DiKMA®

A reliable partner for your lab

CHROMATOGRAPHY

2012/2013

Dikma Technologies Inc.

www.dikmatech.com

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Terms and Conditions

1. CONDITIONS

The information published by Dikma is, to the best of its knowledge, correct and accurate but is not guaranteed to be so. Dikma assumes no responsibility with respect thereto and has not verified the values or specifications stated experimentally and does not guarantee their accuracy. The sale of any products by Dikma does not waive any patent restrictions connected with those products. Buyer agrees and represents that it is buying for its own end use only, and not for resale. Buyer warrants that they have sufficient knowledge, training, facilities and skills to safely use and store products provided under this agreement.

2. USE OF PRODUCTS

The products offered are for laboratory or manufacturing use only. They are not intended for medicinal or food use.

3. QUALITY

All purchases are subject to Dikma approval not withstanding prior payments, and if not in accordance with the specifications at Dikma sole option, may be returned to Dikma at Buyer's expense for transportation. Dikma reserves the right to change product specifications, quantities, designs or prices without notice and without liability for such changes.

4. PRICE

The price(s) set forth in any Dikma Order Acknowledgement are firm and shall not be changed without the prior written consent of Dikma. If no price is specified in this Purchase Order, the goods shall be invoiced at the current list price.

5. PAYMENT

Payment will be due thirty (30) days from receipt on approved credit. All shipments are F.O.B. factory.

6. SHIPMENT

Shipment of the goods shall be made in accordance with customary shipping practices for such goods. Unless otherwise stated in the Order Acknowledgement, no charge will be allowed for packing, boxing, cartage or insurance and Buyer shall absorb and pre-pay all shipping and insurance charges. Goods ordered in error or duplicated from a mailed-in order not clearly marked "CONFIRMING" will be subject to a 20% restocking charge, if approved by Dikma.

7. DELIVERY

Buyer shall notify Dikma immediately of any situation that may delay or threaten to delay the timely acceptance of services and/or receipt of goods. Dikma, at its option, may cancel all or any portion of this Order Acknowledgement without liability. Acceptance of all or part of the goods, or payment therefore, or failure to notify Buyer promptly shall not waive or affect Dikma's right to cancel the order or recover damages.

8. RETURNS

No returns will be accepted without prior authorization, and are subject to approval by Dikma. If it is necessary to return goods to Dikma for any reason, please contact your Technical Representative for forwarding instructions. This procedure will prevent delays and enable us to resolve the situation to your satisfaction. Dikma is not liable for goods returned without authorization. Returns must be sent through a traceable carrier.

9. WARRANTY

Dikma will repack, replace, or refund charges on any column at our discretion at no cost if a column fails to perform satisfactorily. Columns being returned must have prior return authorization granted by Dikma. Defective products must be accompanied by a written explanation of failure. Approval is subject to the following exclusions:

a. All columns must be tested upon receipt and all deficiencies must be reported to Dikma no later than 15 days after the date of receipt of the column.
b. Maximum warranty period is limited to 60 days on HPLC columns unless previously agreed upon. However, columns may not be returned for refund or credit after 30 days or without prior authorization.
c. Removal of column end-fittings automatically voids column warranty.
d. Column performance warranty is limited to the conditions of the original test chromatogram.
e. Physical damage to the column due to misuse, abuse, or mishap, including mechanical shock.
f. Chemical damage to the packing material due to operation at incorrect chemical conditions, temperatures, or pressures.
g. Failure due to high backpressures caused by improper solvent or sample filtration practices causing particulate build-up or precipitation or sample fouling in the column or end-fitting.
h. Incorrect selection of packing material made by customer for their particular use or incompatibility of equipment, etc.

For products supplied by, but not manufactured by Dikma, the warranty is limited by the terms of the original manufacturer's warranty.

HPLC Columns

Dikma HPLC Columns

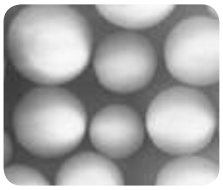
About Dikma HPLC Columns

Dikma has over 15 years of R&D experience in HPLC columns. Dikma HPLC columns have been widely used by pharmaceutical manufacturers. We offer columns of ultimate performance and maximum versatility to address the challenges and increasing needs of today's chromatographic laboratories.

The quality of packing material is the basis for all good chromatographic separation. Dikma is in a unique position to control the manufacturing process from start to finish, from making the high-purity (99.999%) raw silica to applying different bonding chemistries. Furthermore, to ensure the high performance and robustness of our columns, we maintain tight specifications during all stages of the manufacturing process and follow rigid, audited ISO 9001 procedures to guarantee reproducible products. The end results that get delivered to you are columns that perform at their best, and offer you highly reproducible batch-to-batch results without alteration of HPLC conditions.

Dikma silica of ultra-purity and incredible smoothness

Dikma silica is extremely pure (99.999%) and free of metals. Meticulous care is given to the quality control of surface smoothness, particle shape uniformity, pore structure and pore consistency to ensure uniformity of particle structure and enhanced mechanical strength. Low percentages of fines from damaged silica particles strengthen the column bed, leading to low backpressure and enhanced column performance and lifetime.



Features of Endeavorsil™ Columns

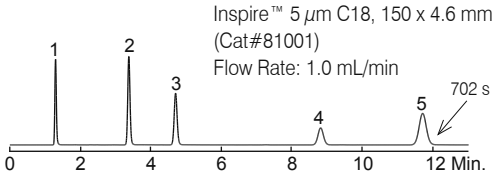
- Combined speed, resolution and sensitivity
- Reduced analysis time and solvent waste
- High efficiency combined with high selectivity generates more information and productivity
- Superior column performance at higher pressure
- Excellent separation characteristics over wide pH range

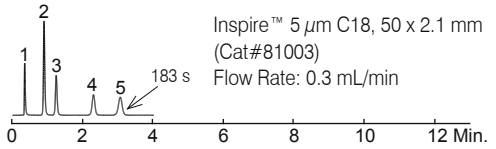
Endeavorsil™ Material Characteristics

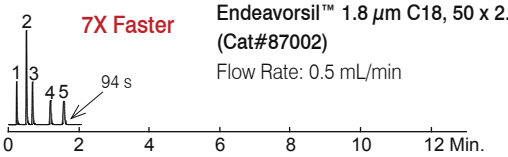
Bonded phase	Particle size (μm)	Pore size (Å)	Surface area (m^2/g)	Purity (%)	Phase density (μmol/m^2)	Carbon loading (%)	pH range	Endcapping
C18	1.8	120	300	> 99.999	3.5	20	1.5 - 9	Yes

Speed

Column: Listed on chromatograms
Mobile Phase: MeCN:H_2O = 55:45
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Uracil
2. Acetophenone
3. Methyl benzoate
4. Toluene
5. Naphthalene

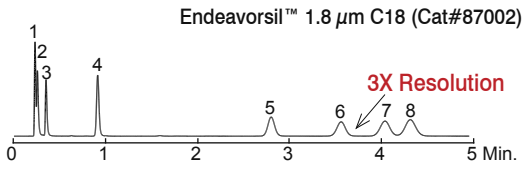


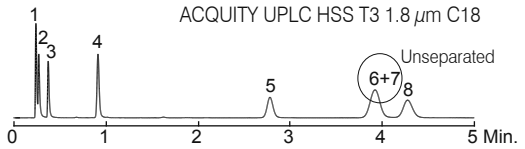


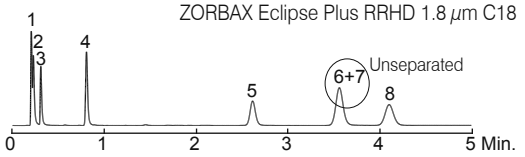


Selectivity*

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: MeCN:H_2O = 60:40
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Uracil 5. Butylbenzene
2. Caffeine 6. *o*-Terphenyl
3. Phenol 7. Triphenylene
4. Toluene 8. Amylbenzene







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Endeavorsil™ Ordering Information

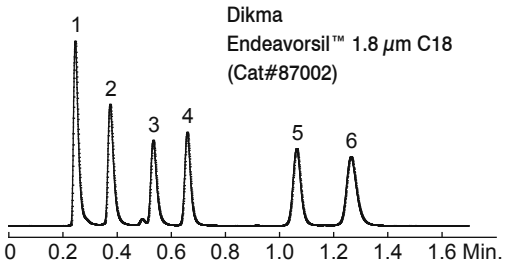
1.8 μm Microbore Columns (2.1 mm)

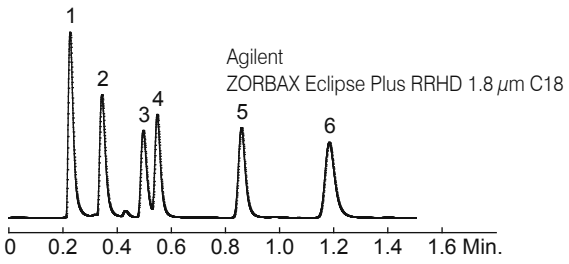
Phase	30 x 2.1	Price	50 x 2.1	Price	100 x 2.1	Price
Endeavorsil™ C18	87001	$715	87002	$725	87003	$735

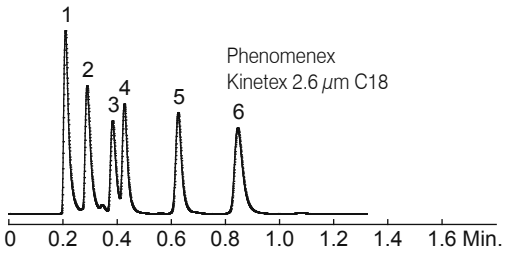
Endeavorsil™

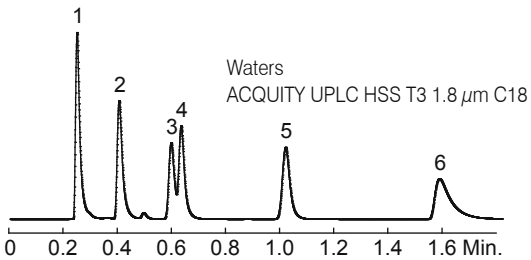
Separation of Hydrophobic, Polar and Basic Mixture*

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: MeOH:20 mM phosphate buffer (pH 7) = 80:20
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Uracil
2. Butyl paraben
3. Dipropyl phthalate
4. Naphthalene
5. Acenaphthene
6. Amitriptyline



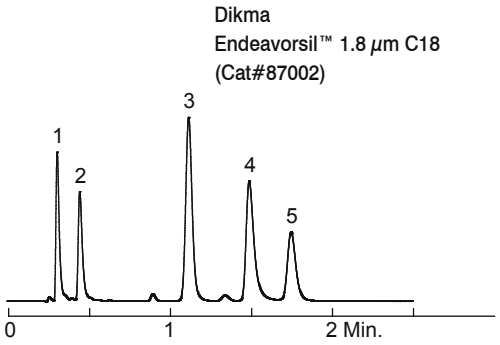


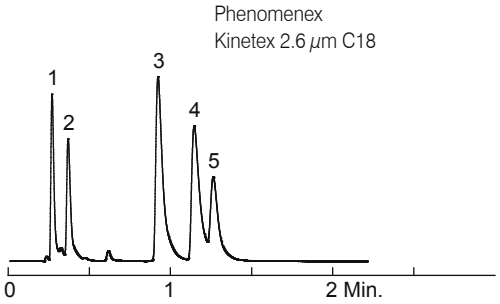


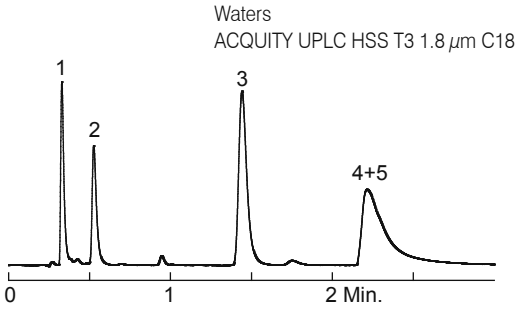


Strong Basic Compounds at Neutral pH

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: MeOH:20 mM phosphate buffer (pH 7) = 65:35
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Pyridine
2. Codeine
3. Quinine
4. Nortriptyline
5. Diphenhydramine







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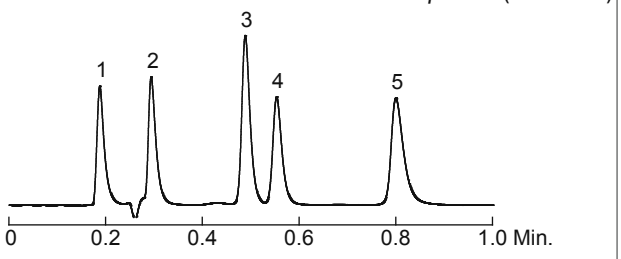
Cold Medicine*

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 35:65
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 220 nm
Sample: 1. Doxylamine
2. Acetaminophen
3. Acetanilide
4. Acetylsalicylic acid
5. Salicylic acid

Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



Agilent
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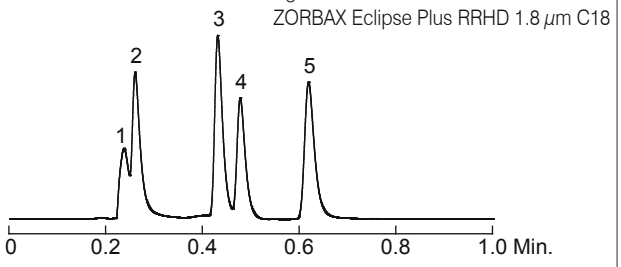
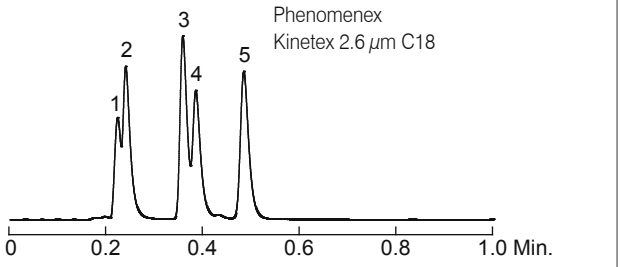
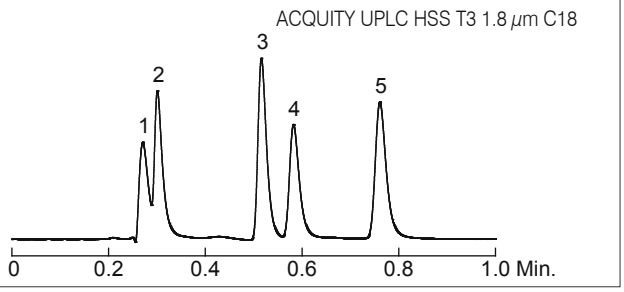


Phenomenex
Kinetex 2.6 μm C18



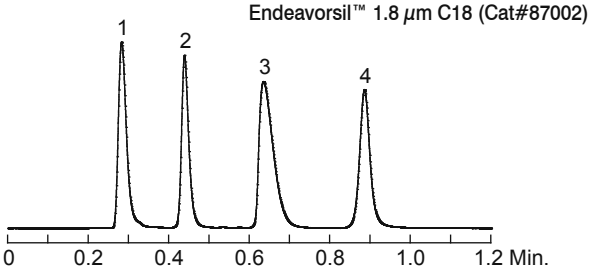
Waters
ACQUITY UPLC HSS T3 1.8 μm C18



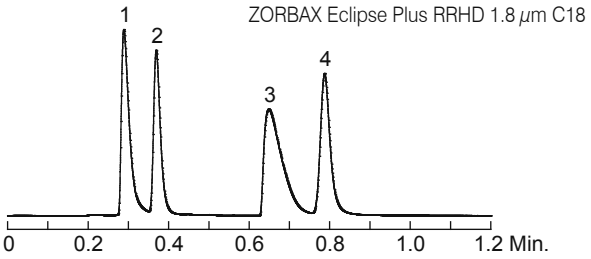
Water-Soluble Vitamins

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: 10 mM NH_4COOH, pH 3
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Pyridoxamine
2. *L*-Ascorbic acid
3. Pyridoxal
4. Nicotinamide

Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



Agilent
ZORBAX Eclipse Plus RRHD 1.8 μm C18



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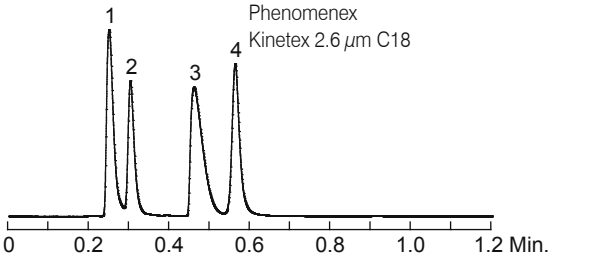
Kinetex 2.6 μm C18



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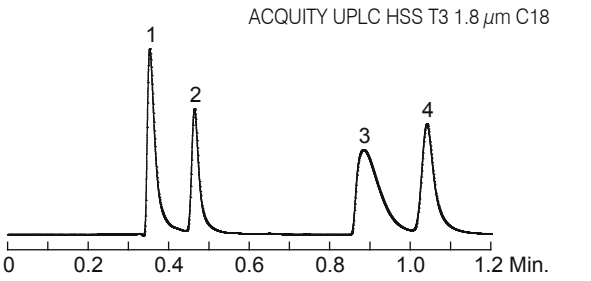

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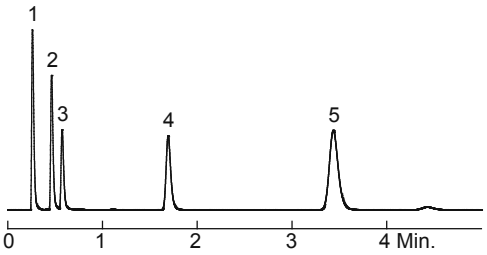
Endeavorsil™

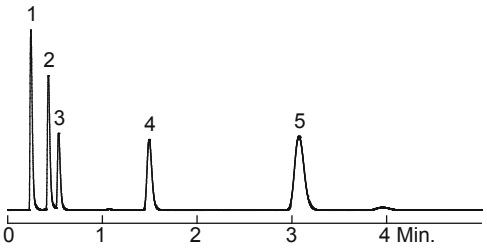
Galushko Test*

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: MeOH:H_2O = 50:50
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Uracil
2. Aniline
3. Phenol
4. Benzene
5. Toluene

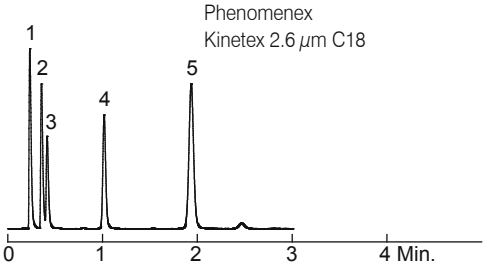
Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



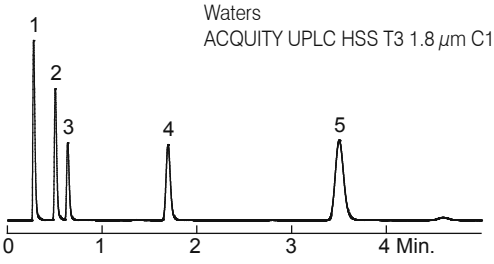
Agilent
ZORBAX Eclipse Plus RRHD 1.8 μm C18



Phenomenex
Kinetex 2.6 μm C18



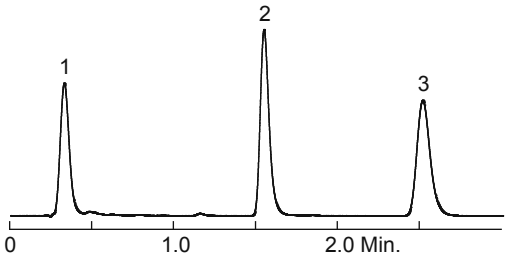
Waters
ACQUITY UPLC HSS T3 1.8 μm C18



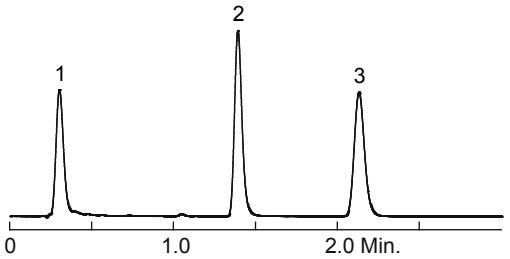
Verzele Test

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: MeOH:0.5% CH_3COONa (pH 7.8) = 60:40
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Acetylacetone
2. 1-Nitronaphthalene
3. Naphthalene

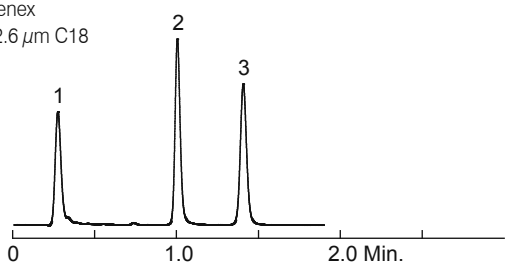
Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



Agilent
ZORBAX Eclipse Plus RRHD 1.8 μm C18



Phenomenex
Kinetex 2.6 μm C18



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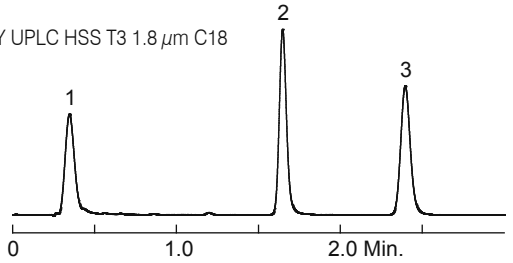

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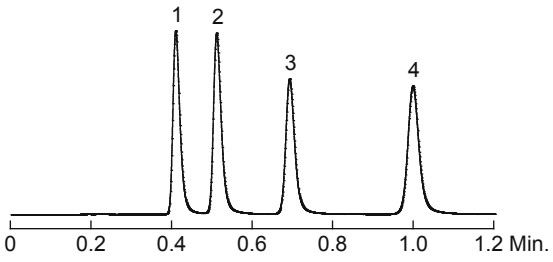
Parabens*

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: MeCN:20 mM K_2HPO_4 (pH 7) = 50:50
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Methyl paraben
2. Ethyl paraben
3. Propyl paraben
4. Butyl paraben

Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



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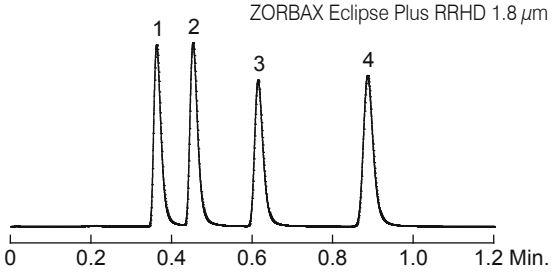
ZORBAX Eclipse Plus RRHD 1.8 μm C18



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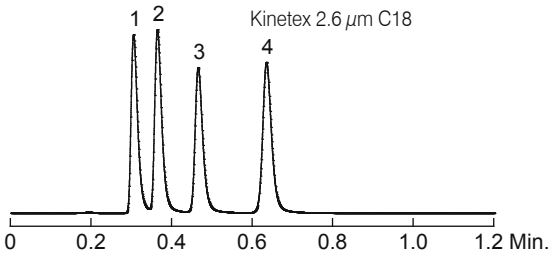
Kinetex 2.6 μm C18



Waters
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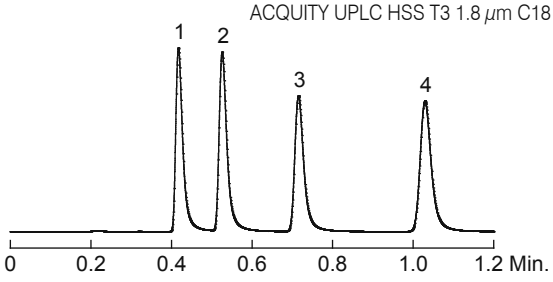
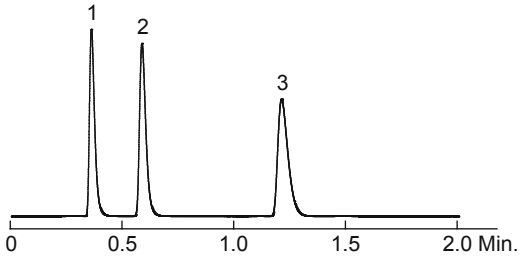


Catecholamines

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: 0.1% TFA in H_2O
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 270 nm
Sample: 1. Norepinephrine
2. Epinephrine
3. Dopamine

Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



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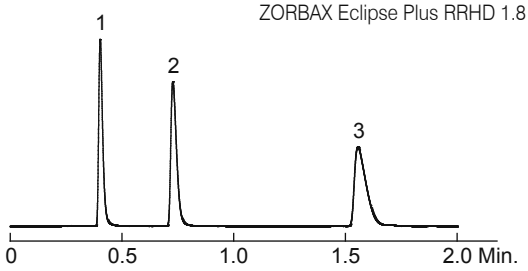
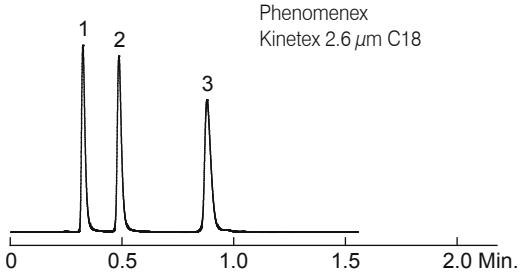
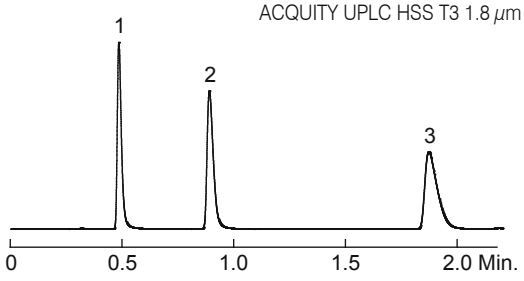


Phenomenex
Kinetex 2.6 μm C18



Waters
ACQUITY UPLC HSS T3 1.8 μm C18



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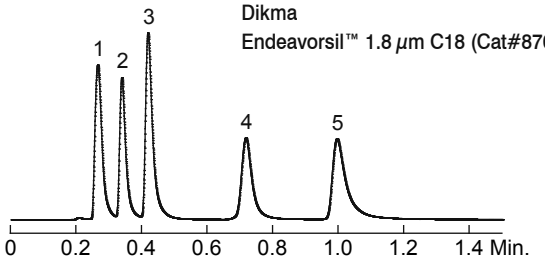
Endeavorsil™

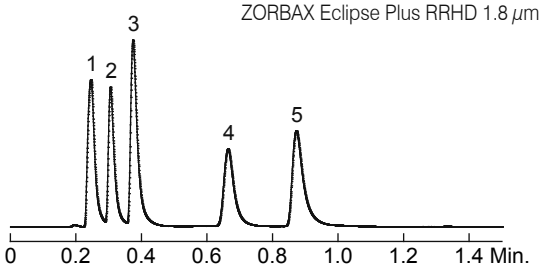
β-Blockers at Neutral pH*

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: MeCN:20 mM phosphate buffer (pH 7) = 30:70
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 220 nm
Sample: 1. Nadolol
2. Pindolol
3. Metoprolol
4. Labetolol
5. Propranolol

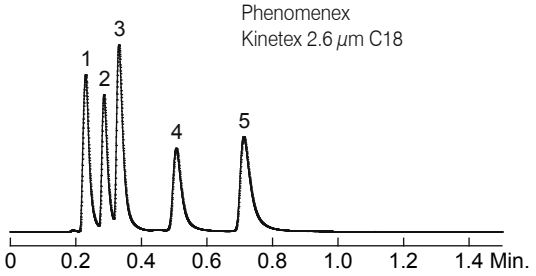
Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



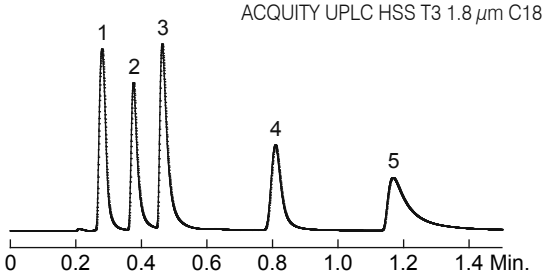
Agilent
ZORBAX Eclipse Plus RRHD 1.8 μm C18



Phenomenex
Kinetex 2.6 μm C18



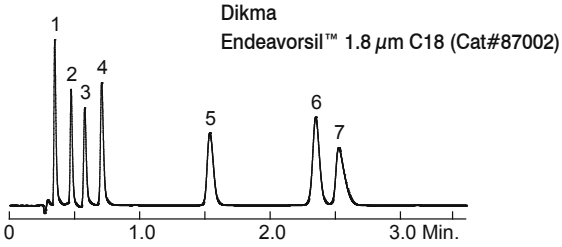
Waters
ACQUITY UPLC HSS T3 1.8 μm C18



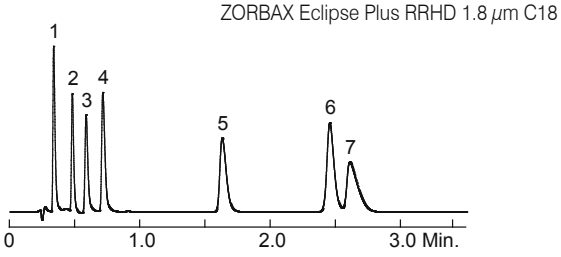
β-Blockers at Low pH

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 25:75
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 220 nm
Sample: 1. Nadolol
2. Pindolol
3. Acebutolol
4. Metoprolol
5. Labetolol
6. Propranolol
7. Alprenolol

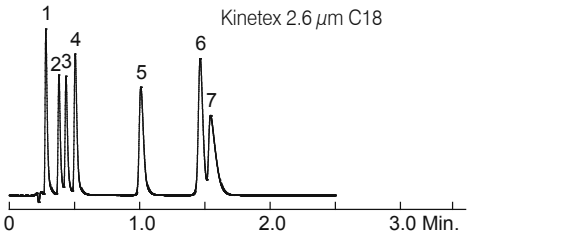
Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



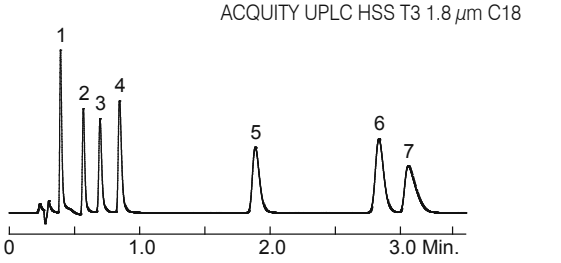
Agilent
ZORBAX Eclipse Plus RRHD 1.8 μm C18



Phenomenex
Kinetex 2.6 μm C18



Waters
ACQUITY UPLC HSS T3 1.8 μm C18



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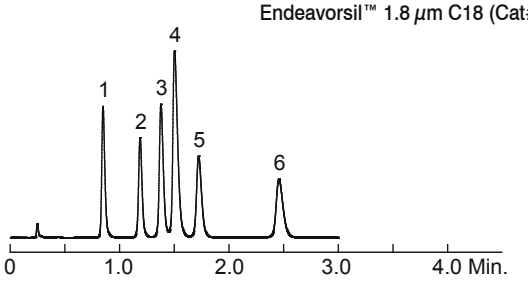
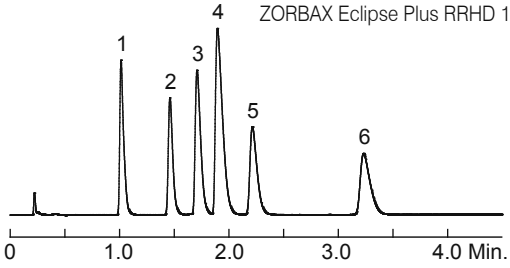
TCAs at Low pH*

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 35:65
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Doxepin
2. Desipramine
3. Nortriptyline
4. Amitriptyline
5. Trimipramine
6. Clomipramine

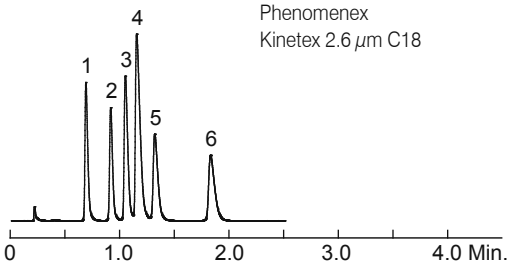
Dikma
Endeavorsil™ 1.8 µm C18 (Cat#87002)



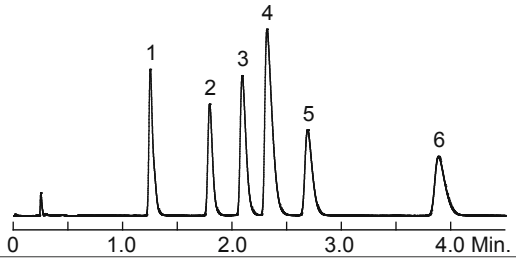
Agilent
ZORBAX Eclipse Plus RRHD 1.8 µm C18



Phenomenex
Kinetex 2.6 µm C18



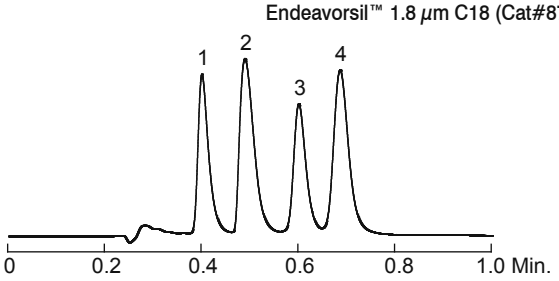
Waters
ACQUITY UPLC HSS T3 1.8 µm C18



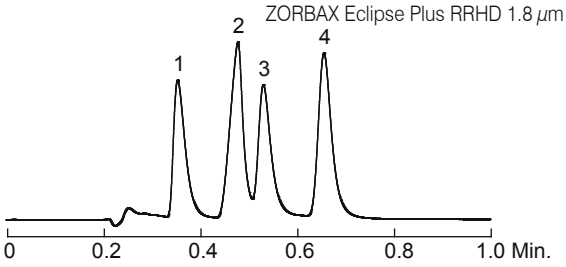
Antiulcers

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: MeOH:10 mM CH_3COONH_4 (pH 7) = 35:65
Flow Rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV 220 nm
Sample:
1. Famotidine
2. Ranitidine
3. Cimetidine
4. Nizatidine

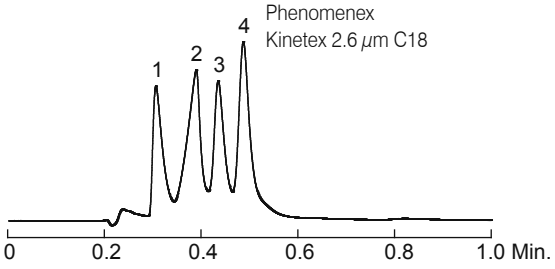
Dikma
Endeavorsil™ 1.8 µm C18 (Cat#87002)



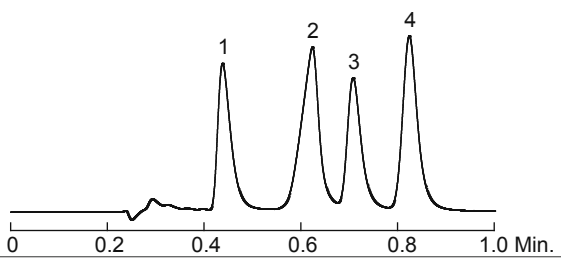
Agilent
ZORBAX Eclipse Plus RRHD 1.8 µm C18



Phenomenex
Kinetex 2.6 µm C18



Waters
ACQUITY UPLC HSS T3 1.8 µm C18



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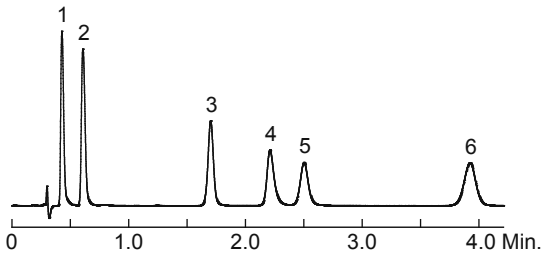
Endeavorsil™

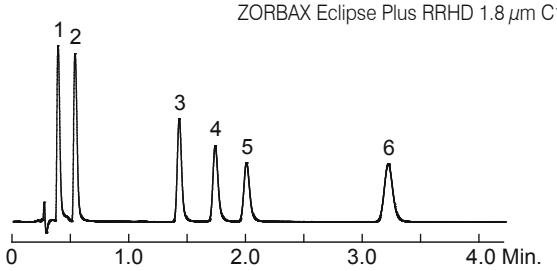
Polar Acids*

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 20:80
Flow Rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample:
1. *p*-Aminobenzoic acid
2. Homovanillic acid
3. Sorbic acid
4. Salicylic acid
5. *p*-Chlorobenzoic acid
6. *p*-Nitrobenzoic acid

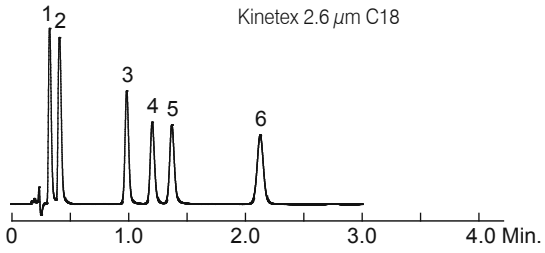
Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



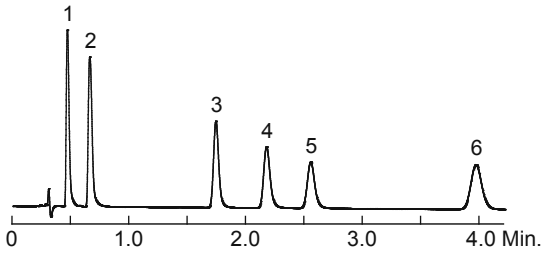
Agilent
ZORBAX Eclipse Plus RRHD 1.8 μm C18



Phenomenex
Kinetex 2.6 μm C18



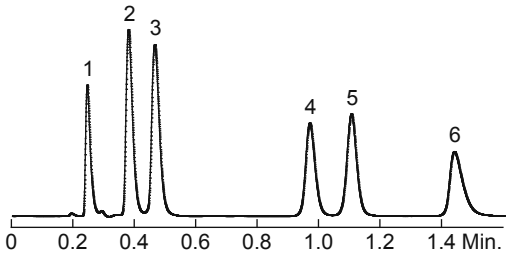
Waters
ACQUITY UPLC HSS T3 1.8 μm C18



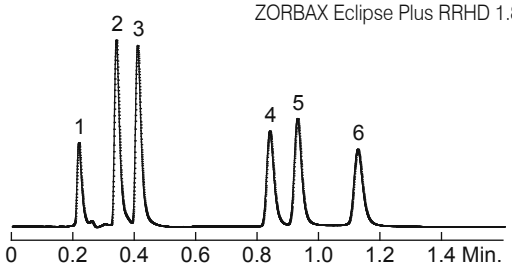
Acidic Compounds

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 25:75
Flow Rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample:
1. *L*-Ascorbic acid
2. *p*-Aminobenzoic acid
3. Homovanillic acid
4. Acetylsalicylic acid
5. Sorbic acid
6. Salicylic acid

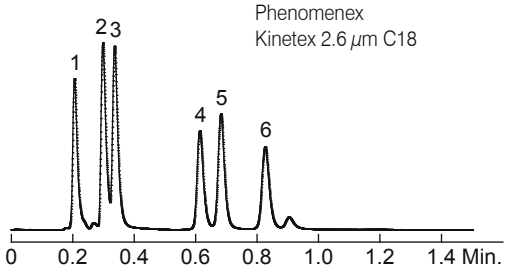
Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



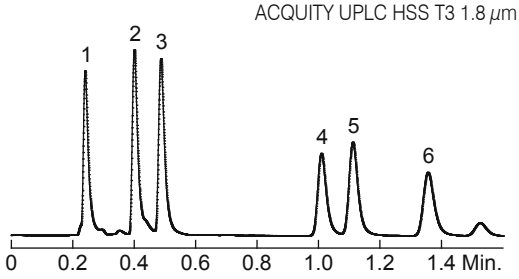
Agilent
ZORBAX Eclipse Plus RRHD 1.8 μm C18



Phenomenex
Kinetex 2.6 μm C18



Waters
ACQUITY UPLC HSS T3 1.8 μm C18



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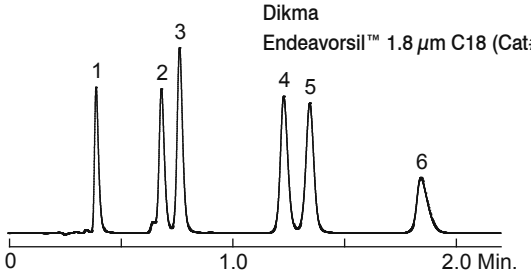
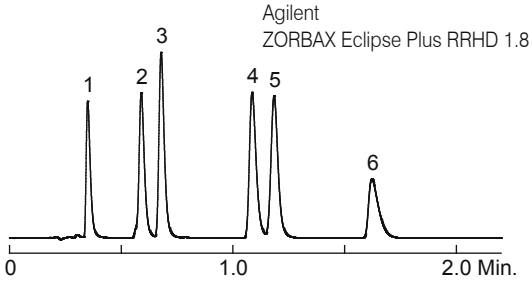
Anti-inflammatories*

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 50:50
Flow Rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample:
1. Phenacetin
2. Tolmetin
3. Ketoprofen
4. Fenoprofen
5. Flurbiprofen
6. Ibuprofen

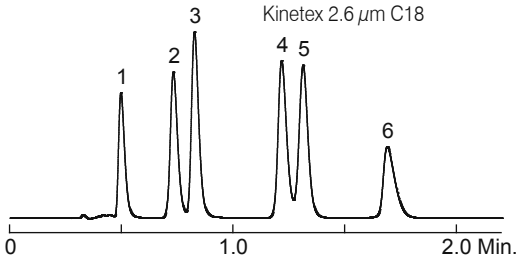
Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



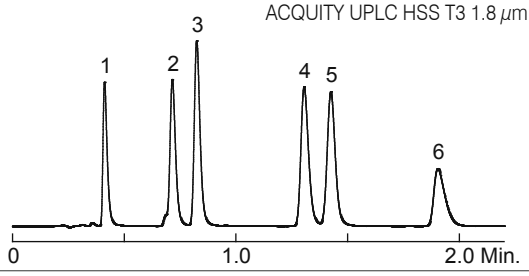
Agilent
ZORBAX Eclipse Plus RRHD 1.8 μm C18



Phenomenex
Kinetex 2.6 μm C18



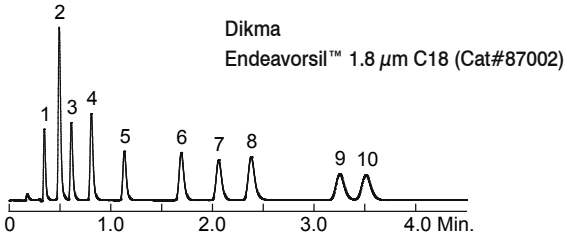
Waters
ACQUITY UPLC HSS T3 1.8 μm C18



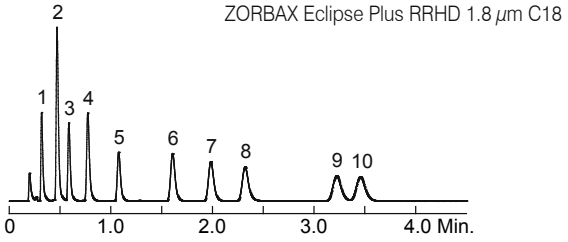
Antibacterials

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 20:80
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Sulfanilamide
2. Carbadox
3. Sulfamerazine
4. Sulfamethoxypyridazine
5. Furazolidone
6. Sulfamethoxazole
7. Sulfisoxazole
8. Oxolinic acid
9. Sulfadimethoxine
10. Sulfaquinoxaline

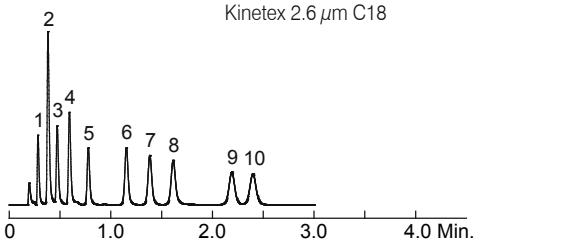
Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



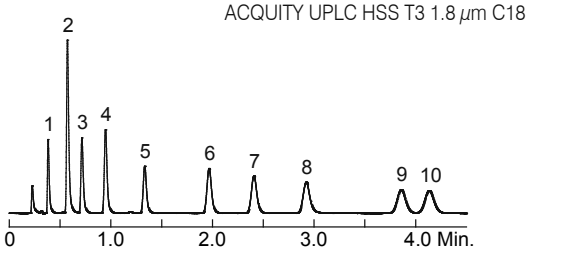
Agilent
ZORBAX Eclipse Plus RRHD 1.8 μm C18



Phenomenex
Kinetex 2.6 μm C18



Waters
ACQUITY UPLC HSS T3 1.8 μm C18



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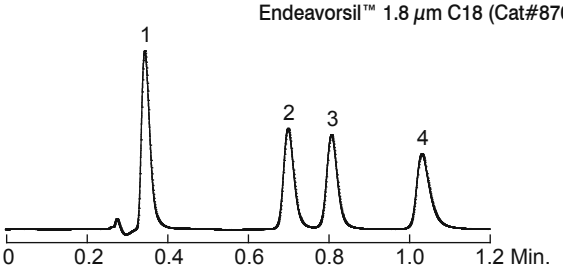
Endeavorsil™

