	357
Linoleic acid methyl ester	1818,1918,2250,1819,1919,2251

Linoleic acid methyl ester (C18:2)	1842,1962
Linoleic acid methyl ester (C18:2n6c)	1637,1815,1915,2247,1817,1917,2249,1836,1945,1837,1954, 1839,1959,1840,1960,1844,1964,1845,1965,1846,1966,1847,1967
Linoleic acid methyl ester (C18:2n6c) at 2 wt %	1822,1922,2254
Linolelaidic acid	357
Linolelaidic acid methyl ester	1818,1918,2250,1819,1919,2251
Linolelaidic acid methyl ester (C18:2n6t)	1815,1915,2247,1817,1917,2249
Linolelaidic acid methyl ester (C18:2n6t) at 2 wt %	1822,1922,2254
Linolenate (C18:3)	1636
α -Linolenic acid methyl ester	1637,1818,1918,2250,1819,1919,2251,1840,1960,1846,1966,1847,1967
γ -Linolenic acid methyl ester	1818,1918,2250,1819,1919,2251
Linolenic acid methyl ester (C18:3)	1842,1962
Linolenic acid methyl ester (C18:3n3)	1836,1945,1837,1954,1839,1959,1844,1964
α -Linolenic acid methyl ester (C18:3n3)	1815,1915,2247,1817,1917,2249
α -Linolenic acid methyl ester (C18:3n3) at 2 wt %	1822,1922,2254
γ -Linolenic acid methyl ester (C18:3n6)	1815,1915,2247,1817,1917,2249
α -Linolenic acid methyl ester (C18:3n6) at 2 wt %	1822,1922,2254
Linuron	1,295,5,110,15,111,16,294,302,2374,303,1391,305,314,375,317
Lipoxidase from <i>Glycine max</i> (soybean)	646
Lisinopril	129,892
Lithocholic acid	141,234
LLLn	392,393
LLnLn	392,393
LnPP	391
Lomeloxacin	1004,355,1005,356,878,880,881
Lopinavir	911
Lorazepam solution	833,1224
(\pm)-Lorazepam	1191,233,1044,2937,1045,2938,1046,2939
Lorazepam glucuronide solution	833,1224
Losartan potassium	1211
Lovastatin	1148,194,964
LSD	2291,2463,2301
LSD TMS	2301
Luciferin	2592,2804,647,73,2593,74
Lufenuron	1419,406
Lumiflavine (7,8,10-trimethylbenzo[g]pteridine-2,4(3H,10H)-dione), Compound B	1219,274
Luteinizing hormone releasing hormone	710,721
Luteinizing hormone releasing hormone (LHRH)	709,720
Luteolin	352

Lycopene	1239,344,1317
Lypressin	820
D-Lysine	2805,648
L-Lysine	2805,648,1897,2304
D,L-Lysine	2806,649
D,L-Lysine (FMOC derivatives)	2783,598
Lysozyme	754,755,756,759
Lysozyme from chicken egg white	651,705,732,733,738,743,1130,746,747,761,762,1184,805

— M —

Malathion	1350,1401,1860,1995,1351,1403,1862,2000,1466,1740,1858,1989,2356,2384,2392,2406, 1471,1746,1861,1997,2361,2386,2393,2411,1542,1543,1544,1545,1585,2342,1885,2064
Maleic acid	850,890,891,954
Malic acid	68
Maltitol	382
Maltoheptaose	364
Maltohexaose	364
Maltopentaose	364
Maltose	364,384,385,386
Maltose solution	387
D-(+)-Maltose monohydrate	380
Maltotetraose	364
Maltotriose	364,384,385,386
Malvidin 3-(6-acetylglucoside)	336
Malvidin 3-(6-caffeoylglucoside)	336
Malvidin chloride	1320,1321
Malvidin 3-(6-cumarylglucoside)	336
Malvidin 3-glucoside	336
D,L-Mandelic acid	1053,2656,288,2940
Mannitol	2036,2037
Mannose	364,383
D-(+)-Mannose	379
Maysin	1246
MCHM isomer #1	1465,2355
MCHM isomer #2	1465,2355
MCPA-thioethyl	1889,2068
MCPB	1890,2069
MCPB-ethyl	1890,2069
MDA	2234,2285,2457,2460

MDAI hydrochloride solution	472,476
MDA (3,4-methylenedioxyamphetamine)	411,412
MDEA	2234,2285,2457,2460
MDMA	2234,2285,2457,2460
(±)-MDMA solution	481
MDMA (Ecstasy, methylenedioxymethamphetamine)	411,412,427
MDPBP hydrochloride solution	469
Mecarbam	1419,406
Mecizine	860
Mecoprop methyl ester	1430,1641,1796,1892
Mefanamic acid	899
Mefenacet	1889,2068
Melamine	397,398,405,2078,2079,2080,2081
Mellitin	788
Membrane protein	663
Menadione (K3)	1252,1298
<i>trans-p</i> -Mentha-2,8-dien-1-ol	2131
<i>cis-p</i> -Mentha-2-en-1-ol	2131,2142
<i>trans-p</i> -Mentha-2-en-1-ol	2131
Menthofuran	2136,2137
Menthol	2095
(-)-Menthol	2126,2189,2655,2678,2136
Menthol	2137,2138,2167,2183,2446
iso-Menthol	2137,2138
neo-Menthol	2137,2138
(+)-Menthol	2126,2189,2655,2678
(-)-Menthone	2111,2184
Menthone	2112
(-)-Menthone	2136
Menthone	2137,2138
iso-Menthone	2137,2138
Menthyl acetate	2137
Menthyl acetate	2138,2167
iso-Menthyl acetate	2137,2138
neo-Menthyl acetate	2137,2138
Mepenzolate bromide	119,1134
Meperidine	427
Meperidine solution	481
mephedrone	435

Mephedrone hydrochloride	2049,2433
Mephedrone hydrochloride solution	243,468,434,472,476
(±)-Mephénytoin	1054,2941
Mephobarbital	414,925,417,929,418,930,928,1055,2942
(±)-Mephobarbital	415,926,2287,2714,843
Mephobarbital (methylphenobarbital)	1064,2951
Mepivacaine hydrochloride	1056,2943,1187
Mepronil	1888,2067
Meptazinol	1057,2944
Mercarbam	1887,2066
Merphos	1466,1740,1858,1989,2356,2384,2392,2406,1471,1746,1861,1997,2361,2386,2393,2411,1507,2076,1542,1543
Mesitylene	1527,1546,1547,1548,1549,1568,1588,2322,2344,1610,1611,1612,1621
Mesityl oxide	1676,1725,1726,1727,1780
Mesoridazine	165,578
Mesoridazine benzenesulfonate	1212
Metalaxyl	319,1430,1641,1796,1892,1888,2067
Metanephrine	254
Metaproterenol hemisulfate salt	1058,2945
Metaxaxil	1444,1678,1825,1930
Metazachlor	5,1447,1681,1828,1933
Met-enkephalin	709,710,719,720,721
Methabenzthiazuron	5,1419,406
Methacrifos	1440,1677,1824,1926,1885,2064
Methacrolein-2,4-dinitrophenylhydrazone	22,2334,23,2335
Methacrolein (2,4-DNPH derivative)	2336,24
Methacrylic acid	1582,2332
Methacrylonitrile	1504,2073
Methadone	2723,439,445,464,479,2289
(±)-Methadone hydrochloride	176,2637,2724,440,2288
Methamidophos	1347,1394,1798,1894,1797,1893
Methamidophos	1350,1401,1860,1995
Methamphetamine	189,448
(-)-Methamphetamine	2718,409
Methamphetamine	411,412,480,2234,2285,2457,2460,2289
(+)-Methamphetamine	2718,409
d-Methamphetamine	2195,2231,2282,2621,2711,2847
l-Methamphetamine	2195,2231,2282,2621,2711,2847
(±)-Methamphetamine solution	481
Methamphetamine (TFA derivative)	1694,1835,1941,2296,2693,2235,2286,2458,2461

Methandienone	197, 198, 200, 201	2-Methoxy-5-methylaniline	1673
Methane	1622, 1628, 1639, 1665, 1723, 1724, 1734, 1749, 1750, 1751, 1753, 1754	2-Methoxy-5-nitroaniline	1673
Methane (430 ng on column)	1752	2-Methoxyphenol	2056, 2439
Methanethiol	1687, 2382	Methoxyverapamil	952, 953
Methanol	1160, 1485, 1778, 2032, 2367, 2390, 2422, 1493, 2057, 2370, 2440, 1500, 1586, 2321, 2343, 1629, 1630, 1676, 1721, 1722, 1725, 1726, 1727, 1728, 1780, 1895, 1969, 2026, 2027, 2205, 2206, 2207, 2450, 2208, 2209, 2451, 2226, 2456, 2292, 2464, 2293, 2294	(±)-Methoxyverapamil hydrochloride	1222
Methanol, 0.01%	1635, 2378	Methscopolamine	119
Methanol (solvent)	1525, 1528, 1529, 1530	Methyl acetate	1565, 1566, 1675, 1676, 1725, 1726, 1727, 1780, 1969, 2056, 2439, 2136, 2210, 2211, 2212, 2452, 2213, 2214, 2453
Methanol (~15 %)	1699	Methylacrylate	1504, 2073
Methapyrilene	858, 859, 1550, 1551	1-Methyladenosine	686
Methapyrilene HCl	1213	Methylamine	1648, 2379, 1649, 2380, 2225, 2455
Methcathinone	441	Methyl anthranilate	2131
Methedrone	435	Methyl arachidate	1814, 1914, 2246, 1816, 1916, 2248, 1820, 1920, 2252, 1843, 1963, 1850, 1978, 1866, 2015, 2273, 1867, 2018, 2274, 2237
Methedrone hydrochloride	2049, 2433	Methyl arachidonate	1814, 1914, 2246, 1816, 1916, 2248, 1820, 1920, 2252, 1848, 1968, 2263, 1859, 1992, 2272, 1867, 2018, 2274, 1868, 2019, 2275, 1869, 2020, 2276, 2262
Methedrone hydrochloride solution	243, 468, 434, 469, 477	<i>DL</i> -threo- β -Methylaspartic acid	2810, 667
Methidathion	1419, 406, 1350, 1401, 1860, 1995, 1885, 2064	Methyl azinphos	1544, 1545
Methidation	1448, 1682, 1829, 1934	Methyl behenate	1814, 1914, 2246, 1816, 1916, 2248, 1820, 1920, 2252, 1843, 1963, 1850, 1978
Methiocarb	1,295, 294, 2004, 2413	Methyl benzoate	1207, 273, 489
<i>D</i> -Methionine	2808, 665	<i>o</i> -Methylbenzylamine	2594, 75
<i>L</i> -Methionine	2808, 665, 1231, 1897, 2304	<i>o</i> -Methylbenzylamine (N-3,5-Dinitrobenzoyl derivative)	2595, 76
<i>DL</i> -Methionine	2807, 664, 2809, 666	(±)- <i>o</i> -Methylbenzyl butyrate	1759, 2149, 2541, 2680
<i>DL</i> -Methionine (t-BOC derivatives)	2752, 534	2-Methylbutanal	1896, 2403, 2056, 2439
<i>DL</i> -Methionine (FMOc derivatives)	2784, 599	3-Methylbutanal	1871, 2022, 2395, 2417, 1896, 2403, 2056, 2439
Methionine methyl ester (N-trifluoroacetyl derivatives)	1987, 2305, 2702, 2726	2-Methylbutane	1610, 1611, 1612, 1665, 1723
<i>L</i> -Methionine sulfone	118, 813	2-Methyl-1-butanol	1644, 1876, 2035, 2396, 2423, 2060, 2443
<i>L</i> -Methionine sulfoxide	813	2-Methyl-2-butanol	1644
<i>L</i> -Methionine sulfoximine	118, 121, 813	3-Methylbutanol	1676, 1726, 1727, 1895, 2210, 2211, 2212, 2452, 2213, 2214, 2453
Methomyl	1,295, 294, 302, 1391, 305, 1419, 406	3-Methyl-1-butanol	1644
Methoprene	1889, 2068	3-Methyl-2-butanol	1969
Methorphan	1060, 2947	3-Methyl-2-butanone	1485, 1778, 2032, 2367, 2390, 2422
Methotrexate	863, 864, 903, 904	2-Methyl-1-butene	1612
Methoxychlor	1351, 1403, 1862, 2000, 1381, 1395, 1438, 1924, 1382, 1396, 1439, 1925, 1388, 1411, 1482, 2028, 1466, 1740, 1858, 1989, 2356, 2384, 2392, 2406, 1469, 1994, 2359, 2409, 1506, 2075, 1507, 2076, 1509, 1510, 1511, 1512, 1513, 1514, 1516, 1532, 1571, 1591, 2325, 2347, 1604	2-Methyl-2-butene	1612, 1721, 1722
2-Methoxyethanol	1383, 1457, 1703, 1975, 2185, 1725, 1726, 1727, 2205, 2206, 2207, 2450, 2208, 2209, 2451, 2225, 2455	Methyl <i>tert</i> -butyl ether	1493, 2057, 2370, 2440, 1594, 1722, 2224
2-Methoxyethanol (methyl Cellosolve [®])	1704, 1976, 2186	Methyl <i>t</i> -butyl ether-(<i>o</i> , <i>o'</i> - ¹³ C)	1528
Methoxymysin	1246	Methyl <i>tert</i> -butyl ether (MTBE)	1530
3-Methoxymethcathinone hydrochloride	469, 477	3-Methylbutyl hexanoate	1876, 2035, 2396, 2423
		Methyl butyl ketone	2205, 2206, 2207, 2450, 2208, 2209, 2451
		methyl <i>n</i> -butyl ketone	1568, 1588, 2322, 2344

Methyl butyrate	1814,1914,2246,1816,1916,2248,1820,1920,2252,1971,2405	Methyl <i>cis,cis</i> -11,14-eicosadienoate	1814,1914,2246,1816,1916,2248
3-Methyl butyrate	2124	Methyl eicosanoate	2236,2238,2239,2240
Methyl caprate	1820,1920,2252,1850,1978	Methyl eicosapentaenoate	1848,1968,2263,1859,1992,2272
Methyl caproate	1809,1909,2245,1820,1920,2252	Methyl all- <i>cis</i> -5,8,11,14,17-eicosapentaenoate	1814,1914,2246,1816,1916,2248,1820,1920,2252,
Methyl caprylate	350,56,1814,1914,2246,1816,1916,2248,1820,1920,2252,1850,1978	1867,2018,2274,1868,2019,2275,1869,2020,2276,2262	
3-Methylcatechol	152,44	Methyl <i>cis</i> -8,11,14,17-eicosatetraenoate	1868,2019,2275,1869,2020,2276
4-Methylcatechol	152,44	Methyl eicosatrienoate	1848,1968,2263,1859,1992,2272
Methyl cellosolve	1780	Methyl <i>cis</i> -8,11,14-eicosatrienoate	1820,1920,2252
Methyl chavicol	2161	Methyl <i>cis</i> -11,14,17-eicosatrienoate	1820,1920,2252
Methyl chloro isothiazolinone	1210,293,321	Methyl eicosenoate	1843,1963,1848,1968,2263,1866,2015,2273
Methyl chloropyrifos	1544,1545	Methyl <i>cis</i> -9-eicosenoate	1868,2019,2275
Methyl chlorpyrifos	1347,1394,1798,1894,1797,1893	Methyl <i>cis</i> -11-eicosenoate	1814,1914,2246,1816,1916,2248,1820,1920,2252,1850,1978,1867,2018,2274,1868,2019,2275,1869,2020,2276
3-Methylcholanthrene	1540,1541,1550,1551	Methyl elaidate	1814,1914,2246,1816,1916,2248,1820,1920,2252,1850,1978,2237
5-Methylchrysene	1795,1891	4,4'-Methylenebis(<i>N,N</i> -dimethylaniline)	1673
Methylcyclohexane	1565,1566,2205,2206,2207,2450,2208,2209,2451	Methylenebis(phenyl isocyanate)	2340,27
2-Methylcyclohexanol	1725	Methylene chloride	1493,2057,2370,2440,1494,2058,2371,2441,1497,2061,1498,2062,2373,2444,
2-Methylcyclohexanol isomers	1726,1727	1500,1586,2321,2343,1502,2071,1503,2072,1504,2073,1505,2074,1522,1569,1589,2323,2345,1725,1780,2206,2208,2224,2226,2456	
Methylcyclopentane	1592,1612	Methylene chloride (impurity)	1529
3-Methylcyclopentene	1612	Methylene chloride (solvent)	1526,2308,2311
2-Methyl-2-cyclopentenone	2056,2439	(±)-3,4-Methylenedioxyamphetamine hydrochloride solution	432
2'-O-Methylcytidine	686	3,4-Methylenedioxypropylvalerone	2049,2433
3-Methylcytidine	686	3,4-Methylenedioxypropylvalerone HCl (MDPV) solution	243,468,434,470,478
5-Methylcytidine	686	4,4'-Methylenediphenyl diisocyanate	2338
Methyl decanoate	350,56,1808,1908,2244,1814,1914,2246,1816,1916,2248	<i>N,N</i> -(Methylenediphenylene)bis(4-(2-pyridyl) nyl)-1-piperazinecarboxamide)	25
2-Methyl-4,6-dinitrophenol	1476,1756,2006,2363,2388,2414,1477,1757,2007,2364,2389,2415,1524,1531,1552,1553,1554,	(±)-4-Methylephedrine hydrochloride solution	470,474
1555,1556,1557,1558,1564		Methyl erucate	1814,1914,2246,1816,1916,2248,1820,1920,2252,1843,1963,1850,1978,1868,2019,2275
Methyl <i>cis</i> -13,16-docosadienoate	1814,1914,2246,1816,1916,2248,1820,1920,2252	2,4-D methyl ester	306,307,1571,1591,2325,2347
Methyl docosahexaenoate	1848,1968,2263,1859,1992,2272	2,4,5-T methyl ester	306,307
Methyl <i>cis</i> -4,7,10,13,16,19-docosahexaenoate	1820,1920,2252	4-Methylethcathinone hydrochloride solution	471,478
Methyl docosanoate	1866,2015,2273	2-Methyl-6-ethylaniline	1655,1672
Methyl docosapentaenoate	1848,1968,2263,1859,1992,2272	1-Methyl-2-ethylbenzene	1610,1612
Methyl <i>cis</i> -4,7,10,13,16-docosapentaenoate	1867,2018,2274,1868,2019,2275,1869,2020,2276,2262	1-Methyl-3-ethylbenzene	1610,1611,1612
Methyl all- <i>cis</i> -7,10,13,16,19-docosapentaenoate	1867,2018,2274,1868,2019,2275,1869,2020,2276,2262	1-Methyl-4-ethylbenzene	1610,1612
Methyl docosatetraenoate	1848,1968,2263,1859,1992,2272	2-Methyl-4-ethylhexane	1592
Methyl <i>cis</i> -11-docosenoate	1868,2019,2275	Methyl ethyl ketone	1431,1572,1593,1725,1780,2051,2435,2224
Methyl dodecanoate	350,56,1808,1908,2244,2236,2237,2238,2239,2240	2-Methyl-3-ethylpentane	1592
Methyl eicosadienoate	1859,1992,2272	3-Methyl-3-ethylpentane	1592
Methyl <i>cis</i> -8,11-eicosadienoate	1867,2018,2274	Methyl eugenol	2161
Methyl <i>cis</i> -11,14-eicosadienoate	1820,1920,2252	Methyl formate	1675,1676,1725,1726,1727,1780,2060,2443

<i>N</i> -Methyl-2-formylpyrrole	2056,2439
5-Methyl-2-furaldehyde	59,60
2-Methylfuran	2056,2439
5-Methylfurfural	2056,2439
1-(5-Methyl-2-furyl)-2-propanone	2056,2439
Methyl geranate	2096
Methyl geranoate	2050,2434,2120
7-Methylguanosine	686
Methyl heneicosanoate	1814,1914,2246,1816,1916,2248,1820,1920,2252
Methyl heptadecanoate	1814,1914,2246,1816,1916,2248,1820,1920,2252,1850,1978,2236,2237,2238,2239,2240,2262
Methyl <i>cis</i> -10-heptadecenoate	1814,1914,2246,1816,1916,2248,1820,1920,2252
2-Methylheptane	1592,1610,1612
3-Methylheptane	1592,1610,1612
4-Methylheptane	1592,1612
Methylheptanol	1971,2405
2-Methyl-1-heptene	1612
6-Methyl-5-hepten-2-ol	1642,2487,2131
6-Methyl-5-hepten-2-one	1491,1581,2319,2331,1582,2332,2045,2350,2096,2111,2184,2131,2142
Methyl <i>cis</i> -9,12-hexadecadienoate	1869,2020,2276
Methyl hexadecanoate	2239,2240
Methyl <i>cis</i> -6,9,12,15-hexadecatetraenoate	1869,2020,2276
Methyl <i>cis</i> -6,9,12-hexadecatrenoate	1869,2020,2276,2262
Methyl <i>cis</i> -9-hexadecenoate	2236,2237,2238
Methyl <i>cis</i> -9-hexadecenoate	2239,2240
Methylhexanal	1971,2405
2-Methylhexane	1592,1610,1611
3-Methylhexane	1592,1610,1611,1612
Methyl hexanoate	1814,1914,2246,1816,1916,2248
5-Methyl-2-hexanone	1676,1725,1727
2-Methyl-1-hexene	1612
5-Methyl-1-hexene	1612
2-Methylhexenes	1612
<i>o</i> -Methylhippuric acid	170,433
<i>m</i> -Methylhippuric acid	170,433
<i>p</i> -Methylhippuric acid	170,433
Methyl 4-hydroxybenzoate	284,1748,1998,2190,2223,2387,2412,2447,2454
Methyl 2-hydroxydecanoate	2236,2238,2239,2240
Methyl (±)-2-hydroxydecanoate	2237
Methyl 2-hydroxydodecanoate	2236,2237,2238,2239,2240

Methyl 3-hydroxydodecanoate	2236,2238,2239,2240
Methyl (±)-3-hydroxydodecanoate	2237
Methyl 2-hydroxyhexadecanoate	2236,2237,2238,2239,2240
7-Methyl-12-hydroxymethylbenz[<i>a</i>]anthracene	175,304,438
7-Methyl-12-hydroxymethylbenz[<i>a</i>]anthracene- <i>trans</i> -8,9-diol	175,304,438
7-Methyl-12-hydroxymethylbenz[<i>a</i>]anthracen-2-ol	175,304,438
7-Methyl-12-hydroxymethylbenz[<i>a</i>]anthracen-3-ol	175,304,438
7-Methyl-12-hydroxymethylbenz[<i>a</i>]anthracen-4-ol	175,304,438
Methyl 2-hydroxytetradecanoate	2236,2237,2238,2239,2240
Methyl 3-hydroxytetradecanoate	2236,2237,2238,2239,2240
2-Methylimidazole	365
4(5)-Methylimidazole	365
2-Methylindane	1612
Methylindan isomer	1621
Methylionone	2183,2446
2-Methylisoborneol	1488,2038,2368,2424,1499,2070,2376,2445
Methyl isocyanate	2338
2-Methyl-5-isopropylpyrazine	1871,2022,2395,2417
2-Methyl-4-isothiazolin-3-one	1210,293,321
Methyl jasmonate	2111,2184
Methyl α -lactate	322
(±)-Methyl- γ -lactone	1729,2118,2529,2676
Methyl laurate	1814,1914,2246,1816,1916,2248,1820,1920,2252,1850,1978
Methyl lignocerate	1820,1920,2252,1843,1963,1859,1992,2272
Methyl linoleate	350,56,1808,1908,2244,1814,1914,2246,1816,1916,2248,1820,1920,2252,1850,1978,1859,1992,2272,1866,2015,2273,1867,2018,2274,1868,2019,2275,1869,2020,2276,2262
Methyl linolealdate	1814,1914,2246,1816,1916,2248,1820,1920,2252
Methyl linolenate	350,56,1808,1908,2244,1814,1914,2246,1816,1916,2248,1820,1920,2252,1843,1963,1866,2015,2273,1868,2019,2275,1869,2020,2276,2262
Methyl α -linolenate	357
Methyl γ -linolenate	1814,1914,2246,1816,1916,2248,1820,1920,2252,1859,1992,2272,1867,2018,2274
Methyl (R)-(-)-mandelate	1733,2221,2533,2858,1785,2172,2558,2688
Methyl (S)-(+)-mandelate	1733,2221,2533,2858,1785,2172,2558,2688
Methyl α -mandelate	322
R-(-)-Methyl mandelate	1731,2219,2531,2856,1732,2220,2532,2857
S-(+)-Methyl mandelate	1731,2219,2531,2856,1732,2220,2532,2857
Methyl mercaptan	1686,2381
Methyl mercaptan (1 ppm)	1783
Methyl methacrylate	1504,2073

Methyl methanesulfonate	1550,1551	Methyl palmitoleate	357,1808,1908,2244,1814,1914,2246,1816,1916,2248,1820,1920,2252,1850,1978,1868,2019,2275,1869,2020,2276,2262
α -Methyl- α -methionine	810	Methyl paraben	282,283,286
Methyl (E)- α -(methoxymino)-2-(2-methylphenoxyethyl)phenylacetate	1886,2065	Methyl Paraben	289,290,291
Methyl N-methyl anthranilate	2103,2131,2142,2166	Methyl Paraoxon	1106
Methyl <i>cis</i> -9,10-methylenehexadecanoate	2236,2237,2238,2239,2240	Methyl paraoxion	1506,2075
Methyl <i>cis</i> -9,10-methyleneoctadecanoate	2236,2237,2238,2239,2240	Methyl parathion	308,309,1440,1677,1824,1926,1466,1740,1858,1989,2356,2384,2392,2406,1470,1996,2360,2410,1471,1746,1861,1997,2361,2386,2393,2411,1542,1543,1550,1551
Methyl 15-methylhexadecanoate	2236,2237,2238,2239,2240	Methyl pentadecanoate	1814,1914,2246,1816,1916,2248,1820,1920,2252,1850,1978,2236,2237,2238,2239,2240,2262
Methyl 14-methylpentadecanoate	2236,2237,2238,2239,2240	Methyl <i>cis</i> -10-pentadecenoate	1814,1914,2246,1816,1916,2248,1820,1920,2252
Methyl 12-methyltetradecanoate	2236,2237,2238,2239,2240	2-Methylpentane	1528,1529,1530,1592,1610,1611,1612
Methyl 13-methyltetradecanoate	2236,2237,2238,2239,2240	3-Methylpentane	1592,1610,1611,1612,2051,2435
Methyl myristate	350,56,1814,1914,2246,1816,1916,2248,1820,1920,2252,1843,1963,1848,1968,2263,1850,1978,1859,1992,2272,1868,2019,2275,1869,2020,2276,2236,2237,2238,2262	1-Methylpentan-1-ol	1969
Methyl myristoleate	1814,1914,2246,1816,1916,2248,1820,1920,2252,1850,1978	2-Methyl-1-pentanol	1969
1-Methylnaphthalene	1408,2010,1409,2011,1550,1551,1593,1594,1595,1596,1610,1611,1612,2300,2467	4-Methyl-2-pentanol	1666
1-Methylnaphthalene solution	1597	4-Methyl-2-pentanone	1431,1572,1504,2073,1525,1546,1547,1548,1549,1565,1566,1568,1588,2322,2344,1676,1725,1726,1727,2051,2435,2210,2211,2212,2452,2213,2214,2453,2224
2-Methylnaphthalene	1408,2010,1484,2030,2366,2421,1552,1553,1554,1555,1556,1557,1564,1593,1594,1596,1597,2300,2467	3-Methyl-2-pentene	1612
2-Methylnaphthalene solution	1595	<i>trans</i> -3-Methyl-2-pentene	1612
2-Methylnaphthalene (B)	1409,2011,1558,1610,1611,1612	4-Methylpenten-2-one	1871,2022,2395,2417
Methyl nervonate	1820,1920,2252,1859,1992,2272	1-Methylphenanthrene	1408,2010,1409,2011
2-Methyl-5-nitroaniline	1673	Methylphenidate	1138,2997,446,2222,2271,2302,2632,2716,2859,844,974
4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL)	245	Methylphenidate hydrochloride	1062,177,2638,2949,1061,2948,442,1063,2950,443,1072,2959
4-(Methylnitrosamino)-1-(3-pyridinyl)-1-butanone	246	Methylphenidate (Ritalin)	2234,2285,2457,2460
Methyl nonadecanoate	2236,2237,2238,2239,2240	2-Methylphenol	1359,1386,1407,1475,1755,2005,1476,1756,2006,2363,2388,2414,1477,1757,2007,2364,2389,2415,1531,1552,1553,1554,1555,1557,1564,1725
3-Methylnonane	1612	3-Methylphenol	1359,1386,1407,1475,1755,2005,1476,1756,2006,2363,2388,2414,1477,1757,2007,2364,2389,2415,1531,1550,1551,1725
Methyl <i>cis</i> -9,12-oxadecadienoate	2236,2238,2239,2240	4-Methylphenol	1476,1756,2006,2363,2388,2414,1477,1757,2007,2364,2389,2415,1531,1552,1553,1554,1555,1557,1564,1725
Methyl octadecanoate	2236,2238,2239,2240	<i>N,N'</i> -(2-Methyl-1,3-phenylene)bis(4-(2-pyridinyl)-1-piperazinecarboxamide)	25
Methyl <i>cis</i> -9-octadecanoate	2236,2238,2239,2240	<i>N,N'</i> -(4-Methyl-1,3-phenylene)bis(4-(2-pyridinyl)-1-piperazinecarboxamide)	25
Methyl <i>trans</i> -9-octadecanoate	2236,2238,2239,2240	4-Methyl- <i>m</i> -phenylenediamine	1672
2-Methyloctane	1592	5-Methyl-5-phenylhydantoin	2596,77,2597,78,2811,668,1066,2953
3-Methyloctane	1592,1612	4-Methyl-5-phenyl-2-oxazolidinone	2598,79
4-Methyloctane	1592,1612	1-Methyl-3-phenylpropylamine (4-Phenyl-2-butylamine) (N-TFA derivatives)	1738,2537
Methyl oleate	350,56,1808,1908,2244,1814,1914,2246,1816,1916,2248,1820,1920,2252,1843,1963,1850,1978,1866,2015,2273,1867,2018,2274,1868,2019,2275,1869,2020,2276,2237,2262	α -Methyl- α -phenylsuccinimide	2599,80,2812,669
Methylone	435	Methyl phenyl sulfoxide	1067,2600,2954,81
Methylone hydrochloride	243,468,434,472,2049,2433		
Methyl palmitate	350,56,1808,1908,2244,1814,1914,2246,1816,1916,2248,1820,1920,2252,1843,1963,1850,1978,1859,1992,2272,1867,2018,2274,1868,2019,2275,1869,2020,2276,2236,2237,2238,2262		