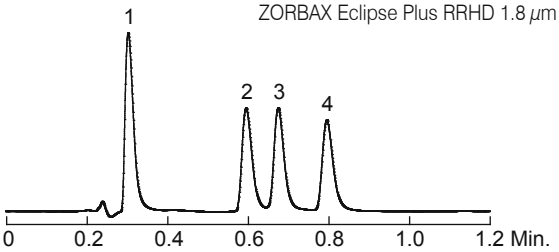
Antifungals*

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 30:70
Flow Rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample: 1. *p*-Aminobenzoic acid
2. Acetylsalicylic acid
3. Benzoic acid
4. Salicylic acid

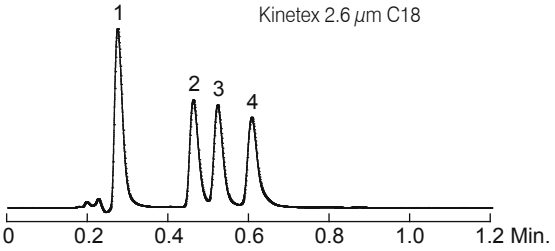
Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



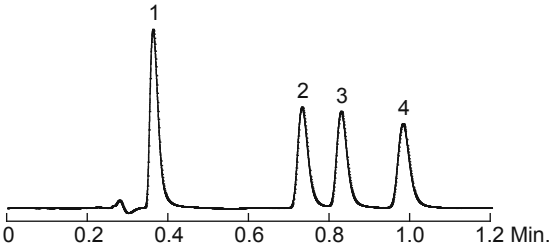
Agilent
ZORBAX Eclipse Plus RRHD 1.8 μm C18



Phenomenex
Kinetex 2.6 μm C18



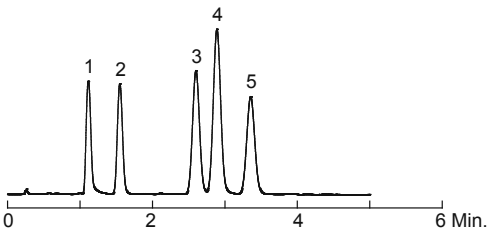
Waters
ACQUITY UPLC HSS T3 1.8 μm C18



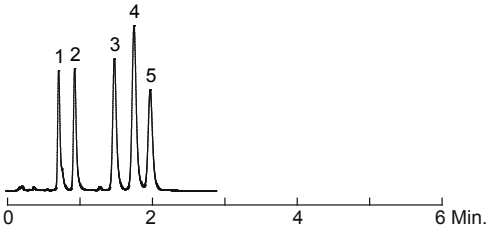
Steroids

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: MeOH:H_2O = 50:50
Flow Rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample: 1. Prednisone
2. Prednisolone
3. Dexamethasone
4. Hydrocortisone 21-acetate
5. 11-α-Hydroprogesterone

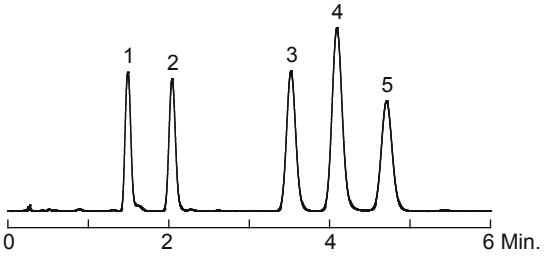
Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



Phenomenex
Kinetex 2.6 μm C18



Waters
ACQUITY UPLC HSS T3 1.8 μm C18



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Features of Leapsil™ Columns

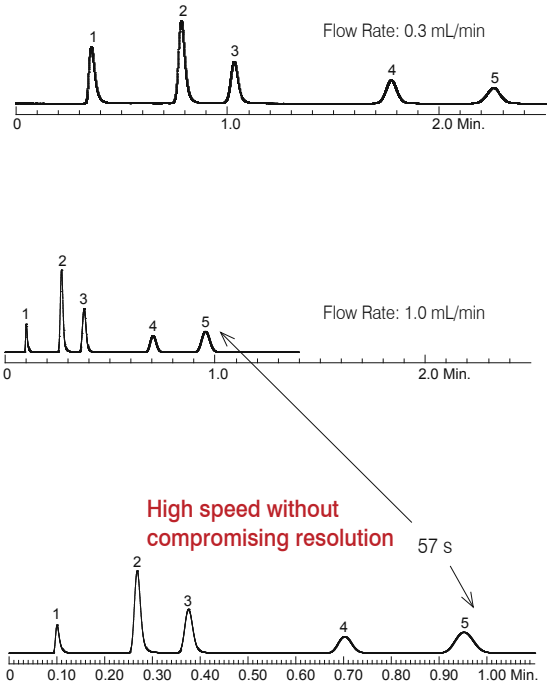
- Ultra fast separation without compromising resolution
- Compatible with all HPLC and UHPLC instruments
- Method development flexibility
- Wide pH stability
- Full spectrum of phases and selectivities

Leapsil™ Material Characteristics

Bonded phase	Particle size (µm)	Pore size (Å)	Surface area (m^2/g)	Purity (%)	Phase density (µmol/m^2)	Carbon loading (%)	pH range	Endcapping
C18	2.7	100	440	> 99.999	3.9	27	1.5 - 10	Yes

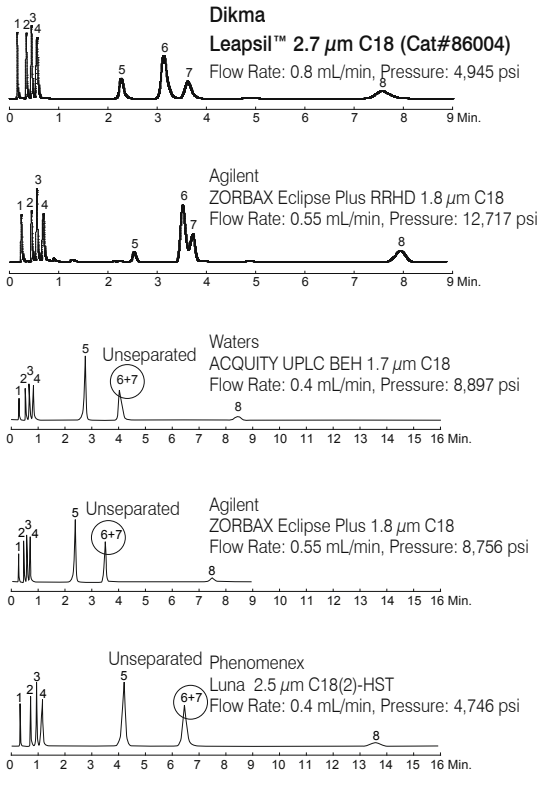
Speed

Column: Leapsil™ 2.7 µm C18, 50 x 2.1 mm
Cat. No.: **86004**
Mobile Phase: MeCN:H_2O = 60:40
Temperature: 30 °C
Detection: UV 254 nm
Sample: 1. Uracil
2. Acetophenone
3. Methyl benzoate
4. Toluene
5. Naphthalene



Selectivity*

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: MeOH:H_2O = 45:55
Temperature: 30 °C
Detection: UV 254 nm
Sample: 1. Thiourea
2. Aniline
3. Phenol
4. *o,m,p*-Toluidine
5. *N,N*-Dimethylaniline
6. Ethyl benzoate
7. Toluene
8. Ethylbenzene



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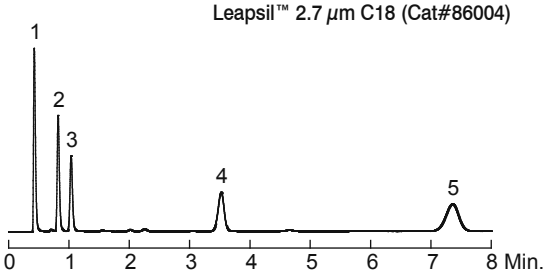
*BEH Technology is a trademark of Waters Corporation. Dikma Technologies Inc. is not affiliated with the above company.
*ACQUITY UPLC is a registered trademark of Waters Corporation. Dikma Technologies Inc. is not affiliated with the above company.
*Luna is a registered trademark of Phenomenex. Dikma Technologies Inc. is not affiliated with the above company.

Leapsil™

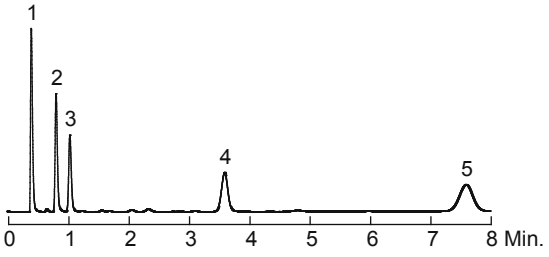
Galushko Test*

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: MeOH:H_2O = 50:50
Flow Rate: 0.3 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Uracil
2. Aniline
3. Phenol
4. Benzene
5. Toluene

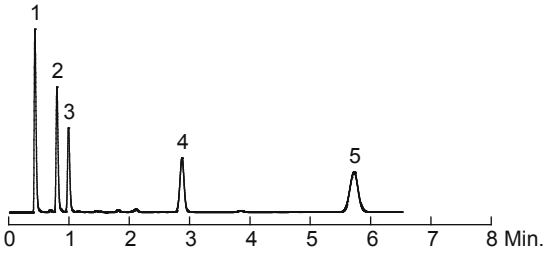
Dikma
Leapsil™ 2.7 µm C18 (Cat#86004)



Agilent
Pursuit XRs ULTRA 2.8 µm C18



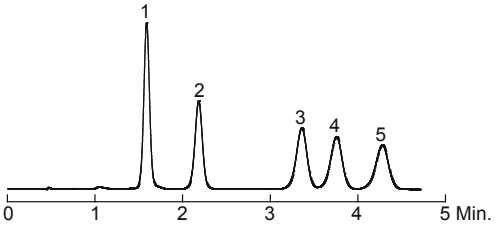
Phenomenex
Luna 2.5 µm C18(2)-HST



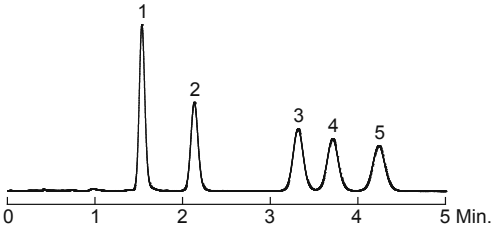
Steroids

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: MeOH:H_2O = 55:45
Flow Rate: 0.3 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample: 1. Prednisone
2. Prednisolone
3. Betamethasone
4. Cortisone 21-acetate
5. 11-α-Hydroprogesterone

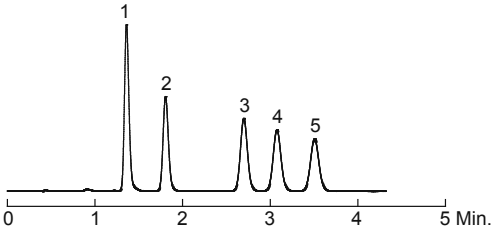
Dikma
Leapsil™ 2.7 µm C18 (Cat#86004)



Agilent
Pursuit XRs ULTRA 2.8 µm C18



Phenomenex
Luna 2.5 µm C18(2)-HST



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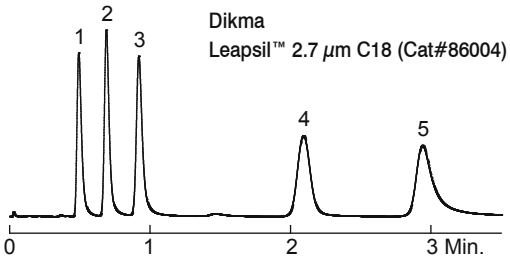
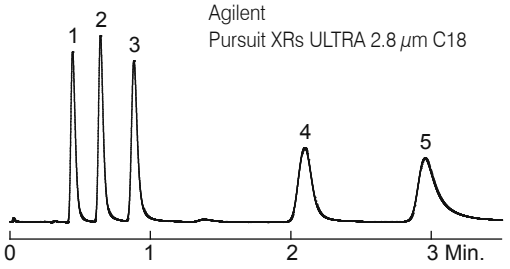
*Luna is a registered trademark of Phenomenex. Dikma Technologies Inc. is not affiliated with the above company.

β-Blockers at Neutral pH*

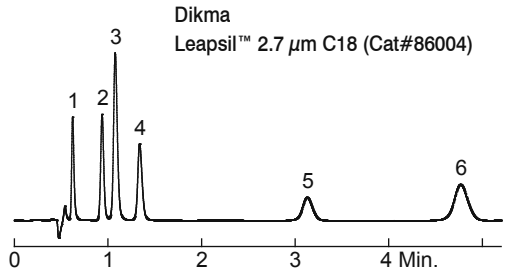
Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: MeCN:20 mM phosphate buffer (pH 7) = 25:75
Flow Rate: 0.3 mL/min
Temperature: 30 °C
Detection: UV 220 nm
Sample: 1. Nadolol
2. Pindolol
3. Metoprolol
4. Labetolol
5. Propranolol

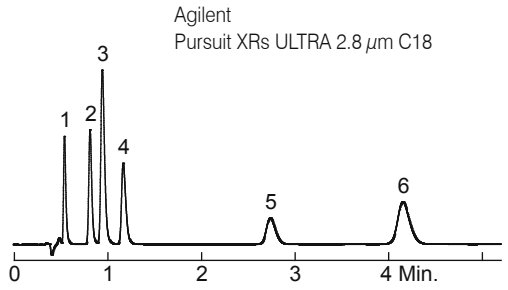




β-Blockers at Low pH

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 25:75
Flow Rate: 0.3 mL/min
Temperature: 30 °C
Detection: UV 220 nm
Sample: 1. Nadolol
2. Pindolol
3. Acebutolol
4. Metoprolol
5. Labetolol
6. Propranolol





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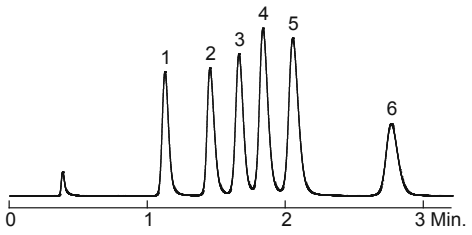
Leapsil™

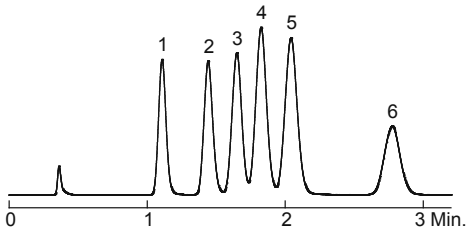
TCAs at Low pH*

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 40:60
Flow Rate: 0.3 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Doxepin
2. Protriptyline
3. Nortriptyline
4. Amitriptyline
5. Trimipramine
6. Clomipramine

Dikma
Leapsil™ 2.7 µm C18 (Cat#86004)



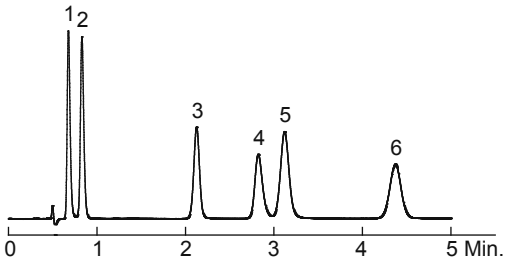
Agilent
Pursuit XRs ULTRA 2.8 µm C18



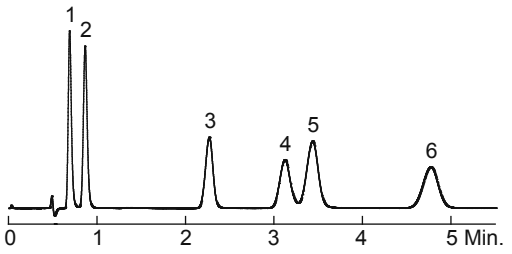
Polar Acids

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 25:75
Flow Rate: 0.3 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample: 1. *p*-Aminobenzoic acid
2. Homovanillic acid
3. Sorbic acid
4. Salicylic acid
5. *p*-Nitrobenzoic acid
6. *p*-Toluic acid

Dikma
Leapsil™ 2.7 µm C18 (Cat#86004)



Agilent
Pursuit XRs ULTRA 2.8 µm C18



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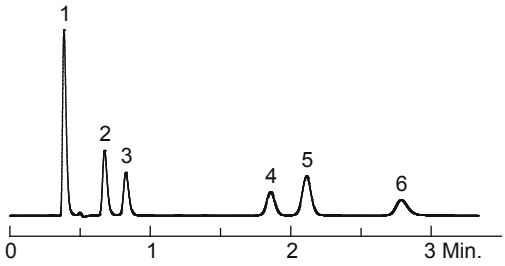
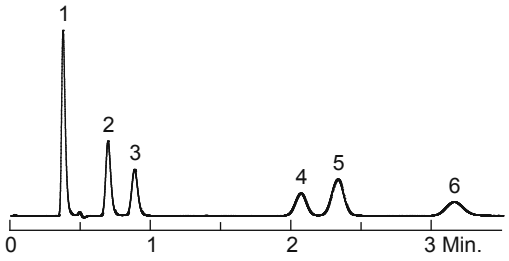
Acidic Compounds*

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 25:75
Flow Rate: 0.3 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample:
1. *L*-Ascorbic acid
2. *p*-Aminobenzoic acid
3. Homovanillic acid
4. Acetylsalicylic acid
5. Sorbic acid
6. Salicylic acid

Dikma
Leapsil™ 2.7 µm C18 (Cat#86004)



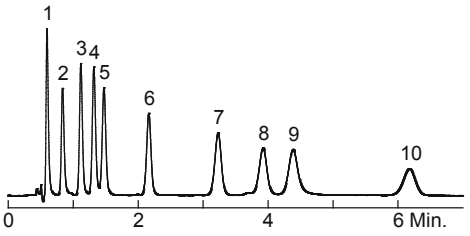
Agilent
Pursuit XRs ULTRA 2.8 µm C18



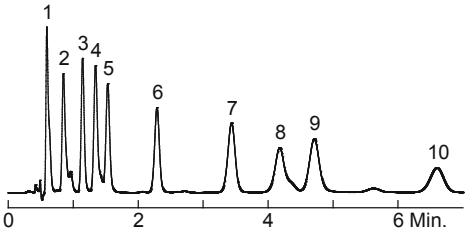
Antibacterials

Column: Listed on chromatograms
Dimension: 50 x 2.1 mm
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 20:80
Flow Rate: 0.3 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Sulfanilamide
2. Carbadox
3. Sulfamerazine
4. Sulfamethazine
5. Sulfamethoxypyridazine
6. Furazolidone
7. Sulfamethoxazole
8. Sulfisoxazole
9. Oxolinic acid
10. Sulfadimethoxine

Dikma
Leapsil™ 2.7 µm C18 (Cat#86004)



Agilent
Pursuit XRs ULTRA 2.8 µm C18



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Leapsil™

Leapsil™ Ordering Information

2.7 µm Microbore Columns (2.1 mm)

Phase	50 x 2.1	Price	100 x 2.1	Price	150 x 2.1	Price
Leapsil™ C18	86004	$463	86005	$562	86006	$662

2.7 µm Analytical Columns (3.0 mm)

Phase	50 x 3.0	Price	100 x 3.0	Price	150 x 3.0	Price
Leapsil™ C18	86007	$463	86008	$562	86009	$662

2.7 µm Analytical Columns (4.6 mm)

Phase	50 x 4.6	Price	100 x 4.6	Price	150 x 4.6	Price
Leapsil™ C18	86001	$463	86002	$562	86003	$662

Features of Inspire™ Columns

- Rapid separations with outstanding resolution
- Advanced bonding technologies
- High efficiency and outstanding lifetime
- Excellent separation characteristics over wide pH range
- Superior batch-to-batch reproducibility
- Choose from a variety of phases and hardware formats

Inspire™ columns are engineered with high purity raw silica, proprietary bonding techniques, tightly controlled manufacturing processes, and column packing procedures that provide today's chromatographic laboratories with HPLC columns of unrivaled performance.

Inspire™ Material Characteristics

Bonded phase	Particle size (µm)	Pore size (Å)	Surface area (m^2/g)	Purity (%)	Phase density ($\mu mol/m^2$)	Carbon loading (%)	pH range	Endcapping
C18	3, 5, 10	100	440	> 99.999	3.9	27	1 - 11	Yes
C8	3, 5, 10	100	440	> 99.999	4.2	17	1 - 11	Yes

Superior Batch-to-batch Reproducibility

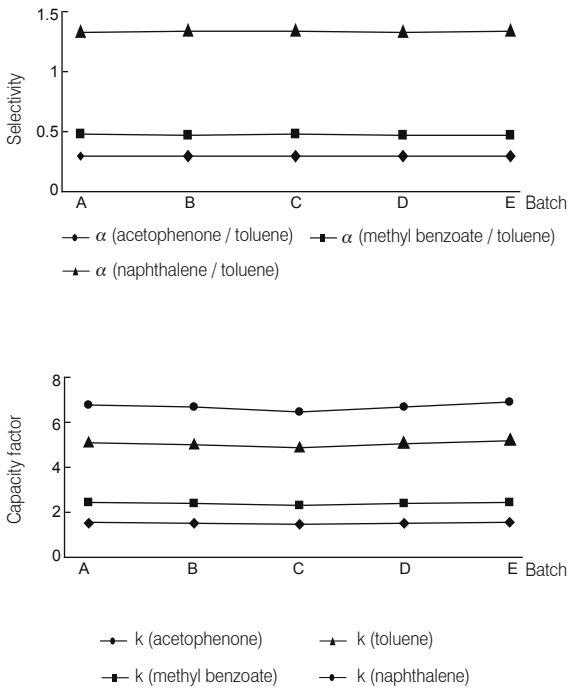
Reproducibility is essential for the selection of a HPLC column. Today's chemists often need to establish new analytical methods to evaluate the latest pharmaceutical and biopharmaceutical products. The column they select has to provide the same chromatographic results over the entire lifespan of the new drug product. Chemists doing QA / QC also need a well-producible column, which ensures the accuracy of analytical results and high productivity of chromatographic laboratories. Inspire™ columns undergo rigorous quality control testing to ensure long-term reproducibility, letting you increase your laboratory's productivity and allowing for easier method transfer between labs.

Long Lifetime

Columns that last longer not only save your money, but also save your time in establishing and verifying methods for a new column. Inspire™ columns deliver guaranteed, consistent performance in optimizing the two key factors that control column lifetime: the packing material and the mechanical stability of the packed bed.

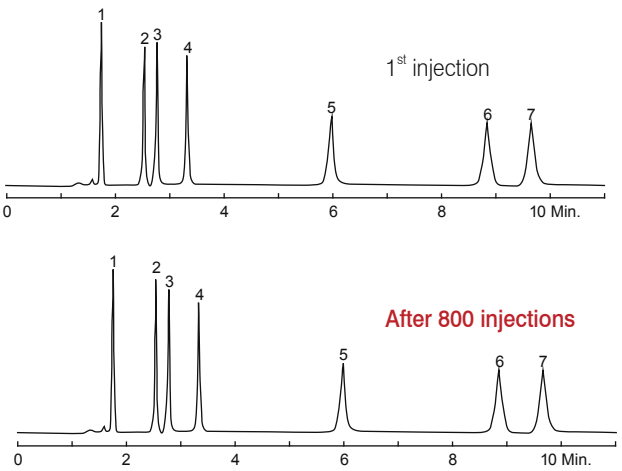
Reproducibility Test

Five randomly selected batches demonstrated excellent reproducibility in the example shown:



Lifetime Test

Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 30:70
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 220 nm
Sample:
1. Nadolol
2. Pindolol
3. Acebutolol
4. Metoprolol
5. Labetolol
6. Propranolol
7. Alprenolol



Inspire™ columns can last over 800 injections with minimal loss in efficiency, symmetry and retention time.

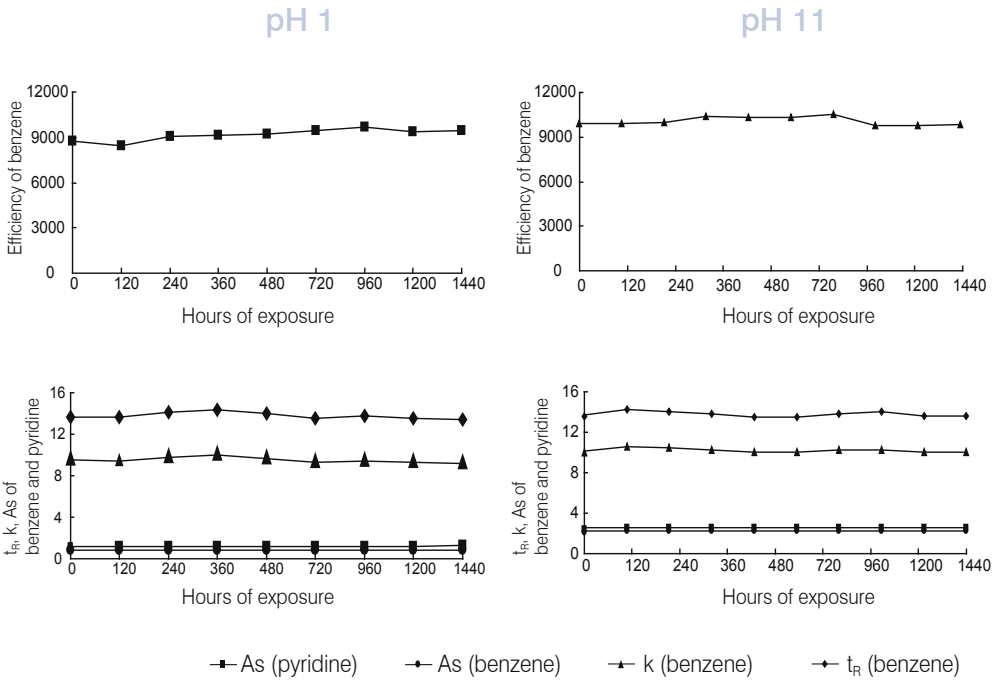
Stable from pH 1 - 11

Generally, the cause of shortened column lifetime relates to exposure under extreme pH mobile phases, which leads to hydrolysis of the bonded phase at low pH and dissolution of silica at high pH. The hydrolysis can also lead to significant changes in analyte retention time, making method reproducibility requirements difficult to achieve.

Dikma incorporates proprietary bonding and endcapping techniques, making Inspire™ packing much more stable across a broad pH range when compared to conventionally prepared material. Our packing platform also effectively resists the typical ligand hydrolysis and silica dissolution seen with conventional columns. In both low pH and high pH tests, Inspire™ C18 columns undergo elution over 1,440 hours and show very little loss of retention time, capacity factor and symmetry, exhibiting their unsurpassed endurance and stability.

pH Stability Test

Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: MeCN:20 mM phosphate buffer (pH 7) = 40:60
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Uracil
2. Pyridine
3. Phenol
4. Benzene



Flush solution (pH 1)

Mobile Phase: 1% TFA in MeCN:1% TFA in H_2O = 50:50
Flow Rate: 1.0 mL/min
Temperature: Ambient

Flush solution (pH 11)

Mobile Phase: MeCN:20 mM phosphate buffer = 50:50
Flow Rate: 1.0 mL/min
Temperature: Ambient

Efficient Method Development

Inspire™ columns provide chromatographic laboratories with advanced performance and robust, rugged methods that can be achieved across the entire log *P* range of -2 to 8, simplifying the method validation and transfer process.

In the test below, aspartame, reserpine, cortisone and dioctyl phthalate are chosen to evaluate the Inspire™ columns with a sample representative of molecules encountered in drug discovery. The compounds vary in polarity (log *P* = -2 to 8) and molecular weight (MW 294 to 608). High quality separation of these components demonstrates the broad applicability of Inspire™ C18 to a range of compounds with drug-like properties.

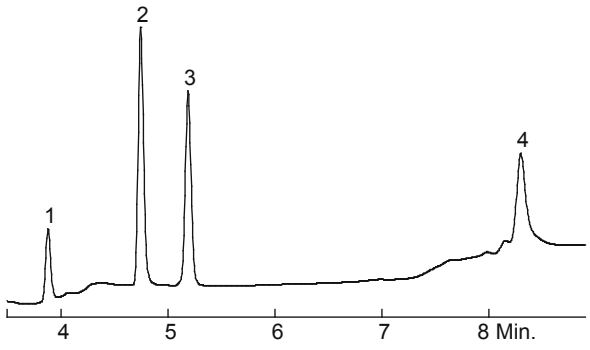
Tang, L.; Fitch, W.L.; Alexander, M.S.; Dolan J.W. Anal. Chem., 2000, 72, 5211 - 5218.

Engelhardt Test

The Engelhardt test is a stringent test we use to verify the selectivity of Inspire™ columns. It is based solely on stationary phase chemistry. In this test, aniline elutes before phenol and the three toluidine isomers coelute, indicating that the acidic silanol groups of Inspire™ columns are deactivated.

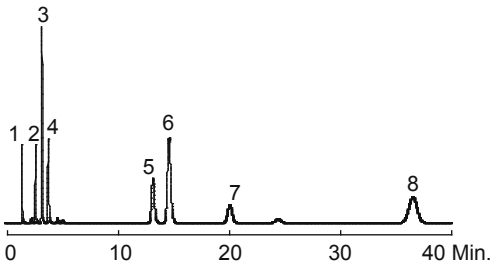
LC / MS Performance Test Mix

Column:	Inspire™ 5 µm C18
Dimension:	150 x 4.6 mm
Cat. No.:	**81001**
Mobile Phase:	A: 0.05% HCOOH in MeCN
	B: 0.05% HCOOH in H_2O
	Gradient: 10 - 90% A in 5 min, hold at 90% A for 5 min
Flow Rate:	1.0 mL/min
Temperature:	Ambient
Detection:	UV 220 nm
Sample:	1. Aspartame
	2. Reserpine
	3. Cortisone
	4. Dioctyl phthalate



Engelhardt Test

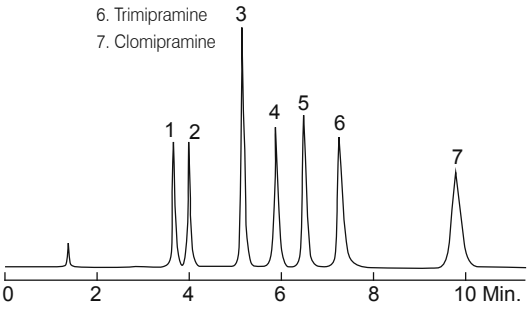
Column:	Inspire™ 5 µm C18
Dimension:	150 x 4.6 mm
Cat. No.:	**81001**
Mobile Phase:	MeOH:H_2O = 55:45
Flow Rate:	1.0 mL/min
Temperature:	30 °C
Detection:	UV 254 nm
Sample:	1. Thiourea
	2. Aniline
	3. Phenol
	4. *o,m,p*-Toluidine
	5. *N,N*-Dimethylaniline
	6. Ethyl benzoate
	7. Toluene
	8. Ethylbenzene



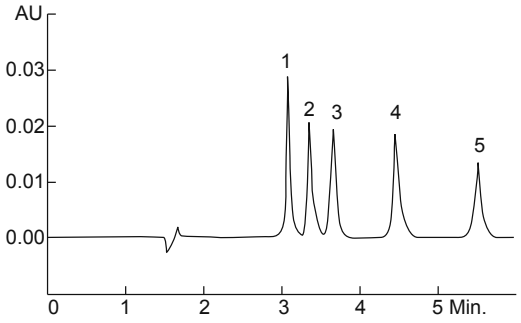
Inspire™

Excellent Peak Shapes with Basic Molecules - but simple mobile phase*

Column: Inspire™ 5 μm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: A: 0.1% TFA in H_2O
B: 0.1% TFA in MeCN
A:B = 60:40
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Nordoxepin
2. Doxepin
3. Desipramine
4. Nortriptyline
5. Amitriptyline
6. Trimipramine
7. Clomipramine

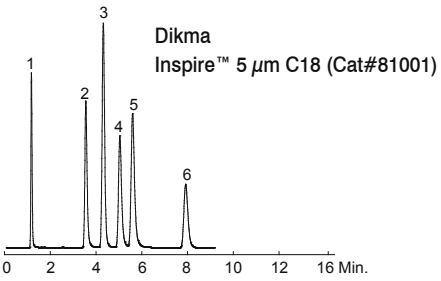


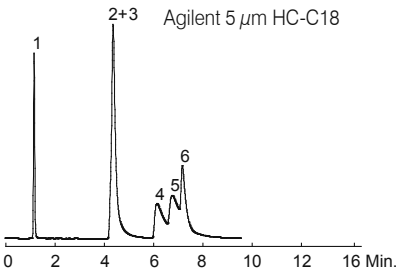
Column: SunFire™ 5 μm C18, 150 x 4.6 mm
Mobile Phase: A: H_2O
B: MeOH
C: 100 mM CH_3COONH_4, pH 6.0
A:B:C = 18:72:10
Flow Rate: 1.0 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample: 1. Desipramine
2. Nortriptyline
3. Doxepin
4. Imipramine
5. Amitriptyline

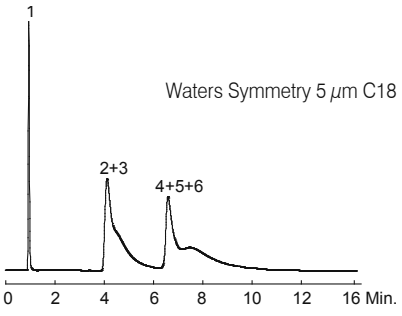


Antihistamines at High pH*

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: MeOH:5 mM NH_4HCO_3 (pH 10) = 75:25
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Maleic acid
2. Pheniramine
3. Doxylamine
4. Chlorpheniramine
5. Brompheniramine
6. Diphenhydramine







*SunFire is a trademark of Waters Corporation. Dikma Technologies Inc. is not affiliated with the above company.
*Symmetry is a registered trademark of Waters Corporation. Dikma Technologies Inc. is not affiliated with the above company.

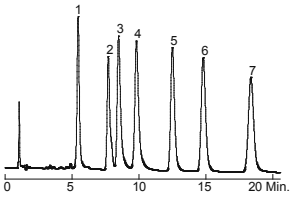
TCAs at High and Neutral pHs

Basic compounds tend to tail on alkyl phases because of the interaction with the silanols on the silica surface. This can often cause increased retention but loss in performance (peak shape). The most sensitive measurement of silanol interactions is achieved using highly basic probes with a pH 7 mobile phase. At this pH, many of the residual silanols are in their ionized form, and the basic probes are completely protonated. The protonated bases interact with the ionized silanols by an ion-exchange mechanism, and the degree of tailing is a direct measure of silanol activity. Inspire™ columns provide more symmetrical peaks and greater resolution for TCAs at high and neutral pHs, demonstrating their outstanding bonding and endcapping techniques.

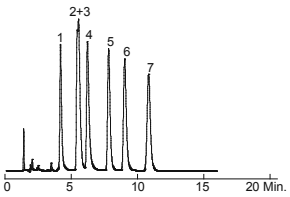
TCAs at High pH*

Column:	Listed on chromatograms
Dimension:	150 x 4.6 mm
Mobile Phase:	MeOH:5 mM NH_4HCO_3 (pH 10) = 80:20
Flow Rate:	1.0 mL/min
Temperature:	Ambient
Detection:	UV 254 nm
Sample:	1. Nordoxepin 2. Doxepin 3. Desipramine 4. Nortriptyline 5. Imipramine 6. Amitriptyline 7. Trimipramine

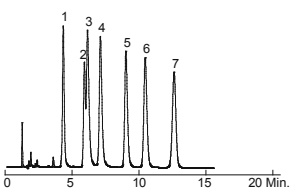
Dikma
Inspire™ 5 µm C18 (Cat#81001)



Phenomenex Gemini 5 µm C18



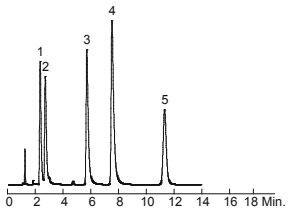
Kromasil 5 µm C18



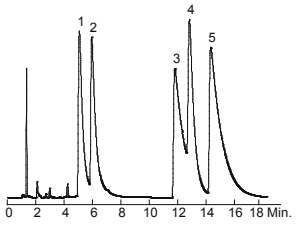
TCAs at Neutral pH*

Column:	Listed on chromatograms
Dimension:	150 x 4.6 mm
Mobile Phase:	MeCN:20 mM phosphate buffer (pH 7) = 2:1
Flow Rate:	1.0 mL/min
Temperature:	Ambient
Detection:	UV 254 nm
Sample:	1. Desipramine 2. Nortriptyline 3. Imipramine 4. Amitriptyline 5. Trimipramine

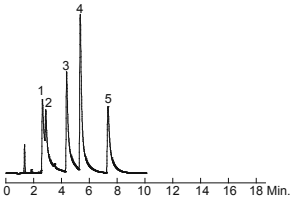
Dikma
Inspire™ 5 µm C18 (Cat#81001)



Agilent 5 µm HC-C18



Waters XBridge 5 µm C18



*XBridge is a trademark of Waters Corporation. Dikma Technologies Inc. is not affiliated with the above company.
*Gemini is a registered trademark of Phenomenex. Dikma Technologies Inc. is not affiliated with the above company.
*Kromasil is a registered trademark of Eka Chemicals AB. Dikma Technologies Inc. is not affiliated with the above company.

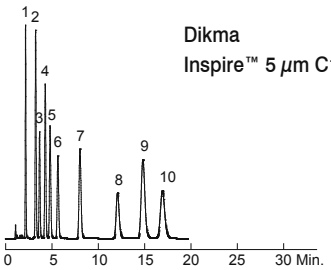
Inspire™

Ultimate Performance

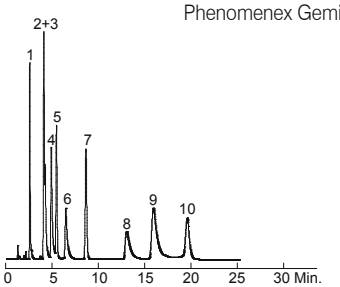
High phase density results in increased analyte-bonded phase interactions. These interactions impart greater selectivity and retention, leading to enhanced resolution.

Antibacterials*

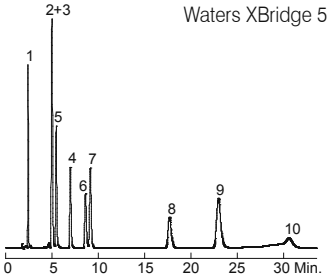
Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 20:80
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Sulfanilamide
2. Carbadox
3. Sulfapyridine
4. Sulfamerazine
5. Thiamphenicol
6. Sulfamethoxypyridazine
7. Furazolidone
8. Sulfamethoxazole
9. Sulfisoxazole
10. Oxolinic acid



Dikma
Inspire™ 5 µm C18 (Cat#81001)



Phenomenex Gemini 5 µm C18

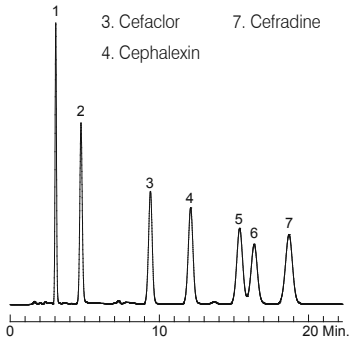


Waters XBridge 5 µm C18

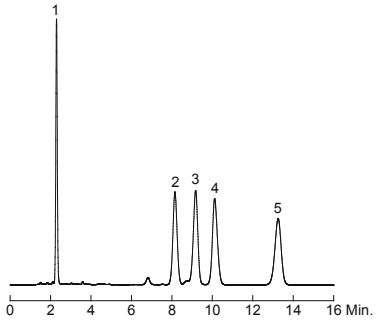
*XBridge is a trademark of Waters Corporation. Dikma Technologies Inc. is not affiliated with the above company.
*Gemini is a registered trademark of Phenomenex. Dikma Technologies Inc. is not affiliated with the above company.

Separation of Cephalosporin Antibiotics at Different Mobile Phase Conditions

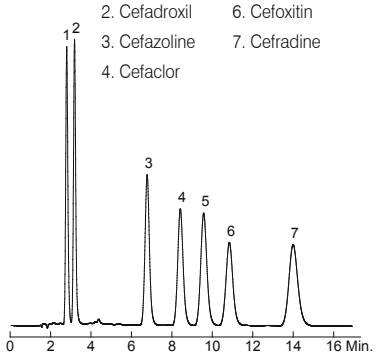
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: MeOH:25 mM phosphate buffer (pH 3) = 20:80
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 230 nm
Sample:
1. Cefadroxil
2. Ceftazidime
3. Cefaclor
4. Cephalexin
5. Cefazoline
6. Cefoxitin
7. Cefradine



Mobile Phase: MeOH:100 mM acetate buffer = 20:80
Flow Rate: 1.0 mL/min
Detection: UV 254 nm
Sample:
1. Cefadroxil
2. Cefuroxime
3. Cefaclor
4. Cefoxitin
5. Cefradine



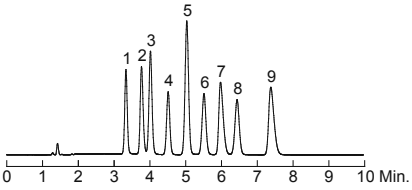
Mobile Phase: MeOH:0.1% TFA in H_2O = 30:70
Flow Rate: 1.0 mL/min
Detection: UV 230 nm
Sample:
1. Ceftazidime
2. Cefadroxil
3. Cefazoline
4. Cefaclor
5. Cephalexin
6. Cefoxitin
7. Cefradine



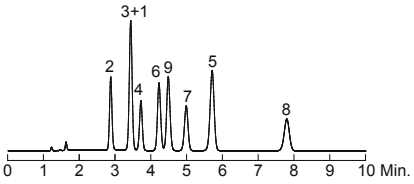
Separation of TCAs and Benzos*

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 40:60
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Nitrozepam
2. Nordoxepin
3. Alprazolam
4. Diazepam
5. Oxazepam
6. Triazolam
7. Nortriptyline
8. Clonazepam
9. Trimipramine

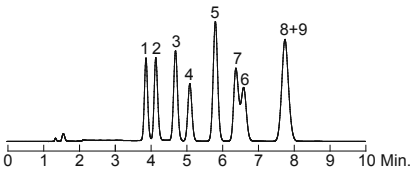
Dikma
Inspire™ 5 µm C18 (Cat#81001)



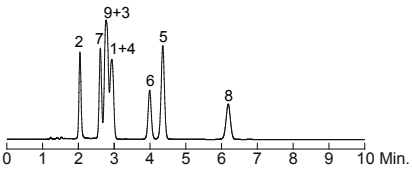
Dikma
Spursil™ 5 µm C18-EP (Cat#82101)



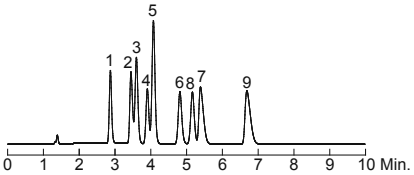
GL Science
Inertsil 5 µm ODS-3



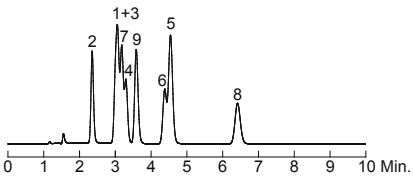
Agilent
ZORBAX 5 µm Bonus-RP



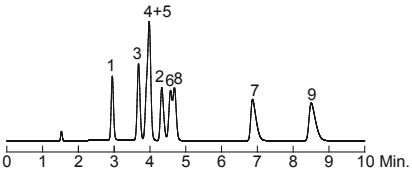
Agilent
ZORBAX Eclipse 5 µm XDB-C18



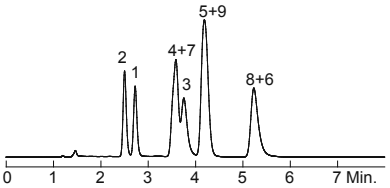
Waters
SymmetryShield 5 µm RP18



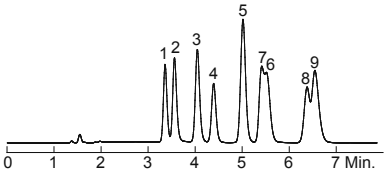
Waters
XBridge 5 µm C18



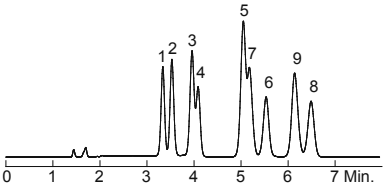
Waters
Symmetry 5 µm C18



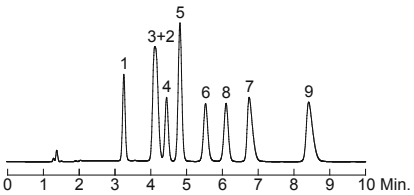
Phenomenex
Luna 5 µm C18(2)



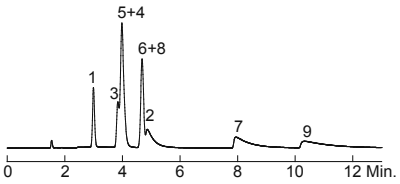
Phenomenex
Gemini 5 µm C18



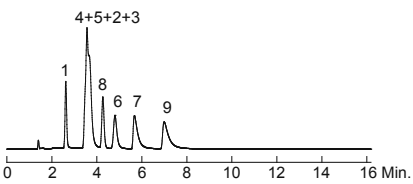
Eka Chemicals AB
Kromasil 5 µm C18



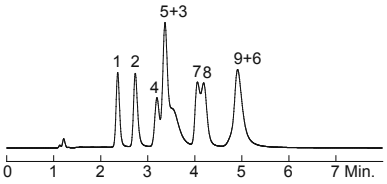
Thermo Scientific
Hypersil 5 µm BDS C18



Beckman Coulter
Ultrasphere 5 µm C18



Separation Methods Technologies
OD-5-100 5 µm C18



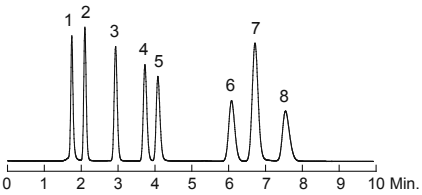
*The comparative data presented here may not be representative for all applications.