2-Methylpropanal	1896,2403	(±)-Metoprolol (+)-tartrate salt	140,2633,2720,419,1069,2956,1070,2957,1071,2958
2-Methylpropane	1610,1611,1612,1665,1723	Metoxuron	5
2-Methyl-1-propanol	1644,1666,1676,1726,1727,1895	Metribuzin	1391,305,1506,2075,1507,2076,1889,2068
2-Methylpropene	1612,1665,1723	Metronidazole solution	831,832
2-Methyl-6-propenylpyrazine	1871,2022,2395,2417	Mevinolin from <i>Aspergillus</i> sp.	157
Methylpropyl butanoate	1876,2035,2396,2423	Mevinphos	1506,2075,1507,2076,1542,1543
2-Methyl-5-propylpyrazine	1871,2022,2395,2417	Mevinphos-1	1885,2064
2-Methylpyrazine	1871,2022,2395,2417,2056,2439	Mevinphos-2	1885,2064
3-Methylpyrazole	1423,444	Mevinphos isomers	1544,1545
4-Methylpyrazole	1423,444	Mexacarbate	1,295,294
1-Methylpyrrole	1871,2022,2395,2417,2056,2439	MGK 264	1506,2075
n-Methylpyrrolidone	2205,2206,2207,2450,2208,2209,2451	Mianserin hydrochloride	1073,2960,1074,2961,1075,2962,1076,2963,1077,2964,1078,2965
2-Methylresorcinol	152,44	Miconazole	112,2614,1079,2966
Methyl salicylate	2045,2350,2183,2446	(±)-Miconazole nitrate salt	1080,2967
Methylscopolamine	885,886	Midazolam solution	833
Methyl stearate	350,56,1808,1908,2244,1814,1914,2246, 1816,1916,2248,1820,1920,2252,1843,1963,1866,2015,2273,1867,2018,2274,1869,2020,2276,2237,2262	Milk proteins	366,671
Methyl stearidonate	1866,2015,2273,1868,2019,2275,1869,2020,2276	Minocycline	1157
Methylstyrene	1492,1583,2320,2333	Mirex	1571,1591,2325,2347
17 α -Methyltestosterone solution	1374,257,258	Molinate	1448,1682,1829,1934,1506,2075,1507,2076,1886,2065
Methyl tetracosanoate	1814,1914,2246,1816,1916,2248	Monensin	215,1174
Methyl <i>cis</i> -15-tetracosenoate	1814,1914,2246,1816,1916,2248,2237	3-Monoacetylmorphine (m/z 328) NMD766	490
Methyl tetradecanoate	2239,2240	2-Monochlorobiphenyl	1441,1927,1442,1928
2-Methylthiophene	1685	2-monochlorobiphenyl	1443,1929
Methyl tricosanoate	1814,1914,2246,1816,1916,2248,1820,1920,2252,1866,2015,2273	4-Monochlorobiphenyl	1441,1927,1442,1928
Methyl tridecanoate	1814,1914,2246,1816,1916,2248,1820,1920,2252,1850,1978,2236,2237,2238,2239,2240	4-monochlorobiphenyl	1443,1929
3-Methyl-4-(2,6,6-trimethyl-2-cyclohexen-1-yl)-3-buten-2-one	2180	Monocrotophos	1350,1401,1860,1995,1444,1678,1825,1930,1542,1543,1544,1545,1887,2066
α -Methyl-m-tyrosine	2813,670	Monolinolein (C18:2)	1638
Methyl undecanoate	1814,1914,2246,1816,1916,2248,1820,1920,2252,1850,1978,2404,2236,2237,2238,2239,2240	Monolinolenin (C18:3)	1638
1-Methyluric acid	149,150	Monolinuron	5
5-Methyluridine	686	Monolein	1632,1633
1-Methylxanthine	149,150,1315,802	Monolein (C18:1)	1634,1638
3-Methylxanthine	150	Monopalmitin (C16:0)	1634,1638
7-Methylxanthine	1362,1427,148,946,149,150,1315,802	Monostearin (C18:0)	1634,1638
Methyprylon	415,926	Monuron	1,295,294,302,1391,305,314,375,317
Metobromuron	5	Morphine	124,868,427,428,429,2288,2289
Metolachlor	5,1351,1403,1862,2000,1506,2075,1507,2076,1888,2067	Morphine solution	1082,178,264,484,481,490,491,692
Metoprolol	894,941,954,1020	Morphine glucuronide	692
Metoprolol tartrate solution	1228	Morphine-3- β - <i>D</i> -glucuronide solution	1082,178,491
		Morphine-6- β - <i>D</i> -glucuronide solution	1082,178

Mosapride citrate salt dihydrate	1083,2968
Musk T	2111,2184
Musk ambrette	2111,2184
Musk ketone	2111,2184
Musk xylol	2111,2184
α -Murolene	2131
τ -Murolol	2161
Myoclobutanol	1447,1681,1828,1933,1886,2065,2004,2413
Myoglobin	207,740,754,755,756,757,826
Myoglobin from equine heart	825
Myrcene	2047,2175,2351,2353,2050,2434,2095,2096,2099,2103,2105,2106, 2111,2184,2120,2121,2124,2131,2136,2137,2138,2142,2161,2166,2167,2170,2183,2446
β -Myrcene	2056,2439
Myricetin	352,1259
Myristic acid	1808,1908,2244
Myristic acid methyl ester	1818,1918,2250,1819,1919,2251,1837,1954
Myristic acid methyl ester (C14:0)	1815,1915,2247,1817,1917,2249,1836,1945,1839,1959,1842,1962,1844,1964
Myristic acid methyl ester (C14:0) at 4 wt %	1822,1922,2254
Myristoleic acid methyl ester	1818,1918,2250,1819,1919,2251
Myristoleic acid methyl ester (C14:1)	1815,1915,2247,1817,1917,2249
Myristoleic acid methyl ester (C14:1) at 2 wt %	1822,1922,2254
(E)-Myroxide	2120
trans-Myrtanol	2131

— N —

NAD ⁺	690
NADH	690
NADP ⁺	690
NADPH	690
Naled	1542,1543
Nandrolone	195,197,198,200,201
Naphthalene	2375,310,311,842,845,1117,1408,2010,1409,2011, 1451,1936,1480,2013,1481,2014,1483,2029,2365,2420,1493,2057,2370,2440,1497,2061,1498,2062,2373,2444,1502,2071,1503,2072, 1504,2073,1505,2074,1517,1518,1524,1527,1528,1530,1540,1541,1546,1547,1548,1549,1552,1553,1554,1555,1556,1557,1558,1560,1561, 1562,1563,1564,1567,1587,1582,2332,1593,1594,1595,1596,1597,1611,1612,1613,1614,1615,1616,1617,1618,2300,2467
Naphthalene-d ₈	842,1409,2011,1477,1757,2007,2364,2389,2415, 1524,1550,1551,1552,1553,1554,1555,1556,1557,1564
Naphthalene-d ₈	1567,1587
Naphthalene-d ₈	1795,1891

Naphthalene-d8 (I.S)	1558
1,4-Naphthoquinone	1550,1551
1-Naphthylamine	1550,1551
2-Naphthylamine	1484,2030,2366,2421,1550,1551,1673
1-(1-Naphthyl)ethylamine	1339,2618
(±)-1-(1-Naphthyl)ethylamine	1086,2601,2969,82
1-Naphthyl-N-methylcarbamate	1,295,294,302,1391,305,2004,2413
N-(1-Naphthyl)thiourea	1391,305
Naphyrone hydrochloride	469
Napropamide	313,1430,1641,1796,1892,1506,2075,1888,2067
Naproxen	850,899,1087,2970,1093,1094
Narasin	215
Naringin	359
Narirutin	353,354,359
Natriuretic Peptide, C-Type	1889,2068
Nebivolol	1088,2971
Neburon	1,295,294,302,2374,303,314,375
Nefazodone	157
Neo-chlorogenic acid	1275
Neodihydrocarveol	2167
(-)-Neomenthol	2126,2189,2655,2678
Neomenthol	2136
(+)-Neomenthol	2126,2189,2655,2678
Neon	1745
Neotame	346,347,348,349
Neral	2050,2434,2096,2099,2103,2105,2106,2120,2121,2131,2142,2166,2170,2180,2181
Nereistoxin oxalate	1890,2069
Nerol	2131,2142
Nerolidol	2111,2184
(E)-Nerolidol	2096,2131,2142
Nervonic acid methyl ester	1818,1918,2250,1819,1919,2251
Nervonic acid methyl ester (C24:1n9)	1815,1915,2247,1817,1917,2249
Nervonic acid methyl ester (C24:1n9) at 2 wt %	1822,1922,2254
Neryl acetate	2050,2434,2099,2103,2105,2106,2120,2121,2131,2142,2166,2170
Neurotensin	788
Nevirapine	911,1214
New Coccine	388
Niacin	1301
Niacinamide	122,1299,1300,1332,1333

Niacinamide (Vitamin B ₃)	334,335,332	<i>N</i> -Nitrosodi- <i>n</i> -propylamine	1468,1744,1991,2358,2385,2408,1524,1552,1553,1554,1555,1556,1557,1558,1564
Nicardipine hydrochloride	1089,2972,1090,2973	<i>N</i> -Nitrosomethylethylamine	1468,1744,1991,2358,2385,2408,1550,1551
Nicotinamide	1302,1303,1304,1306,1307,1308	<i>N</i> -Nitrosomorpholine	1550,1551
Nicotine	2289	<i>N</i> -Nitrosopiperidine	1468,1744,1991,2358,2385,2408,1550,1551
(±)-Nicotine	2288	<i>N</i> -Nitrosopyrrolidine	1550,1551
S(-)-Nicotine solution	245	Nitrothal- <i>isopropyl</i>	1887,2066
Nicotinic acid	1300,1302,1303,1304,1306,1307,1308,1309,1333	2-Nitrotoluene	297,1455,1695,2297,2354,2383,2466,1456,1696,2298
Nifedipine	896,1215	3-Nitrotoluene	297,1455,1695,2297,2354,2383,2466,1456,1696,2298
Nitenpyram	1358,19	4-Nitrotoluene	297,1455,1695,2297,2354,2383,2466,1456,1696,2298
Nitralin	1889,2068	5-Nitro- <i>o</i> -toluidine	1550,1551
Nitrazepam	135,935,1191,233,916,1091	Nitrous oxide	1743
Nitrazepam solution	833	Nivalenol	17,394
2-Nitroaniline	492,1484,2030,2366,2421,1552,1553,1554,1555,1556,1557,1558,1564,1673	Nivalenol hydrate	12,358
3-Nitroaniline	1484,2030,2366,2421,1552,1553,1554,1555,1556,1557,1558,1564,1673	Nizattidine	1173
4-Nitroaniline	1484,2030,2366,2421,1552,1553,1554,1555,1556,1557,1558,1564,1673	<i>trans</i> -Nonachlor	1388,1411,1482,2028,1507,2076,1571,1591,2325,2347
Nitrobenzene	296,1455,1695,2297,2354,2383,2466,1456,1696,2298,1504,2073,1524,1552,1553,1554,1555,1556,1557,1558,1564	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	1441,1927,1442,1928
Nitrobenzene- <i>ds</i>	1524,1550,1551,1552,1553,1554,1555,1556,1557,1558,1564	2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	1443,1929
4-Nitrocatechol	152,44	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	1441,1927,1442,1928
Nitrofen	1889,2068	2,2',3,3',4,5,5',6,6'-nonachlorobiphenyl	1443,1929
Nitrofurantoin	127,877,879	Nonadecane	1637
Nitrogen	1622,1627,1628,1639,1743,1747,1749,1750,1751,1753	Nonadecane (C19)	1636
Nitrogen (bulk)	1752,1754	Nonanal	1431,1572,1490,1580,2318,2330,1491,1581,2319,2331,1878,2044,2398,2430,1879,2046,2399,2431,1880,2048,2400,2432,1881,2052,2349,2352,1882,2053,2401,2436,1883,2054,2402,2437,1971,2405,2045,2350,2050,2434,2096,2099,2111,2184,2120,2166,2170
Nitromethane	2205,2206,2207,2450,2208,2209,2451	Nonane	1431,1572,1486,1487,1528,1530,1595,1601,1667,1602,1668,1610
2-Nitrophenol	90,1359,1386,1407,1475,1755,2005,1476,1756,2006,2363,2388,2414,1477,1757,2007,2364,2389,2415,1524,1531,1552,1553,1554,1555,1556,1557,1558,1564	<i>n</i> -Nonane	1592,1612
4-Nitrophenol	90,1359,1386,1407,1475,1755,2005,1476,1756,2006,2363,2388,2414,1477,1757,2007,2364,2389,2415,1524,1531,1552,1553,1554,1555,1556,1557	Nonane (C9)	1636
4-nitrophenol	1558	Nonanoic acid	1492,1583,2320,2333,1878,2044,2398,2430,1879,2046,2399,2431,1880,2048,2400,2432,1881,2052,2349,2352,1882,2053,2401,2436,1883,2054,2402,2437,1970,2404
4-Nitrophenol	1564	Nonanol	1878,2044,2398,2430,1879,2046,2399,2431,1880,2048,2400,2432,1881,2052,2349,2352,1882,2053,2401,2436,1883,2054,2402,2437,2103
4-Nitrophenyl β- <i>D</i> -maltoside	119	Nonan-3-ol	2138
Nitropropane	1676	Nonanone	1971,2405
2-Nitropropane	1504,2073,1725,1726,1727,1780	<i>trans</i> -2-Nonenal	1896,2403
4-Nitroquinoline <i>N</i> -oxide	1550,1551	1-Nonene	1612
(S)- <i>N</i> -Nitrosoanabasine (NAB) solution	245	2-Nonen-1-ol	1492,1583,2320,2333
<i>N</i> -Nitrosodi- <i>n</i> -butylamine	1468,1744,1991,2358,2385,2408,1550,1551	Nonyl acetate	2050,2434,2096,2099
<i>N</i> -Nitrosodithylamine	1468,1744,1991,2358,2385,2408,1550,1551	Nonylamine	1776
<i>N</i> -Nitrosodimethylamine	1468,1744,1991,2358,2385,2408,1552,1553,1554,1555,1556,1557,1558	Nonylphenol	83,299,341
<i>N</i> -Nitrosodiphenylamine	1468,1744,1991,2358,2385,2408,1524,1552,1553,1554,1555,1556,1557,1558,1564		