Inspire™

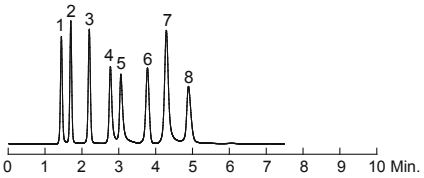
Organic Acids*

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: 25 mM KH_2PO_4, pH 2.5
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 210 nm
Sample: 1. Oxalic acid
2. Tartaric acid
3. Malic acid
4. Lactic acid
5. Acetic acid
6. Citric acid
7. Fumaric acid
8. Succinic acid

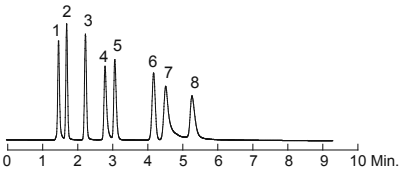
Dikma
Inspire™ 5 µm C18 (Cat#81001)



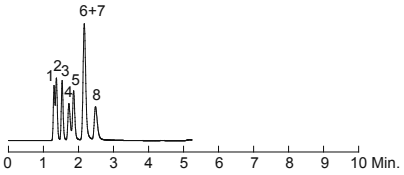
Dikma
Spursil™ 5 µm C18 (Cat#82001)



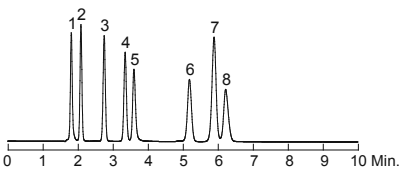
Agilent
ZORBAX 5 µm SB-C18



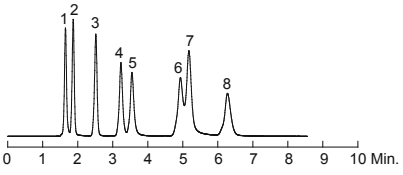
Agilent
ZORBAX Eclipse 5 µm XDB-C18



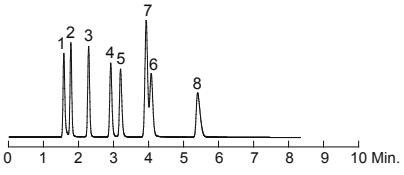
Phenomenex
Gemini 5 µm C18



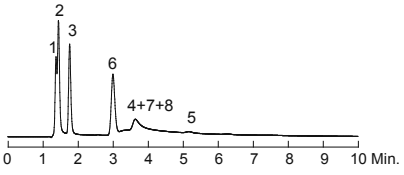
Phenomenex
Luna 5 µm C18(2)



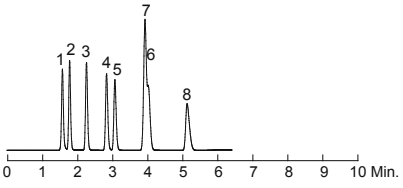
Waters
XBridge 5 µm C18



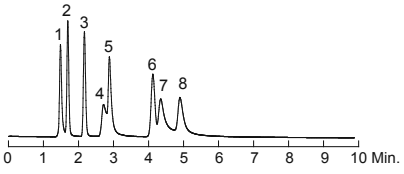
Waters
Symmetry 5 µm C18



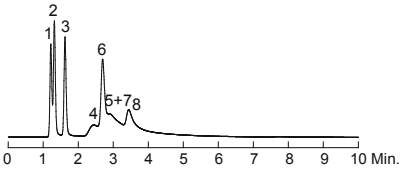
Thermo Scientific
Hypersil 5 µm BDS C18



Beckman Coulter
Ultrasphere 5 µm C18



Separation Methods Technologies
OD-5-100 5 µm C18

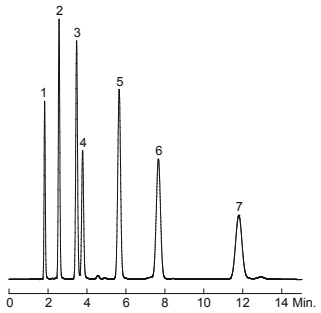


*The comparative data presented here may not be representative for all applications.

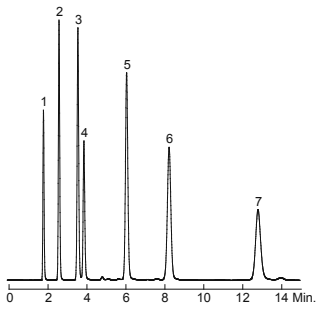
Flavonoids

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: MeCN:0.085% H_3PO_4 = 20:80
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 280 nm
Sample:
1. Gallic acid
2. Catechin
3. Caffeic acid
4. Vanillic acid
5. *p*-Coumaric acid
6. Quercitrin
7. Myricetin

Dikma
Inspire™ 5 µm C18 (Cat#81001)



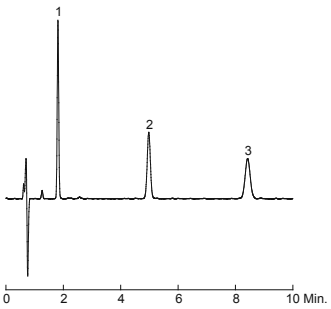
Dikma
Spursil™ 5 µm C18 (Cat#82001)



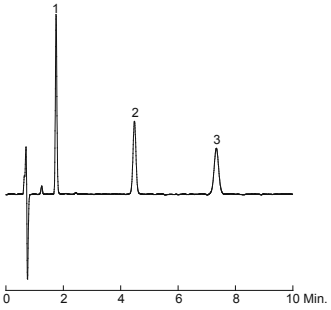
Herbicides

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 40:60
Flow Rate: 2.0 mL/min
Temperature: Ambient
Detection: UV 214 nm
Sample:
1. Dalapon
2. 2,4-D
3. 2,4,5-T

Dikma
Inspire™ 5 µm C18 (Cat#81001)



Dikma
Spursil™ 5 µm C18 (Cat#82001)



Inspire™ Ordering Information

3 μm Microbore Columns (2.1 mm)

Guard Cartridge, 2/pk

Phases	30 x 2.1	Price	50 x 2.1	Price	100 x 2.1	Price	150 x 2.1	Price	250 x 2.1	Price	10 x 2.1	Price
Inspire™ C18	81030	$333	81004	$353	81012	$523	81013	$572	81015	$602	6501	$149
Inspire™ C8	81130	333	81104	353	81112	523	81113	572	81115	602	6502	149

3 μm Analytical Columns (3.0 mm)

Phases	30 x 3.0	Price	50 x 3.0	Price	100 x 3.0	Price	150 x 3.0	Price	250 x 3.0	Price	10 x 2.1	Price
Inspire™ C18	81029	$333	81021	$353	81022	$523	81023	$572	81024	$602	6501	$149
Inspire™ C8	81129	333	81121	353	81122	523	81123	572	81124	602	6502	149

3 μm Analytical Columns (4.6 mm)

Phases	30 x 4.6	Price	50 x 4.6	Price	100 x 4.6	Price	150 x 4.6	Price	250 x 4.6	Price	10 x 4.0	Price
Inspire™ C18	81031	$333	81016	$353	81017	$523	81018	$572	81020	$602	6601	$149
Inspire™ C8	81131	333	81116	353	81117	523	81118	572	81120	602	6602	149

5 μm Microbore Columns (2.1 mm)

Phases	30 x 2.1	Price	50 x 2.1	Price	100 x 2.1	Price	150 x 2.1	Price	250 x 2.1	Price	10 x 2.1	Price
Inspire™ C18	81033	$323	81003	$343	81007	$508	81002	$557	81009	$587	6503	$149
Inspire™ C8	81133	323	81103	343	81107	508	81102	557	81109	587	6504	149

5 μm Analytical Columns (3.0 mm)

Phases	30 x 3.0	Price	50 x 3.0	Price	100 x 3.0	Price	150 x 3.0	Price	250 x 3.0	Price	10 x 2.1	Price
Inspire™ C18	81032	$323	81025	$343	81026	$508	81027	$557	81028	$587	6503	$149
Inspire™ C8	81132	323	81125	343	81126	508	81127	557	81128	587	6504	149

5 μm Analytical Columns (4.6 mm)

Phases	30 x 4.6	Price	50 x 4.6	Price	100 x 4.6	Price	150 x 4.6	Price	250 x 4.6	Price	10 x 4.0	Price
Inspire™ C18	81034	$323	81010	$343	81011	$508	81001	$557	81006	$587	6603	$149
Inspire™ C8	81134	323	81110	343	81111	508	81101	557	81106	587	6604	149

EasyGuard™ Guard Holder: Cat#6220, Price: $99

5 μm and 10 μm Semi-preparative Columns

Guard Cartridge, 2/pk

Phases	Particle Size (μm)	250 x 4.6 Cat. No.	Price	250 x 10.0 Cat. No.	Price	150 x 21.2 Cat. No.	Price	250 x 21.2 Cat. No.	Price	10 x 10.0 Cat. No.	Price	10 x 21.2 Cat. No.	Price
Inspire™ C18	5	81006	$587	81038	$1,291	81045	$2,691	81039	$2,891	6505	$195	6506	$311
Inspire™ C8	5	81106	587	81138	1,291	81145	2,691	81139	2,891	6507	195	6508	311
Inspire™ Diol	5	81247	587	81238	1,291	81245	2,691	81239	2,891	6509	195	6510	311
Inspire™ C18	10	81035	383	81036	1,092	81046	2,291	81037	2,491	6511	195	6512	311
Inspire™ C8	10	81135	383	81136	1,092	81146	2,291	81137	2,491	6513	195	6514	311
Inspire™ Diol	10	81235	383	81236	1,092	81246	2,291	81237	2,491	6515	195	6516	311

10 mm Guard Holder: Cat#6221, Price: $199, 21.2 mm Guard Holder: Cat#6222, Price: $299

10 μm Packing Materials

Phases	Particle Size (μm)	100 G Cat. No.	Price	1 KG Cat. No.	Price
Inspire™ C18	10	85001	Inquire	85002	Inquire
Inspire™ C8	10	85101	Inquire	85102	Inquire
Inspire™ Diol	10	85021	Inquire	85022	Inquire

Features of Spursil™ Columns

- Combine high purity silica with unique polar modification technology
- Unique selectivity and enhanced resolution
- Silanol shielding for excellent peak shape
- Improved water wettability and stable retention in highly aqueous mobile phase conditions
- Excellent retention for polar compounds
- Extended range pH stability
- Choose from a variety of selectivities and hardware formats

Spursil™ polar-modified phases are based on ultra high-purity silica and novel polar modification technology. The unique bonded phases maximize polar retention and selectivity, while virtually eliminating silanol activity. The resulting polar-modified packing material contains a surface which is easily "wetted" with polar eluents and can run in highly aqueous conditions. The polar group also seems to play a role in base deactivation. We have seen some evidence that hydrogen bonding occurs between certain polar linkers and the silica surface, thereby decreasing the interaction of such silanols with basic components in the sample. Additionally, polar-modified phases often provide selectivity quite different from standard C18 phases.

Standard reversed-phase columns, particularly C18 columns, often suffer from "phase collapse" and the retention of the compounds is severely diminished when used in combination with highly aqueous phases. This phenomenon is substantially reduced with Spursil™ because the polar modifications make the phase less hydrophobic and more wettable. Polar-modified phases remain fully extended in aqueous phases, allowing increased interaction between samples and the bonded phase. Spursil™ columns show good retention of polar compounds which tend to elute in the void volume on standard ODS phases.

Spursil™ columns are available in 3, 5, and 10 micron particle sizes, column lengths are ranging from 30 mm to 250 mm, and column dimensions are ranging from 2 mm to 21.2 mm. Ten micron preparative materials are available in bulk form.

Spursil™ Material Characteristics

Bonded phase	Particle size (µm)	Pore size (Å)	Surface area (m^2/g)	Purity (%)	Phase density ($\mu mol/m^2$)	Carbon loading (%)	pH range	Endcapping
C18	3, 5, 10	100	440	> 99.999	3.5	25	1.5 - 10	Yes
C18-EP	3, 5, 10	100	440	> 99.999	3.4	24	1.5 - 10	Yes

High Efficiency

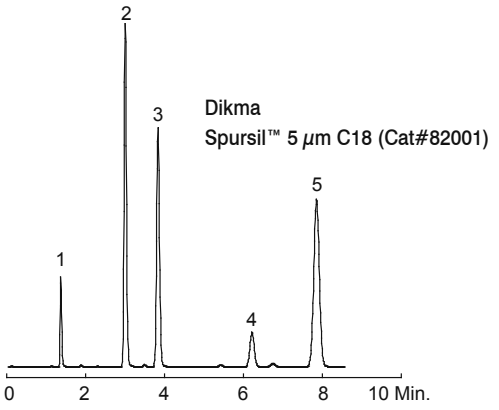
A chromatographic efficiency test is run on all columns. Plates per column and USP tailing factor are measured for each column to confirm packing efficiency. The USP tailing factor, a measure of peak symmetry at 5% of peak height, is a stringent indicator of peak shape. The test analytes are neutral hydrophobic compounds chromatographed in a acetonitrile:water mobile phase. The retention, selectivity, efficiency and peak symmetry of these molecules are measured to provide specifications for column performance.

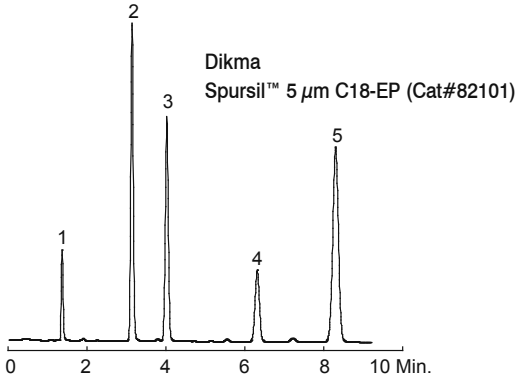
Batch-to-Batch Reproducibility of Spursil™ C18

Reproducibility is imperative to any application in the laboratory. A new column may be interesting, but if the retentivity and selectivity are not consistent, it has little value in a validated method. Dikma has designed reproducibility into the Spursil™ family starting with tight specifications on the surface area, pore size and particle size of the silica. Bonding procedures are transferred to production through a manufacturing transfer validation procedure. All Spursil™ columns are manufactured at our ISO 9001 registered facility. This ISO 9001 registration provides quality oversight into all aspects of the manufacturing process, leading to a product that consistently meets exact specifications.

Performance Test

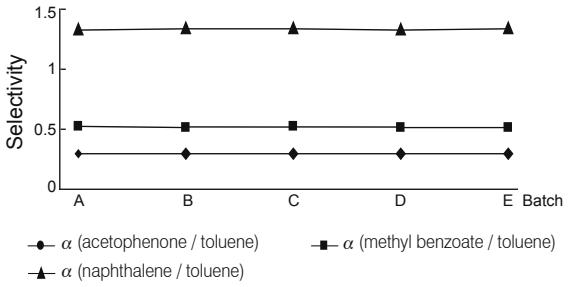
Column:	Listed on chromatograms
Dimension:	150 x 4.6 mm
Mobile Phase:	MeCN:H_2O = 60:40
Flow Rate:	1.0 mL/min
Temperature:	30 °C
Detection:	UV 254 nm
Sample:	1. Uracil
	2. Acetophenone
	3. Methyl benzoate
	4. Toluene
	5. Naphthalene

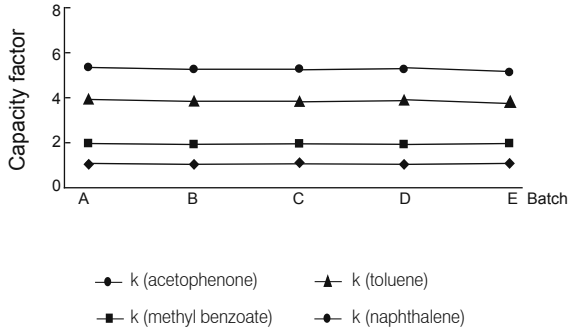




Reproducibility Test

Five randomly selected batches demonstrated excellent reproducibility in the example shown



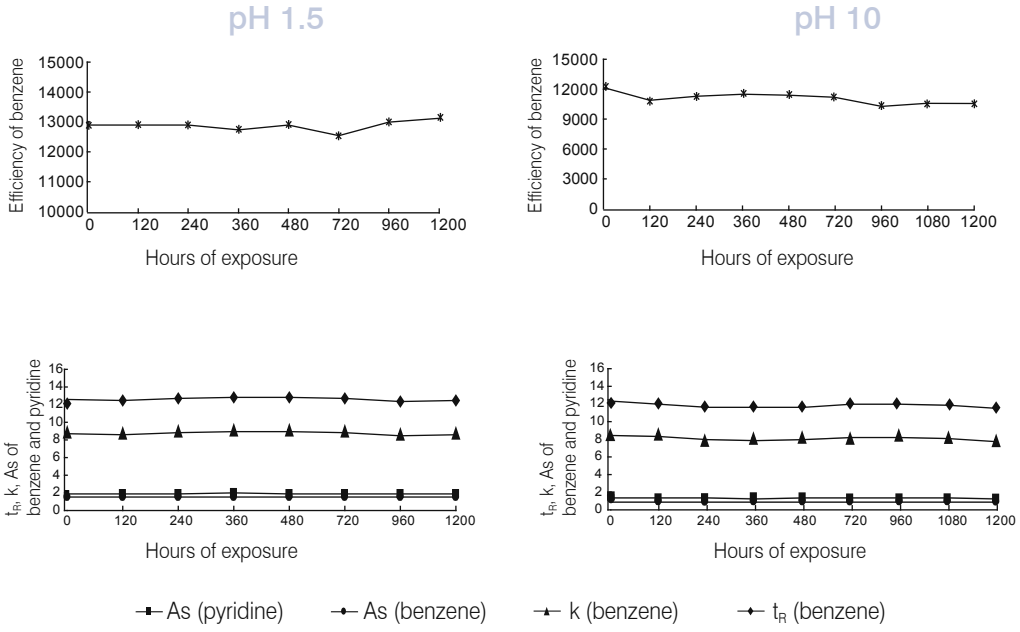


Wide pH Range

One of the most important parameters in choosing a column is lifetime. Columns that last longer save time and money. Column failure often occurs because of hydrolytic instability of the stationary phase and silica as well as mechanical instability of the column packing (voiding). The high phase coverage of all Spursil™ products plus proprietary endcapping creates a phase that is more stable against hydrolytic attack. Dikma's narrow specifications on surface area of the silica help to create a more consistent and well-packed column that minimizes shifting of the column bed during use. This reduces the chance of voiding. With Spursil™ columns, there is no worry about bonded phase hydrolysis, dissolution of the silica particle, or bonded phase collapse. The polar groups make the Spursil™ columns highly stable in hydrophilic conditions, from pH 1.5 to 10 and from 0 to 100% aqueous. All Spursil™ columns are tested at pH 1.5 and pH 10 under "real world" conditions with basic and acidic compounds to ensure good peak symmetry.

pH Stability Test

Column: Spursil™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **82001**
Mobile Phase: MeCN:20 mM phosphate buffer (pH 7) = 40:60
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Uracil
2. Pyridine
3. Phenol
4. Benzene



Flush solution (pH 1.5)

Mobile Phase: 1% TFA in MeCN:1% TFA in H_2O = 50:50
Flow Rate: 1.0 mL/min
Temperature: Ambient

Flush solution (pH 10)

Mobile Phase: MeCN:20 mM phosphate buffer = 50:50
Flow Rate: 1.0 mL/min
Temperature: Ambient

Spursil™

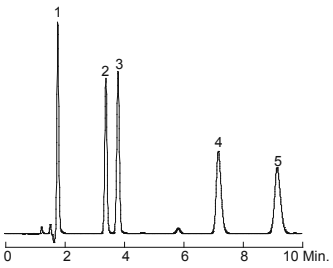
Unique Selectivity

Spursil™ analytical HPLC columns are designed to provide enhanced retention and selectivity for highly polar compounds in the reversed-phase mode, as well as compatibility with highly aqueous mobile phases. These phases offer several advantages over traditional alkyl bonded phases including a unique selectivity, improved peak shape for basic compounds, and the ability to operate in highly aqueous mobile phases. These polar-modified columns give the same range of application but alternative selectivity compared to traditional alkyl bonded phases. Spursil™ phases provide additional charge density to adjacent silanol through electron delocalization, thereby removing mixed-mode interactions and improving peak symmetry. The best methods employ simple mobile phases. Spursil™ columns enable separation scientists who work with polar compounds to consistently deliver robust methods with good selectivity and excellent peak shape.

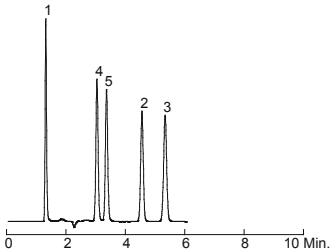
Cold Medicine

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 35:65
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 220 nm
Sample:
1. Doxylamine
2. Acetanilide
3. Acetylsalicylic acid
4. Dextromethorphan
5. Diphenhydramine

Dikma
Spursil™ 5 µm C18 (Cat#82001)



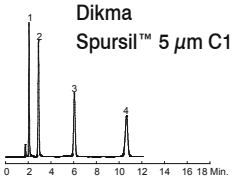
Dikma
Spursil™ 5 µm C18-EP (Cat#82101)



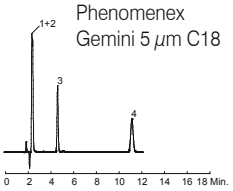
Polar Acids*

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: MeOH:0.1% TFA in H_2O = 20:80
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 210 nm
Sample:
1. Maleic acid
2. Procainamide
3. *o*-Toluamide
4. *p*-Hydroxybenzoic acid

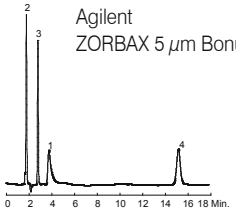
Dikma
Spursil™ 5 µm C18 (Cat#82001)



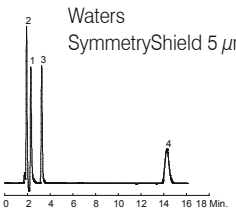
Phenomenex
Gemini 5 µm C18



Agilent
ZORBAX 5 µm Bonus-RP



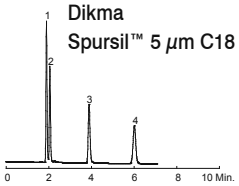
Waters
SymmetryShield 5 µm RP18



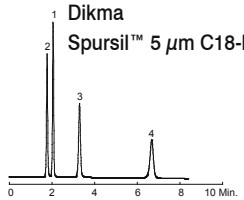
Polar Compounds*

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: 10 mM $HCOONH_4$, pH 3
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Thiourea
2. Cytosine
3. Adenine
4. Uridine

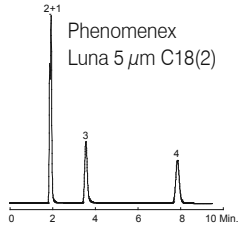
Dikma
Spursil™ 5 µm C18 (Cat#82001)



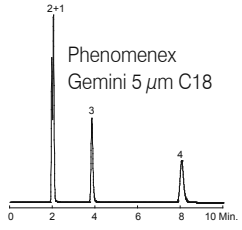
Dikma
Spursil™ 5 µm C18-EP (Cat#82101)



Phenomenex
Luna 5 µm C18(2)



Phenomenex
Gemini 5 µm C18



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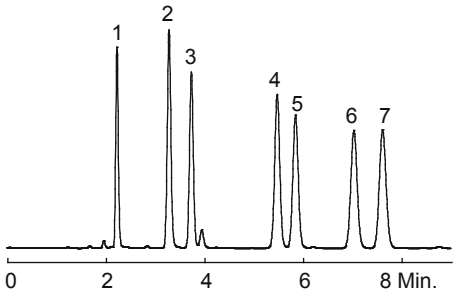
*ZORBAX is a registered trademark of Agilent Technologies. Dikma Technologies Inc. is not affiliated with the above company.
*SymmetryShield is a trademark of Waters Corporation. Dikma Technologies Inc. is not affiliated with the above company.

Outstanding Performance

Our Spursil™ family of reversed-phase columns, each prepared from the same high-purity silica, differ from one another solely and predictably in the hydrophobicity and polarity inherent in the stationary phase chemistry. The outstanding performance of Spursil™ columns allows users who are developing methods to achieve the right separation the first time, even with a simple mobile phase. This means faster development of HPLC methods, and more robust methods being transferred to QA / QC labs.

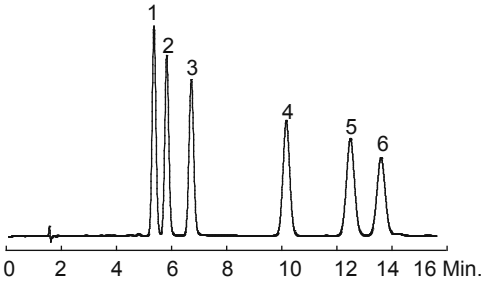
Anti-inflammatories

Column:	Spursil™ 5 μm C18, 150 x 4.6 mm
Cat. No.:	**82001**
Mobile Phase:	0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 55:45
Flow Rate:	1.0 mL/min
Temperature:	Ambient
Detection:	UV 254 nm
Sample:	1. Phenacetin
	2. Tolmetin
	3. Ketoprofen
	4. Fenoprofen
	5. Flurbiprofen
	6. Diclofenac
	7. Ibuprofen



Steroids

Column:	Spursil™ 5 μm C18, 150 x 4.6 mm
Cat. No.:	**82001**
Mobile Phase:	MeOH:H_2O = 55:45
Flow Rate:	1.0 mL/min
Temperature:	Ambient
Detection:	UV 254 nm
Sample:	1. Prednisone
	2. Cortisone
	3. Prednisolone
	4. Dexamethasone
	5. Hydrocortisone 21-acetate
	6. 11-α-Hydroxyprogesterone



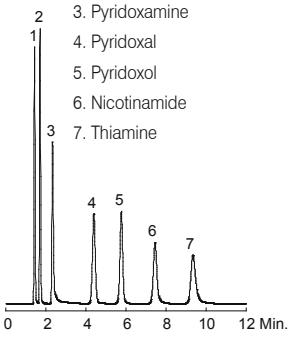
Spursil™

Our Solution for Working Under Highly Aqueous Conditions

The separation of polar compounds under highly aqueous mobile phase conditions is not reproducible with conventional reversed-phase materials. A proprietary derivatization procedure enables Spursil™ columns to be penetrated by water without losing their hydrophobic property. This allows polar compounds to be separated with excellent peak shape and remarkable reproducibility. The separations of water-soluble vitamins and amino acids illustrate the features of the Spursil™ columns in improving selectivity and peak shape and optimizing retention.

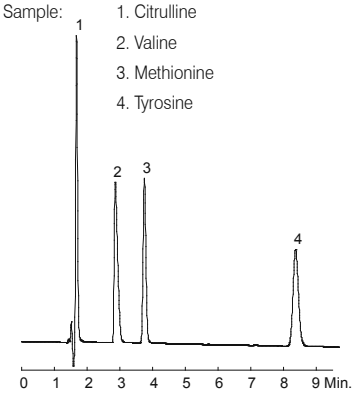
Water-Soluble Vitamins

Column: Spursil™ 5 μm C18, 150 x 4.6 mm
Cat. No.: **82001**
Mobile Phase: MeOH:10 mM K_2HPO_4 (pH 7) = 3:97
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. *L*-Ascorbic acid
2. Orotic acid
3. Pyridoxamine
4. Pyridoxal
5. Pyridoxol
6. Nicotinamide
7. Thiamine



Amino acids

Column: Spursil™ 5 μm C18, 150 x 4.6 mm
Cat. No.: **82001**
Mobile Phase: 20 mM KH_2PO_4 (pH 2.5 by H_3PO_4)
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 210 nm
Sample: 1. Citrulline
2. Valine
3. Methionine
4. Tyrosine

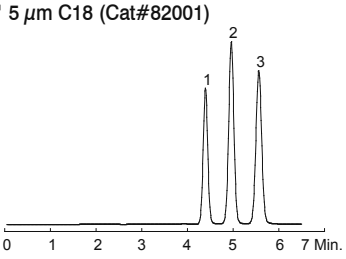


Although they are designed for use in highly aqueous mobile phase conditions, Spursil™ columns are completely compatible with highly organic mobile phases. The ability to cover the full range of mobile phase composition, from 100% aqueous to 100% organic, is useful for developing gradient methods for analyzing complex samples. High phase density allows highly organic mobile phase for the best desolvation and MS sensitivity.

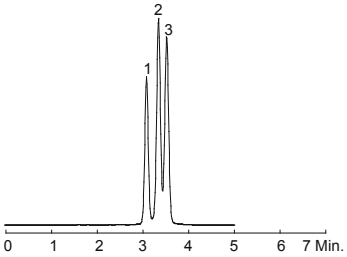
Tocopherols*

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: MeOH
Flow Rate: 1.0 mL/min
Temperature: 30 °C
Detection: UV 295 nm
Sample: 1. δ-Tocopherol
2. γ-Tocopherol
3. α-Tocopherol

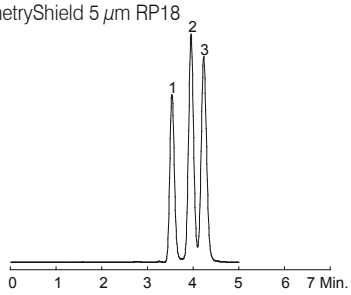
Dikma
Spursil™ 5 μm C18 (Cat#82001)



Agilent
ZORBAX 5 μm Bonus-RP



Waters
SymmetryShield 5 μm RP18



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*SymmetryShield is a trademark of Waters Corporation. Dikma Technologies Inc. is not affiliated with the above company.

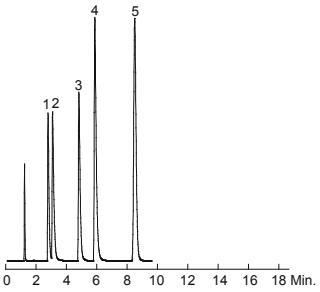
Superior Peak Shape and Resolution for Basic Analytes

The most sensitive measurement of silanol interactions is achieved using highly basic probes with a pH 7 mobile phase. At this pH, many of the residual silanols are in their ionized form, and the basic probes are completely protonated. The protonated bases interact with the ionized silanols by an ion-exchange mechanism, and the degree of tailing is a direct measure of silanol activity. Basic compounds tend to tail on alkyl phases because of the interaction with the silanols on the silica surface. This can often cause increased retention but loss in performance (peak shape). Polar-modified phases shield the silica surface and provide improved peak shape. The separation of a complex mixture of tricyclic antidepressants, having both hydrophobic and polar characteristics, demonstrates the unique selectivity of Spursil™ columns, and the power of stationary phase manipulation in HPLC method development. The polar groups in Spursil™ phases impart a unique selectivity with good separation not observed in traditional alkyl phases. The peak symmetries and efficiency values obtained for these drugs, which are considered to be difficult HPLC candidates, furnish a good measure of performance of these columns for similar problem drugs compared to traditional alkyl columns.

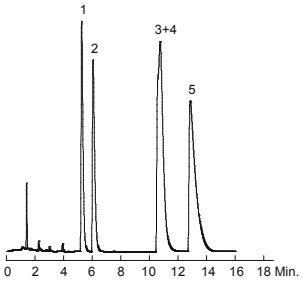
TCAs at Neutral pH*

Column:	Listed on chromatograms
Dimension:	150 x 4.6 mm
Mobile Phase:	MeCN:20 mM phosphate buffer (pH 7) = 2:1
Flow Rate:	1.0 mL/min
Temperature:	Ambient
Detection:	UV 254 nm
Sample:	1. Desipramine
	2. Nortriptyline
	3. Imipramine
	4. Amitriptyline
	5. Trimipramine

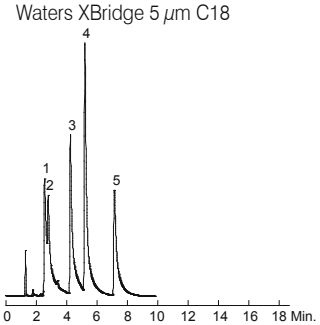
Dikma
Spursil™ 5 µm C18 (Cat#82001)



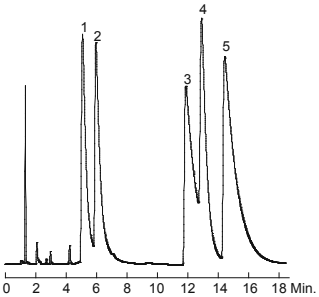
Agilent 5 µm TC-C18



Waters XBridge 5 µm C18



Agilent 5 µm HC-C18



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Spursil™

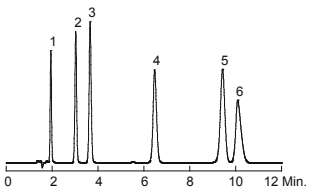
β-Blockers at Low and High pHs

β-Blockers are highly basic compounds that tend to give poor peak shape and resolution on conventional C18 and C8 HPLC columns. Spursil™ columns are packed with ultra pure silica and proprietary C18 and C8 bonding and endcapping technologies, resulting in greater peak shape and resolution.

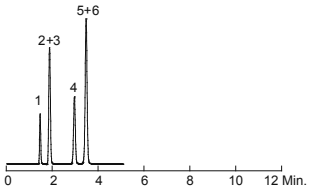
β-Blockers at Low pH*

Column:	Listed on chromatograms
Dimension:	150 x 4.6 mm
Mobile Phase:	0.1% TFA in MeCN:0.1% TFA in H_2O = 30:70
Flow Rate:	1.0 mL/min
Temperature:	Ambient
Detection:	UV 220 nm
Sample:	1. Nadolol
	2. Pindolol
	3. Metoprolol
	4. Labetolol
	5. Propranolol
	6. Alprenolol

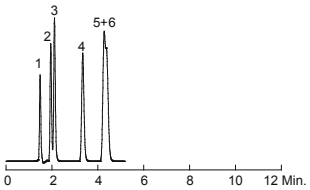
Dikma
Spursil™ 5 µm C18 (Cat#82001)



Agilent
ZORBAX 5 µm Bonus-RP



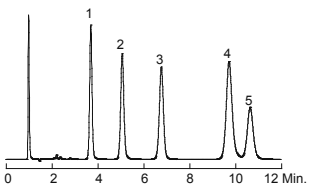
Waters
SymmetryShield 5 µm RP18



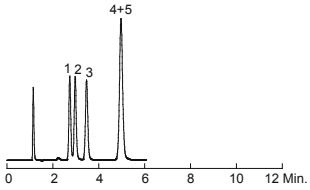
β-Blockers at High pH

Column:	Listed on chromatograms
Dimension:	150 x 4.6 mm
Mobile Phase:	MeOH:5 mM NH_4HCO_3 (pH 10) = 70:30
Flow Rate:	1.0 mL/min
Temperature:	Ambient
Detection:	UV 220 nm
Sample:	1. Pindolol
	2. Metoprolol
	3. Bisoprolol
	4. Propranolol
	5. Alprenolol

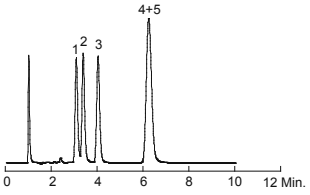
Dikma
Spursil™ 5 µm C18 (Cat#82001)



Agilent
ZORBAX 5 µm Bonus-RP



Waters
SymmetryShield 5 µm RP18



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*SymmetryShield is a trademark of Waters Corporation. Dikma Technologies Inc. is not affiliated with the above company.

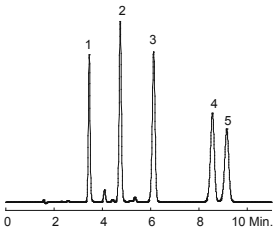
Steric Selectivity

Steric selectivity is often the most critical parameter in method development. Dikma had that in mind when designing the Spursil™ line, creating the C18 and C8 columns when small differences in retention and selectivity are desired. The Spursil™ C18-EP can create larger differences in selectivity for resolving difficult pairs or confirming identity. The Spursil™ line of HPLC columns demonstrates Dikma's commitment to solving real-life problems in selectivity and throughput with advanced technology. The separation of bibenzyl and *trans*-stilbene shows the key performance characteristics of improved shape selectivity for similar structure analytes.

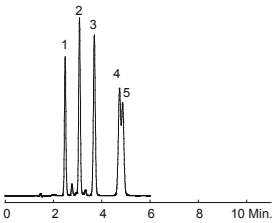
Steric Selectivity*

Column:	Listed on chromatograms
Dimension:	150 x 4.6 mm
Mobile Phase:	MeOH:H_2O = 80:20
Flow Rate:	1.0 mL/min
Temperature:	30 °C
Detection:	UV 254 nm
Sample:	1. *N,N*-Dimethylaniline
	2. Ethylbenzene
	3. Propylbenzene
	4. Bibenzyl
	5. *trans*-Stilbene

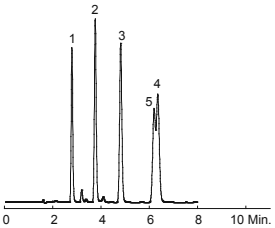
Dikma
Spursil™ 5 µm C18-EP (Cat#82101)



Agilent
ZORBAX 5 µm Bonus-RP



Waters
XBridge 5 µm C18



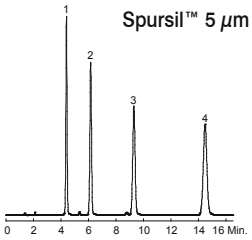
Enhanced Polar Retention

Conventional C18 columns often provide less retention for polar compounds. Spursil™ C18-EP column exhibits enhanced retention of polar compounds due to its unique embedded polar group design for the stationary phase. Enhanced retention of polar compounds results in a column that is compatible with the high aqueous mobile phases necessary for retaining these polar compounds.

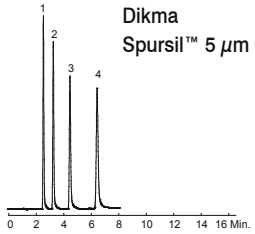
Parabens*

Column:	Listed on chromatograms
Dimension:	150 x 4.6 mm
Mobile Phase:	MeCN:20 mM K_2HPO_4 (pH 7) = 50:50
Flow Rate:	1.0 mL/min
Temperature:	Ambient
Detection:	UV 220 nm
Sample:	1. Methyl paraben
	2. Ethyl paraben
	3. Propyl paraben
	4. Butyl paraben

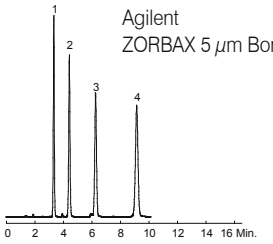
Dikma
Spursil™ 5 µm C18-EP (Cat#82101)



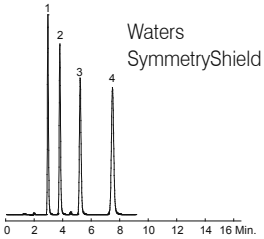
Dikma
Spursil™ 5 µm C18 (Cat#82001)



Agilent
ZORBAX 5 µm Bonus-RP



Waters
SymmetryShield 5 µm RP18



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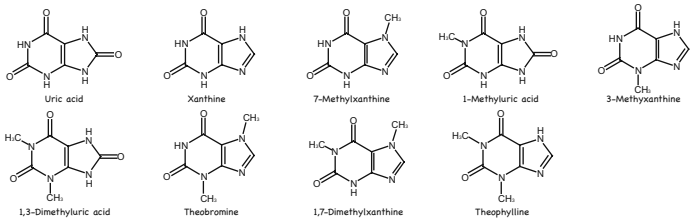
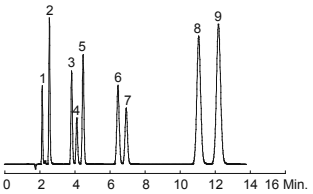
Spursil™

Caffeine Metabolites*

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: MeOH:1% CH_3COOH in H_2O = 10:90
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Uric acid
2. Xanthine
3. 7-Methylxanthine
4. 1-Methyluric acid
5. 3-Methylxanthine
6. 1,3-Dimethyluric acid
7. Theobromine
8. 1,7-Dimethylxanthine
9. Theophylline

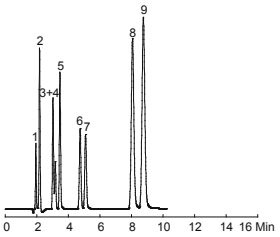


Dikma
Spursil™ 5 µm C18 (Cat#82001)

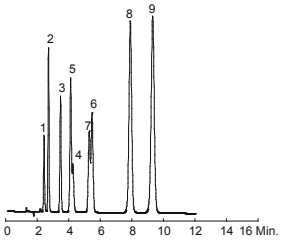


The separation of nine caffeine metabolites, each a geostereoisomer of similar structure, demonstrates the resolving power for positional isomers. The Spursil™ C18 column completes this separation in less than 13 minutes, with remarkable selectivity.

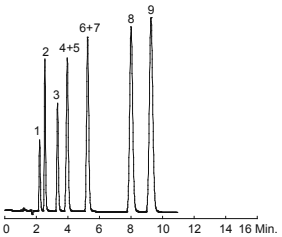
Thermo Scientific
Hypersil 5 µm BDS C18



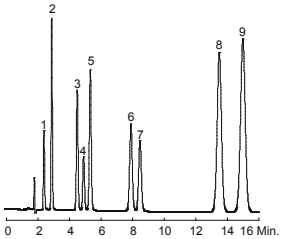
Agilent
ZORBAX 5 µm Bonus-RP



Waters
SymmetryShield 5 µm RP18



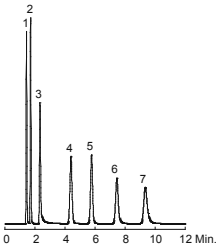
Phenomenex
Gemini 5 µm C18



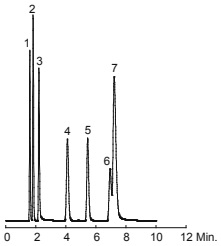
Water-Soluble Vitamins*

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: MeOH:10 mM K_2HPO_4 (pH 7) = 3:97
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. *L*-Ascorbic acid
2. Orotic acid
3. Pyridoxamine
4. Pyridoxal
5. Pyridoxol
6. Nicotinamide
7. Thiamine

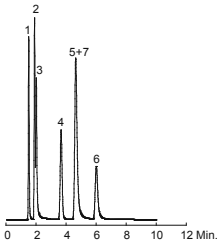
Dikma
Spursil™ 5 µm C18 (Cat#82001)



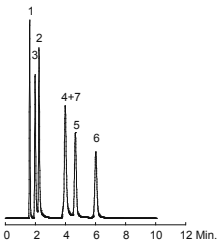
Waters
XBridge 5 µm C18



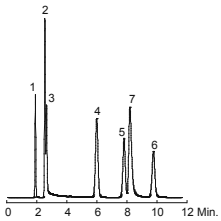
Waters
SymmetryShield 5 µm RP18



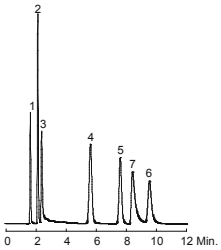
Agilent
ZORBAX 5 µm Bonus-RP



Phenomenex
Gemini 5 µm C18



Phenomenex
Luna 5 µm C18(2)



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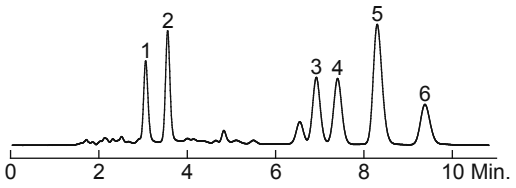
*SymmetryShield and XBridge are trademarks of Waters Corporation. Dikma Technologies Inc. is not affiliated with the above company.
*Gemini and Luna are registered trademarks of Phenomenex. Dikma Technologies Inc. is not affiliated with the above company.
*Hypersil is a registered trademark of Thermo Scientific. Dikma Technologies Inc. is not affiliated with the above company.