Nootkatone	2096
Norbomanol	2120
Norbuprenorphine solution	692
Norbuprenorphine glucuronide solution	692
Norclomipramine	1164,210,1166,211
Norcotinine	245
Nordiazepam solution	833
Nordiazepam-d ₅ solution	833
Nordihydroguaiaretic acid	276,337,1282,292
Nordoxepin	1164,210,1166,211,915,1165,1168
Norephedrine	992
Norepinephrine	144,180,254,955
Norethandrolone	195,197,198,200,201
Norfentanyl	464
Norfloracin	1005,356,878
Norfluoxetine hydrochloride	1008,1010
Norflurazone	1506,2075,1507,2076
Norgestrel	181,2639
DL-Norleucine	2814,681
DL-Norleucine, FMOC derivatives	2785,600
Normeperidine	427
Normeperidine solution	481
Normetanephrine	254
Normorphine	124,868
Normorphine solution	491
(±)-Normicotine solution	246
Noroxycodone	462
Norphenylephrine hydrochloride	2815,682,1092,2602,2974
Norsertaline	1196,252
Nortriptyline	1368,209,1164,210,1166,211,1167,212,1165,1168,1169,1170
DL-Norvaline	2816,683
DL-Norvaline (FMOC derivatives)	2786,601
(±)-Norverapamil hydrochloride	1222
Noscapine	30,407,853
Noscapine hydrochloride hydrate	490
NSAIDs	1094
Nuarimol	1447,1681,1828,1933
Nucleic acids	684

— O —

OCDD	1436,1575,1812,1912,1437,1576,1813,1913
OCDF	1436,1575,1812,1912,1437,1576,1813,1913
Ochratoxin A	331
(Z)-β-Ocimene	2050,2434
(E)-β-Ocimene	2050,2434,2096,2103,2120,2121,2131,2137,2138,2142,2166,2167
trans-β-Ocimene	2170
(Z)-β-Ocimene	2167,2096,2121,2131,2137,2138,2142,2166
2,2',3,3',4,4',5,5'-Octachlorobiphenyl	1441,1927,1442,1928
2,2',3,3',4,4',5,5'-octachlorobiphenyl	1443,1929
2,2',3,3',4,5',6,6'-Octachlorobiphenyl	1388,1411,1482,2028,1506,2075,1507,2076
2,2',3,3',5,5',6,6'-Octachlorobiphenyl	1441,1927,1442,1928
2,2',3,3',5,5',6,6'-octachlorobiphenyl	1443,1929
Octachloronaphthalene	1571,1591,2325,2347
Octacosane	1486,1487,1526
Octadecadienoic acid	1784
Octadecane	1486,1487,1526,1637,2316,2317
Octadecane (C18)	1636
Octadecanoate (C18:0)	1636
Octadecanoic acid	1873,2031,2278
cis-11-Octadecenoic methyl ester	1867,2018,2274,1868,2019,2275,1869,2020,2276
3,5-octadien-2-one	2045,2350
Octanal	1490,1580,2318,2330,1491,1581,2319,2331,1971,2405,2050,2434,2096,2099,2103,2111,2184,2120,2166,2170
Octane	1431,1572,1486,1487,1592,1595,1601,1667,1602,1668,1610,1971,2405
n-Octane	1612
1,2-Octanediol	1646,2489
1,2-Octanediol (O-TFA derivatives)	1647,2490
Octanoic acid	1873,2031,2278,1970,2404,1971,2405,2060,2443
Octanol	2099,2103,2120,2136,2166
1-Octanol	2170,2311,2312,2313,2314,2316,2317
Octan-3-ol	2137,2138,2167
δ-Octanolactone	322
2-Octanone	2311,2312,2313,2314,2316,2317
Octan-3-one	2138
1-Octen-3-ol	2136
Octyl acetate	2050,2434,2096
3-Octyl acetate	2167
Octylamine	1776

Octyl gallate	276,337,1282,292
2-Octyl-4-isothiazolin-3-one	1419,406
Octylphenol	83
Oenothein B	1095,182
Oenothein B isomer	1095,182
Ofloxacin	1004,355
Oleate (C18:1)	1636
Oleic acid	351,357
Oleic acid methyl ester	1637,1818,1918,2250,1819,1919,2251,1837,1954,1840,1960,1845,1965,1846,1966,1847,1967
Oleic acid methyl ester (C18:1n9c)	1815,1915,2247,1817,1917,2249,1836,1945,1839,1959,1842,1962,1844,1964
Oleic acid methyl ester (C18:1n9c) at 4 wt %	1822,1922,2254
OLL	390,391,392,393
OLLn	390,391,392,393
OLO	324
Omeprazole	1372,247,248,249,250,1097,2975,1173
Omeprazole sulfone	1372,247,248,249,250
Omethoate	1350,1401,1860,1995,1447,1681,1828,1933,1887,2066
OOL	390,391,392,393
OOLn	390,391
OOP	390,391
OOPo	390
OPP	1890,2069
Ordram	1467,1990,2357,2407
DL-Ornithine monohydrochloride	2817,693
Oryzalin	1419,406
Ovalbumin	757,760,826
(O) Ovalbumin	1185,808
Ovalbumin (257-264) chicken	1129,187,825
Oxabetrinil	1889,2068
Oxadiazon	1448,1682,1829,1934,1467,1990,2357,2407,1887,2066
Oxadixyl	1889,2068
Oxalide	2111,2184
Oxamniquine	1098,2976
Oxamyl	1,295,294,302
Oxazepam	136,936,137,937,138,938,1190,232,1207,273,489,875,876,915,916,1099,2977,1100,2978
Oxazepam solution	833,1224
Oxazepam-d ₅ solution	833
Oxazepam glucuronide solution	833,1224
Oxazepam-d ₅ glucuronide	833

Oxo-isoctyl alcohols	1728
Oxpoconazole	1890,2069
Oxpoconazole fumarate; fumarate portion	1890,2069
Oxprenolol	954,1101,2979
Oxprenolol hydrochloride	1102,2980,1103,2981
Oxycodone	427,428,462
Oxycodone solution	264,484,481,692
4,4'-Oxydianiline	1673
Oxyfluorfen	1887,2066
Oxygen	1639,1747,1749,1753,1754
Oxymetholone	195
Oxymorphone-D ₃ solution	692
Oxymorphone-3-β-D-glucuronide solution	692
Oxyphenonium bromide	1134
Oxytetracycline	1157
Oxytocin	709,710,720,721,820

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Paarlan	1467,1990,2357,2407
Paclitaxel	1104,1153,1154,1220
Paclitubtrazole	1888,2067
Palmitelaidic acid	357
Palmitic acid	351,357
Palmitic acid methyl ester	1637,1818,1918,2250,1819,1919,2251,1837,1954,1840,1960,1846,1966,1847,1967
Palmitic acid methyl ester (C16:0)	1815,1915,2247,1817,1917,2249,1836,1945,1839,1959,1842,1962,1844,1964
Palmitic acid methyl ester (C16:0) at 6 wt %	1822,1922,2254
Palmitic acid methyl ester	1845,1965
Palmitoleic acid methyl ester	1818,1918,2250,1819,1919,2251,1837,1954,1840,1960
Palmitoleic acid methyl ester (C16:1)	1815,1915,2247,1817,1917,2249,1836,1945,1839,1959,1844,1964
Palmitoleic acid methyl ester (C16:1) at 2 wt %	1822,1922,2254
Papaverine	30,407,853,1233,854
Papaverine hydrochloride	490
Parabens	285
Paracetamol	910,1145
Paraoxon-methyl	1507,2076
Paraquat	13,1356,1392,312
Parathion	1350,1401,1860,1995,1466,1740,1858,1989,2356,2384,2392,2406,1471,1746,1861,1997,2361,2386,2393,2411,1544,1545,1550,1551,1585,2342,2004,2413

Parathion-methyl	1419,406,1350,1401,1860,1995,1449,1683,1830,1935,1544,1545,1885,2064	2,2',4,6,6'-pentachlorobiphenyl	1443,1929
Paraxanthine	1362,1427,148,946	3,3',4,4',5'-Pentachlorobiphenyl	1441,1927,1442,1928
Paroxetine	239,811	3,3',4,4',5'-Pentachlorobiphenyl	1443,1929
Paroxetine hydrochloride hemihydrate	1216	3,3',4,4',5'-Pentachlorobiphenyl	1501
PBDE 8	1450,1684	3,3',4,5,5'-Pentachlorobiphenyl	1501
PBDE 17	1450,1684	2,2',4,5,5'-Pentachlorobiphenyl (No. 101)	1402,1999
PBDE 28	1450,1684	2,3,3',4,4'-Pentachlorobiphenyl (No. 105)	1402,1999
PBDE 66	1450,1684	2,3,4,4',5'-Pentachlorobiphenyl (No. 114)	1402,1999
PBDE 100	1450,1684	2,3',4,4',5'-Pentachlorobiphenyl (No. 118)	1402,1999
PBDE 138	1450,1684	2',3,4,4',5'-Pentachlorobiphenyl (No. 123)	1402,1999
PBDE 153	1450,1684	3,3',4,4',5'-Pentachlorobiphenyl (No. 126)	1402,1999
PBDE 154	1450,1684	Pentachloroethane	1504,2073,1546,1547,1548,1549,1550,1551
PBDE 190	1450,1684	Pentachloronitrobenzene	1351,1403,1862,2000,1509,1510,1511,1550,1551,1887,2066
PBDE 209	1450,1684	Pentachlorophenol	1355,1389,2,298,90,1359,1386,1407,1475,1755,2005,1388,1411,1482,2028,1476,1756,2006,2363,2388,2414, 1477,1757,2007,2364,2389,2415,1506,2075,1507,2076,1524,1531,1552,1553,1554,1555,1556,1557,1558,1564,1571,1591,2325,2347
pBR322 <i>Hae</i> III Digest	695	Pentachlorophenol (acylated)	2040,2426,2042,2428
PCB congeners	1385,1474,1472,2362	Pentacosane	1637
1,2,3,7,8-PCDD	1436,1575,1812,1912,1437,1576,1813,1913	Pentacosane (C25)	1636
1,2,3,7,8-PCDF	1436,1575,1812,1912,1437,1576,1813,1913	Pentadecane	1431,1572,1602,1668,1637,2316,2317
2,3,4,7,8-PCDF	1436,1575,1812,1912,1437,1576,1813,1913	Pentadecane (C15)	1636
PCP	2291,2463	Pentadecanoic acid methyl ester	1818,1918,2250,1819,1919,2251
Pebulat	1507,2076	Pentadecanoic acid methyl ester (C15:0)	1815,1915,2247,1817,1917,2249
Pebulate	1506,2075	Pentadecanoic acid methyl ester (C15:0) at 2 wt %	1822,1922,2254
PEG 40, 000Da	696	<i>cis</i> -10-Pentadecenoic acid methyl ester	1818,1918,2250,1819,1919,2251
PEG 26, 100Da	696	<i>cis</i> -10-Pentadecenoic acid methyl ester (C15:1)	1815,1915,2247,1817,1917,2249
PEG 81, 400Da	696	<i>cis</i> -10-Pentadecenoic acid methyl ester (C15:1) at 2 wt %	1822,1922,2254
PEG 50, 630Da	696	Pentafluorophenol	1531
PEG 8, 730Da	696	Pentamethylbenzene	1621
70 kDa protein (undisclosed drug candidate)	777	2,2,4,6,6-Pentamethyl-3-heptene	1721
Pelargonidin chloride	1320,1321	Pentanal	1490,1580,2318,2330,1491,1581,2319,2331,1969,1971,2405,2051,2435
Pencanazole	1347,1394,1798,1894,1797,1893	Pentane	1528,1530,1592,1595,1601,1667,1602,1668,1610,1611,1612,1721,2210,2211,2212,2452,2213,2214,2453
Penconazole	1887,2066	<i>n</i> -Pentane	1665
Pendimethalin	1430,1641,1796,1892,1449,1683,1830,1935,1887,2066	<i>n</i> -Pentane	1723
<i>DL</i> -Penicillamine	1108,2982	1,2-Pentanediol	1646,2489
Penicillin G	184,1009,1041	1,2-Pentanediol (O-TFA derivatives)	1647,2490
Penicillin V	1009,1041	2,3-Pentanedione	2056,2439
2,2',4,4',5'-Pentabromodiphenyl ether solution	1450,1684	Pentanol	1969
Pentachlorobenzene	1550,1551,1571,1591,2325,2347	1-Pentanol	1644,1666
2,2',3',4,6-Pentachlorobiphenyl	1388,1411,1482,2028,1506,2075,1507,2076	2-Pentanol	1644,1969
2,2',4,6,6'-Pentachlorobiphenyl	1441,1927,1442,1928		

3-Pentanol	1644,1969	Perylene-d12 (I.S.)	1558
Pentedrone hydrochloride	471,478	Pesticides	1515
1-Pentene	1612	Petunidin 3-(6-acetylglucoside)	336
<i>cis</i> -2-Pentene	1612,1721	Petunidin 3-(6-cumarylglucoside)	336
<i>trans</i> -2-Pentene	1612,1721	Petunidin 3-glucoside	336
3-Penten-2-one	2056,2439	α -Phellandrene	2047,2175,2351,2353,2050,2434,2096,2099,2103,2105,2106,2120,2121,2131,2142,2166,2170
2-Pentenyl hexanoate	1876,2035,2396,2423	β -Phellandrene	2121,2138,2167
Pentobarbital	414,925,416,927,417,929,418,930,928	Phenacetin	1372,247,248,249,250,870,1198,1550,1551
Pentoxazone	1889,2068	Phenanthrene	2375,310,311,1388,1411,1482,2028,1408,2010,1409,2011, 1451,1936,1480,2013,1481,2014,1483,2029,2365,2420,1506,2075,1507,2076,1517,1518,1524,1540,1541,1552,1553,1554,1555,1556,1557, 1558,1560,1561,1562,1563,1564,1567,1587,1795,1891
Pentyl acetate	1676	Phenanthrene-d ₁₀	1388,1411,1482,2028,1483,2029,2365,2420,1506,2075, 1507,2076,1524,1550,1551,1552,1553,1554,1555,1556,1557,1564
Pentylamine	1776	Phenanthrene-d ₁₀	1567,1587
Pentyl butanoate	1876,2035,2396,2423	Phenanthrene-d ₁₀	1795,1891
Pentyl hexanoate	1876,2035,2396,2423,1971,2405	Phenanthrene-d ₁₀ (I.S.)	1558
Pentylone hydrochloride	469	Phencyclidine	867
Peonidin 3-(6-acetylglucoside)	336	Phenethyl alcohol	2131
Peonidin chloride	1320,1321	Phenmedipham	1890,2069
Peonidin 3-(6-cumarylglucoside)	336	Phenobarbital	1200,269,485,1201,270,486,414,925,416,927,417,929,418,930,928,2288,2289
Peonidin 3- <i>O</i> -glucoside chloride	336	Phenol	48,90,1117,1283,1359,1386,1407,1475,1755,2005,1476,1756,2006,2363,2388,2414,1477,1757,2007,2364,2389,2415,1531,1552, 1553,1554,1555,1556,1557,1558,1564
Peppermint oil	2136	Phenol-d ₆	1524,1550,1551,1552,1553,1554,1555,1556,1557,1558,1564
Perilla alcohol	2050,2434,2170	Phenols	1531
Perilla aldehyde	2050,2434,2103,2120,2166	Phenothrin-1	1890,2069
(-)-Perillaaldehyde	2170	Phenothrin-2	1890,2069
(+)-Perillaaldehyde	2096	2-Phenoxyethanol	282,283,285,286
Perillyl acetate	2131	Phenoxyethylpenicillinic acid	184
Peritone	2136	1-Phenoxy-2-propanol	284,282,283,285,286,1465,2355
Permanent gases	1749	Phensuximide	1111,2983,1112,2984
<i>cis</i> -Permethrin	1347,1394,1798,1894,1507,2076,1797,1893	Phentermine	2234,2285,2457,2460
<i>cis/trans</i> -Permethrin	1506,2075	Phenthoate	1350,1401,1860,1995,1885,2064
<i>trans</i> -Permethrin	1347,1394,1798,1894,1507,2076,1797,1893	Phentoat	1448,1682,1829,1934
Permethrin-1	1887,2066	Phenylacetaldehyde	1878,2044,2398,2430,1879,2046,2399,2431,1880,2048,2400,2432,1881,2052,2349,2352,1882,2053,2401,2436, 1883,2054,2402,2437,1896,2403
Permethrin-2	1887,2066	Phenylacetic acid	91
Permethrin isomer	1509,1510,1511	<i>o</i> -Phenylalanine	2818,723
Permethrin (isomers) solution	1404,2001	<i>l</i> -Phenylalanine	2818,723,1897,2304
Permetrin	1445,1679,1826,1931	α -Phenylalanine	2819,724
Peroxidase	722		
Perylene	1408,2010,1409,2011,1567,1587		
Perylene-d ₁₂	1388,1411,1482,2028,1408,2010,1409,2011,1434,1435,1483,2029,2365,2420, 1506,2075,1507,2076,1524,1550,1551,1552,1553,1554,1555,1556,1557,1564		
Perylene-d ₁₂	1567,1587		

α -Phenylalanine (AQC derivatives)	2739,518	Phosfolan	1350,1401,1860,1995
α -Phenylalanine (t-BOC derivatives)	2753,535	Phosmet	1419,406,1350,1401,1860,1995,1445,1679,1826,1931,1542,1543,1544,1545,1887,2066
α -Phenylalanine (FMOc derivatives)	2787,602	Phosphamidon	1350,1401,1860,1995
Phenylbutazone	1217	Phosphamidon	1350,1401,1860,1995
4-Phenylcyclohexene	1491,1581,2319,2331	Phosphamidon	1542,1543,1544,1545,1885,2064
Phenylenediamine	1550	L- α -Phosphatidylcholine	399
<i>p</i> -Phenylenediamine	1551	L- α -Phosphatidylethanolamine from egg yolk	399
Phenylephrine	850,1113,2821	Phosphatidylinositol ammonium salt solution	399
Phenylethanol	1759,2149,2541,2680	L- α -Phosphatidyl-L-serine from <i>Glycine max</i> (soybean)	399
1-Phenylethanol	322	Phospholipase-A	801
(<i>R</i>)-(+)-1-Phenylethanol	1760,2150,2542,2681	Phospholipase B	801
(\pm)-(1-Phenyl)ethanol	1759,2149,2541,2680	Phosphorylase b from rabbit muscle	744
Phenylethyl Alcohol	1878,2044,2398,2430,1879,2046,2399,2431,1880,2048,2400,2432,1881,2052,2349,2352,1882,2053,2401,2436,1883,2054,2402,2437	Phthalate esters	1478,1769,2009,2192
Phenylethyl alcohol	2056,2439,2111,2184	Phthalide	1886,2065
1-Phenylethylamine	1761,2543	Phylloquinone (K1)	1255,1256,1253
R-(+)-1-Phenylethylamine (N-Chloroacetyl derivative)	1763,2545,1764,2546	Phytol	2111,2184
S-(-)-1-Phenylethylamine (N-Chloroacetyl derivative)	1763,2545,1764,2546	Picloram	1355,1389,2,298
R-(+)-1-Phenylethylamine (N-TFA derivative)	1762,2544,1765,2547,1766,2548,1767,2549,1768,2550	2-Picoline	1550,1551
S-(-)-1-Phenylethylamine (N-TFA derivative)	1762,2544,1765,2547,1766,2548,1767,2549,1768,2550	2-Picoline (2-Methyl pyridine)	1673
Phenylethyl benzoate	2111,2184	Pilocarpine	1114,1195
<i>N</i> -(1-Phenylethyl)maleimide	2604,92	Pindolol	131,139,943,896,895,941,942,1115,2985,1116,2986
Phenylethyl phenylacetate	2111,2184	α -Pinene	2137
3-Phenyl furan	1878,2044,2398,2430,1879,2046,2399,2431,1880,2048,2400,2432,1881,2052,2349,2352,1882,2053,2401,2436,1883,2054,2402,2437	(-)- α -Pinene	1431,1572
Phenyl isocyanate	2338	α -Pinene	1431,1572,2047,2175,2351,2353,2050,2434,2095,2096
α -3-Phenylactic acid	1285,2605,2707,3038,373,93	α -Pinene	2096,2099,2103,2105,2106,2112,2120,2121,2124,2131,2136,2138,2142,2166,2167,2170
Phenyl methyl ketone	1492,1583,2320,2333	β -Pinene	2050,2434,2056,2439,2096,2097,2099,2103
4-Phenyl-2-oxazolidinone	2606,94,2607,95	(-)- β -Pinene	2105
(\pm)-1-Phenylpentanol	1759,2149,2541,2680	β -Pinene	2111,2184,2120,2121,2124,2131,2136,2137,2138,2142,2166,2167,2169
1-Phenyl-2-propanol	1642,2487	(-)- β -Pinene	2170
2-Phenyl-2-propanol	1492,1583,2320,2333	d- β -Pinene	1771,2152,2552,2683,1773,2154,2554,2685,1775,2156,2556,2687
2-Phenylpropionic acid	1286,3039,323,374	l- β -Pinene	1771,2152,2552,2683,1773,2154,2554,2685,1775,2156,2556,2687
Phenylsuccinic anhydride	2608,96	d- α -Pinene (R-(+)- α -Pinene)	1770,2151,2551,2682,1772,2153,2553,2684
Phloxine B	388	l- α -Pinene (S-(-)- α -Pinene)	1770,2151,2551,2682,1772,2153,2553,2684
Phorate	1419,406,1350,1401,1860,1995,1447,1681,1828,1933,1466,1740,1858,1989,2356,2384,2392,2406,1470,1996,2360,2410,1471,1746,1861,1997,2361,2386,2393,2411,1542,1543,1544,1545,1550,1551,1885,2064	(-)- <i>trans</i> -Pinocarveol	2095
Phosalone	1350,1401,1860,1995,1885,2064,2004,2413	Pioglitazone hydrochloride	840
Phosdrin	1350,1401,1860,1995	Pipecolic acid	185,2640,2822,726
		Pipenzolate bromide	1134
		Piperacillin	1009,1041
		<i>trans</i> -Piperitol	2131

Piperitone	2137,2138,2167	Procyanidin B3	1287
Piperonylbutoxide	1404,2001,1889,2068	Procyimidone	1887,2066,2004,2413
Piperophos	1885,2064	Profenfos	1350,1401,1860,1995
Pirenzepine	1173	Profenfos	1449,1683,1830,1935,1885,2064
Pirimicarb	1446,1680,1827,1932	Progesterone	851
Pirimiphos-methyl	1448,1682,1829,1934,1885,2064	Progesterone solution	1374,257
Pirmiphos-ethyl	1350,1401,1860,1995	Proglumide sodium salt	1122,2987,1123,2988
Pirmiphos-methyl	1350,1401,1860,1995	Prohydrojasmon-1	1890,2069
Piroxicam	866,897,899,900,901,902	Prohydrojasmon-2	1890,2069
PLL	390,391,392,393	D-Proline	2823,729
PLLn	392,393	L-Proline	2823,729,1897,2304
PLO	390,391	DL-Proline	2824,730,2825,731,2844,830
PLP	390,391	DL-Proline (FMOC derivatives)	2788,603
POL	393	D-Proline methyl ester (N-Acetyl derivative)	2016,2306,2704,2727
POLn	390,391	L-Proline methyl ester (N-Acetyl derivative)	2016,2306,2704,2727
POL+SLL	392	Promazine	165,578
Poly- α -alanine	207	Promecarb	1449,1683,1830,1935
Poly- α -alanine, 1,000-5,000 Da	757,758	Promethazine	1124
Polybrominated diphenyl ether (PBDE)	1450,1684	Promethazine hydrochloride	1125,2989
Poly(ethylene glycol)	97	Promethazine sulfoxide	1126,2990
POO	393	Prometon	1466,1740,1858,1989,2356,2384,2392,2406,1489,1788,1877,2039,2369,2391,2397,2425,1506,2075,1507,2076
PoOLn	390,391	Prometryn	1466,1740,1858,1989,2356,2384,2392,2406,1489,1788,1877,2039,2369,2391,2397,2425,1506,2075,1507,2076,1888,2067
PoOO	391	Pronamide	1506,2075,1550,1551
POP	390,391,392	Propachlor	1391,305,316,1467,1990,2357,2407,1506,2075,1507,2076,1509,1510,1511,1888,2067
PoPO	390	Propanal	1969
Posaconazole solution	831,832	Propane	1592,1612,1628,1665,1723,1724,1751
PPL	392,393	Propane (215 ng on column)	1752
Pravastatin	1148,194,851,964	1,2-Propanediol	1383,1457,1646,2489,1705,1977,2187,2045,2350
Prazepam	2289	1,3-Propanediol	1703,1975,2185,1704,1976,2186
Prednisolone	169,199,1290,204,851,1120	1,2-Propanediol (O-TFA derivatives)	1647,2490
Prednisone	199,203,1290,204,205,453	1-Propanethiol	1685
Pregabalin solution	836	2-Propanethiol	1685
Pretilachlor	1888,2067	Propanil	313,1889,2068
Prifenox-2	1887,2066	Propanoic acid, 2-methyl-, 3-hydroxy-2,4,4-trimethylpentyl ester	1491,1581,2319,2331
Prilocaine	125,872	Propanol	1490,1580,2318,2330
Procainamide hydrochloride	1121,1187	n-Propanol	1649,2380,1676
Procaine hydrochloride	490	1-Propanol	1431,1572,1644,1666,1725,1726,1727,1895,1969,
Procyanidin B1	1287	2026,2027,2210,2211,2212,2452,2213,2214,2453,2225,2455,2292,2464,2293,2294	
Procyanidin B2	376,1287	2-Propanol	1568,1588,2322,2344,1676,1676,1727,1895,2210,2211,2212,2452,2213,2214,2453,2294