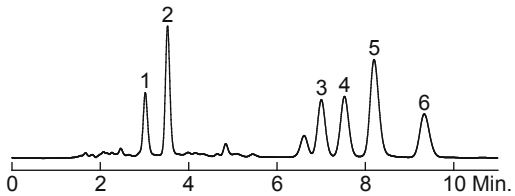
Multiple Injections of Antibiotics on Spursil™ C18 Column

Column: Spursil™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **82001**
Mobile Phase: MeOH:0.1% TFA in H_2O = 30:70
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 230 nm
Sample: 1. Ceftazidime
2. Cefadroxil
3. Cefuroxime
4. Cefazoline
5. Cefaclor
6. Cephalexin

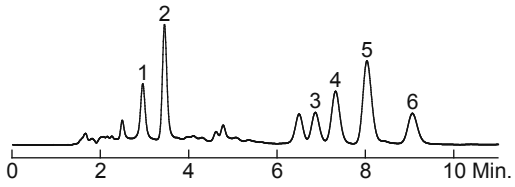
1st injection



After 500 injections



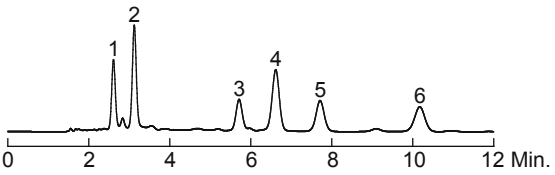
After 1,000 injections



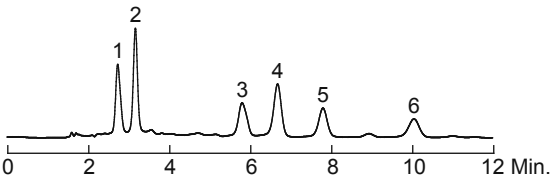
Multiple Injections of Antibiotics on Spursil™ C18-EP Column

Column: Spursil™ 5 µm C18-EP, 150 x 4.6 mm
Cat. No.: **82101**
Mobile Phase: MeOH:0.1% TFA in H_2O = 30:70
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 230 nm
Sample: 1. Ceftazidime
2. Cefadroxil
3. Cephalexin
4. Cefradine
5. Cefazoline
6. Cefoxitin

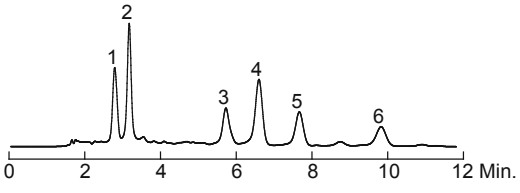
1st injection



After 500 injections



After 1,000 injections

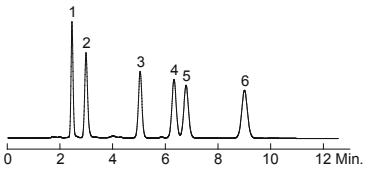


Spursil™

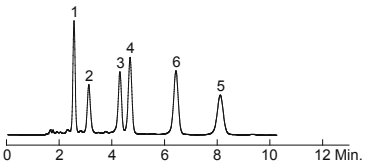
Separation of Cephalosporin Antibiotics at Phosphate Buffer Mobile Phase Conditions*

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: MeOH:25 mM phosphate buffer (pH 3) = 25:75
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 230 nm
Sample:
1. Cefadroxil
2. Ceftazidime
3. Cefaclor
4. Cephalexin
5. Cefazoline
6. Cefradine

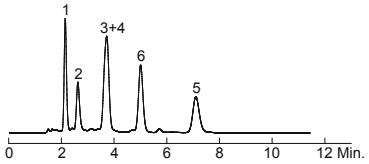
Dikma
Spursil™ 5 µm C18 (Cat#82001)



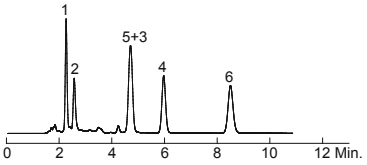
Dikma
Spursil™ 5 µm C18-EP (Cat#82101)



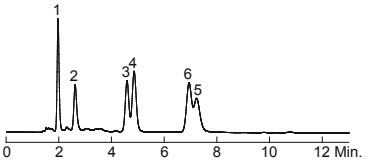
Waters
SymmetryShield 5 µm RP18



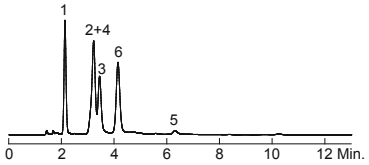
Waters
XBridge 5 µm C18



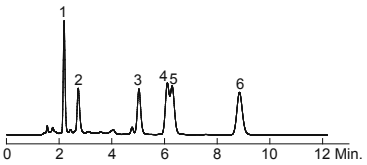
Waters
Symmetry 5 µm C18



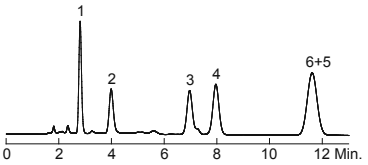
Agilent
ZORBAX 5 µm Bonus-RP



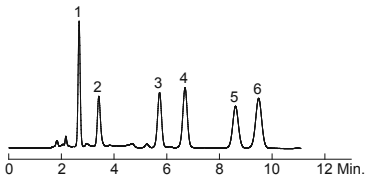
Agilent
ZORBAX Eclipse 5 µm XDB-C18



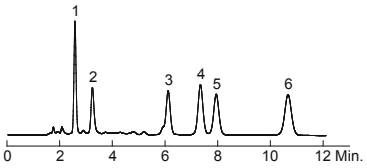
GL Science
Inertsil 5 µm ODS-3



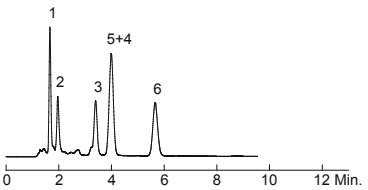
Phenomenex
Gemini 5 µm C18



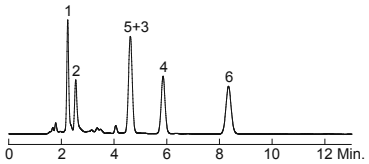
Phenomenex
Luna 5 µm C18(2)



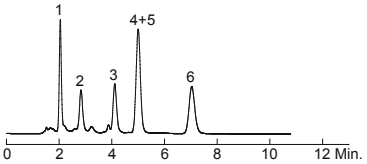
Eka Chemicals AB
Kromasil 5 µm C18



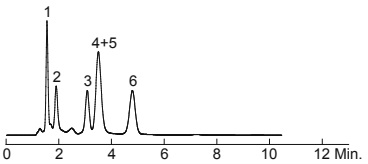
Thermo Scientific
Hypersil 5 µm BDS C18



Beckman Coulter
Ultrasphere 5 µm C18



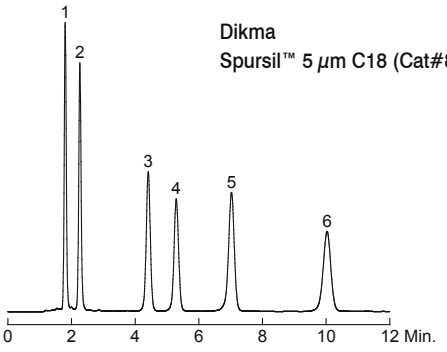
Separation Methods Technologies
OD-5-100 5 µm C18



*The comparative data presented here may not be representative for all applications.

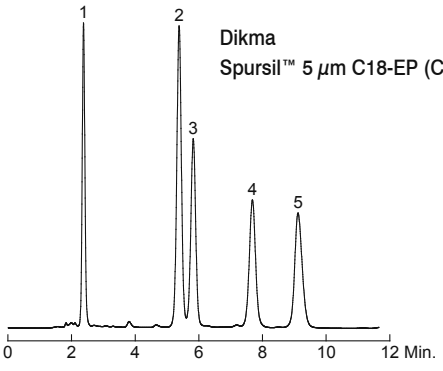
Separation of Cephalosporin Antibiotics at Acetate Buffer Mobile Phase Conditions

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: MeOH:100 mM acetate buffer = 20:80
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Ceftazidime
2. Cefadroxil
3. Cefuroxime
4. Cefoxitin
5. Cefaclor
6. Cefradine



Dikma
Spursil™ 5 µm C18 (Cat#82001)

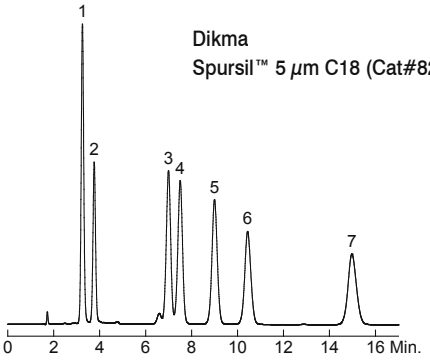
Mobile Phase: MeOH:100 mM acetate buffer = 20:80
Flow Rate: 1.0 mL/min
Detection: UV 254 nm
Sample:
1. Ceftazidime
2. Cephalexin
3. Cefaclor
4. Cefradine
5. Cefoxitin



Dikma
Spursil™ 5 µm C18-EP (Cat#82101)

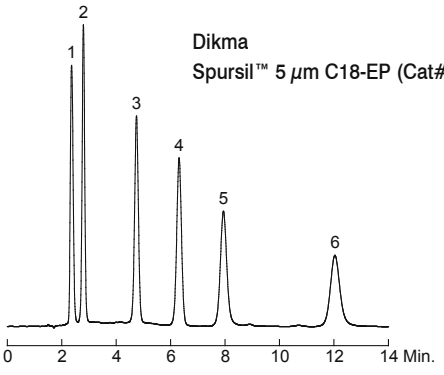
Separation of Cephalosporin Antibiotics at TFA Mobile Phase Conditions

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: MeOH:0.1% TFA in H_2O = 30:70
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 230 nm
Sample:
1. Ceftazidime
2. Cefadroxil
3. Cefuroxime
4. Cefazoline
5. Cefaclor
6. Cephalexin
7. Cefradine



Dikma
Spursil™ 5 µm C18 (Cat#82001)

Mobile Phase: MeOH:0.1% TFA in H_2O = 30:70
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 230 nm
Sample:
1. Ceftazidime
2. Cefadroxil
3. Cephalexin
4. Cefradine
5. Cefazoline
6. Cefoxitin



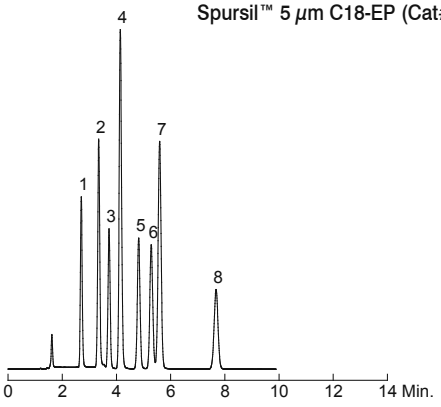
Dikma
Spursil™ 5 µm C18-EP (Cat#82101)

Spursil™

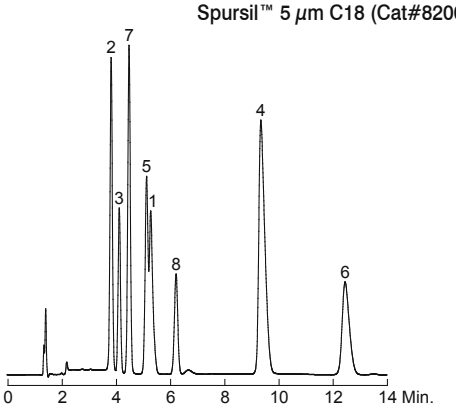
Separation of TCAs and Benzos

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 40:60
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Doxepin
2. Alprazolam
3. Diazepam
4. Trimipramine
5. Triazolam
6. Clomipramine
7. Oxazepam
8. Clonazepam

Dikma
Spursil™ 5 μm C18-EP (Cat#82101)



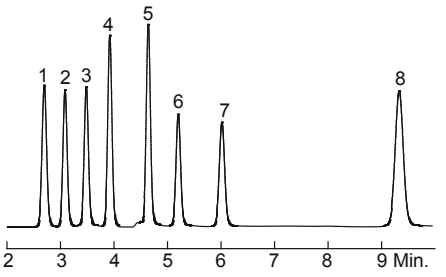
Dikma
Spursil™ 5 μm C18 (Cat#82001)



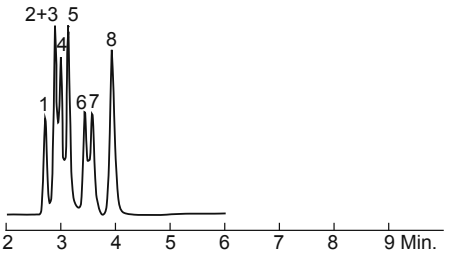
Separation of Nucleotides in 100% Aqueous Conditions

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: 50 mM K_2HPO_4, pH 6
Flow Rate: 0.7 mL/min
Temperature: Ambient
Detection: UV 260 nm
Sample:
1. CTP
2. CMP
3. GTP
4. GDP
5. GMP
6. ATP
7. ADP
8. AMP

Dikma
Spursil™ 5 μm C18 (Cat#82001)



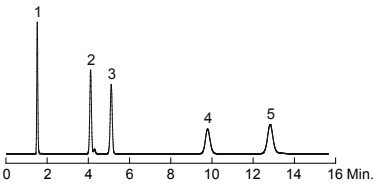
Separation Method Technologies
OD-5-100 5 μm C18



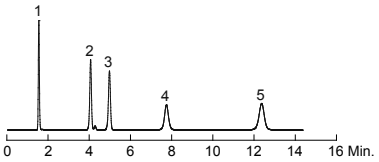
Sander Test*

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: MeOH:20 mM phosphate buffer (pH 7) = 80:20
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Uracil
2. Toluene
3. Ethylbenzene
4. Amitriptyline
5. Quinizarin

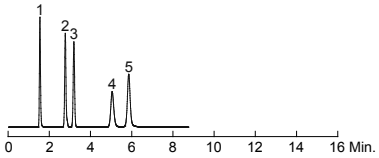
Dikma
Spursil™ 5 µm C18 (Cat#82001)



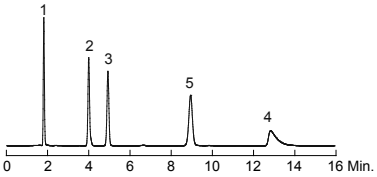
Dikma
Spursil™ 5 µm C18-EP (Cat#82101)



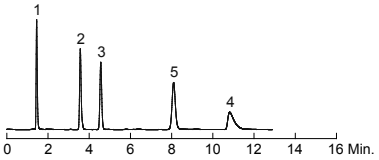
Agilent
ZORBAX 5 µm Bonus-RP



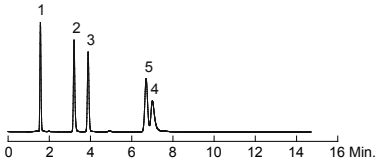
Agilent
5 µm HC-C18



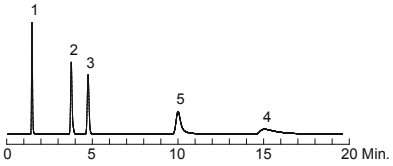
Agilent
ZORBAX Eclipse 5 µm XDB-C18



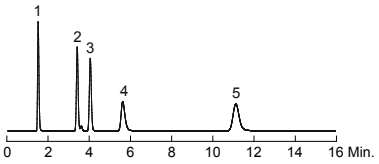
Waters
XBridge 5 µm C18



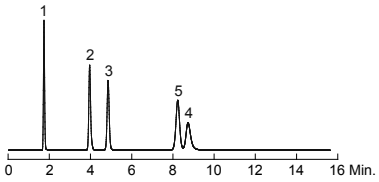
Waters
Symmetry 5 µm C18



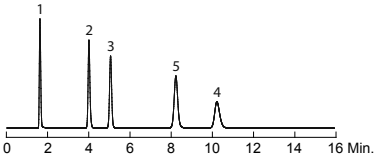
Waters
SymmetryShield 5 µm RP18



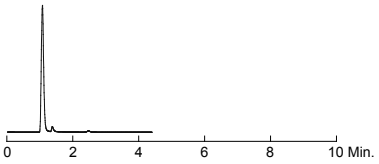
Phenomenex
Gemini 5 µm C18



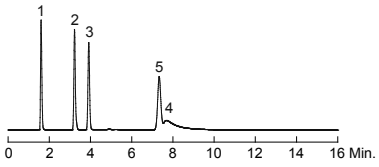
Phenomenex
Luna 5 µm C18(2)



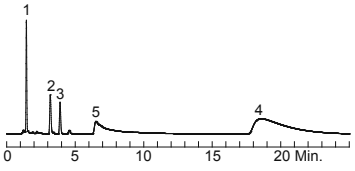
Eka Chemicals AB
Kromasil 5 µm C18



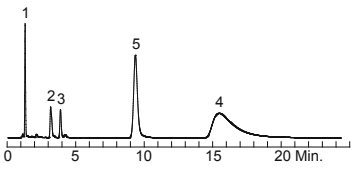
Thermo Scientific
Hypersil 5 µm BDS C18



Beckman Coulter
Ultrasphere 5 µm C18



Separation Methods Technologies
OD-5-100 5 µm C18



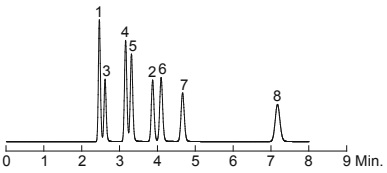
*The comparative data presented here may not be representative for all applications.

Spursil™

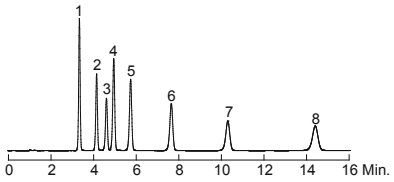
Phenols*

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 55:45
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 280 nm
Sample:
1. Phenol
2. 2-Nitrophenol
3. 4-Nitrophenol
4. 2-Chlorophenol
5. 4-Chlorophenol
6. 4-Chloro-3-methylphenol
7. 2,4-Dichlorophenol
8. 2,4,6-Trichlorophenol

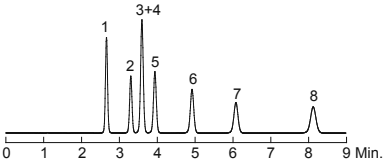
Dikma
Spursil™ 5 µm C18 (Cat#82001)



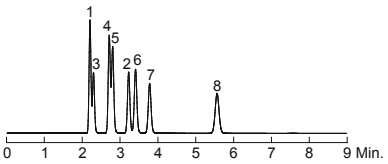
Dikma
Spursil™ 5 µm C18-EP (Cat#82101)



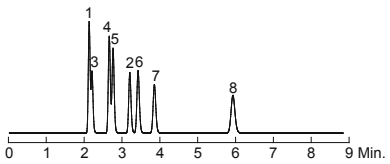
Agilent
ZORBAX 5 µm Bonus-RP



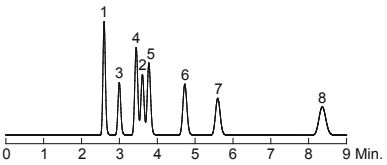
Agilent
ZORBAX 5 µm SB-C18



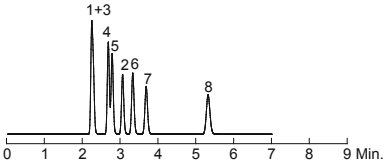
Agilent
ZORBAX Eclipse 5 µm XDB-C18



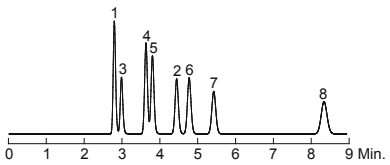
Waters
SymmetryShield 5 µm RP18



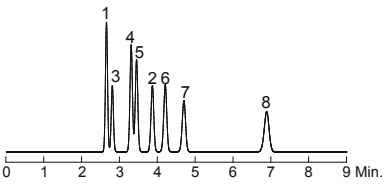
Waters
XBridge 5 µm C18



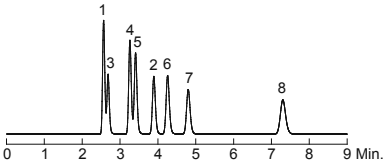
GL Science
Inertsil 5 µm ODS-3



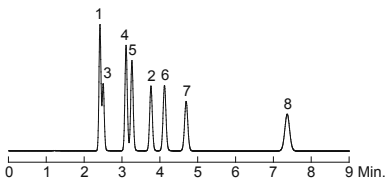
Phenomenex
Gemini 5 µm C18



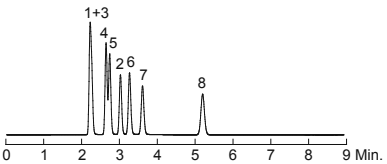
Phenomenex
Luna 5 µm C18(2)



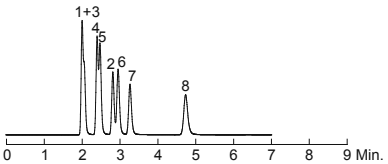
Eka Chemicals AB
Kromasil 5 µm C18



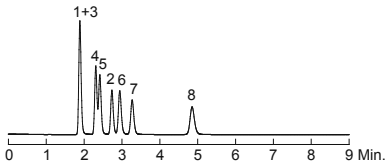
Thermo Scientific
Hypersil 5 µm BDS C18



Beckman Coulter
Ultrasphere 5 µm C18



Separation Methods Technologies
OD-5-100 5 µm C18

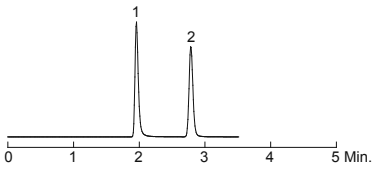


*The comparative data presented here may not be representative for all applications.

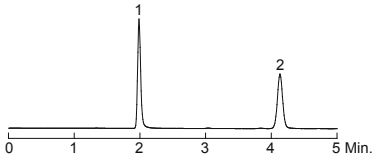
Pyridine / Phenol*

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: MeCN:H_2O = 50:50
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Pyridine
2. Phenol

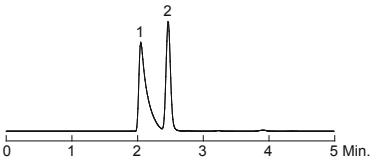
Dikma
Spursil™ 5 µm C18 (Cat#82001)



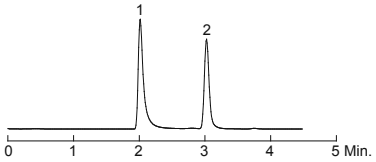
Dikma
Spursil™ 5 µm C18-EP (Cat#82101)



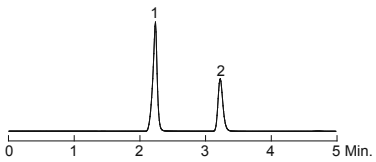
Waters
XBridge 5 µm C18



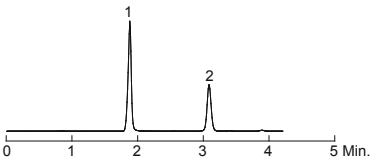
Waters
SymmetryShield 5 µm C18



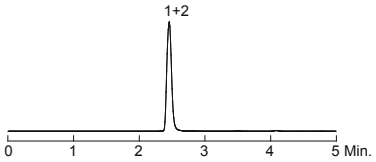
GL Science
Inertsil 5 µm ODS-3



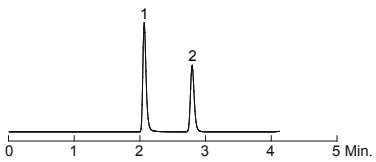
Agilent
ZORBAX 5 µm Bonus-RP



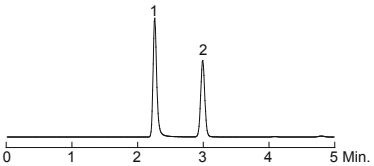
Agilent
ZORBAX 5 µm SB-C18



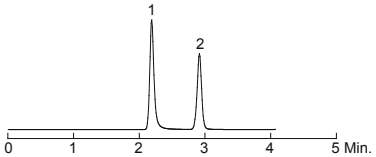
Agilent
ZORBAX Eclipse 5 µm XDB-C18



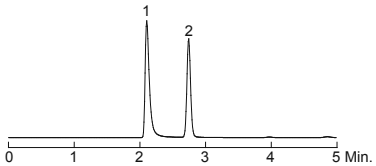
Phenomenex
Gemini 5 µm C18



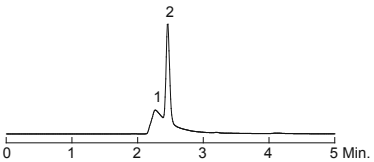
Phenomenex
Luna 5 µm C18(2)



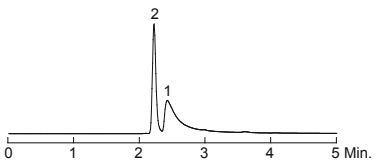
Eka Chemicals AB
Kromasil 5 µm C18



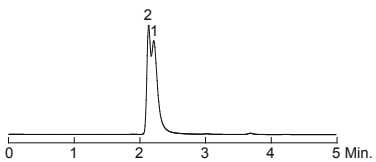
Thermo Scientific
Hypersil 5 µm BDS C18



Beckman Coulter
Ultrasphere 5 µm C18



Separation Methods Technologies
OD-5-100 5 µm C18



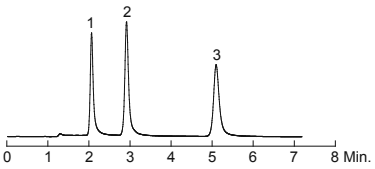
*The comparative data presented here may not be representative for all applications.

Spursil™

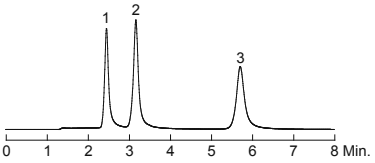
Catecholamines*

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: 20 mM KH_2PO_4, pH 7
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 270 nm
Sample: 1. Norepinephrine
2. Epinephrine
3. Dopamine

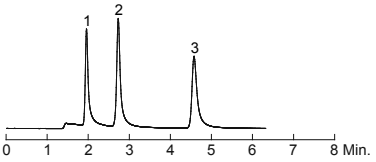
Dikma
Spursil™ 5 µm C18 (Cat#82001)



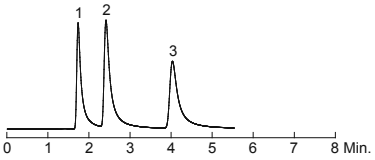
Dikma
Spursil™ 5 µm C18-EP (Cat#82101)



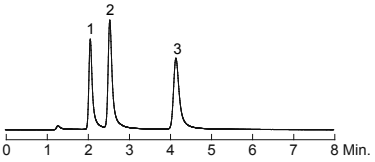
Waters
XBridge 5 µm C18



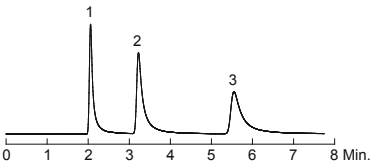
Waters
Symmetry 5 µm C18



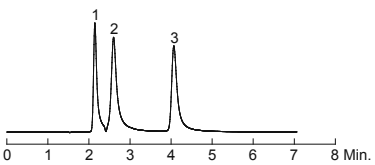
Waters
SymmetryShield 5 µm RP18



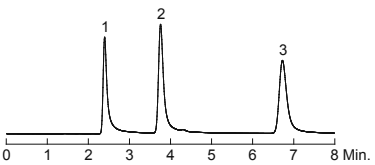
Agilent
ZORBAX 5 µm SB-C18



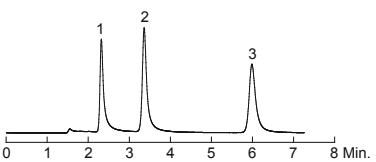
Agilent
ZORBAX 5 µm Bonus-RP



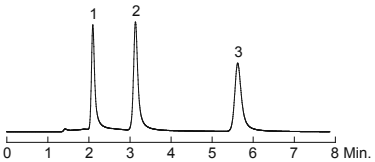
GL Science
Inertsil 5 µm ODS-3



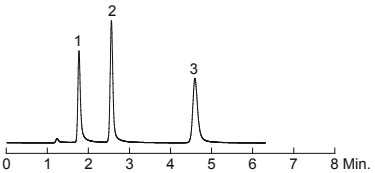
Phenomenex
Gemini 5 µm C18



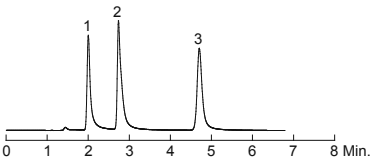
Phenomenex
Luna 5 µm C18(2)



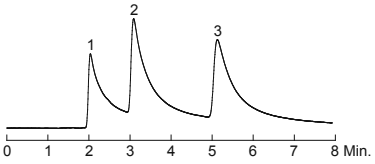
Eka Chemicals AB
Kromasil 5 µm C18



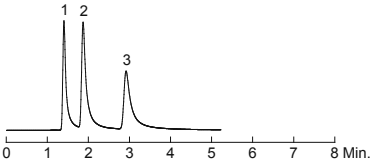
Thermo Scientific
Hypersil 5 µm BDS C18



Beckman Coulter
Ultrasphere 5 µm C18



Separation Methods Technologies
OD-5-100 5 µm C18

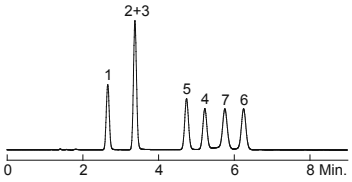


*The comparative data presented here may not be representative for all applications.

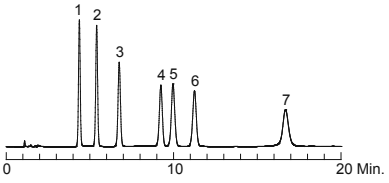
Catechols and Resorcinols*

Column: Listed on chromatograms
Dimension: 150 x 4.6 mm
Mobile Phase: MeCN:0.1% HCOOH in H_2O = 25:75
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 270 nm
Sample:
1. Resorcinol
2. Catechol
3. 2-Methylresorcinol
4. 4-Methylcatechol
5. 2,5-Dimethylresorcinol
6. 3-Methylcatechol
7. 4-Nitrocatechol

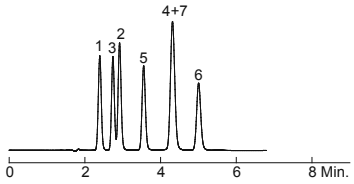
Dikma
Spursil™ 5 µm C18 (Cat#82001)



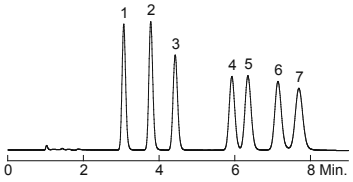
Dikma
Spursil™ 5 µm C18-EP (Cat#82101)



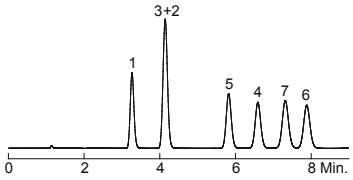
Waters
XBridge 5 µm C18



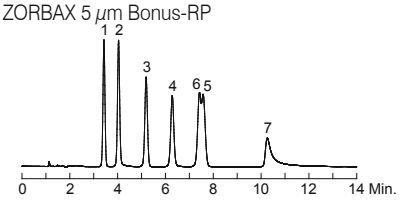
Waters
SymmetryShield 5 µm RP18



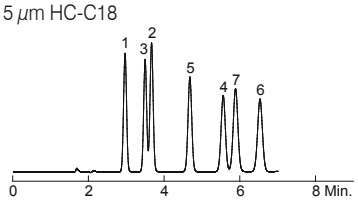
GL Science
Inertsil 5 µm ODS-3



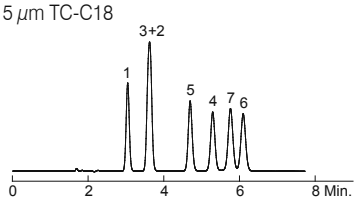
Agilent
ZORBAX 5 µm Bonus-RP



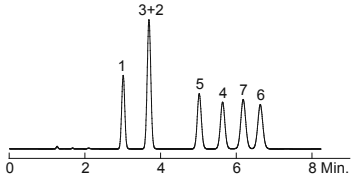
Agilent
5 µm HC-C18



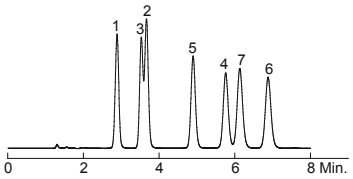
Agilent
5 µm TC-C18



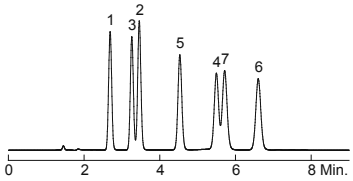
Phenomenex
Gemini 5 µm C18



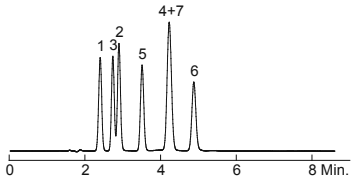
Phenomenex
Luna 5 µm C18(2)



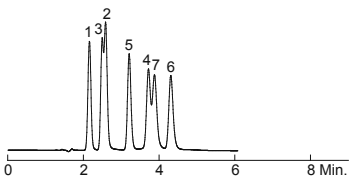
Eka Chemicals AB
Kromasil 5 µm C18



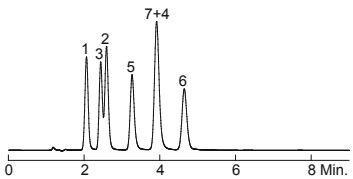
Thermo Scientific
Hypersil 5 µm BDS C18



Beckman Coulter
Ultrasphere 5 µm C18



Separation Methods Technologies
OD-5-100 5 µm C18



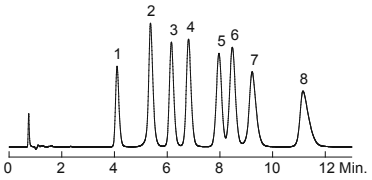
*The comparative data presented here may not be representative for all applications.

Spursil™

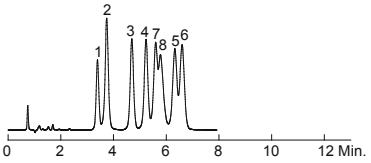
TCAs at High pH*

Column:	Listed on chromatograms	
Dimension:	150 x 4.6 mm	
Mobile Phase:	MeOH:5 mM NH_4HCO_3 (pH 10) = 80:20	
Flow Rate:	1.5 mL/min	
Temperature:	Ambient	
Detection:	UV 254 nm	
Sample:	1. Doxepin	5. Trimipramine
	2. Nordoxepin	6. Clomipramine
	3. Imipramine	7. Nortriptyline
	4. Amitriptyline	8. Protriptyline

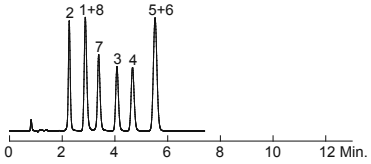
Dikma
Spursil™ 5 µm C18 (Cat#82001)



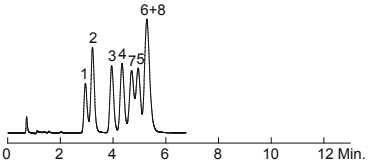
Dikma
Spursil™ 5 µm C18-EP (Cat#82101)



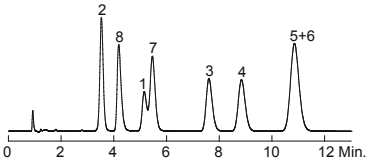
Waters
XBridge 5 µm C18



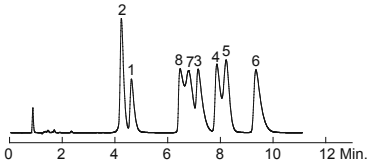
Waters
SymmetryShield 5 µm RP18



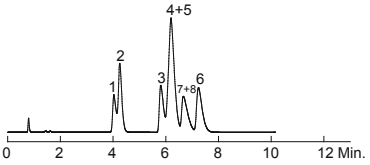
GL Science
Inertsil 5 µm ODS-3



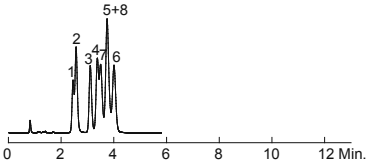
Agilent
5 µm HC-C18



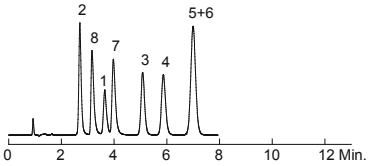
Agilent
5 µm TC-C18



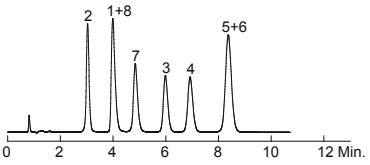
Agilent
ZORBAX 5 µm Bonus-RP



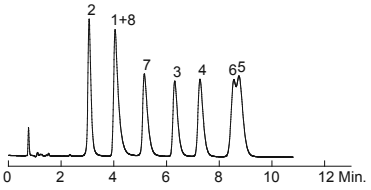
Phenomenex
Gemini 5 µm C18



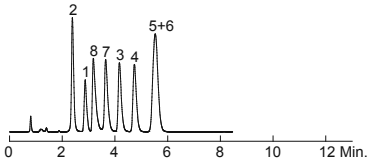
Phenomenex
Luna 5 µm C18(2)



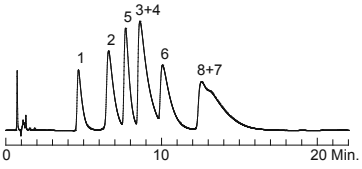
Eka Chemicals AB
Kromasil 5 µm C18



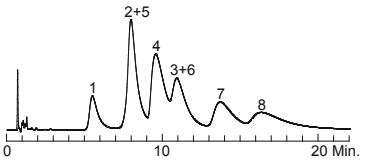
Thermo Scientific
Hypersil 5 µm BDS C18



Beckman Coulter
Ultrasphere 5 µm C18



Separation Methods Technologies
OD-5-100 5 µm C18



*The comparative data presented here may not be representative for all applications.

Spursil™ Ordering Information

3 μm Microbore Columns (2.1 mm)

Guard Cartridge, 2/pk

Phases	30 x 2.1	Price	50 x 2.1	Price	100 x 2.1	Price	150 x 2.1	Price	250 x 2.1	Price	10 x 2.1	Price
Spursil™ C18	82030	$353	82004	$373	82012	$542	82013	$592	82015	$621	6701	$149
Spursil ™C18-EP	82130	353	82104	373	82112	542	82113	592	82115	621	6702	149

3 μm Analytical Columns (3.0 mm)

Phases	30 x 3.0	Price	50 x 3.0	Price	100 x 3.0	Price	150 x 3.0	Price	250 x 3.0	Price	10 x 2.1	Price
Spursil™ C18	82029	$353	82021	$373	82022	$542	82023	$592	82024	$621	6701	$149
Spursil™ C18-EP	82129	353	82121	373	82122	542	82123	592	82124	621	6702	149

3 μm Analytical Columns (4.6 mm)

Phases	30 x 4.6	Price	50 x 4.6	Price	100 x 4.6	Price	150 x 4.6	Price	250 x 4.6	Price	10 x 4.0	Price
Spursil™ C18	82031	$353	82016	$373	82017	$542	82018	$592	82020	$621	6801	$149
Spursil™ C18-EP	82131	353	82116	373	82117	542	82118	592	82120	621	6802	149

5 μm Microbore Columns (2.1 mm)

Phases	30 x 2.1	Price	50 x 2.1	Price	100 x 2.1	Price	150 x 2.1	Price	250 x 2.1	Price	10 x 2.1	Price
Spursil™ C18	82033	$343	82003	$363	82007	$527	82002	$577	82009	$606	6703	$149
Spursil™ C18-EP	82133	343	82103	363	82107	527	82102	577	82109	606	6704	149

5 μm Analytical Columns (3.0 mm)

Phases	30 x 3.0	Price	50 x 3.0	Price	100 x 3.0	Price	150 x 3.0	Price	250 x 3.0	Price	10 x 2.1	Price
Spursil™ C18	82032	$343	82025	$363	82026	$527	82027	$577	82028	$606	6703	$149
Spursil™ C18-EP	82132	343	82125	363	82126	527	82127	577	82128	606	6704	149

5 μm Analytical Columns (4.6 mm)

Phases	30 x 4.6	Price	50 x 4.6	Price	100 x 4.6	Price	150 x 4.6	Price	250 x 4.6	Price	10 x 4.0	Price
Spursil™ C18	82034	$343	82010	$363	82011	$527	82001	$577	82006	$606	6803	$149
Spursil™ C18-EP	82134	343	82110	363	82111	527	82101	577	82106	606	6804	149

EasyGuard™ Guard Holder: Cat#6220, Price: $99

5 μm and 10 μm Semi-preparative Columns

Guard Cartridge, 2/pk

Phases	Particle Size (μm)	250 x 4.6 Cat. No.	Price	250 x 10.0 Cat. No.	Price	150 x 21.2 Cat. No.	Price	250 x 21.2 Cat. No.	Price	10 x 10.0 Cat. No.	Price	10 x 21.2 Cat. No.	Price
Spursil™ C18	5	82006	$606	82038	$1,359	82045	$2,759	82039	$2,959	6705	$195	6706	$311
Spursil™ C18-EP	5	82106	606	82138	1,359	82145	2,759	82139	2,959	6707	195	6708	311
Spursil™ C18	10	82035	403	82036	1,159	82046	2,359	82037	2,559	6709	195	6710	311
Spursil™ C18-EP	10	82135	403	82136	1,159	82146	2,359	82137	2,559	6711	195	6712	311

10 mm Guard Holder: Cat#6221, Price: $199, 21.2 mm Guard Holder: Cat#6222, Price: $299

10 μm Packing Materials

Phases	Particle Size (μm)	100 G Cat. No.	Price	1 KG Cat. No.	Price
Spursil™ C18	10	85201	Inquire	85202	Inquire
Spursil™ C18-EP	10	85301	Inquire	85302	Inquire

Bio-Bond™

Features of Bio-Bond™ Columns

- Designed to analyze and purify proteins, peptides and biomolecules
- Available with C18, C8 and C4 bonded phases
- Direct scale-up to preparative material
- Outstanding reproducibility, efficiency and column lifetime

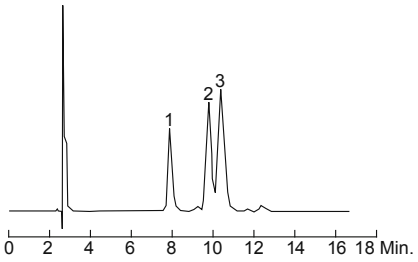
Bio-Bond™ columns with 300 Å pore silica gel are suitable for analysis of proteins, peptides and biological samples. Meticulous care is given to the quality control of surface smoothness, particle shape, pore structure and pore consistency to ensure uniformity of particle structure and enhanced mechanical strength. A low fine percentage from damaged silica particles strengthens the column bed, leading to low backpressure and enhanced column performance and lifetime. Ultra low active silanol and metal content make perfect symmetrical peaks and avoid protein absorption, thereby ensuring detectable activity for protein sensitive to metal.

Bio-Bond™ Material Characteristics

Bonded phase	Particle size (µm)	Pore size (Å)	Surface area (m^2/g)	Purity (%)	Phase density ($\mu mol/m^2$)	Carbon loading (%)	pH range	Endcapping
C18	3, 5, 10	300	100	> 99.999	3.7	8	2 - 8	Yes
C8	3, 5, 10	300	100	> 99.999	4.5	5	2 - 8	Yes
C4	3, 5, 10	300	100	> 99.999	4.4	3	2 - 8	Yes

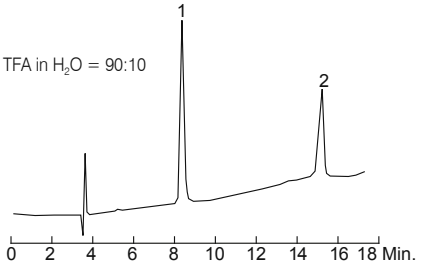
Insulin Genetic Variant

Column: Bio-Bond™ 5 µm 300 Å C18, 250 x 4.6 mm
Cat. No.: **84006**
Mobile Phase: A: 0.1% TFA in H_2O B: 0.1% TFA in MeCN
A:B = 70:30 to A:B = 65:35 in 25 min
Flow Rate: 1.0 mL/min
Detection: UV 210 nm
Sample: 1. Bovine insulin
2. Human insulin
3. Porcine insulin



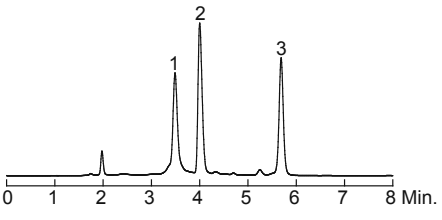
Chemotactic Peptide

Column: Bio-Bond™ 5 µm 300 Å C4, 250 x 4.6 mm
Cat. No.: **84406**
Mobile Phase: A: 0.1% TFA in H_2O B: 0.1% TFA in MeCN:0.1% TFA in H_2O = 90:10
A:B = 60:40 to A:B = 24:76 in 18 min
Flow Rate: 1.0 mL/min
Detection: UV 210 nm
Sample: 1. N-Formyl-Nle-Leu-Phe-Nle-Tyr-Lys
2. Lle-Val-Pro-Phe-Lyl-Pro-Leu-Thr-Amide



Proteins

Column: Bio-Bond™ 5 µm 300 Å C18, 150 x 4.6 mm
Cat. No.: **84001**
Mobile Phase: A: 0.1% TFA in H_2O B: 0.1% TFA in MeCN
Gradient: 30 - 50 % B in 10 min
Flow Rate: 1.0 mL/min
Detection: UV 280 nm
Sample: 1. Cytochrome C
2. Insulin
3. Lysozymes



Bio-Bond™ Ordering Information

3 µm Analytical Columns

Phases	50 x 2.1	Price	150 x 2.1	Price	50 x 4.6	Price	150 x 4.6	Price	250 x 4.6	Price	10 x 2.1	Price	10 x 4.0	Price
Bio-Bond™ C18	84004	$373	84013	$592	84016	$373	84018	$592	84020	$621	6901	$149	6951	$149
Bio-Bond™ C8	84104	373	84113	592	84116	373	84118	592	84120	621	6902	149	6952	149
Bio-Bond™ C4	84404	373	84413	592	84416	373	84418	592	84420	621	6905	149	6955	149

5 µm Analytical Columns

Phases	50 x 2.1	Price	150 x 2.1	Price	50 x 4.6	Price	150 x 4.6	Price	250 x 4.6	Price	10 x 2.1	Price	10 x 4.0	Price
Bio-Bond™ C18	84003	$363	84002	$577	84010	$363	84001	$577	84006	$606	6903	$149	6953	$149
Bio-Bond™ C8	84103	363	84102	577	84110	363	84101	577	84106	606	6904	149	6954	149
Bio-Bond™ C4	84403	363	84402	577	84410	363	84401	577	84406	606	6906	149	6956	149

EasyGuard™ Holder: Cat#6220

5 µm and 10 µm Semi-preparative Columns

Phases	Particle Size (µm)	250 x 4.6 Cat. No.	Price	250 x 10.0 Cat. No.	Price	150 x 21.2 Cat. No.	Price	250 x 21.2 Cat. No.	Price	10 x 10.0 Cat. No.	Price	10 x 21.2 Cat. No.	Price
Bio-Bond™ C18	5	84006	$606	84038	$1,359	84045	$2,759	84039	$2,959	6907	$195	6908	$311
Bio-Bond™ C8	5	84106	606	84138	1,359	84145	2,759	84139	2,959	6909	195	6910	311
Bio-Bond™ C4	5	84406	606	84438	1,359	84445	2,759	84439	2,959	6911	195	6912	311
Bio-Bond™ C18	10	84035	403	84036	1,159	84046	2,359	84037	2,559	6913	195	6914	311
Bio-Bond™ C8	10	84135	403	84136	1,159	84146	2,359	84137	2,559	6915	195	6916	311
Bio-Bond™ C4	10	84435	403	84436	1,159	84446	2,359	84437	2,559	6917	195	6918	311

10 mm EasyGuard™ Holder: Cat#6221, Price: $199, 21.2 mm EasyGuard™ Holder: Cat#6222, Price: $299

Platisil™

Features of Platisil™ Columns

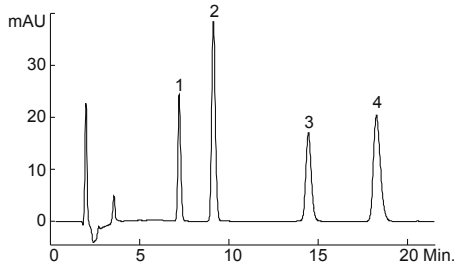
- Unique bonding technology prevents the phase collapse, and allows stable retention in highly aqueous mobile phases
- Unique selectivity, excellent peak shape
- Enhanced retention of polar compounds
- High loadability
- pH range 1 - 11
- Reduced silanol interactions and improved peak shape for basic analytes

Platisil™ Material Characteristics

Bonded phase	Particle size (μm)	Pore size (Å)	Surface area (m^2/g)	Purity (%)	Impurities (mg/kg)	Carbon loading (%)	pH range	Endcapping
C18	5	100	440	> 99.999	< 10	15	1 - 11	Yes

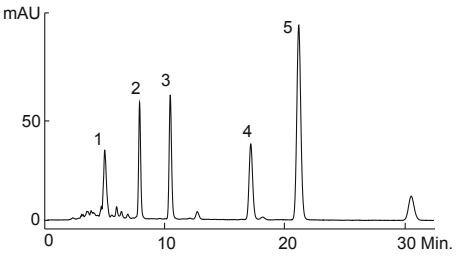
Cold Medicine

Column: Platisil™ 5 μm C18, 150 x 4.6 mm
Cat. No.: **99501**
Mobile Phase: MeOH:MeCN:1% sodium dodecyl sulfate: acetic acid = 30:35:30:0.3
Flow Rate: 1.0 mL/min
Detection: UV 265 nm
Temperature: Ambient
Sample:
1. Pseudoephedrine hydrochloride
2. Naphazoline hydrochloride
3. Chlorpheniramine
4. Dextromethorphan hydrobromide



The Active Ingredients of Rhubarb

Column: Platisil™ 5 μm C18, 250 x 4.6 mm
Cat. No.: **99503**
Mobile Phase: MeOH:0.1% phosphoric acid = 80:20
Flow Rate: 1.0 mL/min
Detection: UV 254 nm
Temperature: 30 °C
Sample:
1. Aloe emodin
2. Rhein
3. Emodin
4. Chrysophanol
5. Physcion



Platisil™ Ordering Information

5 μm Analytical Columns

Phase	150 x 4.6	Price	250 x 4.6	Price
Platisil™ C18	99501	$519	99503	$545

Features of EasyGuard™ Columns

- Universal design to match any brand column
- A variety of optional bonded phase material
- Does not affect the analytical column resolution
- Long lifetime column cartridges, high performance and low price

Balance

Guard columns provide protection against contamination with minimal impact on column efficiency. The column diameter determines both the sample loadability and column efficiency. A small diameter will decrease the column lifetime, but a large diameter will adversely affect column resolution. EasyGuard™ columns effectively profect the analytical column without adversely affecting the resolution or column lifetime.

Simple to Use

- Flexibility to move PEEK fittings
- Matches any brand analytical column
- Low dead volume connection
- Rugged 316 stainless steel column holder

EasyGuard™ Kit (1 holder and 2 cartridges)

Description	10 x 2.1 mm	Price	10 x 4.0 mm	Price
C18	6231	$158	6201	$158
C8	6232	158	6202	158
Phenyl	6233	158	6203	158
CN	6234	158	6204	158
NH_2	6235	158	6205	158
Silica	6236	158	6206	158

EasyGuard™ Replacement Cartridges (5/pk)

Description	10 x 2.1 mm	Price	10 x 4.0 mm	Price
C18	6241	$147	6211	$147
C8	6242	147	6212	147
Phenyl	6243	147	6213	147
CN	6244	147	6214	147
NH_2	6245	147	6215	147
Silica	6246	147	6216	147

EasyGuard™ Guard Column Accessories

Description	Qty	Cat. No.	Price
EasyGuard™ Holder Assembly	1/pk	6220	$99
PEEK Fingertight Fitting (Machined Version)	5/pk	90412	55

Easy-Lok™ Coupler New!

When the EasyGuard™ guard column connects to a 250 mm analytical column, it can not fit in certain ovens (such as Agilent 1200) because the length is not long enough. The Easy-Lok™ coupler resolves this issue by removing the pre-tightened connecting pipe by wrench before using.

Description	Qty	Cat. No.	Price
Easy-Lok™ Coupler	1/pk	6132	$59
Tip for Easy-Lok™ Coupler, PEEK	2/pk	6133	49

Preparative Chromatography

Dikma prep materials are designed to provide fast separation with superior performance in suitable for the most demanding preparative applications. The stationary phases created by combining advanced bonding technologies with high surface area ultra-pure silica deliver superior resolution and loadability, extended column lifetime and excellent stability and reproducibility. With Dikma prep column you can load more samples and obtain a larger amount of purified product in less time.

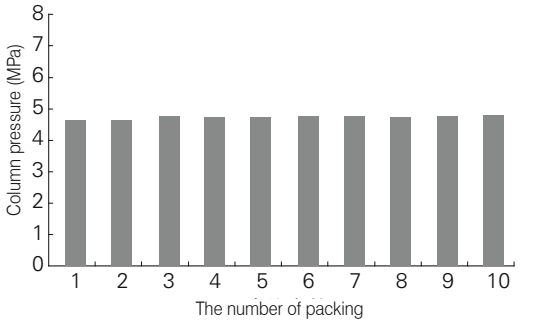
Features of Dikma Preparative Chromatography Packing Materials :

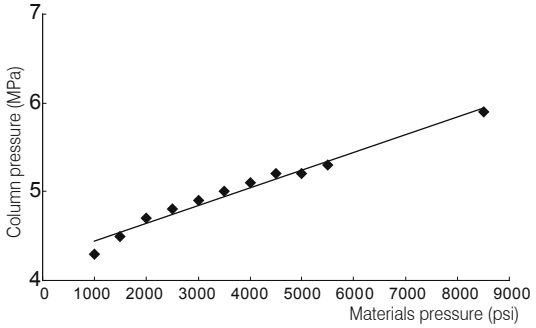
Excellent Mechanical Stability

By optimizing pore volume, pore diameter, particle size structure, Dikma preparative chromatography packing materials maintain their physical and chemical integrity through repeated packing and unpacking cycles.

During the mechanical strength test, the same batch for Dikma Inspire™ 10 μm materials was packed, tested for column pressure, and then unpacked material. This process is repeated for 10 times in a 250 x 4.6 mm column at a pressure of 2,000 psi. The result of the pressure test as shown below did not significantly change.

The second test proves as well the mechanical strength of Dikma packing materials. The data illustrated clearly indicates a linear correlation between column pressure and packing pressure, which indicates that Dikma packing materials have strong mechanical stablity.





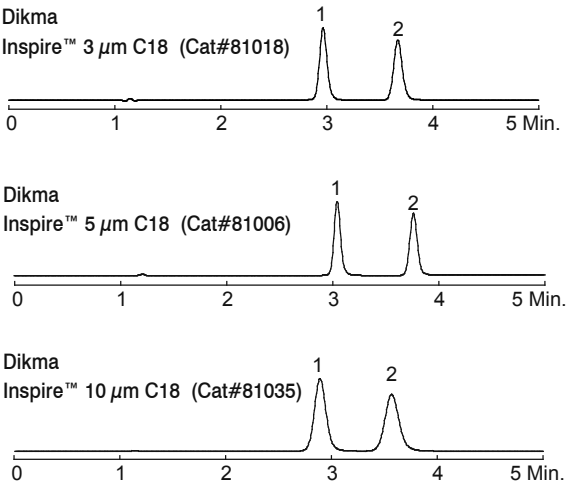
Quick and Easy Transition from Analytical to Prep

Dikma Technologies Inc. offers the same line of packing materials, although the particles are different with no change in selectivity and retention characteristics, to support rapid scale-up from analytical to preparative scale, making it more convenient for method development.

Scale up from analytical to prep is easily achieved without loss of performance. High-tech packing procedures in combination with the State-of-the-Art Dikma bonded phases ensure similar chromatographic performance regardless of dimension. This eliminates the need of additional time-consuming method development. Dikma offers columns in 3, 5 and 10 μm particle sizes that make it easy to scale-up. The data demonstrates easy linear scale-up of natural products from 3 μm and 5 μm analytical columns to a 10 μm preparative column.

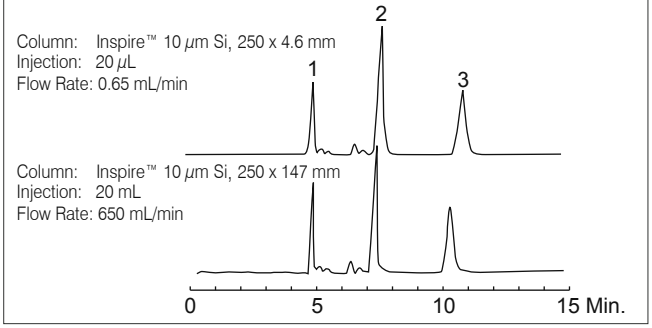
Linear Scale-up

Column: Inspire™ C18, 250 x 4.6 mm
Mobile Phase: MeCN:H_2O = 70:30
Flow Rate: 1.0 mL/min
Temperature: 30 °C
Detection: UV 220 nm
Sample: 1. Capsaicin 2. Dihydrocapsaicin



Linear Scale-up with LSF=1000

Mobile Phase: *n*-hexane:isopropanol = 80:20
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Toluene 2. 4-Nitrobenzyl alcohol 3. 2-Nitrobenzyl alcohol

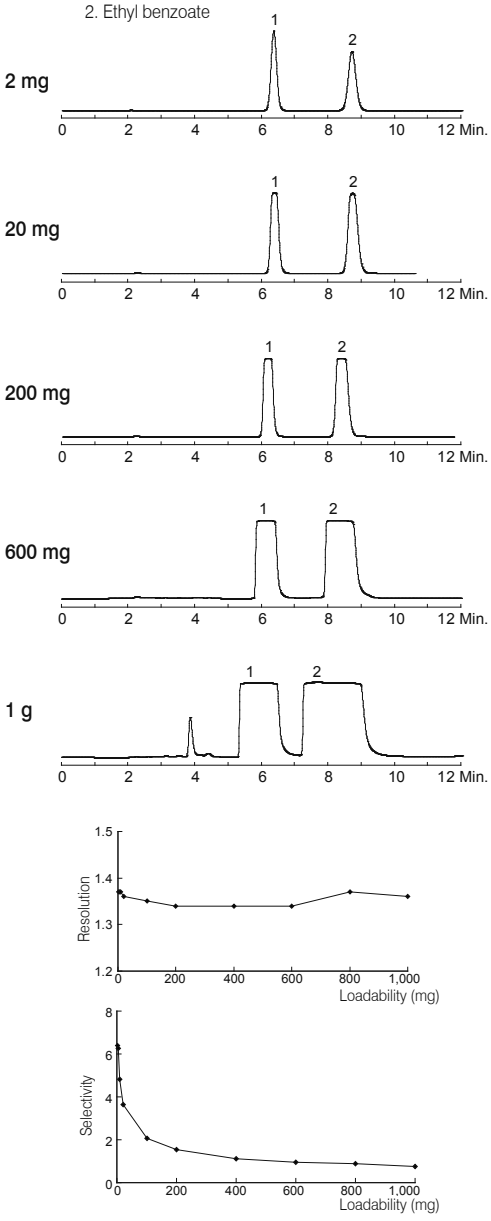


Maximum Loadability

The loadability is an important parameter for preparative chromatography as packing materials with high loading capacity and good separation efficiency can undoubtedly improve the overall yield. Dikma uses a proprietary technique to bond more alkyl groups to silica surface to increase the loadability of the packing material.

Dikma prep offers maximum loadability, which results in improved laboratory productivity by delivering more purified material per run time. Superior mass loading capabilities translate into less preparative runs for a given amount of pure material, resulting in faster purification and increased throughput.

Column: Inspire™ 10 μm C18, 250 x 21.2 mm
Cat. No.: **81037**
Mobile Phase: MeOH:H_2O = 70:30
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Methyl benzoate
2. Ethyl benzoate

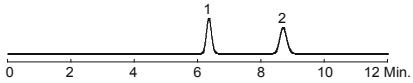


Increasing loadability did not reduce the resolution of compounds 1 and 2

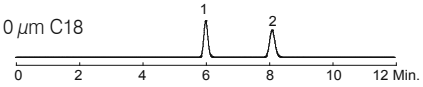
Column: Listed on chromatograms
Dimension: 250 x 4.6 mm
Mobile Phase: MeOH:H_2O = 70:30
Flow Rate: 20 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Methyl benzoate
2. Ethyl benzoate

0.1 mg

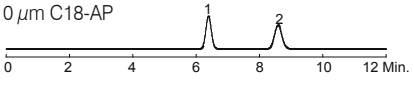
Dikma Inspire™ 10 μm C18 (Cat#81035)



Kromasil* 10 μm C18

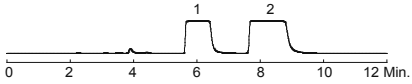


DAISOGEL* 10 μm C18-AP

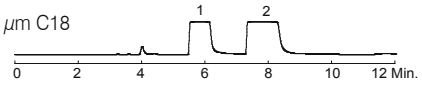


20 mg

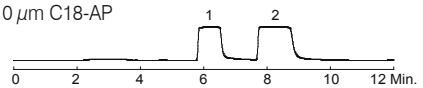
Dikma Inspire™ 10 μm C18 (Cat#81035)



Kromasil 10 μm C18

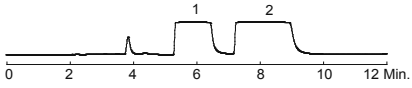


DAISOGEL 10 μm C18-AP

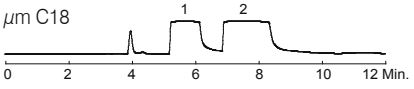


50 mg

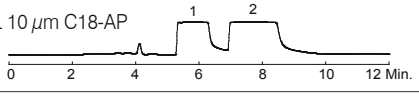
Dikma Inspire™ 10 μm C18 (Cat#81035)



Kromasil 10 μm C18



DAISOGEL 10 μm C18-AP

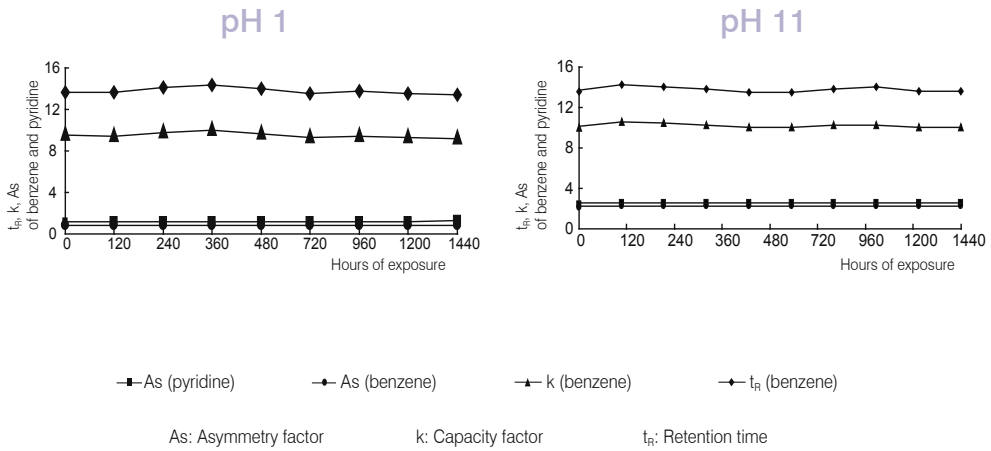


*Kromasil is a registered trademark of Eka Chemicals AB. Dikma Technologies Inc. is not affiliated with the above company.
*DAISOGEL is a registered trademark of DAISO Co., LTD.. Dikma Technologies Inc. is not affiliated with the above company.

Outstanding Chemical Stability

Silica-based materials may be hydrolyzed or dissolved in the low pH or high pH, leading to loss of stationary phase and rapidly decreasing column efficiency. Dikma preparative chromatography packing materials have excellent stability in these extreme pH conditions. We continuously flushed a Dikma Inspire™ C18 column for more than 1440 hours at pH 1 and pH 11 respectively, and then recorded and calculated the retention time, asymmetry and capacity factor (as shown below). The experimental data show the Dikma Inspire™ C18 column can maintain outstanding tolerance and stability under extreme pH conditions.

Column: Inspire™ 10 μm C18, 150 x 4.6 mm
Mobile Phase: MeCN:20 mM phosphate buffer (pH 7) = 40:60
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Uracil
2. Pyridine
3. Phenol
4. Benzene



Flush solution (pH 1)

Mobile Phase: 1% TFA in MeCN:1% TFA in H_2O = 50:50
Flow Rate: 1.0 mL/min
Temperature: Ambient

Flush solution (pH 11)

Mobile Phase: MeCN:20 mM phosphate buffer = 50:50
Flow Rate: 1.0 mL/min
Temperature: Ambient

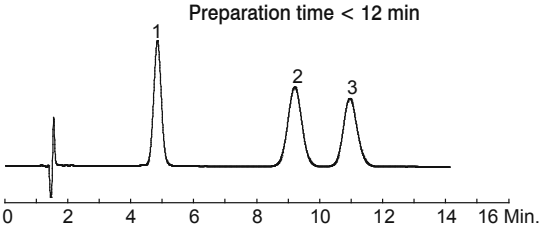
Ultimate Performance

Large-scale purification process consumes a large amount of solvents and increases production costs. Fast separation without compromising resolution can reduce solvent use and production costs.

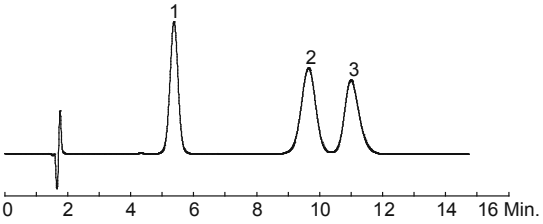
Separation of Basic Compounds*

Column: Listed on chromatograms
Dimension: 250 x 4.6 mm
Mobile Phase: MeOH:5 mM $NaHCO_3$ (pH 10) = 70:30
Flow Rate: 1.0 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample: 1. Norclozapine
2. Verapamil
3. Diphenhydramine

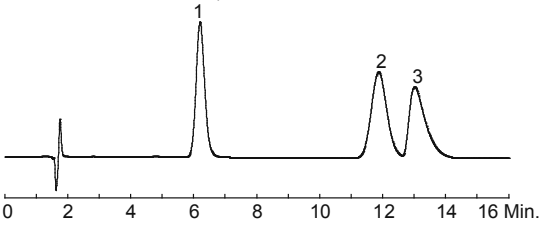
Inspire™ 10 μm C18 (Cat#81035)
Preparation time < 12 min



DAISOGEL 10 μm C18-AP
Resolution of peak 2 and peak 3 less than Inspire™ C18



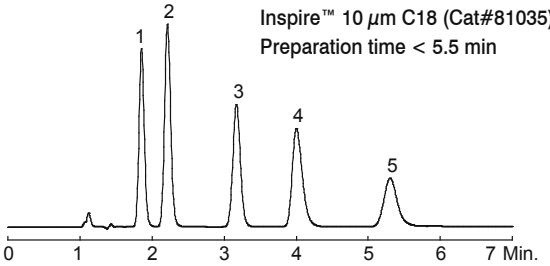
CHROMATOREX-SMB 10 μm C18
Resolution of peak 2 and peak 3 less than Inspire™ C18
Preparation time > 13 min



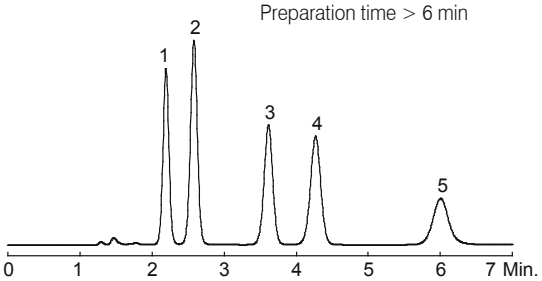
Separation of Acidic Compounds

Column: Listed on chromatograms
Dimension: 250 x 4.6 mm
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 40:60
Flow Rate: 1.0 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample: 1. Homovanillic acid
2. *o*-Hydroxyhippuric acid
3. Sorbic acid
4. Salicylic acid
5. Nalidixic acid

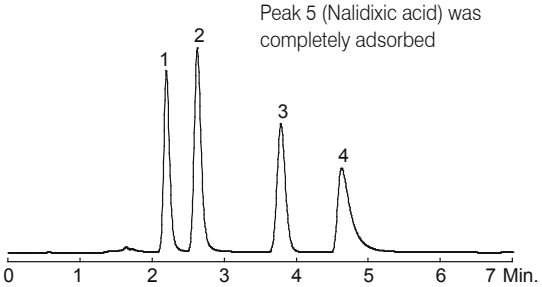
Inspire™ 10 μm C18 (Cat#81035)
Preparation time < 5.5 min



DAISOGEL 10 μm C18-AP
Preparation time > 6 min



CHROMATOREX-SMB 10 μm C18
Peak 5 (Nalidixic acid) was completely adsorbed



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Preparative Chromatography

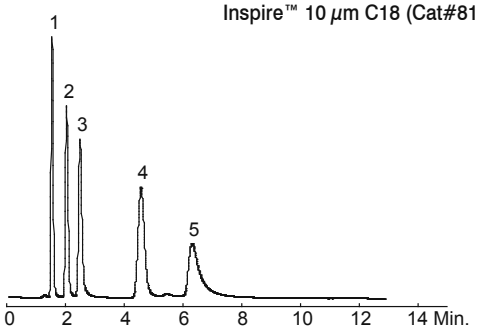
Unparalleled Performance

Dikma preparative chromatography packing materials are promoted by Dikma Technologies Inc. with independent intellectual property rights. Dikma adopts ultrapure spherical silica with a larger specific surface area and patented chemical bonding technology to ensure high resolution and shortened separation time, thereby increasing the loadability while saving solvent, and improving yield.

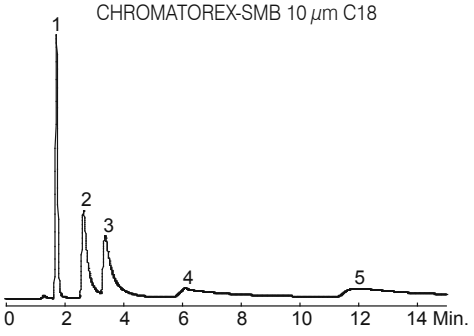
Separation of Basic Compounds*

Column: Listed on chromatograms
Dimension: 250 x 4.6 mm
Mobile Phase: MeCN:20 mM phosphate buffer (pH 7) = 30:70
Flow Rate: 1.0 mL/min
Temperature: 30 °C
Detection: UV 220 nm
Sample: 1. Nadolol
2. Pindolol
3. Metoprolol
4. Labetolol
5. Propranolol

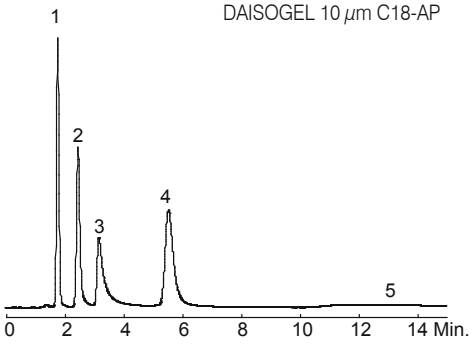
Dikma
Inspire™ 10 μm C18 (Cat#81035)



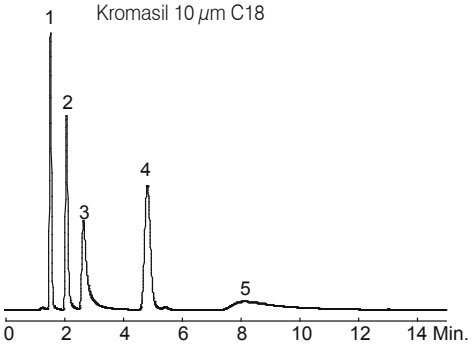
CHROMATOREX-SMB 10 μm C18



DAISOGEL 10 μm C18-AP



Kromasil 10 μm C18



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Features of Inspire™ Semi-preparative and Preparative Columns

- Rapid separations with outstanding resolution, high loadability
- Wide applications, suitable for separation of acidic / neutral / basic compounds
- Support linear scale-up, from analytical to preparative scale
- High mechanical strength, long column lifetime

Inspire™ material meets the most stringent requirements from analytical to preparative scale in the pharmaceutical industry. High surface area and carbon load are the keys to success. These features meet preparative chromatography resolution, and loadability requirements in the pharmaceutical production.

Inspire™ Material Characteristics

Bonded phase	Particle size (μm)	Pore size (Å)	Surface area (m^2/g)	Carbon loading (%)	pH range	Endcapping
C18	5, 10	100	440	27	1 - 11	Yes
C8	5, 10	100	440	17	1 - 11	Yes
Diol	5, 10	100	440	7.5	2 - 8	No

Inspire™ Ordering Information

										Guard Cartridge 2/pk				Bulk Materials			
	Particle	250 x 4.6		250 x 10.0		150 x 21.2		250 x 21.2		10 x 10.0		10 x 21.2		100 G		1 KG	
Phases	(μm)	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
Inspire™ C18	5	81006	$587	81038	$1,291	81045	$2,691	81039	$2,891	6505	$195	6506	$311	-	-	-	-
Inspire™ C8	5	81106	587	81138	1,291	81145	2,691	81139	2,891	6507	195	6508	311	-	-	-	-
Inspire™ Diol	5	81247	587	81238	1,291	81245	2,691	81239	2,891	6509	195	6510	311	-	-	-	-
Inspire™ C18	10	81035	383	81036	1,092	81046	2,291	81037	2,491	6511	195	6512	311	85001	Inquire	85002	Inquire
Inspire™ C8	10	81135	383	81136	1,092	81146	2,291	81137	2,491	6513	195	6514	311	85101	Inquire	85102	Inquire
Inspire™ Diol	10	81235	383	81236	1,092	81246	2,291	81237	2,491	6515	195	6516	311	85021	Inquire	85022	Inquire

Features of Spursil™ Semi-preparative and Preparative Columns

- Surfaces modified with polar groups, stable retention in highly aqueous mobile phase conditions
- Enhanced retention for hydrophilic and polar compounds
- Support linear scale-up, from analytical to preparative scale
- High mechanical strength, long column lifetime

Spursil™ Material Characteristics

Bonded phase	Particle size (μm)	Pore size (Å)	Surface area (m^2/g)	Carbon loading (%)	pH range	Endcapping
C18	5, 10	100	440	25	1.5 - 10	Yes
C18-EP	5, 10	100	440	24	1.5 - 10	Yes

Spursil™ Ordering Information

										Guard Cartridge 2/pk				Bulk Materials			
	Particle	250 x 4.6		250 x 10.0		150 x 21.2		250 x 21.2		10 x 10.0		10 x 21.2		100 G		1 KG	
Phases	(μm)	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
Spursil™ C18	5	82006	$606	82038	$1,359	82045	$2,759	82039	$2,959	6705	$195	6706	$311	-	-	-	-
Spursil™ C18-EP	5	82106	606	82138	1,359	82145	2,759	82139	2,959	6707	195	6708	311	-	-	-	-
Spursil™ C18	10	82035	403	82036	1,159	82046	2,359	82037	2,559	6709	195	6710	311	85201	Inquire	85202	Inquire
Spursil™ C18-EP	10	82135	403	82136	1,159	82146	2,359	82137	2,559	6711	195	6712	311	85301	Inquire	85302	Inquire

Preparative Chromatography

Features of Luster™ Semi-preparative and Preparative Columns

- Support linear scale-up, from analytical to preparative scale
- Economical packing
- High separation capacity and loadability
- Long column lifetime
- Excellent reproducibility
- High performance at a reasonable price

Luster™ Material Characteristics

Bonded phase	Particle size (μm)	Pore size (Å)	Surface area (m^2/g)	Carbon loading (%)	pH range	Endcapping
C18	5, 10	110	320	20	2 - 9	Yes
C8	5, 10	110	320	12	2 - 9	Yes
Diol	5, 10	110	320	5	2 - 8	No
Silica	5, 10	110	320	-	-	No

Luster™ Ordering Information

										Guard Cartridge 2/pk				Bulk Materials			
Phases	Particle	250 x 4.6		250 x 10.0		150 x 21.2		250 x 21.2		10 x 10.0		10 x 21.2		100 G		1 KG	
	(μm)	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
Luster™ C18	5	83046	$528	83047	$1,161	83051	$2,401	83048	$2,601	6409	$195	6410	$311	-	-	-	-
Luster™ C8	5	83146	528	83147	1,161	83151	2,401	83148	2,601	6411	195	6412	311	-	-	-	-
Luster™ Diol	5	83246	528	83247	1,161	83251	2,401	83248	2,601	6413	195	6414	311	-	-	-	-
Luster™ Silica	5	83346	528	83347	1,161	83351	2,401	83348	2,601	6415	195	6416	311	-	-	-	-
Luster™ C18	10	83035	345	83036	983	83045	2,041	83037	2,241	6401	195	6402	311	85601	Inquire	85602	Inquire
Luster™ C8	10	83135	345	83136	983	83145	2,041	83137	2,241	6403	195	6404	311	85631	Inquire	85632	Inquire
Luster™ Diol	10	83235	345	83236	983	83245	2,041	83237	2,241	6405	195	6406	311	85621	Inquire	85622	Inquire
Luster™ Silica	10	83335	345	83336	983	83345	2,041	83337	2,241	6407	195	6408	311	85611	Inquire	85612	Inquire

Features of Bio-Bond™ Semi-preparative and Preparative Columns

- Designed to analyze and purify proteins, peptides and biomolecules
- Uniformity of particle structure
- Perfect endcapping
- Support linear scale-up, from analytical to preparative scale

Bio-Bond™ Material Characteristics

Bonded phase	Particle size (μm)	Pore size (Å)	Surface area (m^2/g)	Carbon loading (%)	pH range	Endcapping
C18	5, 10	300	100	8	2 - 8	Yes
C8	5, 10	300	100	5	2 - 8	Yes
C4	5, 10	300	100	3	2 - 8	Yes

Bio-Bond™ Ordering Information

										Guard Cartridge 2/pk				Bulk Materials			
	Particle	250 x 4.6		250 x 10.0		150 x 21.2		250 x 21.2		10 x 10.0		10 x 21.2		100 G		1 KG	
Phases	(μm)	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
Bio-Bond™ C18	5	84006	$606	84038	$1,359	84045	$2,759	84039	$2,959	6907	$195	6908	$311	-	-	-	-
Bio-Bond™ C8	5	84106	606	84138	1,359	84145	2,759	84139	2,959	6909	195	6910	311	-	-	-	-
Bio-Bond™ C4	5	84406	606	84438	1,359	84445	2,759	84439	2,959	6911	195	6912	311	-	-	-	-
Bio-Bond™ C18	10	84035	403	84036	1,159	84046	2,359	84037	2,559	6913	195	6914	311	85701	Inquire	85702	Inquire
Bio-Bond™ C8	10	84135	403	84136	1,159	84146	2,359	84137	2,559	6915	195	6916	311	85731	Inquire	85732	Inquire
Bio-Bond™ C4	10	84435	403	84436	1,159	84446	2,359	84437	2,559	6917	195	6918	311	85741	Inquire	85742	Inquire

10 mm EasyGuard™ Holder, Cat# 6221 Price: $199, 21.2 mm EasyGuard™ Holder, Cat# 6222, Price: 299

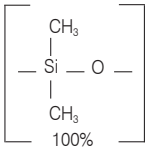
GC Columns

DikmaCap™ (DM)

Structures, Properties, Polarities and Uses for DM Columns

DM-1 / DM-1MS / DM-1HT

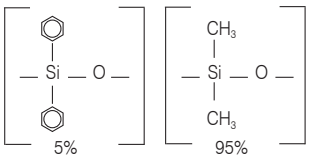
100% Dimethyl polysiloxane



Polarity: Non-polar
Application: Solvents, natural gases, petroleum products, etc.

DM-5 / DM-5MS / DM-5HT

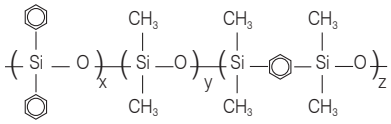
5% Diphenyl
95% Dimethyl polysiloxane



Polarity: Slightly polar
Application: Flavors, aromatic hydrocarbons, environmental compounds, etc.

DM-5MS / LB

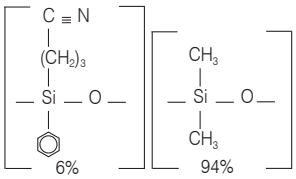
5% Diphenyl
95% Phenyl arylene dimethyl polysiloxane



Polarity: Slightly polar
Application: Semi-volatile / volatile compounds, phenols, aromatic hydrocarbons, PCBs

DM-624 / DM-624MS

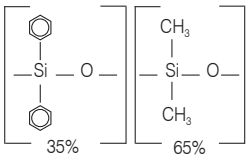
6% Cyanopropylphenyl
94% Dimethyl polysiloxane



Polarity: Slightly polar
Application: Insecticides, alcohols, volatile organic compounds

DM-35 / DM-35MS

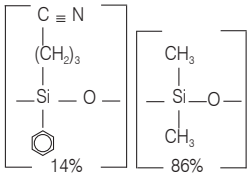
35% Diphenyl
65% Dimethyl polysiloxane



Polarity: Intermediately polar
Application: Pesticides, PCBs, herbicides

DM-1701

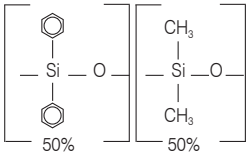
14% Cyanopropylphenyl
86% Dimethyl polysiloxane



Polarity: Intermediately polar
Application: Alcohols, oxygenates, PCBs

DM-17 / DM-17MS

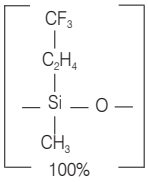
50% Diphenyl
50% Dimethyl polysiloxane



Polarity: Intermediately polar
Application: Triglycerides, steroids, PAEs

DM-200

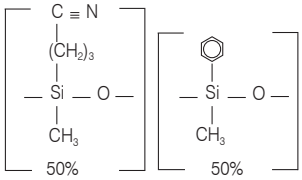
100% Trifluoropropylmethyl polysiloxane



Polarity: Intermediately polar, special selectivity for compounds containing lone pair electron groups
Application: Solvents, alcohols, etc.

DM-225

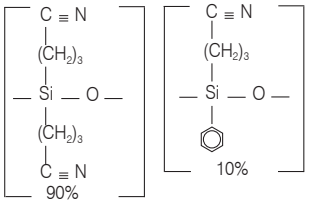
50% Cyanopropylmethyl
50% Phenylmethyl polysiloxane



Polarity: Polar
Application: Adipic acid monomethyl ester, sugars, FAMEs

DM-2330

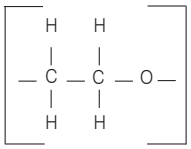
90% Biscyanopropyl
10% Cyanopropylphenyl polysiloxane



Polarity: Polar
Application: *cis / trans* FAMEs, dioxins, rosin acids

DM-Wax / DM-InertWax

Polyethylene glycol



Polarity: Polar
Application: FAMEs, flavors, solvents, aromatic hydrocarbons

Column Phase Cross Reference

DikmaCap™	Phase	Agilent	SGE	Restek	Supelco
DM-1	100% Dimethyl polysiloxane	HP-1, DB-1, CP-Sil 5 CB	BP-1	Rtx-1, MXT-1	SPB-1
DM-1HT	100% Dimethyl polysiloxane	DB-1ht, VF-1ht	-	Rxi-1HT	-
DM-1MS	100% Dimethyl polysiloxane (low bleed)	HP-1, HP-1ms, DB-1, DB-1ms, Ultra 1, VF-1ms, CP-Sil 5 CB Low Bleed / MS	BP-1	Rxi-1MS	SPB-1, Equity-1
DM-5	5% Diphenyl 95% Dimethyl polysiloxane	HP-5, DB-5, CP-Sil 8 CB	BP-5	Rtx-5, MXT-5	SPB-5
DM-5HT	5% Diphenyl 95% Dimethyl polysiloxane	DB-5ht, VF-5ht	-	Rxi-5HT	-
DM-5MS	5% Diphenyl 95% Dimethyl polysiloxane (low bleed)	HP-5, HP-5ms, DB-5, Ultra 2, CP-Sil 8 CB	BP-5	Rxi-5MS	SPB-5, Equity-5
DM-5MS / LB	5% Diphenyl 95% Phenyl arylene dimethyl polysiloxane (low bleed)	DB-5ms, DB-5ms UI, VF-5ms, CP-Sil 8 CB Low Bleed / MS	BPX-5	Rxi-5Sil MS	SLB-5MS
DM-35	35% Diphenyl 65% Dimethylpolysiloxane	HP-35, DB-35	BPX-35, BPX-608	Rtx-35	SPB-35, SPB-608
DM-35MS	35% Diphenyl 65% Dimethyl arylene polysiloxane	DB-35ms, VF-35ms	BP-35	Rxi-35Sil MS	-
DM-1701	14% Cyanopropylphenyl 86% Dimethyl polysiloxane	HP-1701, PAS-1701, DB-1701, CP-Sil 19 CB, VF-1701ms	BP-10	Rtx-1701	SPB-1701
DM-17	50% Diphenyl 50% Dimethyl polysiloxane	HP-50+, HP-17, DB-17, DB-608, CP-Sil 24 CB	-	Rxi-17	SPB-50
DM-17MS	50% Diphenyl 50% Dimethyl arylene polysiloxane	HP-17, DB-17, DB-17ms, CP-Sil 24 CB, VF-17ms	BPX-50	Rxi-17Sil MS	-
DM-200	100% Trifluoropropylmethyl polysiloxane	DB-210, DB-200, VF-200ms	-	Rtx-200	-
DM-200MS	100% Trifluoropropylmethyl polysiloxane (low bleed)	VF-200ms	-	Rtx-200MS	-
DM-225	50% Cyanopropylmethyl 50% Phenylmethyl polysiloxane	HP-225, DB-225, CP-Sil 43 CB	BP-225	Rtx-225	SPB-225
DM-Wax	Polyethylene glycol	HP-INNOWax, CP-Wax 52 CB, VF-WAXms	-	Stabilwax	Supelcowax 10
DM-InertWax	Polyethylene glycol	HP-Wax, DB-Wax, CP-Wax 52 CB	BP-20	Rtx-Wax	-
DM-FFAP	Polyethylene glycol	HP-FFAP, DB-FFAP, CP-Wax 58 CB	BP-21	Stabilwax-DA	Nukol
DM-2330	90% Biscyanopropyl 10% Cyanopropylphenyl polysiloxane	-	BPX-70	Rt-2330	SP-2330, SP-2331, SP-2380
DM-2560	Biscyanopropyl polysiloxane	HP-88, CP-Sil 88	-	Rt-2560	SP-2560
DM-PLOT Alumina	Aluminum oxide	GS-Alumina, HP-PLOT S, CP-Al_2O_3 PLOT	-	-	-
DM-PLOT Alumina / Na_2SO_4	Aluminum oxide Na_2SO_4 deactivation	GS-Alumina, HP-PLOT S, CP-Al_2O_3 / Na_2SO_4 PLOT	-	Rt-Alumina BOND / Na_2SO_4	Alumina Sulfate PLOT
DM-PLOT Alumina / KCl	Aluminum oxide KCl deactivation	GS-Alumina / KCl, HP-PLOT Al_2O_3 / KCl, CP-Al_2O_3 / KCl PLOT	-	Rt-Alumina BOND / KCl	Alumina Chloride PLOT
DM-PLOT CFC		-	-	Rt-Alumina BOND / CFC	-
DM-PLOT MS 5A	Molecular sieve 5A	GS-Molsieve, HP-PLOT Molesieve, CP-Molesieve 5A	-	Rt-Msieve 5A	Molsieve 5A
DM-PLOT Q	100% Divinylbenzene	CP-PoraPLOT Q, CP-PoraBond Q	-	Rt-Q-BOND	Supel-Q PLOT
DM-PLOT QS	Porous divinyl benzene homopolymer	GS-Q	-	Rt-QS-BOND	-
DM-PLOT S	Divinylbenzene 4-vinylpyridine	CP-PoraPLOT S	-	Rt-S-BOND	-
DM-PLOT U	Divinylbenzene ethylene glycol / dimethylacrylate	HP-PLOT U, CP-PoraPLOT U, CP-PoraBond U	-	Rt-U-BOND	-
DM-624	6% Cyanopropylphenyl 94% Dimethyl polysiloxane	HP-1301, HP-624, DB-1301, DB-624, CP-1301, VF-624ms, VF-1301ms	BP-624	Rtx-1301, Rtx-624	SPB-1301
DM-624MS	6% Cyanopropylphenyl 94% Dimethyl arylene polysiloxane	HP-624, DB-624, VF-624ms	BP-624	Rxi-624Sil MS	-
DM-FAMEWAX	Polyethylene glycol	-	-	FAMEWAX	Omegawax
DM-5 Amine	5% Diphenyl 95% Dimethyl polysiloxane	CP-Sil 8 CB	-	Rtx-5 Amine	-
DM-35 Amine	35% Diphenyl 65% Dimethyl polysiloxane	-	-	Rtx-35 Amine	-
DM-Wax Amine	Polyethylene glycol	CAM, CP-Wax 51	-	Stabilwax-DB	Carbowax Amine
DM-TVOC	100% Dimethyl polysiloxane	-	-	-	-
DM-PONA	100% Dimethyl polysiloxane	HP-PONA, DB-Petro, CP-Sil PONA CB	BP1-PONA	Rtx-DHA	Petrocol DH
DM-TCEP	1,2,3-*tris*[2-cyanoethoxy]propane	CP-TCEP	-	Rt-TCEP	TCEP
DM-2887 DM-2887 Metal	100% Dimethyl polysiloxane	DB-2887	-	Rtx-2887	Petrocol 2887, Petrocol EX2887
DM-AQUA	25% Phenyl 75% Methyl polysiloxane	-	-	-	-
DM-1HT SimDist Metal	100% Dimethyl polysiloxane	DB-HT Sim Dis, CP-SimDist	-	MXT-1HT SimDist	-
DM-1 SimDist Metal		CP-SimDist	-	MXT-1HT SimDist	-
DM-500 SimDist Metal	Carborane siloxane polymer	-	-	MXT-500 SimDist	-
DM-BDTG Metal		-	-	MXT-Biodiesel TG	-
DM-Volatile Amine		CP-VolAmine	-	Rtx-Volatile Amine	-
DM-PAH	50% Methyl 50% Phenyl polysiloxane	-	-	-	-

GC Guard Columns

Guard Columns / Transfer Lines (Intermediate Polarity Deactivated)

- Use in a wide variety of applications
- Allow most common solvents

Ordering Information

			5 m		5 m (6/pk)		10 m		30 m	
ID (mm)	OD (mm)	MAOT (°C)	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
0.05	0.363 ± 0.012	325	7001	$115						
0.10	0.363 ± 0.012	325	7002	130						
0.15	0.363 ± 0.012	325	7003	130						
0.18	0.37 ± 0.04	325	7004	87						
0.25	0.37 ± 0.04	325	7005	64	7061	$345	7015	$115	7064	$336
0.28	0.37 ± 0.04	325	7006	64						
0.32	0.45 ± 0.04	325	7007	73	7062	390	7017	130	7065	385
0.45	0.69 ± 0.04	325	7008	94						
0.53	0.69 ± 0.05	325	7009	94	7063	503	7019	175	7066	511

Guard Columns / Transfer Lines (Polar Deactivated)

- Provide optimum wettability for polar compounds
- Minimize peak splitting and peak tailing when using polar solvents such as water or methanol
- Polyethylene glycol deactivation used for DM-Wax, DM-225 and DM-2330

Ordering Information

			5 m			10 m		30 m	
ID (mm)	OD (mm)	MAOT (°C)	Cat. No.	Price		Cat. No.	Price	Cat. No.	Price
0.25	0.37 ± 0.04	280	7011	$64		7014	$115	7010	$336
0.32	0.45 ± 0.04	280	7012	73		7016	130	7020	385
0.53	0.69 ± 0.05	280	7013	94		7018	175	7030	511

Guard Columns / Transfer Lines (Water Resistant Deactivated)

- High-density surface deactivation and excellent water resistance
- Use for purge / trap system, headspace injection, gas concentration analysis and hydrated sample test
- Inertness and water resistance tube connection

Ordering Information

			5 m		5 m (6/pk)		10 m		30 m	
ID (mm)	OD (mm)	MAOT (°C)	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
0.05	0.363 ± 0.012	325	7021	$115						
0.10	0.363 ± 0.012	325	7022	130						
0.15	0.363 ± 0.012	325	7023	130						
0.18	0.37 ± 0.04	325	7024	87						
0.25	0.37 ± 0.04	325	7025	64	7031	$345	7034	$130	7037	$385
0.32	0.45 ± 0.04	325	7027	73	7032	390	7035	147	7038	427
0.53	0.69 ± 0.05	325	7029	94	7033	503	7036	196	7039	560

Guard Columns / Transfer Lines (Base Deactivated)

- Excellent inertness for basic compounds
- Use for DM-5 Amine, DM-35 Amine, DM-Wax Amine, DM-Volatile Amine
- Batch test with basic compounds

Ordering Information

			5 m		5 m (6/pk)	
ID (mm)	OD (mm)	MAOT (°C)	Cat. No.	Price	Cat. No.	Price
0.25	0.37 ± 0.04	315	7041	$73	7044	$390
0.32	0.45 ± 0.04	315	7042	80	7045	428
0.53	0.69 ± 0.05	315	7043	101	7046	540

DM-1 / DM-1MS

- 100% Dimethyl polysiloxane
- General purpose column of non-polar phase
- Long lifetime
- Temperature range: -60 °C to 350 °C
- Bonded and cross-linked phase, solvent rinsable
- DM-1MS is a low bleed column, use for MSDs
- Similar to DB-1, SPB-1, HP-1, etc.
- Equivalent to USP G1, G2, G38 phases

DM-1MS column exhibits ultra-low bleed that has excellent inertness for active compounds and improves detection performance for MSDs, ECDs and NPDs.