2-Propanol, 0.0785% (I.S.)	1635,2378	R-(+)-Propylene oxide	1777,2557
Propantheline	119	S-(-)-Propylene oxide	1777,2557
Propantheline bromide	1134	Propylene (~95 %)	1723
Propaphos	1885,2064	Propyl gallate	276,337,1282,292,1898,2182
Propargite-1	1889,2068	Propyl 4-hydroxybenzoate	1748,1998,2190,2223,2387,2412,2447,2454
Propargite-2	1889,2068	Propyl isocyanate	2338
Propazine	110,15,111,16,1357,1393,315, 1466,1740,1858,1989,2356,2384,2392,2406,1467,1990,2357,2407,1489,1788,1877,2039,2369,2391,2397,2425,1506,2075,1507,2076	(±)-Propyl-γ-lactone	1729,2118,2529,2676
Propetamphos	1350,1401,1860,1995,1449,1683,1830,1935	Propyl paraben	282,283,286
Propham	1,295,294,302,2374,303,1391,305,1444,1678,1825,1930	Propylparaben	289
Propiconazole-1	1888,2067	Propyl paraben	290,291,1106
Propiconazole-2	1888,2067	Propyltoluene	1621
Propiconazole isomers	1430,1641,1796,1892	Propyne	1665,1723,1724,1751
Propionaldehyde	21,2326	Propyne (215 ng on column)	1752
Propionaldehyde-2,4-dinitrophenylhydrazone	22,2334,23,2335	Propyzamide	1430,1641,1796,1892,1446,1680,1827,1932,1507,2076,1887,2066
Propionaldehyde-2,4-DNPH	2337	Prothiofos	1885,2064
Propionaldehyde (2,4-DNPH derivative)	2336,24	Prothiophos	308
Propionic acid	1808,1908,2244,1809,1909,2245,1873,2031,2278,1969,1970,2404	Prothoate	1448,1682,1829,1934
Propionic acid, 0.7%	1993	Protriptiline	1167,212,1169,1170
Propionitrile	1504,2073	Protriptiline hydrochloride	1165
Propoxur	1,295,294,302,1347,1394,1798,1894,1797,1893	Prowl®	1467,1990,2357,2407
Propoxyphene	427,445	Pseudoephedrine	850,871,912,992,1132,2994,1145,1160,2234,2285,2457,2460
(+)-Propoxyphene solution	481	Pseudolimonene	2138
Propranolol	139,943,931,942,954	Pseudouridine	686
Propranolol hydrochloride solution	1228	Psoralen	1262
rac-Propranolol hydrochloride	1128,2992	Pulegone	2047,2175,2351,2353,2136,2137,2138
(±)-Propranolol hydrochloride	837,1127,2991,1342,3025	Pullulan MW 10,000	378,764
Propyl acetate	1676,2210,2211,2212,2452,2213,2214,2453	Pullulan MW 113,000	378,764
n-Propyl acetate	1675,1725,1726,1727,1780,1969,1971,2405	Pullulan MW 210,000	378,764
n-Propyl alcohol	1780	Pullulan MW 1,320	378,764
Propylamine	1776	Pullulan MW 342	378,764
N-Propylaniline	32	Pullulan MW 366,000	378,764
Propylbenzene	1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1505,2074,1548,1549,1610,1621	Pullulan MW 6,000	378,764
n-Propylbenzene	1504,2073,1546,1547,1612	Pullulan MW 21,700	378,764
iso-Propylbenzene	1610	Pullulan MW 48,800	378,764
α-Propyldopacetamide	1172,213	Pullulan MW 805,000	378,764
Propylene	1665,1724,1751	Pyraclufos	1885,2064
Propylene (215 ng on column)	1752	Pyraclostrobin	1419,406,1890,2069
Propylene glycol	1703,1975,2185,1704,1976,2186	Pyraflufen-ethyl	1890,2069
		4-Pyran-4-one	2056,2439

Pyrazine	2056,2439
Pyrazophos	1886,2065
Pyrazoxyfen	1889,2068
Pyrene	2375,310,311,1388,1411,1482,2028,1408,2010,1409,2011,1451,1936,1480,2013,1481,2014,1483,2029,2365,2420,1506,2075, 1507,2076,1517,1518,1524,1540,1541,1552,1553,1554,1555,1556,1557,1558,1560,1561,1562,1563,1564,1567,1587
Pyrene-d ₁₀	1484,2030,2366,2421
Pyrene-d ₁₀	1567,1587
Pyributicarb	1887,2066
Pyridaben	1447,1681,1828,1933,1887,2066
Pyridafenthion	1885,2064
Pyridaphenthion	1350,1401,1860,1995,1430,1641,1796,1892
Pyridine	1550,1551,1552,1553,1554,1555,1556,1557,1558,2056,2439,2205,2206,2207,2450,2208,2209,2451
Pyridoglutethimide	1133,2995
Pyridoxine	122,1301,1302,1303,1304,1309
Pyridoxine hydrochloride	1299,1300,1306,1307,1308,1332,1333
Pyridoxine hydrochloride (Vitamin B ₆)	334,335,332
1-(2-Pyridyl)piperazine	2340,27
Pyrifenoxy-1	1887,2066
Pyrimethamine	1199
Pyrimethanil	1890,2069
Pyrimidifen	1887,2066
Pyriminobac-E-methyl	1887,2066
Pyriminobac-Z-methyl	1887,2066
Pyrimiphos-ethyl	1446,1680,1827,1932
Pyriproxyfen	1889,2068
Pyrocatechol	152,44,1283
α-Pyroglutamic acid	2826,766
Pyroquilon	1889,2068
Pyrovalerone hydrochloride solution	472
Pyrrrole	2056,2439
Pyrrrole-2-carboxaldehyde	2056,2439
α-Pyrrolidinoveralphenone hydrochloride solution	470

— Q —

Quercetin	352,1259
Quercetin-3-O-glycoside	1275
Quercitrin	1259,1266,1276
Quinalphos	1419,406,1350,1401,1860,1995,1885,2064
Quinapril	123,849

Quinapril hydrochloride	1211
Quinidine	30,67,256,407,853,846,1233,854,931,1135,1218
Quinine	30,407,853,1233,854
Quinoclamine	1886,2065
Quinoxifen	1887,2066
Quizalofop-ethyl	1890,2069

— R —

Rabeprazole	1136,2996
Ranitidine	1173
Rapamycin	188
Rapeseed oil	1843,1963
RCS-4 (322.19 m/z)	1227,839
RCS-8 (376.246 m/z)	1227,839
RDX	296,465
Residual solvents	2224
Resmethrin	1888,2067
Resorcinol	152,44,1283
cis-Resveratrol	2024,2418,2025,2419
trans-Resveratrol	2024,2418,2025,2419
Retene	1408,2010,1409,2011
Retinol	1296
Retinol palmitate	1255,1256,1295,1296,1327,1328
Retinyl acetate	1255,1256,1295,1296,1327,1328
Retinyl palmitate	1328
RGAGGLGLGK-amide	771
Rhamnitol	2036,2037
Ribitol	386,2036,2037
(-)-Riboflavin	1219,274,1300,1302,1303,1304,1333
Riboflavin (B2)	1306,1307,1308
Riboflavin (Vitamin B ₂)	334,335,332
Ribonuclease	754,755,756
Ribonuclease A	739,758,759,826
Ribonuclease A	829
Ribonuclease A from bovine pancreas	1129,187,704,732,733,734,735,736,737,738,743,1130,746,747,762,1184,805,825
(R) Ribonuclease A	1185,808
Ribonuclease A bovine pancreas (13.7 kDa)	493
Ribonucleosides	769
Ritalinic acid	1138,2997,446

Ritonavir	911
Robenidine	281,957
Rolitetracycline	1157
Ro-Neet	1467,1990,2357,2407
Ronnel	1350,1401,1860,1995,1542,1543,1544,1545,1571,1591,2325,2347
Rose bengal	388
cis-Rose oxide	2112
trans-Rose oxide	2112
Rosmarinic acid	1284
Roxarsone	4
Ruelene (cruformate)	100,2609
Rutin	1259,1275
Rutin hydrate	376,377
RVYIHP1	531,932

— S —

Sabinene	2050,2434,2056,2439,2096,2099,2103,2120,2121,2131,2136,2137,2138,2142,2161,2166,2167
(+)-Sabinene	2170
cis-Sabinene hydrate	2050,2434
cis-Sabinene hydrate	2096,2120,2137,2138,2167
trans-Sabinene hydrate	2103,2136,2138,2166
Safrole	1550
Salbutamol	1140,2999
Salicylic acid	37,1279,370,87,1281,372,89,279,910,922,978,979,1141,1236
Salinomycin	1174
Salinomycin SV	215
β-Santalene	2096
(Z)-β-Santelene	2050,2434
Saquinavir	911
Sarafloxacin	1004,355,1005,356,1013
Sauvagine	788
scFc	673
scFc	675,676,678
scFc	768
Scopolamine	119,885,886
Sebuthylazin	5
Secobarbital	414,925,416,927,417,929,418,930,928
Secodehydroabietic acid	1784
Selegiline (Deprenyl)	189,448,480,2897,975

α-Selinene	2103,2166
β-Selinene	2124
Se-Methyl-seleno- <i>DL</i> -cysteine	1068,2955
Semivolatiles	1506,2075
Sencor	1467,1990,2357,2407
Serine	819
D-Serine	2827,773
L-Serine	508,509,727,2827,773,1897,2304
DL-Serine	2828,774,2829,775
DL-Serine (AQC derivatives)	2740,519,2741,520
DL-Serine (FMOC derivatives)	2789,604
Serotonin	191,192
Sertraline	157,1196,252
Sertraline hydrochloride	1142,3000
β-Sesquiphellandrene	2096,2131,2142
cis-Sesquisabinene hydrate	2096
Sethoxydim	1419,406
Sibutramine hydrochloride monohydrate	1143,3001,1144,3002
Siduron	1,295,294,302,2374,303,1430,1641,1796,1892
Siduron A	314,375
Siduron B	314,375
Silafuofen	1889,2068
Sildenafil	995,996
Silibinin	1266
Siloxane	1574,2328
Silybin A	1276,1288
Silybin B	1266,1276,1288
Silychristin	1266,1276,1288
Silydianin	1266,1276,1288
Simazine	5,110,15,111,16,1391,305,1357,1393,315,316,1351,1403,1862,2000,1388,1411,1482,2028,1430,1641,1796,1892,1466,1740,1858,1989,2356,2384,2392,2406,1467,1990,2357,2407,1489,1788,1877,2039,2369,2391,2397,2425,1507,2076,1544,1545,1888,2067
Simeconazole	1886,2065
Simetryn	1466,1740,1858,1989,2356,2384,2392,2406,1489,1788,1877,2039,2369,2391,2397,2425,1506,2075,1507,2076,1889,2068
Simstatin	1148,194
Simvastatin	964
α-Sinensal	2103,2131,2166
β-Sinensal	2131
Sirolimus solution	1229

β-Sitosterol	1354,1412,1875,2034,1874,2033
SLL	391,393
SLO	324
Sodium glycochenodeoxycholate	234
Sodium glycochenodeoxycholate	237,238
Sodium taurochenodeoxycholate	234,237
Sodium taurodeoxycholate hydrate	234
Sodium taurodeoxycholate hydrate	237
Sodium tauroolithocholate	234
Sodium taurosodeoxycholate	234
SOL	390,391,393
SOLn	391
Solone	205
SOL+POO	392
Solvents	2224
SOO	390,391
SOP	390,391
Sorbate	338
Sorbic acid	1279,370,87,1281,372,89,280,334,332,335,346,347,910
Sorbic acid, 0.7%	1993
(±)-Sotalol hydrochloride	140,2633,2720,419,1146,3003,1147,3004
Soybean oil	1874,2033
Sparfloxacin	880,881
Spathulenol	2095,2096,2131,2142
Spearmint oil	2169
Spermidine	143
Spermine	143
Sphingomyelin	399
Spirodiclofen	1890,2069
Spiromesifen	1419,406
Stavudine	911
Stearic acid	351,357
Stearic acid methyl ester	1637,1818,1918,2250,1819,1919,2251,1837,1954,1840,1960,1845,1965,1846,1966,1847,1967
Stearic acid methyl ester (C18:0)	1815,1915,2247,1817,1917,2249,1836,1945,1839,1959,1842,1962,1844,1964
Stearic acid methyl ester (C18:0) at 4 wt %	1822,1922,2254
Steroids	195
Sterol ester triterpene alcohols	1884,2063
Sterols	1874,2033
Stigmasterol	1354,1412,1875,2034,1874,2033

trans-Stilbene oxide	101,2610
Stirofos	1506,2075
Stirophos	1542,1544,1545
Storophos	1543
Strigol	14,2485
Strychnine	30,407,853,1233,854
Styrene	1497,2061,1498,2062,2373,2444,1502,2071, 1503,2072,1504,2073,1505,2074,1546,1547,1548,1549,1565,1566,1568,1588,2322,2344,1569,1589,2323,2345,1676,1725,1726,1727,1794, 1795,1891
Substance P	709,720
Sucrose	333,380,381,382,383,384,385,387
Sudan I	120,400
Sudan II	120,400
Sudan III	120,400
Sudan IV	120,400
Sudan Orange G	120,400
Sudan red G	120,400
Sudan Red 7B	120,400
Sulfufotep	1466,1740,1858,1989,2356,2384,2392,2406
Sulconazole nitrate salt	1149,3005
Sulfacetamide	1151,779,883,884
Sulfadiazine	1151,779,883,884
Sulfamerazine	1151,779,883,884,1150
Sulfamethazine	1150
Sulfamethizole	1151,779,883,884
Sulfanilamide	1151,779,883,884,1150
Sulfantran	906
Sulfathiazole	1151,779,883,884,1150
Sulfolane	2205,2206,2207,2450,2208,2209,2451
Sulfonamide positional isomers	103
Sulfopropyl acrylate	29
Sulfopropyl methacrylate	29
Sulfotep	1350,1401,1860,1995,1448,1682,1829,1934,1470,1996,2360,2410,1471,1746,1861,1997,2361,2386,2393,2411,1542,1543,1544, 1545,1550,1551,1890,2069
Sulfotep	1551
Sulfur dioxide	1687,2382,2060,2443
Sulfur dioxide (5 ppm)	1783
Sulindac	899
Sulprofos	1887,2066