Application Chromatogram

DM-1 Ordering Information

			15 m		30 m		50 m		60 m	
ID (mm)	df (µm)	MAOT (°C)	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
0.25	0.10	-60 to 330 / 350			7119	$450				
	0.25	-60 to 330 / 350			7121	435	7172	$785	7122	$775
	0.50	-60 to 330 / 350			7123	435	7174	785	7124	775
	1.00	-60 to 330 / 340			7125	435	7176	785	7126	775
0.32	0.25	-60 to 330 / 350			7131	470	7182	850	7132	840
	0.50	-60 to 330 / 350			7133	470	7184	850	7134	840
	1.00	-60 to 320 / 340			7135	470	7186	850	7136	840
	1.50	-60 to 310 / 330			7137	470			7138	840
	3.00	-60 to 280 / 300			7141	470			7142	840
	4.00	-60 to 280 / 300			7143	495				
	5.00	-60 to 260 / 280			7139	470			7140	855
0.53	0.50	-60 to 310 / 330			7147	530			7148	870
	1.00	-60 to 310 / 330	7109	$295	7149	530			7150	885
	1.50	-60 to 310 / 330	7110	295	7151	530			7152	885
	3.00	-60 to 270 / 290	7112	295	7155	530			7156	885
	5.00	-60 to 270 / 290	7113	310	7157	530			7158	870
	7.00	-60 to 270 / 290			7159	530			7160	870

DM-1MS Ordering Information

			30 m	
ID (mm)	df (µm)	MAOT (°C)	Cat. No.	Price
0.25	0.25	-60 to 330 / 350	8121	$490
0.32	0.25	-60 to 330 / 350	8131	515

DM-5 / DM-5MS

DM-5 / DM-5MS

- Bonded and cross-linked 5% diphenyl / 95% dimethyl polysiloxane
- General purpose column with low polarity phase
- Temperature range: -60 °C to 350 °C
- Solvent rinsable
- DM-5MS is a low bleed column, use for MSDs
- Similar to DB-5, SPB-5, HP-5, etc.
- Equivalent to USP G27, G36 phases

DM-5 column has a slightly higher polarity compared to DM-1, resulting in a better selectivity for aromatic compounds. DM-5 column exhibits excellent reproducibility, high column efficiency, and low bleed.

DM-5MS column exhibits ultra-low bleed with excellent inertness for active compounds and improves detection performance for MSDs, ECDs and NPDs.

Application Chromatogram

DM-5 Ordering Information

			15 m		30 m		50 m		60 m	
ID (mm)	df (µm)	MAOT (°C)*	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
0.25	0.10	-60 to 330 / 350			7219	$450				
	0.25	-60 to 330 / 350			7221	435	7272	$785	7222	$775
	0.50	-60 to 330 / 350			7223	435	7274	785	7224	775
	1.00	-60 to 320 / 340			7225	435	7276	785	7226	775
0.32	0.25	-60 to 330 / 350			7231	470	7282	850	7232	840
	0.50	-60 to 330 / 350			7233	470	7284	850	7234	840
	1.00	-60 to 330 / 350			7235	470	7286	850	7236	840
	1.50	-60 to 310 / 330			7237	470			7238	840
	3.00	-60 to 280 / 300			7241	470			7242	840
	5.00	-60 to 260 / 280			7239	520				
0.53	0.50	-60 to 310 / 330			7247	530			7248	870
	1.00	-60 to 310 / 330	7209	$295	7249	530				
	1.50	-60 to 310 / 330	7210	295	7251	530				
	3.00	-60 to 270 / 290	7212	295	7255	530				
	5.00	-60 to 270 / 290	7213	310	7257	530	7298	885	7258	885

DM-5MS Ordering Information

			30 m		50 m		60 m	
ID (mm)	df (µm)	MAOT (°C)*	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
0.25	0.10	-60 to 330 / 350	8219	$490			8220	$780
	0.25	-60 to 330 / 350	8221	490	8272	$790	8222	780
	0.50	-60 to 330 / 350	8223	490				
0.32	0.10	-60 to 330 / 350	8229	520			8230	845
	0.25	-60 to 330 / 350	8231	515	8282	855	8232	845
	0.50	-60 to 330 / 350	8233	260				

*The listed temperature limits are for 15 m and 30 m columns. Longer columns may have lower temperature limits.

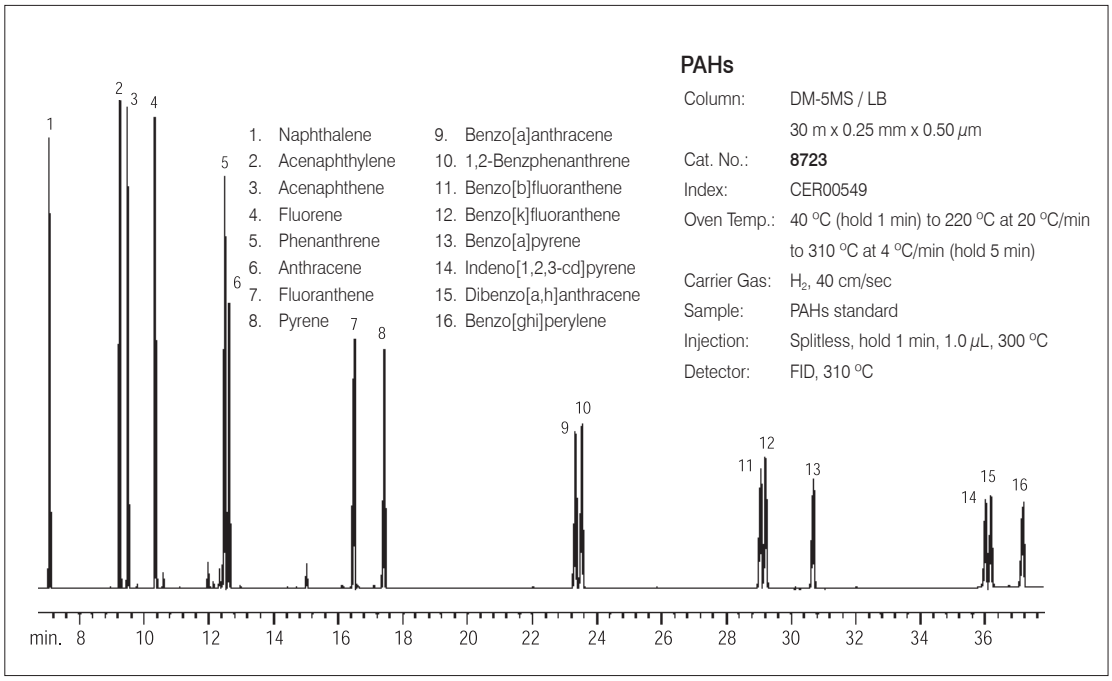
DM-5MS / LB

- Cross-linked 5% diphenyl / 95% phenyl arylene dimethyl polysiloxane
- Very low bleed
- Improves the resolution between Benzo[b]fluoranthene and Benzo[k]fluoranthene
- Similar to DB-5MS

DM-5MS / LB (low bleed) column is coated with a 5% diphenyl / 95% phenyl arylene dimethyl polysiloxane phase, which can inhibit the formation of ring-shaped fragments of siloxane skeleton, thereby reducing column bleed and increasing the thermal stabilty. The stationary phase has better stability; and will not exhibit oxidative degradation when there is trace oxygen in the carrier gas.

DM-5MS / LB column is similar to DM-5MS. The DM-5MS / LB has good sensitivity and peak symmetry for strong polar and basic compounds. We recommend DM-5MS / LB column for analysis of semi-volatile compounds such as PAHs and PCBs.

Application Chromatogram



PAHs

Column:	DM-5MS / LB
	30 m x 0.25 mm x 0.50 µm
Cat. No.:	**8723**
Index:	CER00549
Oven Temp.:	40 °C (hold 1 min) to 220 °C at 20 °C/min
	to 310 °C at 4 °C/min (hold 5 min)
Carrier Gas:	H_2, 40 cm/sec
Sample:	PAHs standard
Injection:	Splitless, hold 1 min, 1.0 µL, 300 °C
Detector:	FID, 310 °C

DM-5MS / LB Ordering Information

			30 m	
ID (mm)	df (µm)	MAOT (°C)	Cat. No.	Price
0.25	0.10	-60 to 330 / 350	8719	$500
	0.25	-60 to 330 / 350	8721	490
	0.50	-60 to 330 / 350	8723	490
0.32	0.10	-60 to 330 / 350	8729	520
	0.25	-60 to 330 / 350	8731	515
	0.50	-60 to 330 / 350	8733	515

DM-1HT / DM-5HT

DM-1HT

- 100% Dimethyl polysiloxane
- High temperature resistant application
- Temperature range: -60 °C to 400 °C

DM-1HT Ordering Information

			15 m		30 m	
ID (mm)	df (µm)	MAOT (°C)*	Cat. No.	Price	Cat. No.	Price
0.25	0.10	-60 to 400	8841	$335	8842	$545
	0.25	-60 to 400			8843	545
0.32	0.10	-60 to 400	8844	365	8845	585
	0.25	-60 to 400			8846	585
0.53	0.15	-60 to 400			8847	640

*Column is capable of going up to 430 °C, but it will reduce column lifetime.

DM-5HT

- Low polarity phase, bonded and cross-linked 5% diphenyl / 95% dimethyl polysiloxane
- 40% longer lifetime from designed fused silica tubing
- High temperature resistant application
- Temperature range: -60 °C to 400 °C
- Similar to DB-5ht, VF-5ht

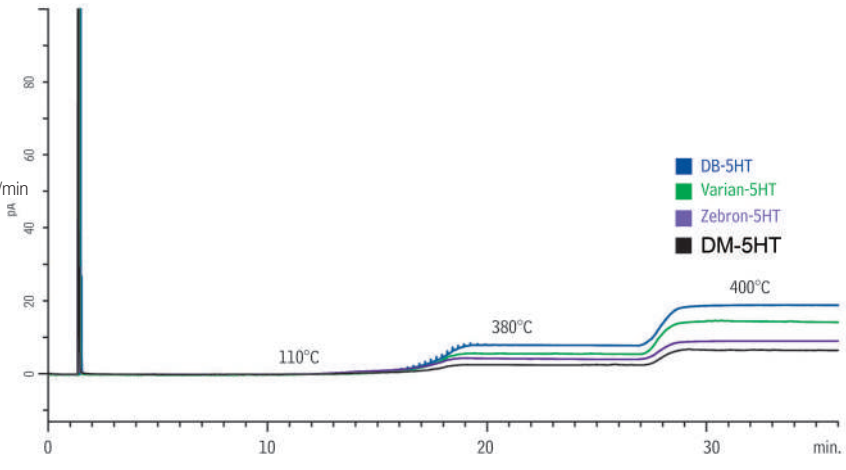
DM-5HT Ordering Information

			15 m		30 m	
ID (mm)	df (µm)	MAOT (°C)*	Cat. No.	Price	Cat. No.	Price
0.25	0.10	-60 to 400	8848	$335	8849	$545
	0.25	-60 to 400			8850	545
0.32	0.10	-60 to 400	8851	365	8852	585
	0.25	-60 to 400			8853	585
0.53	0.15	-60 to 400			8854	640

*Column is capable of going up to 430 °C, but it will reduce column lifetime.

Bleed Profiles of DM-5HT

Column: DM-5HT
30 m x 0.25 mm x 0.10 µm
Cat. No.: **8849**
Index: CGN1144
Carrier Gas: He, 38 cm/sec
Oven Temp.: 110 °C (hold 8 min) to 380 °C (hold 10 min) at 30 °C/min to 400 °C (hold 10 min) at 30 °C/min
Detector: FID, 400 °C
Injection: Split, 250 °C, 1.0 µL
Instrument: HP5890 GC

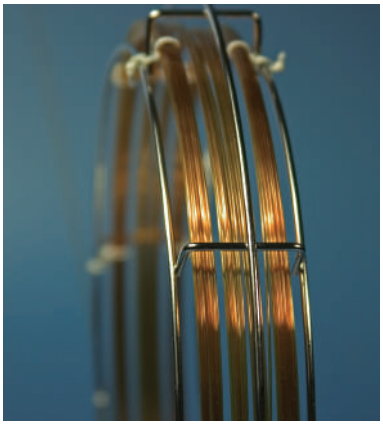


DM-35

- Bonded and cross-linked 35% diphenyl / 65% dimethyl polysiloxane
- General purpose column of mid-polarity phase for pesticides, herbicides, pharmaceuticals, sterols, etc.
- Temperature range: 40 °C to 320 °C
- Solvent rinsable
- Similar to DB-35, SPB-35, HP-35, SPB-608, etc.
- Equivalent to USP G42 phase

DM-35MS

- Bonded and cross-linked 35% diphenyl / 65% dimethyl arylene polysiloxane
- Special selectivity and excellent inertness for substituted polar compounds
- Temperature range: 50 °C to 360 °C
- Ultra-low bleed for MSDs and ECDs analysis
- Similar to DB-35ms, VF-35ms, BP-35



Application Chromatogram

DM-35 Ordering Information

			15 m		30 m		60 m	
ID (mm)	df (µm)	MAOT (°C)*	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
0.25	0.25	40 to 320			7921	$435	7922	$775
	0.50	40 to 310			7923	435	7924	775
0.32	0.25	40 to 320			7931	470	7932	840
	0.50	40 to 310			7933	470	7934	840
0.53	1.00	40 to 290	7910	$295	7951	530		

DM-35MS Ordering Information

			30 m	
ID (mm)	df (µm)	MAOT (°C)	Cat. No.	Price
0.25	0.25	50 to 340 / 360	8101	$490
0.32	0.25	50 to 340 / 360	8102	515

*The listed temperature limits are for 15 m and 30 m columns. Longer columns may have lower temperature limits.

DM-1701

DM-1701

- Cross-linked 14% cyanopropylphenyl / 86% dimethyl polysiloxane
- General purpose column of mid-polarity phase
- Temperature range: -20 °C to 280 °C
- Bonded and cross-linked phase, solvent rinsable
- Similar to DB-1701, HP-1701, SPB-1701
- Equivalent to USP G46 phase

DM-1701 is one of the most popular stationary phases. The mix of cyano and phenyl functional groups increases polarity and offers a different elution order compared to DM-1 or DM-5 column. DM-1701 column exhibits low bleed, high inertness and thermal stability because the polymer is characterized, and can be used for ECDs, NPDs and MSDs.

Application Chromatogram

DM-1701 Ordering Information

			15 m		30 m		50 m		60 m	
ID (mm)	df (µm)	MAOT (°C)*	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
0.25	0.25	-20 to 280			7321	$435			7322	$775
	0.50	-20 to 270 / 280			7325	435			7326	775
	1.00	-20 to 260 / 280			7323	435			7324	775
0.32	0.25	-20 to 280			7331	470	7382	$850	7332	840
	0.50	-20 to 270 / 280			7335	480			7336	840
	1.00	-20 to 260 / 280			7333	470	7384	850	7334	840
0.53	0.50	-20 to 260 / 270			7347	530			7348	870
	1.00	-20 to 250 / 270	7310	$295	7351	530			7352	885
	1.50	-20 to 240 / 260			7353	530			7354	870
	3.00	-20 to 230 / 250			7355	530			7356	870

*The listed temperature limits are for 15 m and 30 m columns. Longer columns may have lower temperature limits.

DM-17

- Bonded and cross-linked 50% diphenyl / 50% dimethyl polysiloxane
- General purpose column of mid-polarity phase for pesticides, herbicides, sterols, etc.
- Temperature range: 40 °C to 320 °C
- Solvent rinsable
- Similar to DB-17, HP-17, HP-50+, etc

DM-17MS

- Bonded and cross-linked 50% diphenyl / 50% dimethyl arylene polysiloxane
- Excellent inertness and selectivity for active environmental compounds
- Temperature range: 40 °C to 360 °C
- Ultra-low bleed
- Similar to DB-17ms, VF-17ms, BPX-50
- Equivalent to USP G3 phase

Application Chromatogram

DM-17 Ordering Information

			15 m		30 m		60 m	
ID (mm)	df (µm)	MAOT (°C)*	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
0.25	0.25	40 to 280 / 320			7421	$435	7422	$775
	0.50	40 to 280 / 320			7423	435	7424	775
0.32	0.25	40 to 280 / 320			7431	470	7432	840
	0.50	40 to 280 / 320			7433	470	7434	840
0.53	1.00	40 to 280 / 320	7410	$295	7451	530		

DM-17MS Ordering Information

			15 m		30 m		60 m	
ID (mm)	df (µm)	MAOT (°C)*	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
0.25	0.25	40 to 340 / 360	8831	$330	8832	$530	8833	$905
0.32	0.25	40 to 340 / 360	8834	350	8835	570		

*The listed temperature limits are for 15 m and 30 m columns. Longer columns may have lower temperature limits.

DM-200 / DM-200MS

DM-200 / DM-200MS

- 100% Trifluoropropylmethyl polysiloxane
- General purpose column of mid-polarity phase
- Temperature range: -20 °C to 340 °C
- Bonded and cross-linked phase, solvent rinsable
- Similar to DB-200, DB-210, etc.
- Equivalent to USP G6 phase

Interaction between trifluoropropylmethyl phase and molecules with lone pair electrons or electron-rich molecules is easier, due to electrophilicity of the fluorine. DM-200 column has accomplished many difficult separations that are not possible on other bonded stationary phases, such as PH, CN and WAX phase. The trifluoropropyl stationary phase can change elution orders of compounds. The DM-200 column can make a qualitative analysis of phenols, nitrosamines, orgaochlorine pesticides, and chlorhydrocarbons and chlorophenoxy herbicides in coordination with the DM-5 column.

DM-200 column offers low bleed, superb inertness, and excellent thermal stability, even with sensitive detectors, such as ECDs, NPDs and MSDs.

Application Chromatogram

DM-200 Ordering Information

			15 m		30 m		60 m	
ID (mm)	df (µm)	MAOT (°C)*	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
0.25	0.25	-20 to 320 / 340			8321	$470	8322	$775
	0.50	-20 to 310 / 330			8323	470	8324	775
	1.00	-20 to 290 / 310			8325	470	8326	775
0.32	0.25	-20 to 320 / 340			8331	495	8332	840
	0.50	-20 to 310 / 330			8333	495	8334	840
	1.00	-20 to 290 / 310			8335	495	8336	840
	1.50	-20 to 280 / 300			8337	495	8338	840
0.53	0.50	-20 to 300 / 320			8347	555	8348	905
	1.00	-20 to 290 / 310	8310	$345	8351	555	8352	965
	1.50	-20 to 280 / 300			8353	555	8354	905
	3.00	-20 to 260 / 280			8355	555	8356	905

DM-200 MS Ordering Information

			30 m	
ID (mm)	df (µm)	MAOT (°C)	Cat. No.	Price
0.25	0.25	-20 to 320 / 340	8103	$490
0.32	0.25	-20 to 320 / 340	8104	515

*The listed temperature limits are for 15 m and 30 m columns. Longer columns may have lower temperature limits.

DM-225

- Cross-linked 50% cyanopropylmethyl / 50% phenylmethyl polysiloxane
- General purpose column of polar phase, for FAMEs, carbohydrates, sterols and flavor compounds
- Temperature range: 40 °C to 240 °C
- Similar to DB-225, HP-225
- Equivalent to USP G7, G19 phases

The stationary phase of DM-225 is less polar than that of WAX column containing polyethylene glycol, but can be used for many of the same applications.

In most cases, the cyanopropyl siloxane polymer is not fully compatible with a Carbowax deactivation layer. DM-225 polymer has solved this problem because of the unique polymer synthesis technology and proprietary siloxane deactivation technology, and provides a 20 °C thermal stability advantage over other "225" columns.

Application Chromatogram

DM-225 Ordering Information

			15 m		30 m		60 m	
ID (mm)	df (µm)	MAOT (°C)*	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
0.25	0.25	40 to 220 / 240			8421	$435	8422	$775
	0.50	40 to 220 / 240			8423	435	8424	775
0.32	0.25	40 to 220 / 240			8431	470	8432	840
	0.50	40 to 220 / 240			8433	470	8434	840
0.53	1.00	40 to 200 / 220	8410	$305	8451	530		

*The listed temperature limits are for 15 m and 30 m columns. Longer columns may have lower temperature limits.

DM-Wax

DM-Wax

- Bonded and cross-linked polyethylene glycol
- General purpose column of polar phase
- Resistant to oxidation
- Temperature range: 40 °C to 260 °C
- Solvent rinsable
- Similar to HP-INNOWax, CP-WAX 52 CB, etc.
- Equivalent to USP G14, G15, G16, G20 and G39 phases

DM-Wax *vs.* DM-InertWax

Column	Features	Benefits
DM-Wax	• Wide chemical compatibility (acidic, basic and neutral samples) • Low bleed at elevated temperatures • High inertness • High stability and ruggedness	• General purpose column • Best choice for MS use
DM-InertWax	• Wide operating temperature range • Lowest operating temperature limit • Best inertness	• Analyze low boiling point analytes

Application Chromatogram

Sample / Compound	Page
Aldehydes	189
Alcohols	186
Alcohols / Aldehydes	188
Amines / Alcohols / Chlorides	185
Aromatics	181, 182
Concentrated Liquors	204
Esters	190
Flavor Volatiles	203
Glycols	187
Ketones	189
Solvents	194, 196, 198
Styrene Impurities	191
Peppermint Oil	205
Petroleum Oxygenates	174
PUFA (Animal Source)	201

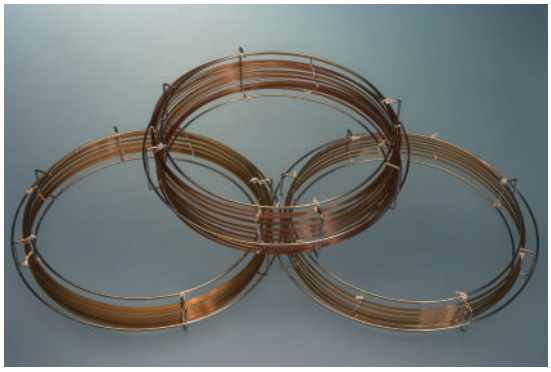
DM-Wax Ordering Information

			15 m		30 m		50 m		60 m	
ID (mm)	df (µm)	MAOT (°C)	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
0.25	0.25	40 to 250 / 260			7521	$450	7572	$810	7522	$790
	0.50	40 to 250 / 260			7523	450	7574	810	7524	790
0.32	0.25	40 to 250 / 260			7531	480	7582	880	7532	870
	0.50	40 to 250 / 260			7533	480	7584	435	7534	860
	1.00	40 to 250 / 260			7535	480			7536	860
0.53	0.50	40 to 250 / 260			7547	545			7548	885
	1.00	40 to 250 / 260	7510	$310	7551	545	7592	900	7552	885
	2.00	40 to 220 / 230	7511	315	7553	545				

DM-InertWax

- Bonded and cross-linked polyethylene glycol
- General purpose column of polar phase for analysis of solvents, such as FAMEs, BTEX, and flavor volatiles
- Temperature range: 20 °C to 250 °C
- Similar to DB-Wax, HP-Wax, etc.
- Equivalent to USP G14, G15, G16, G20 and G39 phases

Application Chromatogram



DM-InertWax Ordering Information

			30 m		60 m	
ID (mm)	df (µm)	MAOT (°C)*	Cat. No.	Price	Cat. No.	Price
0.25	0.25	20 to 250	8521	$450	8522	$790
	0.50	20 to 250	8523	450	8524	790
0.32	0.25	20 to 250	8531	480	8532	860
	0.50	20 to 250	8533	480	8534	860
0.53	1.00	20 to 240 / 250	8551	545	8552	885

*The listed temperature limits are for 30 m columns. Longer columns may have lower temperature limits.

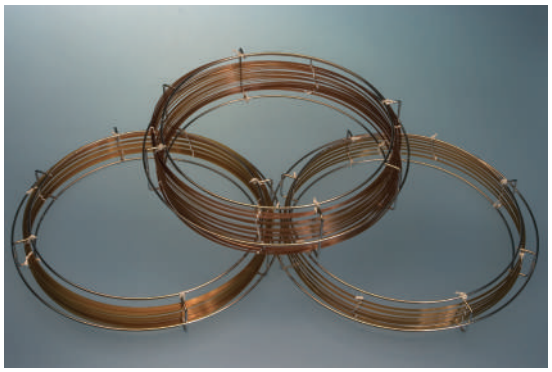
DM-FFAP

DM-FFAP

- Nitroterephthalic acid modified polyethylene glycol
- Designed for analysis of underivatized free acids
- Resistant to oxidation
- Temperature range: 40 °C to 250 °C
- Similar to DB-FFAP, HP-FFAP, Nukol, etc.
- Equivalent to USP G25, G35 phases

DM-FFAP column is used to analyze acidic compounds including phenol, derivatized or underivatized free acids, organic acids, flavor compounds and solvents.

Application Chromatogram



DM-FFAP Ordering Information

			15 m		30 m		50 m		60 m	
ID (mm)	df (µm)	MAOT (°C)	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price	Cat. No.	Price
0.25	0.25	40 to 250			7621	$440	7672	$785	7622	$775
	0.50	40 to 250			7623	440	7673	785	7624	775
0.32	0.25	40 to 250			7631	480	7682	850	7632	840
	0.50	40 to 250			7633	480	7684	850	7634	840
	1.00	40 to 250			7635	480			7636	840
0.53	0.50	40 to 240 / 250			7647	540			7648	920
	1.00	40 to 240 / 250	7610	$315	7651	540	7692	1,010	7652	960
	1.50	40 to 220 / 230	7611	325	7653	540				

DM-2330

- 90% Biscyanopropyl / 10% phenylcyanopropyl polysiloxane
- General purpose highly polar phase for *cis / trans* FAMEs and dioxin isomers
- Temperature range: 0 °C to 275 °C
- Similar to SP-2330, SP-2331, SP-2380, etc.
- Equivalent to USP G8 and G48 phases

DM-2330 is one of the most polar capillary column stationary phases. This column offers high selectivity for *cis / trans* isomers with conjugated double bonds due to cyano groups on both sides of the polymer backbone.

In order to overcome the poor column efficiencies, high bleed and short column lifetime of highly polar columns, we have developed an advanced surface treatment technology that is compatible with the DM-2330 phase. Our improved polymer exhibits better column efficiency and lower bleed.

Since the stationary phase of DM-2330 is not bonded, it should not be solvent rinsed.

Application Chromatogram

DM-2330 Ordering Information

			30 m		60 m	
ID (mm)	df (µm)	MAOT (°C)*	Cat. No.	Price	Cat. No.	Price
0.25	0.10	0 to 260 / 275	8621	$450	8622	$810
	0.20	0 to 260 / 275	8623	450	8624	810
0.32	0.10	0 to 260 / 275	8631	490	8632	855
	0.20	0 to 260 / 275	8633	490	8634	855

*The listed temperature limits are for 30 m columns. Longer columns may have lower temperature limits.

DM-2560

DM-2560

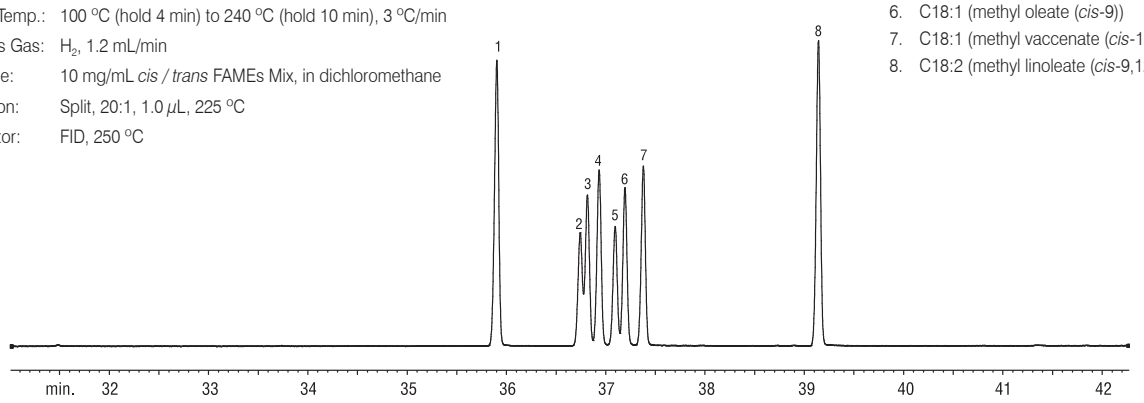
- Biscyanopropyl polysiloxane
- Specially designed for *cis / trans* FAMEs
- Temperature range: 20 °C to 250 °C
- Similar to SP-2560, HP-88, Silar 10C, CP-Sil 88 FAME, and CP-Sil 88
- Since the stationary phase of DM-2560 is not bonded, it should not be solvent rinsed

Application Chromatogram

***cis / trans* FAMEs**

Column: DM-2560
100 m x 0.25 mm x 0.20 µm
Cat. No.: **8858**
Index: CFR00652
Oven Temp.: 100 °C (hold 4 min) to 240 °C (hold 10 min), 3 °C/min
Carries Gas: H_2, 1.2 mL/min
Sample: 10 mg/mL *cis / trans* FAMEs Mix, in dichloromethane
Injection: Split, 20:1, 1.0 µL, 225 °C
Detector: FID, 250 °C

1. C18:0 (methyl stearate)
2. C18:1 (methyl petroselaidate (*trans*-6))
3. C18:1 (methyl elaidate (*trans*-9))
4. C18:1 (methyl transvaccenate (*trans*-11))
5. C18:1 (methyl petroselinate (*cis*-6))
6. C18:1 (methyl oleate (*cis*-9))
7. C18:1 (methyl vaccenate (*cis*-11))
8. C18:2 (methyl linoleate (*cis*-9,12))



DM-2560 Ordering Information

ID (mm)	df (µm)	MAOT (°C)	100 m Cat. No.	Price
0.25	0.20	20 to 250	8858	$1,275

Column Phase Cross Reference

DikmaCap™	Phase	Agilent	Restek	Supelco
DM-PLOT Alumina	Aluminum oxide	GS-Alumina, HP-PLOT S, CP-Al_2O_3 PLOT	-	-
DM-PLOT Alumina / Na_2SO_4	Aluminum oxide Na_2SO_4 deactvation	GS-Alumina, HP-PLOT S, CP-Al_2O_3 / Na_2SO_4 PLOT	Rt-Alumina BOND / Na_2SO_4	Alumina Sulfate PLOT
DM-PLOT Alumina / KCl	Aluminum oxide KCl deactvation	GS-Alumina / KCl, HP-PLOT Al_2O_3 / KCl, CP-Al_2O_3 / KCl PLOT	Rt-Alumina BOND / KCl	Alumina Chloride PLOT
DM-PLOT CFC			Rt-Alumina BOND / CFC	
DM-PLOT MS 5A	Molecular sieve 5A	HP-PLOT Molesieve, CP-Molesieve 5A	Rt-Msieve 5A	Molsieve 5A
DM-PLOT Q	100% DVB	CP-PoraPLOT Q, CP-PoraBond Q	Rt-Q-BOND	Supel-Q PLOT
DM-PLOT QS	Porous DVB homopolymer	GS-Q	Rt-QS-BOND	-
DM-PLOT S	DVB 4-vinylpyridine	CP-PoraPLOT S	Rt-S-BOND	-
DM-PLOT U	DVB ethylene glycol / dimethylacrylate	HP-PLOT U, CP-PoraPLOT U, CP-PoraBond U	Rt-U-BOND	

DM-PLOT Alumina (Al_2O_3)

- Retention index for unsaturated hydrocarbons is higher than that of alkane hydrocarbon. Selectivity of DM-PLOT Alumina column is tested using retention indices for unsaturated hydrocarbons.
- Dikma has developed a special procedure to reduce the activity of alumina to the lowest level. The column sensitivity for unsaturated compounds (such as alkenes, alkynes and dienes) is also verified to ensure a linear and quantitative chromatographic analysis for these compounds.
- Every DM-PLOT Alumina column is tested with a hydrocarbon standard to ensure proper phase thickness and inertness.
- Strong bonding avoids particle generation.
- The phase can be regenerated by water flushing after contamination.

Selectivity

Selectivity of DM-PLOT Alumina columns are measured using retention indices for acetylene and propadiene. The retention property is higher with increasing compounds unsaturation and decreasing volatility.

For saturated substances, the volatility decides the retention strength of compounds. The volatility is stronger with less retention index. All alkane isomers have weaker retention strengths and stronger volatility compared with *n*-alkanes containing same number of carbon atoms. Similarly, the volatility is decreased and retention index is increased as the number of carbon atoms is increased.

For unsaturated hydrocarbons, the retention index is decided by the degree of unsaturation (polarity). Retention properties are higher with stronger degree of unsaturation. In general, hydrocarbons with a higher degree of unsaturation have higher polarity due to the π-electrons.

Sensitivity

A reasonable deactivation treatment can reduce the activity of alumina phase to the lowest level and improves the selectivity of column. The inertness of alumina phase ensures a linear response which is the base of quantitative analysis. Dikma has developed special deactivated procedures to DM-PLOT Alumina to ensure high inertness and linear response to unsaturated and saturated hydrocarbons. The sensitivity of DM-PLOT Alumina is four times more than that of other PLOT columns on the market (see Table 1).

Reproducibility

Every DM-PLOT Alumina column is tested with gas standard (C1-C4) to confirm proper phase thickness and deactivation degree, ensuring maximum reproducibility.

Table 1 The Retention Index and Sensitivity of DM-PLOT Alumina to Unsaturated Hydrocarbons

	Ethylene	Acetylene	Propylene	Allene
Retention Index	255	421	372	407
Ratio of Peak Height	0.65	0.72	0.84	0.54

Application Chromatogram

DM-PLOT Alumina / Na_2SO_4

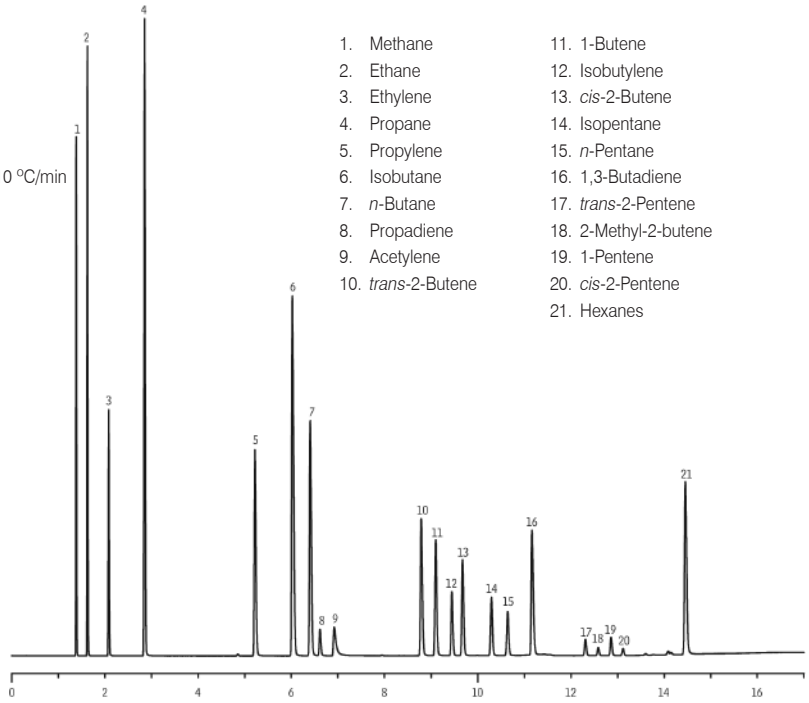
DM-PLOT Alumina / Na_2SO_4

- Butanes (impurities in acetylene / propadiene) elute before acetylene / propadiene
- Best separation for butene isomers (impurities in butene streams)
- Propylene elutes after cyclopropane (impurity in propylene)
- Similar to GS-Alumina, HP-PLOT S, Alumina Sulfate PLOT, AT-Alumina, and CP-Al_2O_3 / Na_2SO_4 PLOT

Application Chromatogram

Refinery Gas

Column: DM-PLOT Alumina / Na_2SO_4
30 m x 0.53 mm x 10.00 μm
Sample: Refinery gas
Cat. No.: **8806**
Index: CSR01139
Oven Temp.: 60 °C (hold 2 min) to 200 °C (hold 1 min) at 10 °C/min
Carrier Gas: He, constant pressure (5.0 psi, 34.5 kPa)
37.3 cm/sec 60 °C
Injection: Split, 10 μL, 200 °C
Split Vent Flow Rate: 40 mL/min
Detector: FID, 200 °C
Makeup Gas: N_2



1. Methane
2. Ethane
3. Ethylene
4. Propane
5. Propylene
6. Isobutane
7. *n*-Butane
8. Propadiene
9. Acetylene
10. *trans*-2-Butene
11. 1-Butene
12. Isobutylene
13. *cis*-2-Butene
14. Isopentane
15. *n*-Pentane
16. 1,3-Butadiene
17. *trans*-2-Pentene
18. 2-Methyl-2-butene
19. 1-Pentene
20. *cis*-2-Pentene
21. Hexanes

DM-PLOT Alumina / Na_2SO_4 Ordering Information

			30 m		50 m	
ID (mm)	df (μm)	MAOT (°C)	Cat. No.	Price	Cat. No.	Price
0.25	4.00	to 200	8860	$620		
0.32	5.00	to 200	8804	620	8805	$1,005
0.53	10.00	to 200	8806	600	8807	990

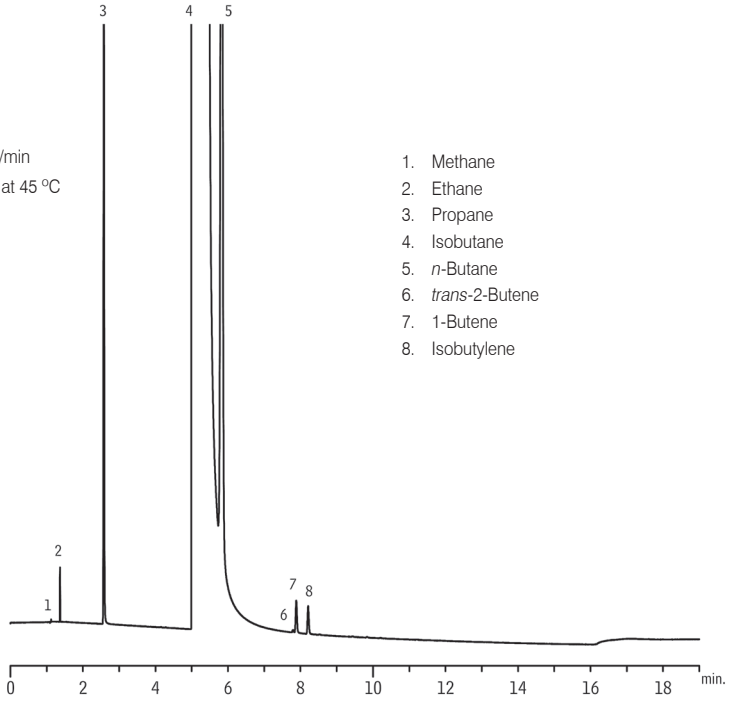
DM-PLOT Alumina / KCl

- C4 hydrocarbons (impurities in butane / isobutane) elute after acetylene
- 1,3-Butadiene elutes after methyl acetylene (impurity in 1,3-butadiene)
- Similar to GS-Alumine / KCl and CP-Al_2O_3 / KCl PLOT

Application Chromatogram

Butane Lighter Fluid

Column: DM-PLOT Alumina / KCl
50 m x 0.53 mm x 10.00 µm
Cat. No.: **8813**
Index: CSR01086
Oven Temp.: 45 °C (hold 1 min) to 200 °C (hold 3.5 min) at 10 °C/min
Carrier Gas: H_2, constant pressure (8.0 psi, 55.2 kPa) 74 cm/sec at 45 °C
Sample: Butane lighter fluid
Injection: Valve, 100 µL, 200 °C
Detector: FID, 200 °C



1. Methane
2. Ethane
3. Propane
4. Isobutane
5. *n*-Butane
6. *trans*-2-Butene
7. 1-Butene
8. Isobutylene

DM-PLOT Alumina / KCl Ordering Information

			30 m		50 m	
ID (mm)	df (µm)	MAOT (°C)	Cat. No.	Price	Cat. No.	Price
0.25	4.00	to 200	8861	$620		
0.32	5.00	to 200	8808	620	8809	$1,005
0.53	10.00	to 200	8811	600	8813	990

DM-PLOT MS 5A

DM-PLOT MS 5A

- Separation for permanent gases
- 100% Stationary phase bonded without particles loss

DM-PLOT MS 5A column is used for separation of Ar / O_2 and other permanent gases. Special procedures ensure high column efficiency and integrity of the porous layer coating. This column has special selectivity to certain compounds by controlling the pore size of particles. Additionally, our spcial immobilization process ensures that the stationary phase particles adheres to the tubing.

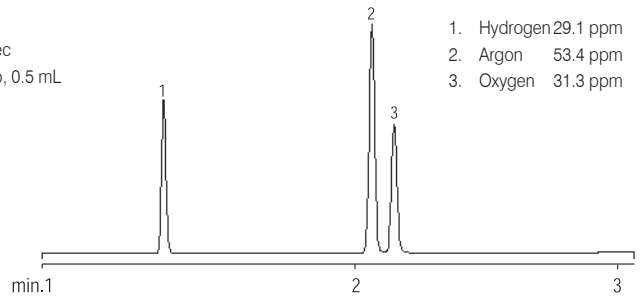
The advanced molecular sieve DM-PLOT MS 5A column can separate Ar / O_2 and H_2 / He at or above ambient temperature. This column is also an ideal choice for separation of permanent gases in refined or natural gases.

Application Chromatogram

Sample / Compound	Page
Permanent Gases	168, 169

Permanent Gases

Column: DM-PLOT MS 5A
30 m x 0.53 mm x 50.00 µm
Cat. No.: **8823**
Index: CSR00170
Oven Temp.: 27 °C
Carrier Gas: He, 34 cm/sec
Injection: Sample Loop, 0.5 mL
Detector: Valco, HID



1. Hydrogen 29.1 ppm
2. Argon 53.4 ppm
3. Oxygen 31.3 ppm

DM-PLOT MS 5A Ordering Information

			30 m	
ID (mm)	df (µm)	MAOT (°C)	Cat. No.	Price
0.32	30.00	to 300	8822	$555
0.53	50	to 300	8823	640

DM-PLOT Q / QS / S / U

- Separation for gases and volatile organic compounds
- 100% Stationary phase bonded without particles loss

We have developed a unique polymer synthesis technology and coating process for the manufacture of porous polymer PLOT columns. The selectivity of stationary phase is similar to the phase of Porapak and HayeSep.

The porous polymer PLOT column is not sensitive to water, so this column can be used for analysis of water-containing samples.

The polarity and selectivity of the stationary phase is changed by incorporating polar groups on PS / DVB. The non-polar phase of DM-PLOT Q column is DVB. DM-PLOT S is the mid-polarity PLOT column with high 4-vinyl pyridine on DVB.

The stationary phase of DM-PLOT QS is porous divinylbenzene homopolymer, which has a polarity between DM-PLOT Q and DM-PLOT S due to intermediate polarity PLOT column incorporation of low 4-vinyl pyridine. This column is used for separation of ethane, ethylene and acetylene to baseline.

DM-PLOT U is a polar PLOT column incorporating divinylbenzene ethylene glycol / dimethylacrylate, and can be used for the analysis of polar and non-polar compounds.

All PLOT columns have wide application range. PLOT columns can analyze permanent gases below room temperature. Inorganic gases such as CO_2, hydrocarbons and polar and non-polar solvents can be easily separated on PLOT columns.

Application Chromatogram

DM-PLOT Q / QS / S / U Ordering Information

	ID (mm)	df (µm)	MAOT (°C)	30 m Cat. No.	Price
DM-PLOT Q	0.25	8.00	to 280 / 300	8866	$580
	0.32	10.00	to 280 / 300	8818	585
	0.53	20.00	to 280 / 300	8816	640
DM-PLOT QS	0.25	8.00	to 250	8867	580
	0.32	10.00	to 250	8828	550
	0.53	20.00	to 250	8830	600
DM-PLOT S	0.25	8.00	to 250	8868	580
	0.32	10.00	to 250	8810	585
	0.53	20.00	to 250	8812	640
DM-PLOT U	0.25	8.00	to 190	8869	580
	0.32	10.00	to 190	8824	595
	0.53	20.00	to 190	8826	640

DM-PLOT CFC

DM-PLOT CFC

- Improved inertness for halogenated compounds
- Highly selective alumina-based column
- High retention and capacity for CFCs
- Specially designed for CFCs separation

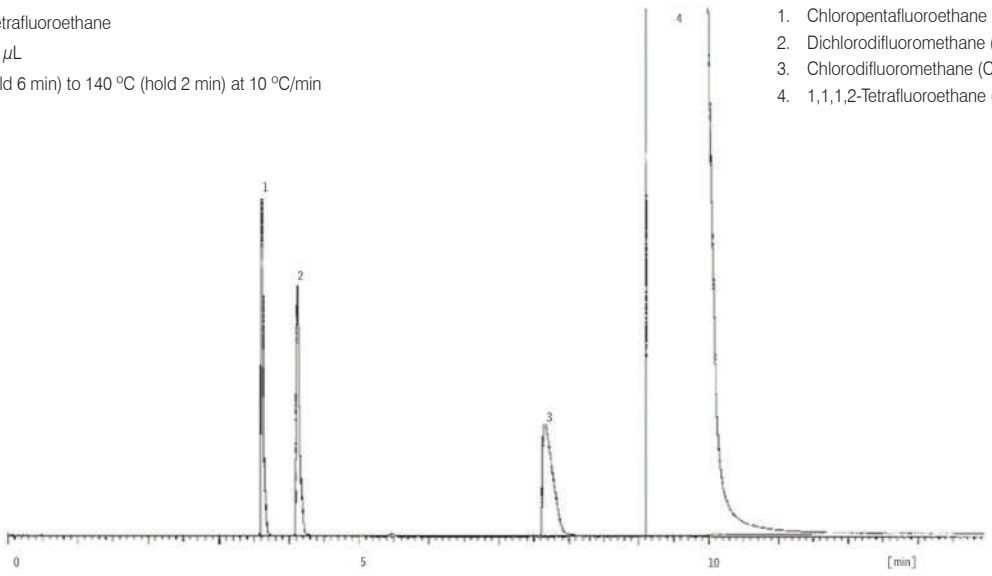
Aluminum oxide is an ideal absorbent for retaining halogenated compounds especially CFCs (Freon products). It has high selectivity for separating CFC isomers at above ambient temperatures.

DM-PLOT CFC column can reduce the reactivity of alumina due to the deactivation process. Even though there is still some residual mono- or di-substituted CFCs, the majority of these compounds can be accurately quantified in impurity analysis.

Application Chromatogram

Impurity Analysis of 1,1,1,2-Tetrafluoroethane

Column: DM-PLOT CFC
30 m x 0.53 mm x 10.00 µm
Cat. No.: **8859**
Index: CGR1155
Sample: 1,1,1,2-Tetrafluoroethane
Injection: Split, 500 µL
Oven Temp.: 80 °C (hold 6 min) to 140 °C (hold 2 min) at 10 °C/min
Carrier Gas: He
Detector: FID



1. Chloropentafluoroethane (CFC-115)
2. Dichlorodifluoromethane (CFC-12)
3. Chlorodifluoromethane (CFC-22)
4. 1,1,1,2-Tetrafluoroethane (CFC-134a)

DM-PLOT CFC Ordering Information

ID (mm)	df (µm)	MAOT (°C)	30 m Cat. No.	Price
0.53	10.00	to 200	8859	$600

DM-PONA

- 100% Dimethyl polysiloxane
- Non-polar phase
- Specially designed for analysis of complex hydrocarbon compounds
- Exceeds ASTM and CGSB method guidelines
- Temperature range: -60 °C to 340 °C
- Similar to Petrocol DH, DB-petro and HP-PONA
- Solvent rinsable

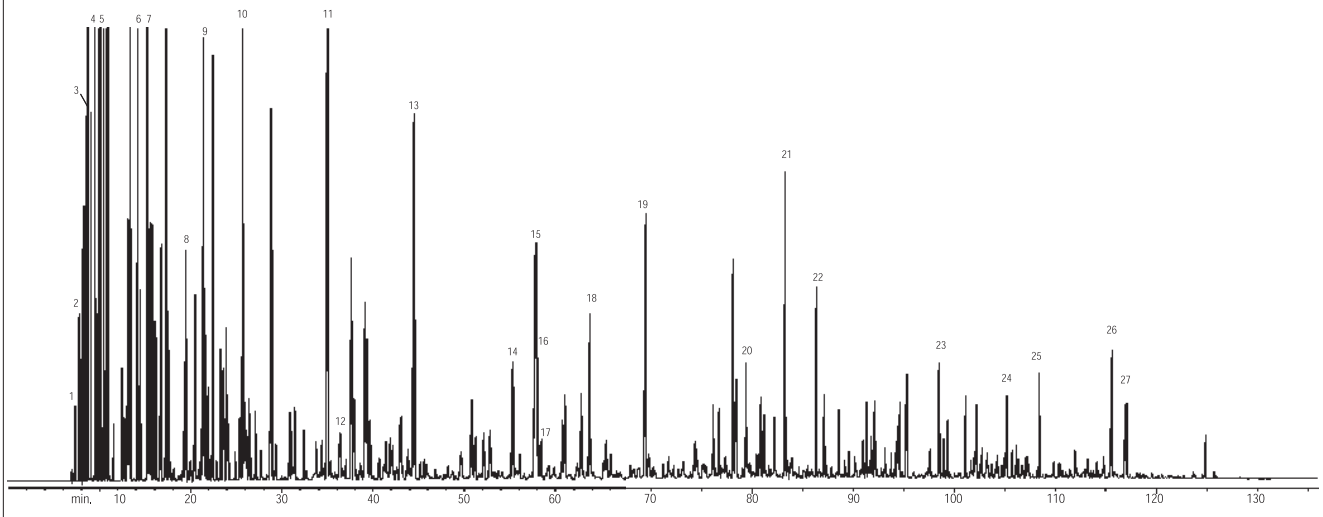
DM-PONA is a non-polar column for analysis of complex hydrocarbon compounds. Our rigorous QC method exceeds the ASTM method guidelines for resolution and retention time.

Application Chromatogram

Detailed Hydrocarbons Analysis

Column: DM-PONA
100 m x 0.25 mm x 0.50 µm
Cat. No.: **7805**
Index: CSR00209
Oven Temp.: 35 °C (hold 13 min) to 45 °C (hold 15 min) at 10 °C/min to 60 °C (hold 15 min) at 1 °C/min to 200 °C (hold 5 min) at 1.9 °C/min
Carrier Gas: He, 24 cm/sec, 35 °C
Sample: Unleaded gasolines, 0.5 µL
Injection: Split, 100:1, 250 °C
Detector: FID, 4 x 10^{-12} AFS, 250 °C

1. Propane
2. Isobutane / Methanol
3. *n*-Butane
4 *iso*-Pentane
5. *n*-Pentane
6. 3-Methylpentane
7. *n*-Hexane
8. Benzene
9. 2-Methylhexane
10. *n*-Heptane
11. Toluene
12. 2,3-Dimethylhexane
13. *n*-Octane
14. Ethylbenzene
15. *m*-Xylene
16. *p*-Xylene
17. 2,3-Dimethylheptane
18. *o*-Xylene
19. *n*-Nonane
20. 1,3,5-Trimethylbenzene
21. 1,2,4-Trimethylbenzene
22. *n*-Decane
23. *n*-Undecane
24. Naphthalene
25. *n*-Dodecane
26. 2-Methylnaphthalene
27. *n*-Tridecane



DM-PONA Ordering Information

ID (mm)	df (µm)	MAOT (°C)	50 m Cat. No.	50 m Price	100 m Cat. No.	100 m Price
0.20	0.50	-60 to 300 / 340	7804	$750		
0.25	0.50	-60 to 300 / 340			7805	$875

DM-TCEP

DM-TCEP

- 1,2,3-*Tris*[2-cyanoethoxy]propane
- Highly polar phase
- General purpose column, ideal for aromatics and oxygenates in gasoline
- Temperature range: 0 °C to 135 °C
- Similar to CP-TCEP

Most gasolines contain aliphatic hydrocarbons up to C12. To separate aromatics and oxygenates in gasoline effectively, it is desirable to elute benzene after C11 and toluene after C12. The strong polar DM-TCEP stationary phase offers a retention index for benzene greater than 1,100 ppm and can separate alcohols and aromatics from the aliphatic constituents in gasoline.

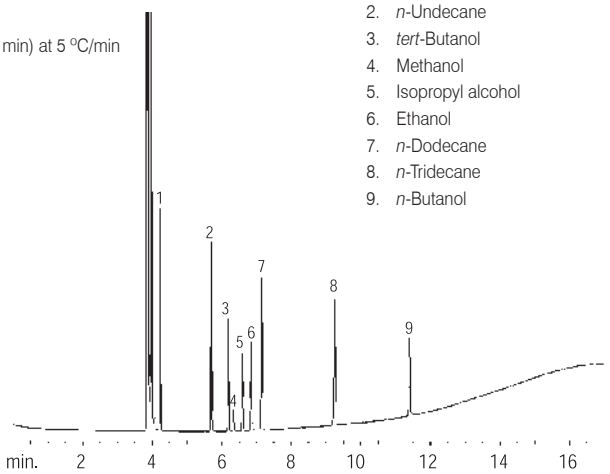
DM-TCEP column has the same high polarity as packed columns, which is a column used for analysis of petroleum oxygenates listed in ASTM D4815 with higher efficiency.

Application Chromatogram

Petroleum Oxygenates

Column: DM-TCEP
60 m x 0.25 mm x 0.40 µm
Cat. No.: **7809**
Index: CSR00195
Oven Temp.: 60 °C (hold 5 min) to 100 °C (hold 10 min) at 5 °C/min
Carrier Gas: He, 30 cm/sec, 80 °C
Sample: 1.0 µL, 500 ppm
Injection: Split, 46 mL/min, 200 °C
Detector: FID, 6.4 x 10^{-11} AFS, 200 °C

1. Methyl *tert*-butyl ether
2. *n*-Undecane
3. *tert*-Butanol
4. Methanol
5. Isopropyl alcohol
6. Ethanol
7. *n*-Dodecane
8. *n*-Tridecane
9. *n*-Butanol



DM-TCEP Ordering Information

ID (mm)	df (µm)	MAOT (°C)	60 m Cat. No.	Price
0.25	0.40	0 to 135	7809	$780

DM-1HT SimDist Metal

- Special purpose column, ideal for high temperature simulated distillation
- Reliably meets all ASTM D6352, D7169, and D7500 specifications
- 100% Dimethyl polysiloxane phase
- Sulfinert-treated high elasticity stainless steel tubing
- Stable up to 450 °C

DM-1 HT SimDist Metal meets ASTM D6352, D7169 and D7500 specifications for high temperature simulated distillation. Highly robust phase provides an accurate retention time / boiling point curve, and exhibits excellent peak shape and low bleed even at 450 °C. DM-1HT SimDist Metal offers a higher maximum operating temperature compared with DM HT SimDist Metal (450 °C *vs*. 430 °C).

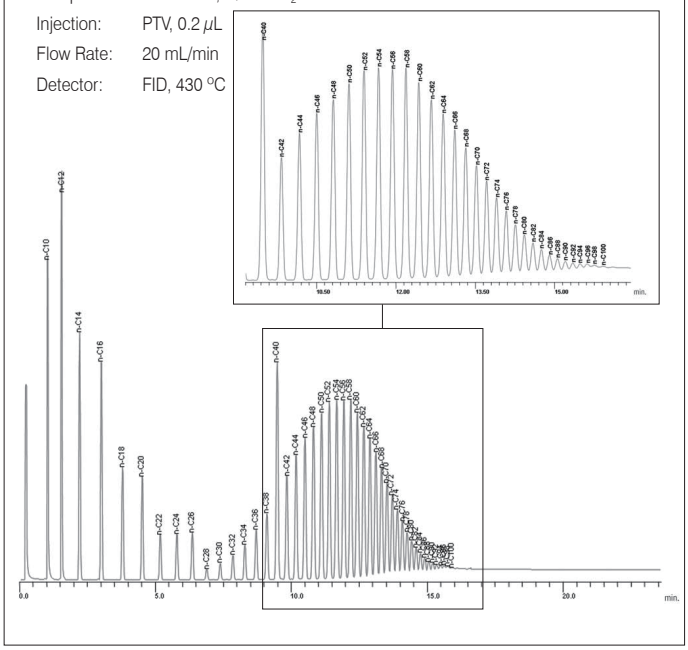
DM-1 / DM-500 SimDist Metal

- Special purpose column, ideal for high temperature simulated distillation
- DM-1 SimDist Metal phase offers true methyl silicone polarity
- DM-500 SimDist Metal phase is a carborane siloxane polymer
- Sulfinert-treated high elasticity stainless steel tubing
- Stable up to 430 °C

Application Chromatogram

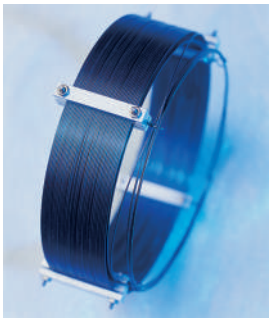
Hydrocarbons, C44-C100

Column: DM-1HT SimDist Metal
5 m x 0.53 mm x 0.20 µm
Cat. No.: **8871**
Index: CSR01120
Oven Temp.: 40 °C to 430 °C at 100 °C/min
Carrier Gas: He
Sample: C10-C100, 1% in CS_2
Injection: PTV, 0.2 µL
Flow Rate: 20 mL/min
Detector: FID, 430 °C



DM Series SimDist Metal (Sulfinert Treated Stainless Steel) Ordering Information

Phase	ID (mm)	df (µm)	MAOT (°C)	5 m Cat. No.	5 m Price	6 m Cat. No.	6 m Price
DM-1HT SimDist Metal	0.53	0.10	-60 to 450	8870	$280		
		0.20	-60 to 450	8871	280		
DM-1 SimDist Metal	0.53	0.15	-60 to 430			7838	$310
DM-500 SimDist Metal	0.53	0.15	-60 to 430			7839	310



DM-2887 / DM-2887 Metal

DM-2887 / 2887 Metal

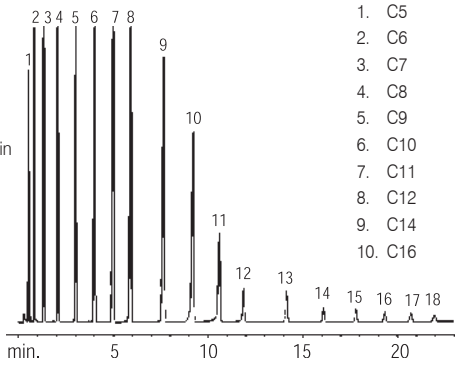
- 100% Dimethyl polysiloxane
- Special purpose column, ideal for simulated distillation
- Stable up to 360 °C
- Similar to DB-2887, Petrocol EX2887

DM-2887 column's stationary phase, film thickness, and dimension have been optimized to exceed the asymmetry factor and resolution requirements specified in ASTM method D2887. Each column is individually tested with hydrocarbon mixtures to guarantee low bleed and reproducibility.

Application Chromatogram

Simulated Distillation

Column: DM-2887
10 m x 0.53 mm x 2.65 µm
Cat. No.: **7808**
Index: CSR00226
Oven Temp.: 35 °C to 360 °C (hold 5 min) at 15 °C/min
Carrier Gas: N_2, 112 cm/sec
Sample: 0.1 - 0.01 wt% hydrocarbons in standard CS_2 solvent, 1.0 µL
Injection: Direct, 360 °C



1. C5
2. C6
3. C7
4. C8
5. C9
6. C10
7. C11
8. C12
9. C14
10. C16
11. C18
12. C20
13. C24
14. C28
15. C32
16. C36
17. C40
18. C44

DM-2887 (Fused Silica) Ordering Information

ID (mm)	df (µm)	MAOT (°C)	10 m Cat. No.	Price
0.53	2.65	-60 to 360	7808	$220

DM-2887 Metal (Sulfinert-Treated Stainless Steel) Ordering Information

ID (mm)	df (µm)	MAOT (°C)	10 m Cat. No.	Price
0.53	2.65	-60 to 400	7810	$225

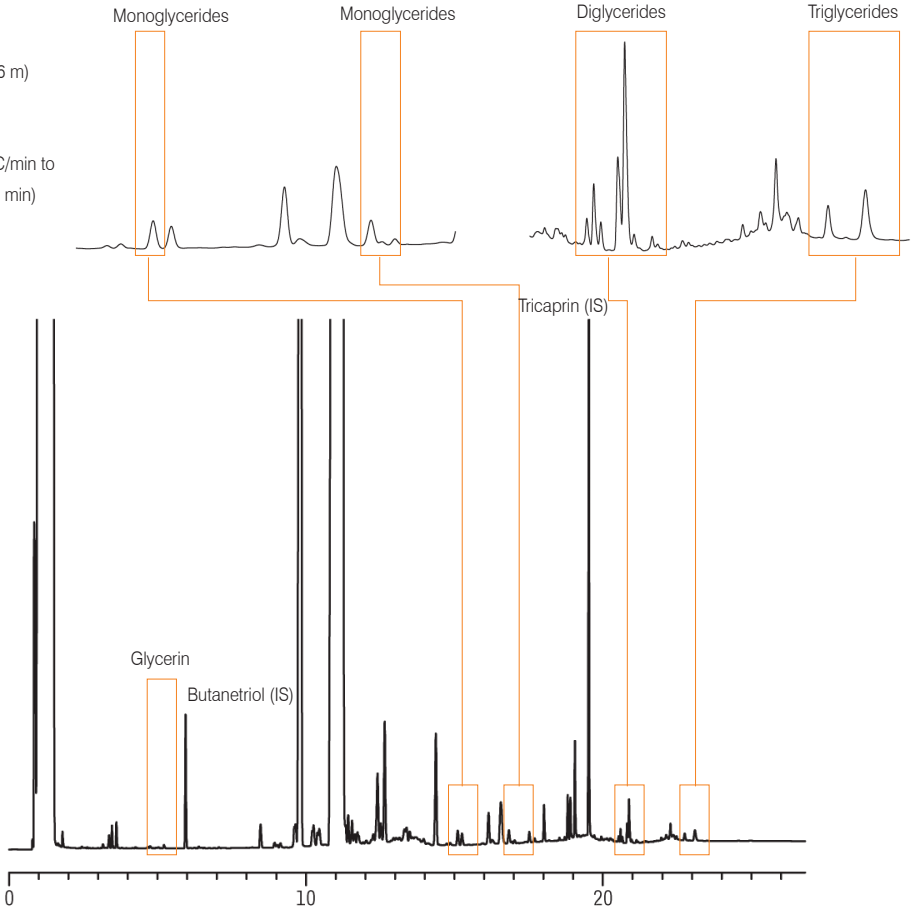
DM-BDTG Metal

- For biological diesel oil analysis
- Reduces analysis time and optimizes mono-,di- and triglyceride peaks
- Stable up to 430 °C
- Integra-Gap built-in retention gap eliminates column coupling completely

Application Chromatogram

Glycerin in Biodiesel (ASTM D6584)

Column: DM-BDTG Metal
14 m x 0.53 mm x 0.16 µm
(with 2 m Integra-Gap, total length 16 m)
Cat. No.: **8864**
Index: CSR00969
Oven Temp.: 50 °C (hold 1 min) to 180 °C at 15 °C/min to 230 °C at 7 °C/min to 380 °C (hold 5 min) at 30 °C/min
Carrier Gas: H_2, 4 mL/min
Sample: Biodiesel (B100) in *n*-hexane
Injection: 1.0 µL cold on-column
Detector: FID, 380 °C



DM-BDTG Metal Ordering Information

ID (mm)	df (µm)	MAOT (°C)	Length	Cat. No.	Price
0.53	0.16	-60 to 380 / 430	14 m with 2 m Integra-Gap (total length 16 m)	8864	$505

DM-Volatile Amine

DM-Volatile Amine

- Special selectivity for baseline resolution of all volatile amines
- Excellent inertness assures sensitivity and accuracy for volatile amines such as free ammonia
- Highly robust phase allows repeated water injections, increases longer column lifetime
- Direct replacement for CP-Volamine, thick-film CP-Sil 8

The DM-Volatile Amine column was optimized for the separation of volatile amines even when the sample contains high precentages of water. The unique base deactivation creates an exceptionally inert surface for these sensitive compounds, resulting in highly symmetric peaks which allow low detection limits.

Both 30 m and 60 m columns are available to ensure the separation for most of amine samples. Due to the high temperature stability up to 290 °C, it ensures elution of amines up to C16 and allows contaminations to be removed by "baking out" the column.

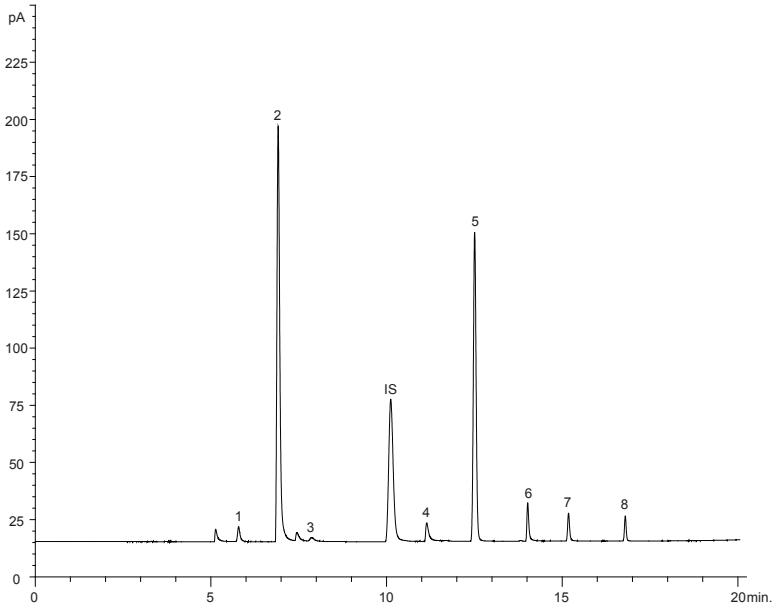
Application Chromatogram

Short Chain Amines in Water

Column: DM-Volatile Amine
60 m x 0.32 mm
Cat. No.: **8857**
Index: CGN1154
Oven Temp.: 40 °C (hold 10 min) to 250 °C at 20 °C/min (hold 10 min)
Carrier Gas: H_2, 2 mL/min, 35 cm/sec 40 °C
Sample: 200 - 1,000 ppm Short chain amines in water
Injection: Split, 15:1, 1.0 µL, 220 °C
Detector: FID, 250 °C

1. Methanol
2. Dimethylamine
3. Trimethylamine
4. Methylethylamine
5. Dimethylethylamine
6. Diethylamine
7. Diethylmethylamine
8. Triethylamine

IS = Isopropylamine



DM-Volatile Amine Ordering Information

ID (mm)	MAOT (°C)	30 m Cat. No.	30 m Price	60 m Cat. No.	60 m Price
0.32	-60 to 290	8856	$540	8857	$1,020

DM-5 Amine

- Bonded and cross-linked 5% diphenyl / 95% dimethyl polysiloxane
- Low polarity phase
- Specially designed for amines and other basic compounds
- Stable up to 315 °C
- Solvent rinsable
- Similar to PTA-5

Typical GC methods for analysis of basic compounds require derivatization to avoid peak tailing. The DM-5 Amine column has a special tubing surface which is chemically altered to reduce tailing of basic compounds, thereby eliminating the need for column priming.

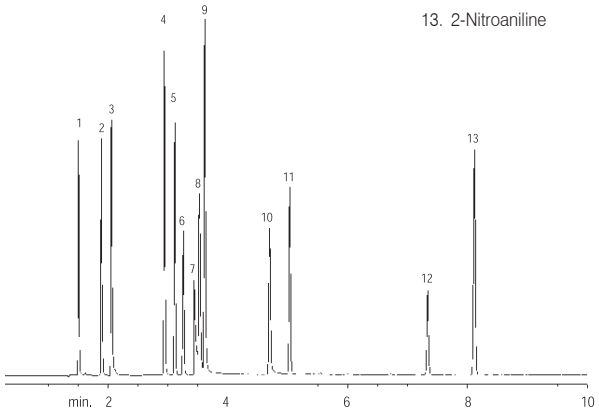
The DM-5 Amine column is ideal for analysis of basic compounds including alkylamines, diamines, triamines, ethanolamines, nitrogen heterocyclic compounds, neutral compounds, and adsorptive compounds with oxygen groups susceptible to hydrogen bonding, or even weakly acidic compounds such as phenols.

Every DM-5 Amine column is tested to ensure that it meets the requirements for analyzing amines with low ppm levels, and to ensure low bleed at maximum operating temperature.

Amines / Phenols

Column: DM-5 Amine
30 m x 0.32 mm x 1.00 µm
Cat. No.: **7817**
Index: CCR00301
Oven Temp.: 120 °C to 220 °C at 10 °C/min
Carrier Gas: H_2, 38 cm/sec, 120 °C
Sample: Amines / phenols in water, 1.0 µL, 22 ng
Injection: Split, 25:1, 305 °C
Detector: FID, 6.4 x 10^{-11} AFS, 305 °C

1. Diethylamine
2. Pyridine
3. Morpholine
4. Phenol
5. Aniline
6. 2-Chlorophenol
7. Diethylenetriamine
8. Octylamine
9. 1-Methyl-2-pyrrolidinone
10. 2-Nitrophenol
11. 2,6-Dimethylaniline
12. Nicotine
13. 2-Nitroaniline



Application Chromatogram

DM-5 Amine Ordering Information

ID (mm)	df (µm)	MAOT (°C)	30 m Cat. No.	Price
0.25	0.50	-60 to 300 / 315	7815	$530
	1.00	-60 to 300 / 315	7816	530
0.32	1.00	-60 to 300 / 315	7817	560
	1.50	-60 to 290 / 305	7818	560
0.53	1.00	-60 to 290 / 305	7819	630
	3.00	-60 to 280 / 295	7820	630

DM-35 Amine

DM-35 Amine

- Bonded and cross-linked 35% diphenyl / 65% dimethyl polysiloxane
- Mid-polarity phase
- Base deactivated
- Specially designed for amines and other basic compounds
- Stable up to 220 °C
- Solvent rinsable

Typical GC methods for analysis of basic compounds require derivatization to avoid peak tailing. The DM-35 Amine column has a special tubing surface which is chemically altered to reduce tailing of basic compounds, thereby eliminating the need for column priming.

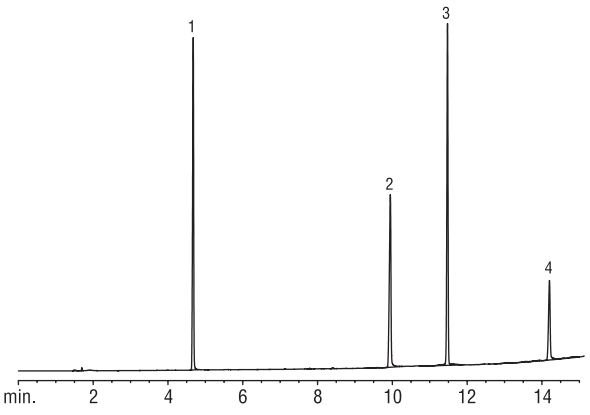
The DM-35 Amine column is ideal for analysis of basic compounds including alkylamines, diamines, triamines, ethanolamines, nitrogen heterocyclic compounds, neutral compounds and adsorptive compounds with oxygen groups susceptible to hydrogen bonding, or even weakly acidic compounds such as phenols.

Every DM-35 Amine column is tested to ensure that it meets the requirements for analyzing amines with low ppm levels, and to ensure low bleed at maximum operating temperature.

Ethanolamines

Column: DM-35 Amine
30 m x 0.32 mm x 1.00 µm
Cat. No.: **7823**
Index: CCR00585
Oven Temp.: 50 °C (hold 0.5 min) to 280 °C at 15 °C/min
Carrier Gas: He, 40 cm/sec constant pressure
Sample: 500 µg/mL Ethanolamine standard in water, 1.0 µL
Injection: Split, 10:1, 300 °C
Detector: FID, 300 °C

1. Monoethanolamine
2. Diethanolamine
3. Triethylene glycol monomethyl ether
4. Triethanolamine



Application Chromatogram

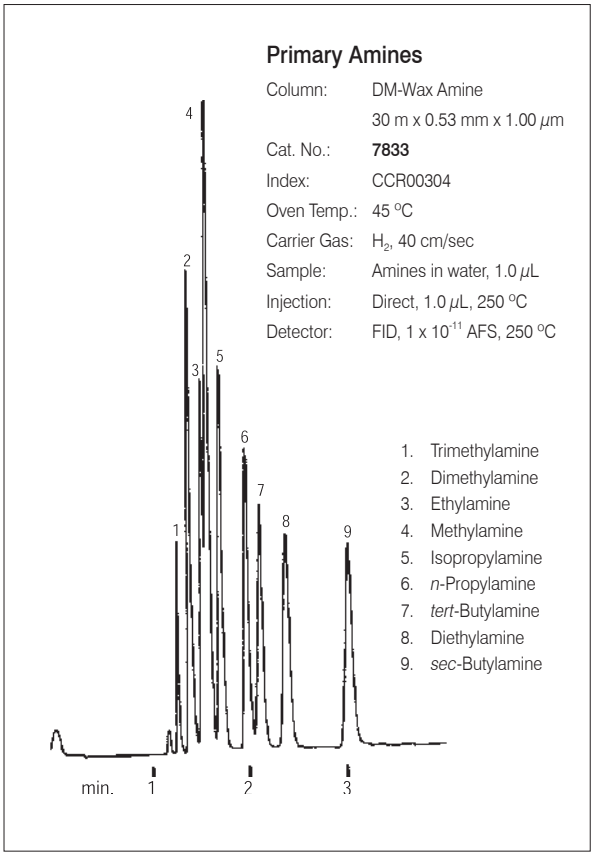
DM-35 Amine Ordering Information

ID (mm)	df (µm)	MAOT (°C)	30 m Cat. No.	Price
0.25	0.50	0 to 220	7821	$530
	1.00	0 to 220	7822	530
0.32	1.00	0 to 220	7823	560
	1.50	0 to 220	7824	560
0.53	1.00	0 to 220	7825	630
	3.00	0 to 220	7826	630

DM-Wax Amine

- 100% polyethylene glycol
- Base deactivated
- Specially designed for amines and other basic compounds
- Does not require derivatization or column priming
- Stable up to 220 °C
- Similar to CAM, Carbowax Amine, CP-Wax 51

DM-Wax Amine column can reduce adsorption and improve sensitivity for many basic compounds without analyte derivatization or column priming. The DM-Wax Amine column can analyze alkylamines, diamines, triamines, ethanolamines and nitrogen heterocyclic compounds. We recommend use of DM-Wax Amine combined with DM-5 Amine columns when separating oxygenates because the DM-Wax Amine has weak adsorption of some compounds at less than ppm concentrations.



Application Chromatogram

DM-Wax Amine Ordering Information

			30 m		60 m	
ID (mm)	df (µm)	MAOT (°C)	Cat. No.	Price	Cat. No.	Price
0.25	0.25	40 to 210 / 220	7827	$520		
	0.50	40 to 210 / 220	7828	520		
0.32	0.25	40 to 210 / 220	7829	565		
	0.50	40 to 210 / 220	7830	565		
	1.00	40 to 210 / 220	7832	565	7835	$1,000
0.53	0.50	40 to 210 / 220	7837	650		
	1.00	40 to 210 / 220	7833	650	7836	$1,110
	1.50	40 to 210 / 220	7834	660		

DM-624 / DM-624MS

DM-624

- 6% Cyanopropylphenyl / 94% dimethyl polysiloxane
- Recommended in US EPA methods for volatile organic pollutants
- Ideal for analyzing residual solvents in drugs
- Stable up to 240 °C
- Solvent rinsable
- Similar to HP-1301, HP-624, DB-1301, DB-624, etc.
- Equivalent to USP G43 phase

DM-624MS

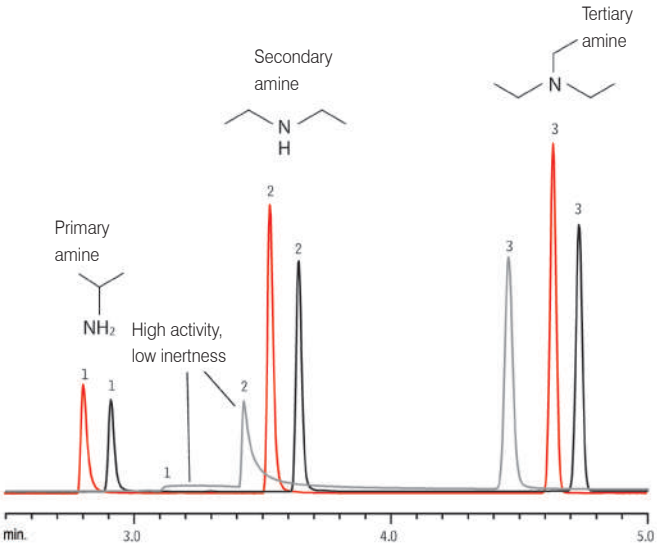
- 6% Cyanopropylphenyl / 94% dimethyl arylene polysiloxane
- High inertness and low bleed
- Highly selective for residual solvents
- Stable up to 320 °C
- Similar to DB-624, HP-624, VF-624 ms, etc.

Application Chromatogram

Primary, Secondary and Tertiary Amines

Column: DM-624MS
30 m x 0.32 mm x 1.80 µm
Cat. No.: **8838**
Index: CPR1162
Oven Temp.: 50 °C (hold 1 min) to 200 °C (hold 5 min) at 20 °C/min
Carrier Gas: He, 37 cm/sec
Sample: Primary, second and tertiary amines in DMSO, 100 µg/mL
Injection: Split, 20:1, 1.0 µL, 250 °C
Detector: FID, 250 °C

1. Isopropylamine
2. Diethylamine
3. Triethylamine



DM-624 Ordering Information

ID (mm)	df (µm)	MAOT (°C)	30 m Cat. No.	30 m Price	60 m Cat. No.	60 m Price	75 m Cat. No.	75 m Price	105 m Cat. No.	105 m Price
0.25	1.40	-20 to 240	7721	$480	7722	$790				
0.32	1.80	-20 to 240	7731	510	7732	860				
0.53	3.00	-20 to 240	7751	545			7752	$1,055	7753	$1,145

DM-624MS Ordering Information

ID (mm)	df (µm)	MAOT (°C)	20 m Cat. No.	20 m Price	30 m Cat. No.	30 m Price	60 m Cat. No.	60 m Price
0.18	1.00	-20 to 300 / 320	8836	$405				
0.25	1.40	-20 to 300 / 320			8837	$500		
0.32	1.80	-20 to 300 / 320			8838	540	8839	$900
0.53	3.00	-20 to 300 / 320			8840	615		

DM-AQUA

- 25% Phenyl / 75% methyl polysiloxane
- Specially designed for VOCs in water
- Chromatogram includes detection of 33 compounds
- Low bleed
- Bonded and cross-linked phase, solvent rinsable

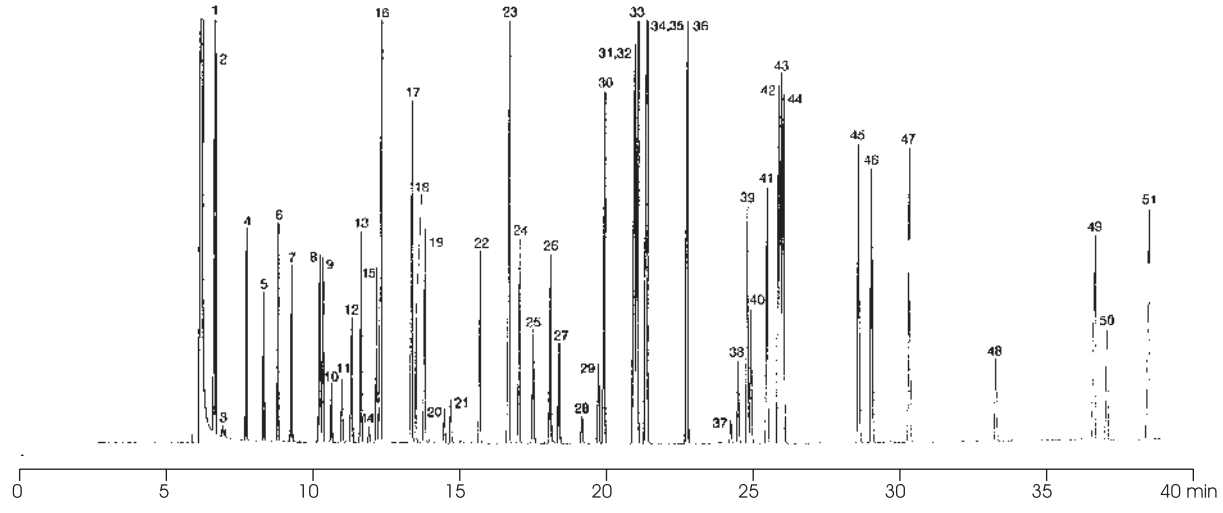
Application Chromatogram

Sample / Compound	Page
VOCs in Water	166

AQUA

Column:	DM-AQUA 60 m x 0.25 mm x 1.00 µm
Cat. No.:	**7801**
Index:	CCO04281
Oven Temp.:	40 °C to 200 °C at 4 °C/min
Carrier Gas:	He, 25 cm/sec, 150 °C
Injection:	Split, 1:100, 0.5 µL
Detector:	FID

1. Bromomethane
2. Chloroethane
3. Trichlorofluoromethane
4. 1,1-Dichloroethylene
5. Dichloromethane
6. *trans*-1,2-Dichloroethylene
7. 1,1-Dichloroethane
8. 2,2-Dichloropropane
9. *cis*-1,2-Dichloroethylene
10. Chloroform
11. Chlorobromomethane
12. 1,1,1-Trichloroethane
13. 1,1-Dichloropropene
14. Tetrachloromethane
15. 1,2-Dichloroethane
16. Benzene
17. Benzotrifluoride
18. Trichloroethylene
19. 1,2-Dichloroethane
20. Bromodichloromethane
21. Dibromomethane
22. *cis*-1,3-Dichloropropene
23. Toluene
24. *cis*-1,3-Dichloropropene
25. 1,1,2-Trichloroethane
26. 1,3-Dichloropropane
27. Tetrachloroethylene
28. Chlorodibromomethane
29. 1-Chlorohexane
30. 1,2-Dibromoethane
31. Chlorobenzene
32. 1,1,1,2-Tetrachloroethane
33. Ethylbenzene
34. *m*-Xylene
35. *p*-Xylene
36. *o*-Xylene
37. Bromoform
38. 1,1,2,2-Tetrachloroethane
39. 4-Bromofluorobenzene
40. 1,2,3-Trichloropropane
41. Bromoben
42. *o*-Chlorotoluene
43. *m*-Chlorotoluene
44. *p*-Chlorotoluene
45. 1,3-Dichlorobenzene
46. 1,4-Dichlorobenzene
47. 1,2-Dichlorobenzene
48. 1,2-Dibromo-3 -chloropropane
49. 1,2,4-Trichlorobenzene
50. 1,1,2,3,4,4-Hexachloro -1,2-butadiene
51. 1,2,3-Trichlorobenzene



DM-AQUA Ordering Information

ID (mm)	df (µm)	MAOT (°C)	60 m Cat. No.	Price
0.25	1.00	to 200 / 220	7801	$1,420
0.32	1.40	to 200 / 220	7802	1,420

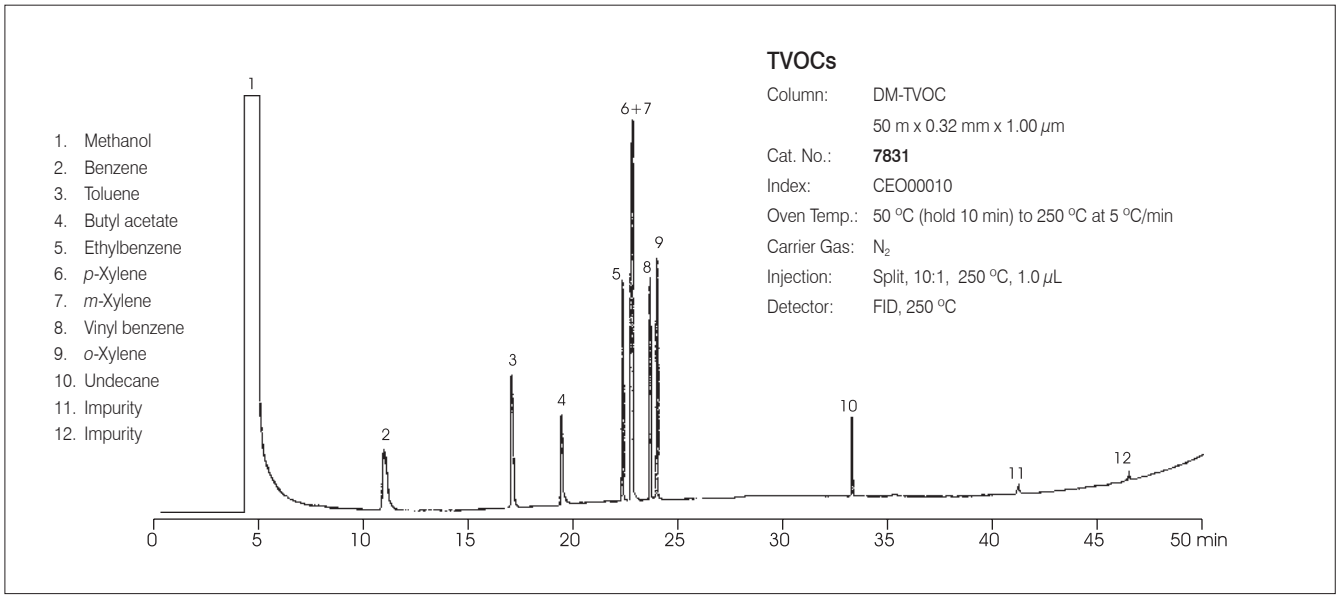
DM-TVOC

DM-TVOC

- 100% Dimethyl polysiloxane
- Specially designed for analysis of TVOCs
- Meets GB 50325-2001 specifications
- Low baseline noise when adopting programmed temperature
- Low bleed
- Bonded and cross-linked phase, solvent rinsable

Application Chromatogram

Sample / Compound	Page
TVOCs	154



DM-TVOC Ordering Information

ID (mm)	df (µm)	MAOT (°C)	50 m Cat. No.	Price
0.32	1.00	to 300 / 320	7831	$870

DM-PAH

- 50% Methyl / 50% phenyl polysiloxane
- Specially designed for analysis of PAHs
- Stable up to 360 °C
- Used for GC / MS and ECDs
- Bonded and cross-linked phase, solvent rinsable

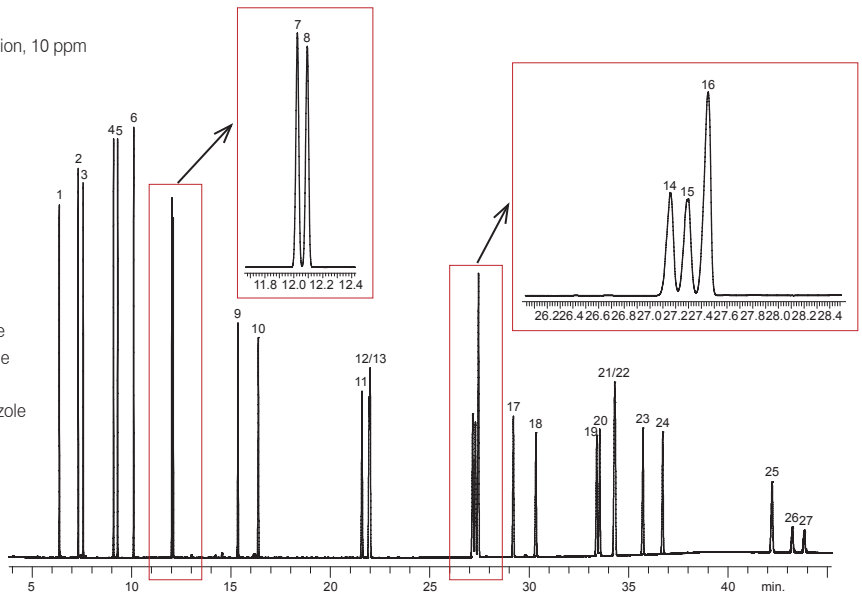
The DM-PAH phase has excellent inertness and selectivity for PAHs. Equivalent to USP G43 phase, DM-PAH can separate EU-PAHs including fluoranthene.