Sunset Yellow FCF	388
Superoxide dismutase	780
Superoxide Dismutase from bovine erythrocytes	738,744
Surfactants	83
Sutan	1467,1990,2357,2407
Sweep	1,295,294,1889,2068
Synephrine	992
(±)-Synephrine	2830,781
Syringic acid	1280,371,88,1259

— T —

2,4,5-T	1355,1389,2,298,306,307
T26	1972
T28	1972
T30	1972
T32	1972
T34	1972
T36	1972
T38	1972
T40	1972
T42	1972
T44	1972,1973
T46	1972,1973
T48	1849,1974,1972,1973
T50	1849,1974,1972,1973
T52	1849,1974,1972,1973
T54	1849,1974,1972,1973
Tadalafil	995,996
Tamoxifen	1152,1223
Tartaric acid	68
l-Tartaric acid	1277,368,85,1278,369,86
DL-Tartaric acid	104,1291,2611,2708,3040,389
Tartrazine	388
Taurine	333,342,343,381
Taurochenodeoxycholic acid	238
Taurocholic acid	234,237,238
Taurocholic acid sodium salt hydrate	234
Taurodeoxycholic acid	238
Taurodeoxycholic acid-2,2,4,4-d ₄	234

Taxifolin	1266,1276,1288
Taxols	1154
Taylor-Wharton Dewar accessories	705,743
2,3,7,8-TCDD	1437,1576,1813,1913
2,3,7,8-TCDF	1436,1575,1812,1912,1437,1576,1813,1913
Tebuconazole	1888,2067
Tebufenpyrad	1888,2067
Tebupirimifos	1890,2069
Tebuthiuron	1506,2075,1507,2076
Tecnazene	1887,2066
Tefluthrin	1887,2066
Temazepam	1190,232,1207,273,489,916
Temazepam solution	833,1224
Temazepam glucuronide lithium salt solution	1224
Temephos	1350,1401,1860,1995,1448,1682,1829,1934
Temsirilimus	1221,1229
Tenylchlor	1888,2067
TEPP	1542,1543
Terbacil	1467,1990,2357,2407,1506,2075,1507,2076,1888,2067
Terbucarb	1430,1641,1796,1892,1890,2069
Terbufos	1419,406,1350,1401,1860,1995,1466,1740,1858,1989,2356,2384,2392,2406,1471,1746,1861,1997,2361,2386,2393,2411, 1506,2075,1507,2076,1542,1543,1544,1545,1885,2064
Terbumeton	110,15,111,16,1447,1681,1828,1933
Terbumeton-desethyl	110,15,111,16
Terbutaline hemisulfate salt	1155,3006
Terbutylazin-desethyl	110,15,111,16
Terbutylazine	110,15,111,16
Terbutryn	110,15,111,16,1466,1740,1858,1989,2356,2384,2392,2406, 1489,1788,1877,2039,2369,2391,2397,2425,1506,2075,1507,2076,1888,2067
Terbutylazine	5
Terfenadine	1156,3007
o-Terphenyl	33
p-Terphenyl-d ₁₄	1550,1551,1552,1556
Terphenyl-d ₁₄	1524,1553,1554,1555,1557,1564
Terphenyl-d ₁₄ (surr.)	1558
o-Terphenyl (surr.)	1526
α-Terpinene	2050,2434,2056,2439,2096,2097,2099, 2103,2105,2111,2184,2120,2121,2131,2136,2137,2138,2142,2166,2167,2169,2170
β-Terpinene	2103,2106,2136

γ-Terpinene	2047,2175,2351,2353,2050,2434,2056,2439,2095,2096, 2099,2105,2120,2121,2124,2131,2137,2138,2142,2161,2166,2167,2170	1,1,1,2-Tetrachloroethane	1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074,1546,1547,1548,1549,1674,1676
Terpinen-1-ol	2105,2106	1,1,2,2-Tetrachloroethane	1494,2058,2371,2441, 1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074,1519,1520,1522,1546,1547,1548,1549,1565,1566, 1568,1588,2322,2344,1569,1589,2323,2345,1674,1676,1725,1726,1727
(-)-Terpinen-4-ol	1785,2172,2558,2688	Tetrachloroethene	1546,1547,1674,1676,1726,1727
Terpinen-4-ol	2050,2434,2099,2103,2106,2120,2121,2131,2136,2142,2161,2166,2167	Tetrachloroethylene	1493,2057,2370,2440,1494,2058,2371,2441,1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073, 1505,2074,1519,1520,1521,1522,1523,1548,1549,1565,1566,1568,1588,2322,2344,1725
(+)-Terpinen-4-ol	1785,2172,2558,2688,2095,2096,2105,2170	2,3,4,5-Tetrachlorophenol	1531
α-Terpineol	2050,2434,2095,2099,2103,2105,2106,2112,2120,2121,2124,2131,2136,2142,2166,2167,2170,2183,2446	2,3,4,6-Tetrachlorophenol	1359,1386,1407,1475,1755,2005,1476,1756,2006,2363,2388,2414, 1477,1757,2007,2364,2389,2415,1531,1550,1551
β-Terpineol	2105	2,3,5,6-Tetrachlorophenol	1531,1550,1551
γ-Terpineol	2105	Tetrachloroterephthalic acid	1355,1389,2,298
Terpinolene	2050,2434,2096,2099,2103,2105,2106,2120,2121,2124,2131,2136,2137,2138,2142,2166,2167,2170	Tetrachloro- <i>m</i> -xylene	1513,1516,1532,1533,1538,1539,1604
α-Terpinyl acetate	2103,2131,2142,2166	2,4,5,6-Tetrachloro- <i>m</i> -xylene	1512,1514,1534,1535
(±)-α-Terpinyl acetate	2095	Tetrachlorvinphos	1507,2076,1885,2064
Testosterone	195,197,198,200,201,206	2,3,4,6-Tetrachlorophenol (acylated)	2040,2426,2042,2428
Testosterone solution	1374,257,258	Tetraconazole	1888,2067
1-Testosterone	206	Tetracontane	1486,1487
Testosterone glucuronide	258	Tetracosane	1486,1487,1526,1637
2,2',4,4'-Tetrabromodiphenyl ether solution	1450,1684	Tetracosane (C24)	1636
2,3',4',6'-Tetrabromodiphenyl ether solution	1450,1684	Tetracyclines	1157
1,2,4,5-Tetrachlorobenzene	1550,1551	Tetradecanal	2103,2166
2,2',4,4'-Tetrachlorobiphenyl	1388,1411,1482,2028,1506,2075,1507,2076	Tetradecane	1431,1572,1486,1487,1526,1596,1597,1602,1668,1637,2120
2,2',6,6'-Tetrachlorobiphenyl	1441,1927,1442,1928	<i>n</i> -Tetradecane	2131
2,2',6,6'-tetrachlorobiphenyl	1443,1929	Tetradecane (C14)	1636
3,3',4,4'-Tetrachlorobiphenyl	1441,1927,1442,1928	Tetradecanoic acid	1873,2031,2278
3,3',4,4'-tetrachlorobiphenyl	1443,1929	<i>n</i> -Tetradecanol	2131
3,3',4,4'-Tetrachlorobiphenyl	1501	(E)-2-Tetradecenal	2103
3,3',4,5'-Tetrachlorobiphenyl	1501	1-Tetradecene	2120
3,3',4,5-Tetrachlorobiphenyl	1501	Tetradifon	1449,1683,1830,1935,1887,2066
3,3',4,5'-Tetrachlorobiphenyl	1501	Tetraethylene glycol	1705,1977,2187
3,3',5,5'-Tetrachlorobiphenyl	1501	Tetraethyl pyrophosphate (TEPP)	1544,1545
3,4,4',5'-Tetrachlorobiphenyl	1501	Δ ⁸ -Tetrahydrocannabinol	459
2,2',5,5'-Tetrachlorobiphenyl (No. 52)	1402,1999	Δ ⁹ -Tetrahydrocannabinol	421,459
3,3',4,4'-Tetrachlorobiphenyl (No. 77)	1402,1999	4,5,6,7-Tetrahydro-3,6-dimethylbenzofuran	2138
3,4,4',5-Tetrachlorobiphenyl (No.81)	1402,1999	Tetrahydrofuran	1504,2073,1568,1588,2322,2344,1675,1676,1725,1726,1727,1780,2210,2211,2212,2452,2213,2214,2453
1,2,3,4-Tetrachlorodibenzo- <i>p</i> -dioxin	1452,1577,1831,1937,1453,1578,1832,1938	<i>cis</i> -(+/-)-3,3a,8,8a-Tetrahydro-2H-indeno[1,2- <i>d</i>]oxazol-2-one	2573,45
1,2,3,7-Tetrachlorodibenzo- <i>p</i> -dioxin	1452,1577,1831,1937,1453,1578,1832,1938	1,2,3,4-Tetrahydro-1-naphthylamine (N-acetyl derivatives)	1786,2559
1,2,3,8-Tetrachlorodibenzo- <i>p</i> -dioxin	1452,1577,1831,1937,1453,1578,1832,1938	1,2,3,4-Tetrahydro-1-naphthylamine (N-TFA derivatives)	1787,2560
1,2,7,8-Tetrachlorodibenzo- <i>p</i> -dioxin	1452,1577,1831,1937,1453,1578,1832,1938		
1,4,7,8-Tetrachlorodibenzo- <i>p</i> -dioxin	1452,1577,1831,1937,1453,1578,1832,1938		
2,3,7,8-Tetrachlorodibenzo- <i>p</i> -dioxin solution	1436,1575,1812,1912,1452,1577,1831,1937,1453,1578,1832,1938		
Tetrachloroethane	1569,1589,2323,2345		

Toluene	36,841,554,842,1117,1118,1493,2057,2370,2440,1494,2058,2371,2441, 1497,2061,1498,2062,2373,2444,1500,1586,2321,2343,1502,2071,1503,2072,1504,2073,1505,2074,1519,1520,1522,1527,1528,1529, 1530,1546,1547,1548,1549,1565,1566,1568,1588,2322,2344,1569,1589,2323,2345,1592,1593,1594,1595,1596,1597,1600,1658,1601,1667, 1602,1668,1610,1611,1612,1613,1614,1615,1616,1617,1618,1621,1624,1625,1626,1640,1676,1725,1726,1727,1780,1794,2205,2206, 2207,2450,2208,2209,2451,2300,2467
Toluene-d ₈	842,1519,1520,1546,1547,1548,1549,1565,1566
2,4-Toluene diisocyanate	2338
2,6-Toluene diisocyanate	2338
p-Toluic acid	1279,370,87,1281,372,89
o-Toluidine	108,109,1484,2030,2366,2421,1550,1551,1655,1672,1673
m-Toluidine	108,109
p-Toluidine	108,109,1673
Tolyfluamide	1445,1679,1826,1931
Tolylene-2,4-diisocyanate	2340,27
Tolylene-2,6-diisocyanate	2340,27
Tolyfluand	1347,1394,1798,1894,1797,1893,1889,2068
Tolyfluand metabolite	1889,2068
Tonalid	2111,2184
2,4,5-TP	1355,1389,2,298
Tramadol hydrochloride	1162,3011
Trazodone	914,918
Triademefon	1506,2075
Triadimefon	1507,2076,1887,2066,2004,2413
Triadimenol	1163,3012
Triadimenol-1	1887,2066
Triadimenol-2	1887,2066
Triallate	1886,2065
Triamcinolone acetonide	167
Triazophos	1885,2064
2,4,6-Tribromophenol	1476,1756,2006,2363,2388,2414,1524,1531,1550,1551,1552,1553,1554,1555,1556,1557,1564
2,4,6-tribromophenol (surr.)	1558
Tribufos	1886,2065
Tributyl phosphate	1545,1585,2342
Tributyl phosphate (surr.)	1544
Tricaprin	1638
Tricaprin (I.S.)	1631,1633,1634
Trichlamide	1889,2068
Trichlorfon	1419,406,1542,1543,1544,1545
2,4,5-Trichloroaniline	1655,1672

2,4,6-Trichloroanisole	1488,2038,2368,2424,2040,2426,2042,2428,2043,2429
1,2,3-Trichlorobenzene	1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074,1546,1547,1548,1549
1,2,4-Trichlorobenzene	1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074, 1524,1546,1547,1548,1549,1552,1553,1554,1555,1556,1557,1558,1564,1565,1566,1568,1588,2322,2344,1569,1589,2323,2345
2,4',5'-Trichlorobiphenyl	1388,1411,1482,2028,1506,2075,1507,2076
2,4,6-Trichlorobiphenyl	1441,1927,1442,1928
2,4,6-trichlorobiphenyl	1443,1929
3,3',4'-Trichlorobiphenyl	1501
3,3',5'-Trichlorobiphenyl	1501
3,4,4'-Trichlorobiphenyl	1441,1927,1442,1928
3,4,4'-trichlorobiphenyl	1443,1929
3,4,4'-Trichlorobiphenyl	1501
3,4,5-Trichlorobiphenyl	1501
3,4',5'-Trichlorobiphenyl	1501
2,3',6'-Trichlorobiphenyl (No. 28)	1402,1999
1,1,1-Trichloroethane	1431,1572,1493,2057,2370,2440,1494,2058,2371,2441,1497,2061,1498,2062,2373,2444, 1500,1586,2321,2343,1502,2071,1503,2072,1504,2073,1505,2074,1519,1520,1522,1546,1547,1548,1549,1565,1566, 1568,1588,2322,2344,1569,1589,2323,2345,1674,1676,1725,1726,1727,2205,2206,2207,2450,2208,2209,2451,2224,2226,2456
1,1,2-Trichloroethane	1494,2058,2371,2441, 1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074,1519,1520,1522,1546,1547,1548,1549,1565,1566
1,1,2-trichloroethane	1568,1588,2322,2344
1,1,2-Trichloroethane	1569,1589,2323,2345
Trichloroethene	1504,2073
Trichloroethylene	1431,1572,1494,2058,2371,2441, 1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1505,2074,1519,1520,1521,1522,1523,1546,1547,1548,1549,1565,1566, 1568,1588,2322,2344,1569,1589,2323,2345,1674,1676,1725,1726,1727,2205,2206,2207,2450,2208,2209,2451,2224,2226,2456
Trichlorofluoromethane	1494,2058,2371,2441,1496,1497,2061,1498,2062,2373,2444, 1502,2071,1503,2072,1504,2073,1505,2074,1519,1520,1522,1546,1547,1548,1549,1565,1566,1568,1588,2322,2344,1697,1698
Trichloronate	1350,1401,1860,1995,1542,1543,1544,1545
2,3,4-Trichlorophenol	1531
2,3,5-Trichlorophenol	1531
2,4,5-Trichlorophenol	1476,1756,2006,2363,2388,2414,1477,1757,2007,2364,2389,2415, 1531,1552,1553,1554,1555,1556,1557,1558,1564,1571,1591,2325,2347
2,4,6-Trichlorophenol	90,1359,1386,1407,1475,1755,2005,1476,1756,2006,2363,2388,2414, 1477,1757,2007,2364,2389,2415,1524,1531,1552,1553,1554,1555,1556,1557,1558,1564
2,4,6-Trichlorophenol (acylated)	2040,2426,2042,2428
1,1,1-Trichloropropane	1500,1586,2321,2343
1,2,3-Trichloropropane	1497,2061,1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074,1546,1547,1548,1549
1,1,2-Trichloro-1,2,2-trifluoroethane	1565,1566,1568,1588,2322,2344
Trichlorphan	1350,1401,1860,1995

Tricosane	1637	1,2,3-Trimethylbenzene	1431,1572,1497,2061,1593,1594, 1595,1596,1597,1610,1611,1612,1621,2300,2467
Tricosanoate (C23)	1636	1,2,4-Trimethylbenzene	1497,2061,1498,2062,2373,2444,1502,2071, 1503,2072,1504,2073,1505,2074,1527,1528,1529,1530,1546,1547,1548,1549,1568,1588,2322,2344,1569,1589,2323,2345,1593,1594,1595, 1596,1597,1610,1611,1613,1614,1615,1616,1617,1618,1621,1624,1625,1626,2300,2467
Tricosanoic acid methyl ester	1818,1918,2250,1819,1919,2251	1,3,5-Trimethylbenzene	1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074,1569,1589,2323,2345
Tricosanoic acid methyl ester (C23:0)	1815,1915,2247,1817,1917,2249	2,2,3-Trimethylbutane	1592
Tricosanoic acid methyl ester (C23:0) at 2 wt %	1822,1922,2254	2,4,5-Trimethylheptane	1612
Tri- <i>o</i> -cresyl phosphate (TOCP)	1544,1545	3,3,4-Trimethylheptane	1610,1612
Tricyclazone	1507,2076	3,3,5-Trimethylheptane	1612
Tricyclene	2050,2434,2120,2131	2,2,5-Trimethylhexane	1592
Tricyclic antidepressants	1164,210	2,3,5-Trimethylhexane	1592
Tridecane	1431,1572,1596,1597,1600,1658,1602,1668,1621,1637	2,3,5-Trimethylnaphthalene	1408,2010,1409,2011
<i>n</i> -Tridecane	1613	2,2,3-Trimethylpentane	1592
<i>n</i> -Tridecane	1614,1615,1616,1617,1618,1625,1626	2,2,4-Trimethylpentane	1431,1572,1528,1529,1530,1610,1611,1612
<i>n</i> -Tridecane	2311,2312	2,3,4-Trimethylpentane	1610,1611,1612
<i>n</i> -tridecane	2313,2314	2,4,4-Trimethyl-1-pentene/trisobutylene	1721
Tridecane (C13)	1636	(±)-1-(2,4,6-Trimethylphenyl)ethanol	1694,1835,1941,2296,2693
Tridecanoic acid methyl ester	1818,1918,2250,1819,1919,2251	Trimethylpyrazine	1871,2022,2395,2417
Tridecanoic acid methyl ester (C13:0)	1815,1915,2247,1817,1917,2249	2,3,5-Trimethylpyrazine	2056,2439
Tridecanoic acid methyl ester (C13:0) at 2 wt %	1822,1922,2254	Trimipramine	1167,212,1169,1170,2279,2303,2459,2468
2-(E)-Tridecal	2166	Trimipramine solution	1368,209
Tridemorph	1888,2067	Trimipramine maleate salt	1165,1171,3013
Triethylamine	1648,2379,1649,2380,1673	1,3,5-Trinitrobenzene	296,465,1455,1695,2297,2354,2383,2466,1456,1696,2298,1550,1551
Triethylene glycol	1383,1457,1705,1977,2187	2,4,6-Trinitrophenylmethylnitramine (Tetryl)	1456,1696,2298
<i>O,O,O</i> -Triethyl phosphorothioate	1470,1996,2360,2410,1550,1551	Trinitrotoluene	1455,1695,2297,2354,2383,2466
Triethyl thiophosphate	1466,1740,1858,1989,2356,2384,2392,2406,1471,1746,1861,1997,2361,2386,2393,2411	2,4,6-Trinitrotoluene	296,465,1456,1696,2298
Trifloxystrobin	1887,2066	Triolein	1633
Trifluoperazine	165,578	Tripelennamine	860
3-(Trifluoromethyl)aniline	1672	Tripelennamine hydrochloride	1213
(±)- γ -(Trifluoromethyl)benzyl alcohol	1759,2149,2541,2680	Triphenylene	33,1408,2010,1409,2011
Trifluorothymidine	168,587	Triphenyl phosphate	1506,2075,1507,2076,1544,1545
α,α,α -Trifluorotoluene	1528,1530	Tripolidine	858,859,860,891
Trifluralin	1351,1403,1862,2000,1446,1680,1827,1932,1467,1990,2357,2407,1506,2075,1507,2076,1887,2066	tRNA hydrolysate	789
2',4',5'-Trihydroxybutyrophenone	1282,292	Troger's Base	113,2615,114,2616,115,2617
3,3',5'-Triiodo-L-thyronine sodium salt	174	Trovaflaxacin	880,881
3,3',5'-Triiodo-L-thyronine (T ₃) solution	822	α -Trypsin	790
3,3',5'-Triiodo-L-thyronine (Reverse T ₃) solution	822	β -Trypsin	790
Trisobutylene	1721	Trypsin Inhibitor	740,760
Trimethylamine	2225,2455		
2,4,5-Trimethylaniline	1673		

Trypsin Inhibitor from <i>Glycine max</i> (soybean)	738,761
Trypsinogen	759
Tryptamine	810
Tryptophan	190,191,192,810
D-Tryptophan	2835,793
L-Tryptophan	2835,793,1897,2304
DL-Tryptophan	2836,794
Tryptophan derivative	1897,2304
DL-Tryptophan (FMOC derivatives)	2791,606
DL-Tryptophan methyl ester (3,5-DNP derivatives)	2772,577
Two PEG molecules attached to protein identified as peak 1	777
Tyramine	143,145,810
D-Tyrosine	2837,795
L-Tyrosine	2837,795,1897,2304
DL-Tyrosine	2840,798
DL-D-Tyrosine	2838,796
DL-m-Tyrosine	2839,797
DL-Tyrosine (t-BOC derivatives)	2754,536
Tyr-Tyr-Tyr	788

— U —

Ucosane	1637
Undecanal	1490,1580,2318,2330,2050,2434,2103,2120,2166,2170
Undecane	1431,1572,1484,2030,2366,2421,1486,1487,1595,1597,1600,1658,1601,1667,1602,1668,1637
n-Undecane	2311,2312
n-undecane	2313,2314
Undecane (C11)	1636
Undecanoic acid methyl ester	1818,1918,2250,1819,1919,2251
Undecanoic acid methyl ester (C11:0)	1815,1915,2247,1817,1917,2249
Undecanoic acid methyl ester (C11:0) at 2 wt %	1822,1922,2254
Undecanone	1971,2405
1-Undecene	1612
Uniconazole P	1887,2066
UR-144	1226
Uracil	36,841,67,207,1200,269,485,1207,273,489,492,684,734,735,736,737,749,757,758,765
Uracil	786
Uracil	825,829,1117,1118,
(U) Uracil	1185,808
Uric acid	149

Uridine	687,688,689,769
Ursodeoxycholic acid	234

— V —

Vacor	313
Valacyclovir	133,913
Valencene	2050,2434
(+)-Valencene	2170
Valeraldehyde	21,2326
Valeraldehyde-2,4-dinitrophenylhydrazone	22,2334,23,2335
Valeraldehyde-2,4-DNPH	2337
Valeraldehyde (2,4-DNPH derivative)	2336,24
Valeric acid	1808,1908,2244,1809,1909,2245,1873,2031,2278,1970,2404
D-Valine	2841,799
L-Valine	2841,799,1897,2304
DL-Valine	2792,607,2842,800
DL-Valine (AQC derivatives)	2743,522
Val-Tyr-Val	708,719
Vanadium oxides tetroxide	825
Vanillic acid	1259
Vanillin	2111,2184
Vardenafil	995,996
[deamino-Cys ¹ , D-Arg ⁸]-Vasopressin acetate salt hydrate	820
Verapamil	896
Verapamil hydrochloride	256
Verapamil hydrochloride solution	1222
(±)-Verapamil	952,953
(R)-(+)-Verbenone	1789,2173,2227,2561,2689,2860,1790,2174,2228,2562,2690,2861
(S)-(-)-Verbenone	1789,2173,2227,2561,2689,2860,1790,2174,2228,2562,2690,2861
Vernam	1467,1990,2357,2407
Vernolat	1507,2076
Vernolate	1506,2075
Vigabatrin solution	836
Vinclozolin	1445,1679,1826,1931,1887,2066,2004,2413
Vinyl chloride	1494,2058,2371,2441,1496,1497,2061, 1498,2062,2373,2444,1502,2071,1503,2072,1504,2073,1505,2074,1519,1520,1522,1546,1547,1548,1549,1565,1566,1569,1589,2323,2345
2-Vinyl-5-methylfuran	2056,2439
Virginiamycin M ₁	395,1109
Viridiflorol	2095,2136,2137,2138,2167

Vitamin E	1295
Vitamin D ₂ solution	1322,253
Vitamin D ₃	420
Vitamin D ₃ solution	1322,253
Vitamin A (acetate)	1295,1296
Vitamin A alcohol	1296
Vitamin E acetate	1295,1296
Vitamin D ₃ solution	1254
Vitamin E acetate	1255,1256,1253
Vitamin K ₁	275,835
Vitamin K ₁ 2,3 epoxide	275,835
Vitamins, water soluble	1301
vitexin 4"-O-glucoside (PHY82682)	1305
vitexin (PHY89290)	1305
vitexin 2"-O-rhamnoside (PHY89291)	1305
Volatile fatty acids	1808,1908,2244
Volatiles	1503,2072
Voriconazole solution	831,832

— W —

Warfarin™	1175,220,1176,221,1177,222,2641,3014,1178,223,2642,3015,1179,224,2643,3016, 1180,225,2644,3017,1183,227,2646,3020,1182,3019,1343,3026,1344,2652,3027,1345,2653,3028
Warfarin solution	1375,259,1377,265,2651,3022
(R)-(+)-Warfarin	1376,262,2650,3021
(S)-(-)-Warfarin	1376,262,2650,3021
Water	1622,1627,1699,1750,1751
R-(-)-Wieland-Miescher Ketone	1791,2563,1792,2564,1793,2565
S-(+)-Wieland-Miescher Ketone	1791,2563,1792,2564,1793,2565
Withaferin A	1235,1310,1311,1312,1313,1314
Withanolide A	1235,1310,1311,1312,1313,1314
Withanolide B	1235,1310,1311,1312,1313,1314
Withanone	1310,1311,1312,1313,1314
Withanositide V	1310
Withanositide IV	1235,1311,1312,1313,1314
Withanositide V	1235,1311,1312,1313,1314
Withanositide IV	1310

— X —

Xanthine	149
Xanthophyll	1239,344,1241,1242,1243,1317
Xanthosine	690
Xanthotoxin	1262
Xenon	1745
XLR-11	1226
<i>o</i> -Xylene	98,116,1493,2057,2370,2440,1497,2061,1498,2062,2373,2444,1502,2071,1503,2072, 1504,2073,1505,2074,1527,1528,1529,1530,1546,1547,1548,1549,1565,1566,1568,1588,2322,2344,1569,1589,2323,2345,1592,1593,1594, 1595,1596,1597,1600,1658,1601,1667,1602,1668,1610,1611,1612,1621,1640,1676,1725,1726,1727,1780,1794,1795,1891,2205
<i>o</i> -Xylene	2206
<i>o</i> -Xylene	2207,2450
<i>o</i> -Xylene	2208
<i>o</i> -Xylene	2209,2451,2300,2467
<i>m</i> -Xylene	98,116,1493,2057,2370,2440,1497,2061,1498,2062,2373,2444,1502,2071, 1503,2072,1504,2073,1505,2074,1527,1528,1529,1530,1546,1547,1548,1549,1565,1566,1568,1588,2322,2344,1569,1589,2323,2345,1592, 1593,1594,1595,1596,1597,1600,1658,1601,1667,1602,1668,1611,1612,1621,1640,1676,1725,1726,1727,1780,1794,1795,1891,2205
<i>m</i> -Xylene	2206
<i>m</i> -Xylene	2207,2450
<i>m</i> -Xylene	2208
<i>m</i> -Xylene	2209,2451,2300,2467
<i>p</i> -Xylene	98,102,116,842,845,1493,2057,2370,2440,1497,2061,1498,2062,2373,2444, 1502,2071,1503,2072,1504,2073,1505,2074,1527,1528,1530,1546,1547,1548,1549,1565,1566,1568,1588,2322,2344, 1569,1589,2323,2345,1592,1593,1594,1595,1596,1597,1600,1658,1601,1667,1602,1668,1611,1612,1613,1614,1615,1616,1617,1618,1621, 1624,1625,1626,1640,1676,1725,1726,1727,1780,1794,1795,1891,2205
<i>p</i> -Xylene	2206
<i>p</i> -Xylene	2207,2450
<i>p</i> -Xylene	2208
<i>p</i> -Xylene	2209,2451,2300,2467
<i>p</i> -Xylene-d ₁₀	842
Xylitol	386
Xylose	383,384,385,386
<i>o</i> -(+)-Xylose	379
7-(β-Xylosyl)paclitaxel	1154
Xylylcarb	1890,2069

— Y —

Yohimbine hydrochloride 1232,1316

— Z —

Zearalenone 331

Zeaxanthin 1239,344,1317

Zuclopenthixol 132,907,1189,231

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