Application Chromatogram

PAH-Mix 27

Column: DM-PAH
30 m x 0.25 mm x 0.25 µm
Cat. No.: **8862**
Index: CER1160
Oven Temp.: 65 °C (hold 0.5 min) to 220 °C at 15 °C/min to 330 °C (hold 15 min), 4 °C/min
Carrier Gas: He, 2.0 mL/min
Sample: EPA 8310 PAHs in dichloromethane solution, 10 ppm
Injection: Splitless (hold 1.75 min), 0.5 µL, 320 °C
Detector: FID, 320 °C
Makeup Gas: 75 mL/min

1. Naphthalene
2. 2-Methylnaphthalene
3. 1-Methylnaphthalene
4. Acenaphthylene
5. Acenaphthene
6. Fluorene
7. Phenanthrene
8. Anthracene
9. Fluoranthene
10. Pyrene
11. Benzo[a]anthracene
12. Chrysene
13. Triphenylene
14. Benzo[b]fluoranthene
15. Benzo[k]fluoranthene
16. Benzo[j]fluoranthene
17. Benzo[a]pyrene
18. 3-Methylcholanthrene
19. Dibenzo[a,h]acridine
20. Dibenzo[a,j]acridine
21. Indeno[1,2,3-cd]pyrene
22. Dibenzo[a,h]anthracene
23. Benzo[ghi]perylene
24. 7H-Dibenzo[c,g]carbazole
25. Dibenzo[a,e]pyrene
26. Dibenzo[a,i]pyrene
27. Dibenzo[a,h]pyrene



DM-PAH Ordering Information

ID (mm)	df (µm)	MAOT (°C)*	30 m Cat. No.	30 m Price	60 m Cat. No.	60 m Price
0.25	0.25	40 to 340 / 360	8862	$530	8863	$905

*The listed temperature limits are for 30 m columns. Longer columns may have lower temperature limits.

DM-FAMEWAX

DM-FAMEWAX

- Polyethylene glycol
- Specially designed for analysis of FAMEs
- Tested with a FAME mixture
- Stable up to 250 °C
- Similar to Omegawax

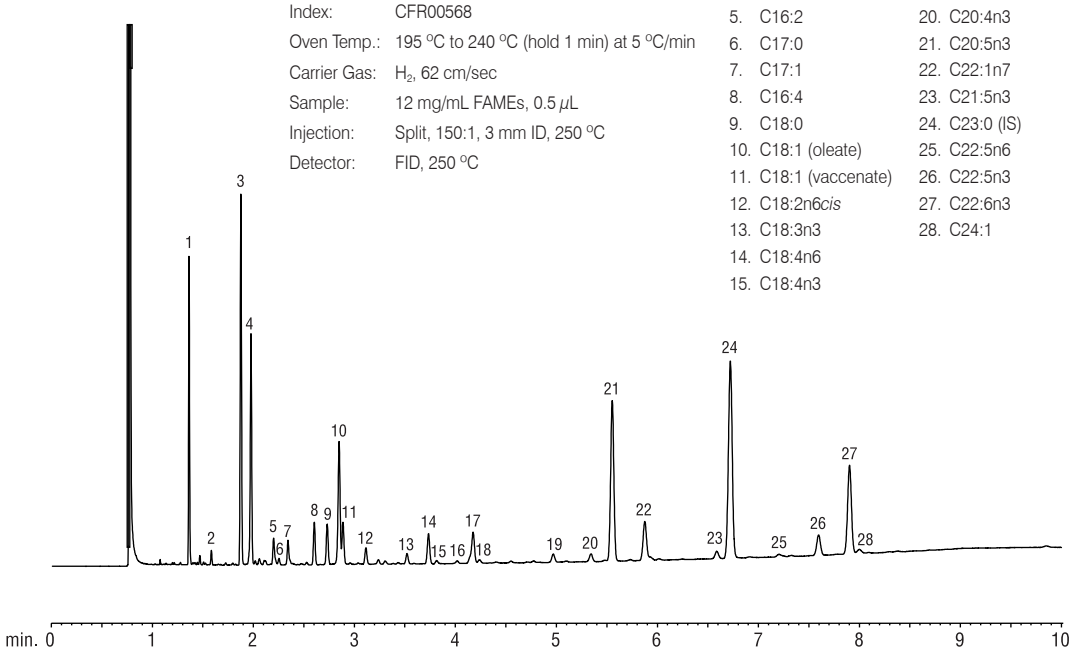
When DM-FAMEWAX is used for separation of unsaturated FAMEs, the baseline resolution is achieved in less time.

Application Chromatogram

FAMEs (Marine Oil Standard)

Column: DM-FAMEWAX
30 m x 0.32 mm x 0.25 µm
Cat. No.: **7813**
Index: CFR00568
Oven Temp.: 195 °C to 240 °C (hold 1 min) at 5 °C/min
Carrier Gas: H_2, 62 cm/sec
Sample: 12 mg/mL FAMEs, 0.5 µL
Injection: Split, 150:1, 3 mm ID, 250 °C
Detector: FID, 250 °C

1. C14:0
2. C15:0
3. C16:0
4. C16:1
5. C16:2
6. C17:0
7. C17:1
8. C16:4
9. C18:0
10. C18:1 (oleate)
11. C18:1 (vaccenate)
12. C18:2n6*cis*
13. C18:3n3
14. C18:4n6
15. C18:4n3
16. C20:0
17. C20:1n7
18. C20:1n9
19. C20:4n6
20. C20:4n3
21. C20:5n3
22. C22:1n7
23. C21:5n3
24. C23:0 (IS)
25. C22:5n6
26. C22:5n3
27. C22:6n3
28. C24:1



DM-FAMEWAX Ordering Information

ID (mm)	df (µm)	MAOT (°C)	30 m Cat. No.	Price
0.25	0.25	20 to 250	7811	$460
0.32	0.25	20 to 250	7813	500
0.53	0.50	20 to 250	7814	555

Sample Preparation

ProElut™ SPE

Introduction

The primary goal of solid phase extraction (SPE) with ProElut™ is the selective extraction of the components of interest from a complex sample or much larger sample volume prior to actual analysis (e.g. HPLC, GC). As SPE works on the principle of liquid chromatography, this is achieved by using strong but reversible interactions between the analyte and surface of the stationary phase. Typical interactions are hydrophobic (the Van der Waals force), polar (hydrogen bonding, dipole-dipole interaction) or ion exchange interactions. Interaction between the stationary phase and matrix should not occur. It is thus meaningful to carry out appropriate sample pre-treatment as this emphasizes the differences in chemical properties between the substance to be analyzed and matrix components so that these are then achieved by altering the pH or the ionic strength of the sample solution.

Under these conditions, the analyte is enriched as a narrow zone on the stationary phase. Subsequent to a washing step, which serves to remove possible adsorbed sample components, the actual selective elution of the analyte takes place.

ProElut™ SPE products are packed and assembled using custom designed equipment. Every part of ProElut™ manufacturing process is carefully monitored, we only accept products that meet our high quality standards.

SPE Principles and Techniques

SPE is a chromatographic technique first developed during the mid-1980s and is increasingly used for sample pre-treatment. The main objectives of SPE are removal of interfering matrix components and selective concentration and isolation of the analytes. This is done either by retaining the substance of interest and washing off everything else or by retaining the interfering substances and eluting the product of interest. Compared to traditional liquid / liquid extraction, SPE is more rapid, uses less solvent, eliminates emulsions, and can be automated. Additionally, a sample preparation task can often be solved more specifically by using SPE, since different interactions of the analyte with the adsorbent are possible, and methods can be optimized by adjusting chromatographic conditions. SPE offers a multitude of adsorbents for polar, hydrophobic and / or ionic interactions and has been widely used in medicine, food, environmental protection, commodity inspection, cosmetics and other fields.

The most popular SPE products are: Normal Phase, Reversed Phase, Ion Exchange Phase and Mix Mode. It is important to select the most suitable product for each application and sample.

Type	Reversed Phase	Normal Phase	Ion Exchange Phase	Mix Mode
Separation Mode	Reserved phase separation involves a polar (usually aqueous) or moderately polar sample matrix and a non-polar stationary phase. The analyte of interest is typically mid- to non-polar. C18 is the most common reversed phase packing	Normal phase SPE typically involves a mid- to non-polar sample matrix and a polar stationary phase. The analytes are polar compounds and the bonded phases are typically NH_2, PSA, polar adsorbent, silica, Florisil, and alumina, etc.	Ion exchange SPE can be used for compounds that are charged when in solution (usually aqueous, but sometimes organic). The primary retention mechanism of the compound is based on the electrostatic attraction of the charged functional group on the compound to the charged group that is bonded to the silica surface. In order for a compound to be retained by ion exchange from an aqueous solution, the pH of the sample matrix must be one at which both the compound of interest and the functional group on the bonded silica are charged The most common stationary phases are SAX and SCX	A mix of ion exchange and reserved phase retention mechanisms. This can be used for hydrophobic compounds (reversed phase) and compounds that are charged in solution (ion exchange). The most common stationary phases are PXC, PXA, etc.
Sample	Polar or hydrophobic compounds	Polar compounds	Compounds with charges	Compounds with charges, polar or hydrophobic compounds
Elution	Water or organic solvents	Non-polar solvents	Water or non-polar organic solvents	Water or organic solvents

Benefits of SPE

- Switch sample matrices to a form more compatible with chromatographic analyses
- Concentrate analytes for increased sensitivity
- Remove interference to simplify chromatography and improve quantitation
- Protect the analytical column from contaminants

Use SPE for Samples That

- Contain particulate matter that may cause system clogging and high back pressure
- Contain components that cause high background, misleading peaks, and / or poor sensitivity
- Require cleanup, trace enrichment / concentration, or purification
- Require sample matrix or solvent exchange

Choosing a SPE Product

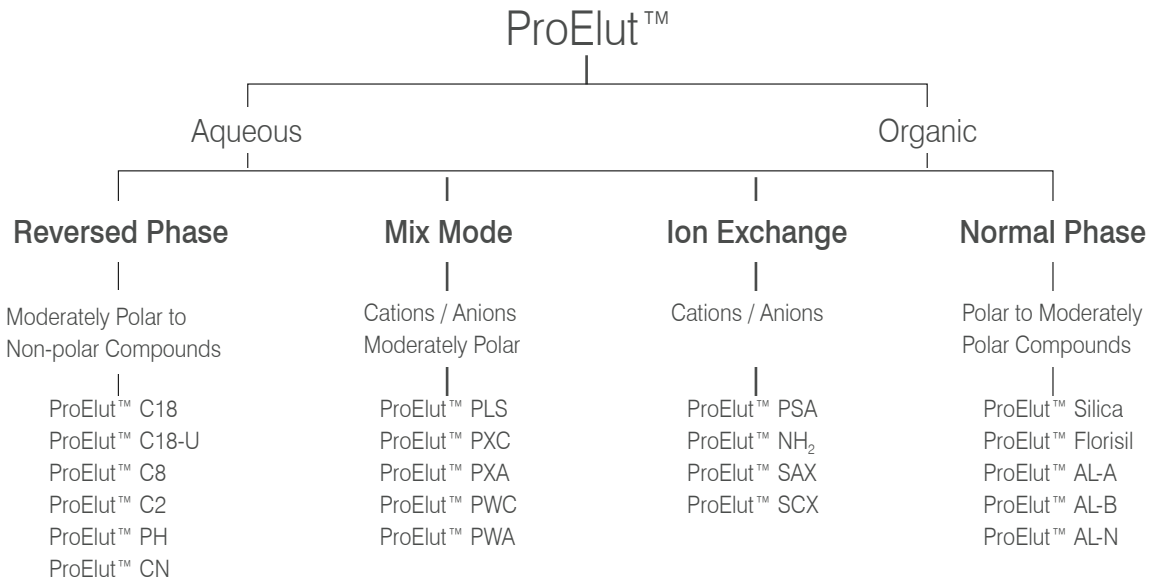
1. *Characterize the sample.* Factors such as the analyte's polarity relative to the matrix, the presence of charged functional groups, solubility, molecular weight, etc., determine how strongly the analyte is retained by the packed bed.

2. *Select a retention strategy.* Two approaches are possible: retain interfering compounds while the analyte passes through, or retain the analyte while interfering compounds pass through. This second approach allows concentration of the sample during analyte elution.

3. *Select proper packing type and bed volume.* Choosing the packing material with the proper selectivity results in the cleanest extract with the highest recovery. Poor sample recovery often occurs when the packed bed dimensions are not optimized. Too large of a bed volume results in an incomplete elution while too small of a bed volume results in an incomplete retention. Due to the unknown composition of many samples, experimentation may be required to determine the optimum bed dimensions for an application. Start with an intermediate bed volume, such as 200 mg or 500 mg. If you observe complete retention, you may be able to use a smaller bed volume and elution volume. If you observe incomplete retention, you will need to use a larger bed volume and elution volume.

4. *Select suitable conditioning, wash, and elution solvents.* Consider the solvent strength relative to the packing material. The final conditioning solvent should be weak, so as not to act as an eluting solvent. Buffers should be used to control ionization of potentially charged compounds. Wash solvents should remove weakly retained interferences without being strong enough to elute the analyte. Elution solvents should be strong enough to completely elute an analyte in a small volume.

SPE Phase Selection



ProElut™ SPE

Common SPE Applications

- Pharmaceutical compounds and metabolites in biological fluids
- Drugs of abuse in biological fluids
- Environmental pollutants in drinking and waste water
- Pesticides and antibiotics in food / agricultural matrices
- Desalting of proteins and peptides
- Fractionation of lipids
- Water and fat soluble vitamins

General SPE Procedures

Reversed Phase

(extraction of hydrophobic or polar organic analytes from aqueous matrix)

A. Conditioning

Rinse tube with 3 - 5 mL of methanol follow by 3 - 5 mL of deionized water / buffer (do not allow tube to dry before next step).

B. Sample Application

Apply sample to the top of the tube and draw through the packing bed.

C. Tube Wash

Wash with 5 mL of a polar solvent if analyte is to be retained (deionized water, buffer or aqueous / organic mixtures are most often used).

D. Elution

Elute analyte into a collection tube with 1 - 5 mL of a non-polar solvent.

Normal Phase

(extraction of polar analytes from non-polar organic solvents)

A. Conditioning

Rinse tube with 3 - 5 mL of non-polar solvent.

B. Sample Application

Apply sample to the top of the tube and draw through the packing bed.

C. Tube Wash

Wash with 5 mL of a non-polar solvent if analyte is to be retained.

D. Elution

Elute analyte into a collection tube with 1 - 5 mL of a polar solvent.

Ion Exchange

(extraction of charged analytes from aqueous or non-polar organic samples)

A. Conditioning

Rinse tube with 3 - 5 mL of deionized water or low ionic strength buffer (10 mM).

B. Sample Application

Apply sample to the top of the tube and draw through the packing bed (ion exchange kinetics is slower than reverse or normal phase, so keep the flow slow).

C. Tube Wash

Wash with 5 mL of deionized water or low ionic strength buffer.

D. Elution

Elute analyte into a collection tube with 1 - 5 mL of buffer at high ionic strength (0.1 - 1 M) or modified pH (pH such that the analyte is uncharged).

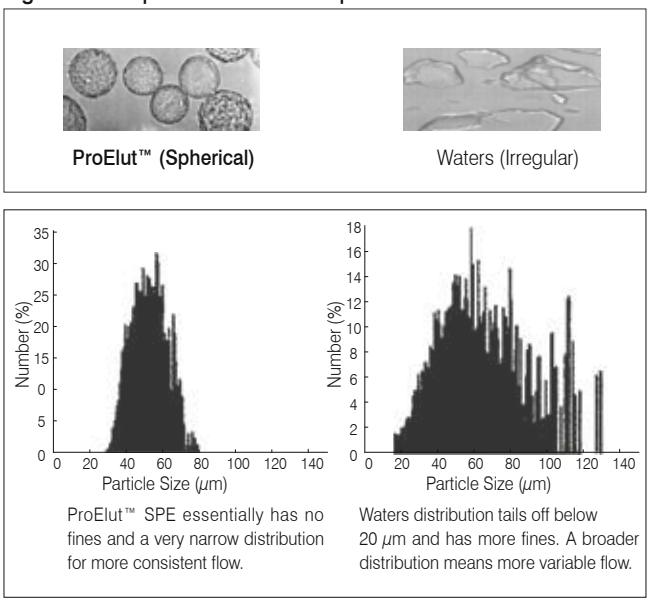
Features of ProElut™ SPE

- Rapid sample preparation within minutes
- Higher recoveries without the formation of emulsion
- High precision of analytical results by use of disposable cartridges
- Saving of solvent and hence reduction in both materials costs and cost of disposal
- Possibilities for automating the entire process
- Optimized, validated and certified manufacturing

ProElut™ SPE Features and Benefits

ProElut™ SPE uses spherical silica with high purity and narrow particle size distribution as support. The spherical silica with fewer fines gives a more regular, stable and reproducible chromatography bed that gives a faster, more even flow rate for better separation. Fines cause back pressure increases that can result in clogging and can pass through filters and contaminate the final product. A narrower particle size distribution will give a more homogenous packing that will help in collecting more concentrated fractions and reducing solvent consumption to achieve higher recovery and reproducible results.

Figure 1. Comparison of Silica Shape and Particle Size Distribution



High Purity Silica Improves Recovery and Reproducibility

- ProElut™ packings are considerably lower in trace metals than the other materials
- High purity silica to enhance retention capacity of basic compounds
- Irregular silica, depending on its method of manufacturing, normally contains trace quantities of a variety of different metals, which in turn can affect the separation

Table 1. Metal Analysis of Base Silica (ppm)

Metal	Dikma ProElut™ High-purity Silica	Brand A Silica	Brand B Silica
Na	< 12	917	17
Al	< 12	276	57
Ca	< 12	< 12	< 12
Fe	< 12	64	23
Ti	< 12	< 12	130
Zr	< 12	48	38

Figure 2. Level of Organic Extractables from SPE Packing Meterials as Measured by GC-FID*

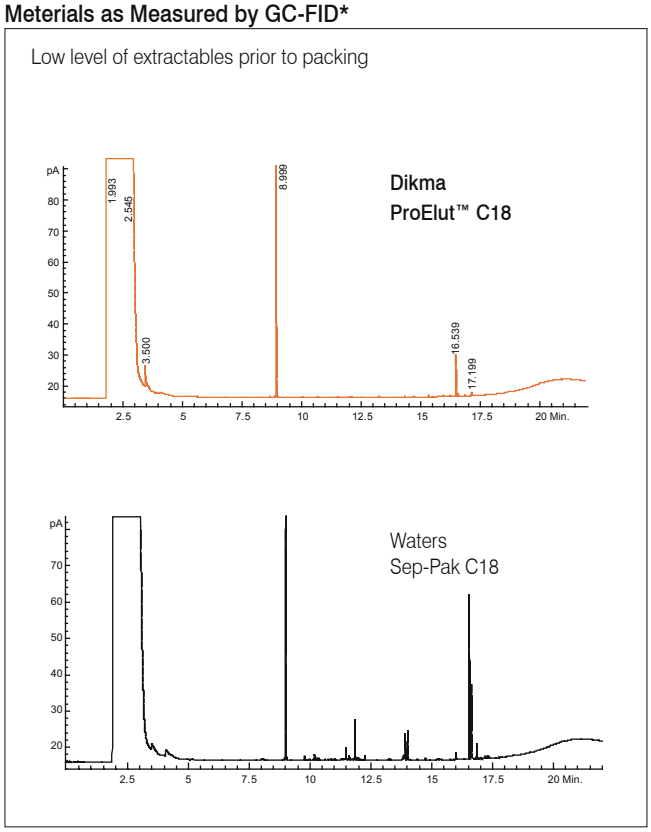
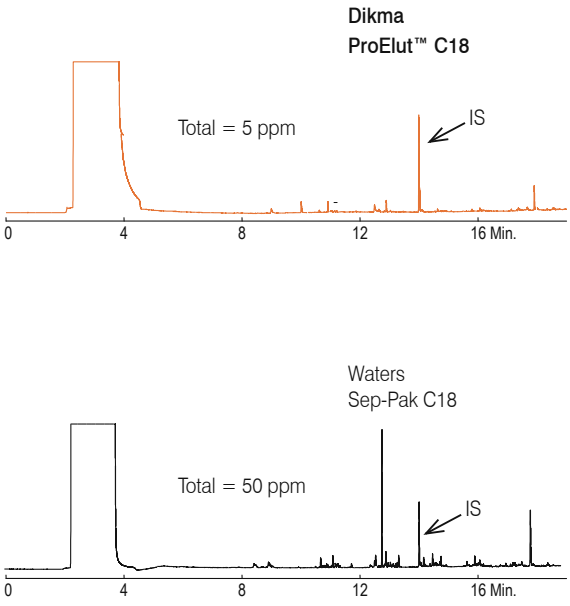


Figure 3. Level of Organic Extractables of Cartridge Tubes and Frits as Measured by GC-FID*

- Clean cartridge tubes and frits
- The sample can easily pass through the cartridge to yield quantitative recovery and reproducible results



*Sep-Pak is a registered trademark of Waters Corporation. Dikma Technologies Inc. is not affiliated with the above company.

ProElut™ SPE

Sorbent Specifications

Sorbent Phase	Category	Base Material	Particle Size (μm)	Pore Size (Å)	Surface Area (m^2/g)	Bonded Functional Group	Carbon Loading	Endcapping
PLS	Reversed phase	PS-DVB	50	80	800	Hydrophilic / lipophilic	-	-
PWC	Reversed phase / weak cation exchange	PS-DVB	50	80	800	Hydrophilic / lipophilic, carboxylic acid	-	-
PWA	Reversed phase / weak anion exchange	PS-DVB	50	80	800	Hydrophilic / lipophilic, ethylene diamine	-	-
PXC	Reversed phase / strong cation exchange	PS-DVB	50	80	800	Hydrophilic / lipophilic, sulfonic acid	-	-
PXA	Reversed phase / strong anion exchange	PS-DVB	50	80	800	Hydrophilic / lipophilic, quaternary amine	-	-
C18	Reversed phase	Silica	50	60	500	Octadecyl	19%	Yes
C18-U	Reversed phase	Silica	50	60	500	Octadecyl, silanol	17%	No
C8	Reversed phase	Silica	50	60	500	Octyl	11%	Yes
C2	Reversed phase	Silica	50	60	500	Ethyl	5.6%	Yes
PH	Reversed phase	Silica	50	60	500	Phenyl	10%	Yes
CN	Normal / reversed phase	Silica	50	60	500	Cyanopropyl	8%	Yes
SCX	Strong cation exchange	Silica	50	60	500	Benzenesulfonic acid	10.9%	No
SAX	Strong anion exchange	Silica	50	60	500	Trimethylaminopropyl	8%	No
Silica	Normal phase	Silica	50	60	500	Silanol	-	No
NH_2	Normal phase / weak anion exchange	Silica	50	60	500	Aminopropyl	5.5%	No
PSA	Normal phase / weak anion exchange	Silica	50	60	500	Ethylenediamino-*N*-propyl	8.5%	No
AL-A	Normal phase	Acidic alumina	125	-	200	Acidic alumina	-	-
AL-B	Normal phase	Basic alumina	125	-	200	Basic alumina	-	-
AL-N	Normal phase	Neutral alumina	125	-	200	Neutral alumina	-	-
Florisil	Normal phase	Magnesium	150 - 200	-	-	-	-	-
CARB	Nonbonded carbon phase	Carbon	120 - 400	-	100	-	-	-

Silica-based Sorbent	Reversed phase	Normal Phase	Weak Ion Exchange	Strong Ion Exchange
	C18 C18-U C8 C2 PH	Silica CN (can also be used as reversed phase)	NH_2 PSA	SCX SAX
Polymer-based Sorbent	**Universal Phase**	**Mix Mode***	**Mix Mode****	
	PLS	PXC PXA	PWC PWA	
Other	**Inorganic Material**		**Double Layer Sorbent**	
	Al_2O_3 (Acidic) Al_2O_3 (Neutral) Al_2O_3 (Basic) Florisil (Magnesium silicate) CARB (Graphitized carbon black) Na_2SO_4		CARB / NH_2 CARB / PSA SAX / PSA	

*Reversed phase and strong ion exchange **Reversed phase and weak ion exchange

Brand Cross Reference

Dikma	Waters	Agilent	Supelco
ProElut™ PLS	Oasis HLB	Plexa	-
ProElut™ PXC	Oasis MCX	Plexa PCX	-
ProElut™ PXA	Oasis MAX	-	-
ProElut™ PWC	Oasis WCX	-	-
ProElut™ PWA	Oasis WAX	-	-
ProElut™ C18	Sep-pak C18	BondElut C18	ENVI-18, LC-18
ProElut™ C18-U	-	BondElut C18-OH	-
ProElut™ C8	Sep-pak C8	BondElut C8	-
ProElut™ C2	-	BondElut C2	-
ProElut™ PH	-	BondElut PH	LC-PH
ProElut™ CN	Sep-pak CN	BondElut CN	LC-CN
ProElut™ NH_2	Sep-pak NH_2	BondElut NH_2	LC-NH_2
ProElut™ PSA	-	BondElut PSA	
ProElut™ Silica	Sep-pak Silica	BondElut Silica	LC-Silica
ProElut™ SCX	-	BondElut SCX	LC-SCX
ProElut™ SAX	-	BondElut SAX	LC-SAX

Technical Reference

A. Typical elution sequence of PLS, PXC, PXA, PWA and PWC

ProElut™ PLS (60 mg / 3 mL)

Suggested Method	Purpose
Condition / equilibrate 3 mL MeOH / 3 mL H_2O	Ready for use
Load sample solution 3 mL	The compounds of interest will be adsorbed by the sorbent
Wash 3 mL H_2O (5% MeOH)	To remove aqueous soluble materials and disruptors
Elution 3 mL MeOH	To get compounds of interest that previously adsorbed on the sorbent by non-polar interaction
Evaporate and reconstitute	For HPLC or GC analysis

ProElut™ PXC (60 mg / 3 mL)

Suggested Method	Purpose
Condition / equilibrate 3 mL MeOH / 3 mL H_2O	Ready for use
Load acidified sample solution 3 mL	Protonated basic compounds (under low pH) will approach sulfonic group by Coulomb force The neutral and acidic compounds will be absorbed on the sorbent by non-polar interaction
Wash 1 3 mL 0.1 M HCl	To remove aqueous soluble materials and disruptors
Wash 2 3 mL MeOH	To remove compounds that adsorbed on the sorbent by non-polar interaction
Elution 3 mL MeOH (5% NH_4OH)	Neutralize the basic compounds that adsorbed on the sorbent by Coulomb force and carry them out
Evaporate and reconstitute	For HPLC or GC analysis

ProElut™ PXA (60 mg / 3 mL)

Suggested Method	Purpose
Condition / equilibrate 3 mL MeOH / 3 mL H_2O	Ready for use
Load sample solution 3 mL	Negative charged acidic compounds will approach quaternary amino group by Coulomb force The neutral and acidic compounds will be absorbed on the sorbent by non-polar interaction
Wash 1 3 mL 5% NH_4OH	To remove aqueous soluble materials and disruptors, including salts and proteins The interaction between acid compounds and the quaternary amino group is reinforced
Wash 2 3 mL MeOH	To remove compounds that adsorbed on the sorbent by non-polar interaction
Elution 3 mL MeOH (2% HCOOH)	Neutralize the acidic compounds that adsorbed on the sorbent by Coulomb force and carry them out
Evaporate and reconstitute	For HPLC or GC analysis

ProElut™ PWC (60 mg / 3 mL)

Suggested Method	Purpose
Condition / equilibrate 3 mL MeOH / 3 mL 5% NH_4OH	Ready for use Add ammonia to make the carboxyl functional group negatively charged
Load sample solution 3 mL	Protonated strong basic compounds will approach carboxyl group by Coulomb force The neutral and weak- / mid- basic compounds will be absorbed on the sorbent by non-polar interaction
Wash 1 3 mL 5% NH_4OH	To remove aqueous soluble materials and disruptors, including salts and proteins The interaction between strong basic compounds and the carboxyl group is reinforced
Wash 2 3 mL MeOH	To remove compounds that adsorbed on the sorbent by non-polar interaction
Elution 3 mL MeOH (2% HCOOH)	To neutralize the carboxyl (negatively charged) so that the Coulomb force between analyte and functional group is cut off and therefore the strong basic compounds will be carried away by methanol
Evaporate and reconstitute	For HPLC or GC analysis

ProElut™ PWA (60 mg / 3 mL)

Suggested Method	Purpose
Condition / equilibrate 3 mL MeOH / 3 mL 2% HCOOH	Ready for use Add formic acid to make the piperazine functional group protonated
Load sample solution 3 mL	Negatively charged strong acidic compounds will approach sorbent functional group by Coulomb force The neutral and weak- / mid- basic compounds will be absorbed on the sorbent by non-polar interaction
Wash 1 3 mL 2% HCOOH	To remove aqueous soluble materials and disruptors, including salts and proteins The interaction between strong acidic compounds and the piperazine group is reinforced
Wash 2 3 mL MeOH	To remove compounds that adsorbed on the sorbent by non-polar interaction
Elution 3 mL MeOH (5% NH_4OH)	To neutralize the protonated functional group so that the Coulomb force between analyte and functional group is cut off and therefore the strong acidic compounds will be carried away by methanol
Evaporate and reconstitute	For HPLC or GC analysis

B. ProElut™ SPE Sorbents Weight Based on Sample Size

Bed Weight (mg)	Bed Capacity (mg)*	Minimum Elution Volume (μL)
50	2.5	125
100	5	250
150	7.5	375
200	10	500
500	25	1250
1000	50	2500

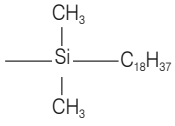
*This value depends on the analyte and sample matrix. As a rule of thumb, the bed capacity can be estimated with ~5% of the bed weight.

ProElut™ SPE Sorbents

Silica-based Sorbents

ProElut™ C18

ProElut™ C18 is the most broadly used SPE cartridge. It can be used to adsorb non-polar, slightly polar and mid-polar compounds. Polar materials such as salt cannot be retained on the sorbent, which makes ProElut™ C18 an excellent choice for desalting samples. In addition, non-polar and slightly polar disruptors in matrix such as fats, PAHs and phthalates can be retained by the sorbent, leaving ionic analytes eluted in the collector for reconstitution.

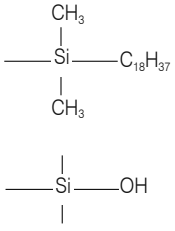
Base material	Spherical silica, Particle Size: 50 μm, Pore Size: 60 Å Specific Surface Area: 500 m^2/g
Functional group	
Endcapping	Yes
Carbon loading	19%
Retention mechanism	Reversed phase
Application	For reversed phase extraction of non-polar to moderately polar compounds, such as antibiotics, barbiturates, benzodiazepines, caffeine, drugs, dyes, essential oils, fat-soluble vitamins, fungicides, herbicides, pesticides, hydrocarbons, parabens, phenols, phthalate esters, steroids, surfactants, theophylline and water-soluble vitamins

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ C18 SPE Tubes				
50 mg	1 mL	100	63101	$125
100 mg	1 mL	100	63102	125
200 mg	3 mL	50	63103	95
500 mg	3 mL	50	63104	115
500 mg	6 mL	30	63105	80
1 g	6 mL	30	63106	105
2 g	12 mL	20	63107	120
5 g	20 mL	20	63108	190
10 g	60 mL	10	63109	260
ProElut™ C18 Bulk Sorbents				
10 g		1	63181	Inquire
100 g		1	63182	Inquire
1 kg		1	63183	Inquire

ProElut™ C18-U

ProElut™ C18-U has a non-endcapped octadecyl bonded phase that enables the silanols on the silica surface to be more active. However, the well-controlled silanol activity exhibits excellent selectivity towards polar compounds, especially amines such as tetracyclines.

Base material	Spherical silica, Particle Size: 50 μm, Pore Size: 60 Å, Specific Surface Area: 500 m^2/g
Functional group	
Endcapping	No
Carbon loading	17%
Retention mechanism	Reversed phase
Application	Similar to ProElut™ C18, but with enhanced retention for polar compounds

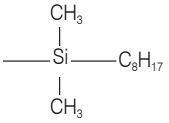
Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ C18-U SPE Tubes				
50 mg	1 mL	100	63501	$125
100 mg	1 mL	100	63502	125
200 mg	3 mL	50	63503	95
500 mg	3 mL	50	63504	115
500 mg	6 mL	30	63505	80
1 g	6 mL	30	63506	105
2 g	12 mL	20	63507	120
5 g	20 mL	20	63508	190
10 g	60 mL	10	63509	260
ProElut™ C18-U Bulk Sorbents				
10 g		1	63581	Inquire
100 g		1	63582	Inquire
1 kg		1	63583	Inquire

ProElut™ SPE

ProElut™ C8

ProElut™ C8 is very similar to the C18 phase, but has a shorter chain. This makes the phase less non-polar than C18, leaving non-polar compounds less retained by the sorbents. In this case, those compounds retained too strongly on the C18 can be effectively eluted if you choose the C8 phase. In addition, the C8 phase for polar interaction is somewhat higher than C18 because there is less coverage of the silica surface. However, this polar interaction is not the main characteristic of C8 phase.

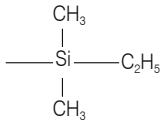
Base material	Spherical silica, Particle Size: 50 μm, Pore Size: 60 Å Specific Surface Area: 500 m^2/g
Functional group	
Endcapping	Yes
Carbon loading	11%
Retention mechanism	Reversed phase
Application	For reversed phase extraction of non-polar to moderately polar compounds, such as antibiotics, barbiturates, benzodiazepines, caffeine, drugs, dyes, essential oils, fat-soluble vitamins, fungicides, herbicides, pesticides, hydrocarbons, parabens, phenols, phthalate esters, steroids, surfactants, theophylline, and water-soluble vitamins

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ C8 SPE Tubes				
100 mg	1 mL	100	63702	$125
200 mg	3 mL	50	63703	95
500 mg	3 mL	50	63704	115
500 mg	6 mL	30	63705	80
1 g	6 mL	30	63706	105
2 g	12 mL	20	63707	120
5 g	20 mL	20	63708	190
10 g	60 mL	10	63709	260
ProElut™ C8 Bulk Sorbents				
10 g		1	63781	Inquire
100 g		1	63782	Inquire
1 kg		1	63783	Inquire

ProElut™ C2

ProElut™ C2 has the shortest carbon chain among non-polar silica-based phases. It provides the least retentive ability for non-polar compounds and somewhat higher polar interaction than C8 and C18 phases. The polarity of C2 is slightly lower than a cyano phase for polar interactions.

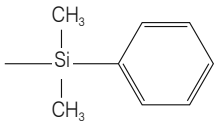
Base material	Spherical silica, Particle Size: 50 μm, Pore Size: 60 Å Specific Surface Area: 500 m^2/g
Functional group	
Endcapping	Yes
Carbon loading	5.6%
Retention mechanism	Reversed phase
Application	Plasma, urine, aqueous samples

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ C2 SPE Tubes				
100 mg	1 mL	100	65602	$125
500 mg	3 mL	50	65604	115
1 g	6 mL	30	65606	105
2 g	12 mL	20	65607	120
5 g	20 mL	20	65608	190
10 g	60 mL	10	65609	260
ProElut™ C2 Bulk Sorbents				
10 g		1	65681	Inquire
100 g		1	65682	Inquire
1 kg		1	65683	Inquire

ProElut™ PH

ProElut™ PH has a similar polarity as that of C8 phase. However, it shows different selectivity to other non-polar phases due to the presence of conjugated double bonds. In addition, the planar shape of benzene and its electron distribution make it much more retentive to aromatic compounds.

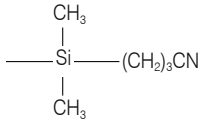
Base material	Spherical silica, Particle Size: 50 μm, Pore Size: 60 Å Specific Surface Area: 500 m^2/g
Functional group	
Endcapping	Yes
Carbon loading	10%
Retention mechanism	Reversed phase
Application	Volatiles in water: PAHs, PAEs, PCBs, pesticides, herbicides, phenols Biological fluids: blood, urine

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ PH SPE Tubes				
100 mg	1 mL	100	63902	$125
500 mg	3 mL	50	63904	115
1 g	6 mL	30	63906	105
2 g	12 mL	20	63907	120
5 g	20 mL	20	63908	190
10 g	60 mL	10	63909	260
ProElut™ PH Bulk Sorbents				
10 g		1	63981	Inquire
100 g		1	63982	Inquire
1 kg		1	63983	Inquire

ProElut™ CN

ProElut™ CN is a mid-polar phase SPE column. We recommend using it to extract samples for which analytes are irreversibly retained on C8 and C18 phases.

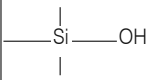
Base material	Spherical silica, Particle Size: 50 μm, Pore Size: 60 Å Specific Surface Area: 500 m^2/g
Functional group	
Endcapping	Yes
Carbon loading	8%
Retention mechanism	Reversed phase or normal phase
Application	Pesticides in water, metabolites

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ CN SPE Tubes				
100 mg	1 mL	100	63802	$125
500 mg	3 mL	50	63804	115
1 g	6 mL	30	63806	105
2 g	12 mL	20	63807	120
5 g	20 mL	20	63808	190
10 g	60 mL	10	63809	260
ProElut™ CN Bulk Sorbents				
10 g		1	63881	Inquire
100 g		1	63882	Inquire
1 kg		1	63883	Inquire

ProElut™ Silica

ProElut™ Silica is the most polar SPE sorbent. It is very effective for separating compounds with similar structures and extracting polar compounds in non-polar solvents. In addition, the silica surface silanols have slight anion exchange properties that can be used to remove organic acids and phenols in extracts.

Base material	Spherical silica, Particle Size: 50 μm, Pore Size: 60 Å Specific Surface Area: 500 m^2/g
Functional group	
Endcapping	No
Carbon loading	-
Retention mechanism	Normal phase or weak anion exchange
Application	Extract polar compounds from non-polar matrix Remove polar hydrocarbons, organic acids, and phenols in extracts. Separate compounds with very similar structures (isomers)

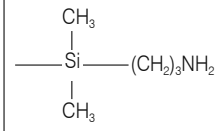
Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ Silica SPE Tubes				
100 mg	1 mL	100	63002	$125
500 mg	3 mL	50	63004	115
1 g	6 mL	30	63006	105
ProElut™ Silica Bulk Sorbents				
10 g		1	63081	Inquire
100 g		1	63082	Inquire
1 kg		1	63083	Inquire

ProElut™ SPE

ProElut™ NH_2

ProElut™ NH_2 has both polar and weak anion exchange interactions. It can effectively absorb compounds with a polar functional group (-OH, -NH_2, -SH, etc.) by hydrogen bonding from non-polar solvents such as hexane. In addition, it has weaker anion exchange property than SAX (a quaternary amine sorbent that is always charged) and is therefore an excellent choice for retention of very strong anions that are always irreversibly adsorbed on a SAX sorbent, such as sulfonic acid.

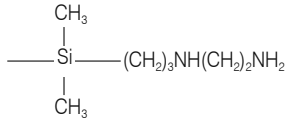
Base material	Spherical silica, Particle Size: 50 μm, Pore Size: 60 Å Specific Surface Area: 500 m^2/g
Functional group	
Endcapping	No
Carbon loading	5.5%
Retention mechanism	Normal phase or anion exchange
Application	Extract polar compounds from non-polar matrix Remove polar hydrocarbons, organic acids, and phenols in extracts Separate compounds with very similar structures (isomers)

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ NH_2 SPE Tubes				
100 mg	1 mL	100	63302	$125
200 mg	3 mL	50	63303	95
500 mg	3 mL	50	63304	115
500 mg	6 mL	30	63305	80
1 g	6 mL	30	63306	105
2 g	12 mL	20	63307	120
5 g	20 mL	20	63308	190
10 g	60 mL	10	63361	260
ProElut™ NH_2 Bulk Sorbents				
10 g		1	63381	Inquire
100 g		1	63382	Inquire
1 kg		1	63383	Inquire

ProElut™ PSA

ProElut™ PSA sorbent contains two different amino groups, one primary and one secondary. It gives comparatively higher pK_a and ionic capacity relative to ProElut™ NH_2. The PSA sorbent is an excellent choice for extracting polar compounds from non-polar solvents. The compounds that are retained too strongly on a NH_2 sorbent can be effectively eluted on a PSA sorbent. In addition, the PSA functional group is a very effective bidentate ligand in chelation applications.

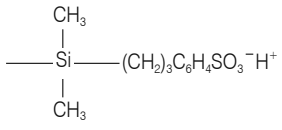
Base material	Spherical silica, Particle Size: 50 μm, Pore Size: 60 Å Specific Surface Area: 500 m^2/g
Functional group	
Endcapping	No
Carbon loading	8.5%
Retention mechanism	Normal phase or weak anion exchange
Application	Extract polar compounds from non-polar matrix Remove polar hydrocarbons, organic acids, and phenols in extracts Separate compounds with very similar structures (isomers)

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ PSA SPE Tubes				
100 mg	1 mL	100	63202	$150
200 mg	3 mL	50	63203	115
500 mg	3 mL	50	63204	140
500 mg	6 mL	30	63205	115
1 g	6 mL	30	63206	160
2 g	12 mL	20	63207	188
5 g	20 mL	20	63208	223
10 g	60 mL	10	63209	307
ProElut™ PSA Bulk Sorbents				
10 g		1	63281	Inquire
100 g		1	63282	Inquire
1 kg		1	63283	Inquire

ProElut™ SCX

ProElut™ SCX sorbent has benzenesulfonic acid as a bonded functional group with a very low pK_a. The presence of the benzene ring in the functional group increases its potential for non-polar interaction. The two properties are quite useful in the absorption of cationic organic compounds from aqueous systems where non-polar compounds are seen.

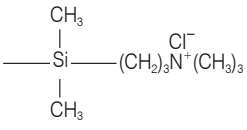
Base material	Spherical silica, Particle Size: 50 μm, Pore Size: 60 Å Specific Surface Area: 500 m^2/g
Functional group	
Endcapping	No
Carbon loading	10.9%
Retention mechanism	Strong cation exchange
Application	Basic compounds in aqueous solution

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ SCX SPE Tubes				
100 mg	1 mL	100	63602	$150
500 mg	3 mL	50	63604	140
500 mg	6 mL	30	63606	115
2 g	12 mL	20	63607	147
5 g	20 mL	20	63608	211
10 g	60 mL	10	63609	271
ProElut™ SCX Bulk Sorbents				
10 g		1	63681	Inquire
100 g		1	63682	Inquire
1 kg		1	63683	Inquire

ProElut™ SAX

ProElut™ SAX sorbent has trimethylaminopropyl as a bonded functional group with a very high pK_a. The presence of the benzene ring in the functional group increases its potential for non-polar interaction. The two properties are quite useful in the absorption of anionic organic compounds from aqueous systems where non-polar compounds are seen.

Base material	Spherical silica, Particle Size: 50 μm, Pore Size: 60 Å Specific Surface Area: 500 m^2/g
Functional group	
Endcapping	No
Carbon loading	8%
Retention mechanism	Strong anion exchange
Application	Carboxylic acids in aqueous solution

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ SAX SPE Tubes				
100 mg	1 mL	100	63402	$150
500 mg	3 mL	50	63404	140
500 mg	6 mL	30	63406	115
2 g	12 mL	20	63407	147
5 g	20 mL	20	63408	211
10 g	60 mL	10	63409	271
ProElut™ SAX Bulk Sorbents				
10 g		1	63481	Inquire
100 g		1	63482	Inquire
1 kg		1	63483	Inquire

Polymer-based Sorbents

ProElut™ PLS-Hydrophilic-Lipophilic-Balance Copolymer, Reversed Phase Sorbent

ProElut™ PLS is a hydrophilic polystyrene / divinylbenzene copolymer sorbent, designed to expand the SPE application fields and improve extraction efficiency. This sorbent contains the lipophilic divinylbenzene and the hydrophilic pyrrolidone. The hydrophilic-lipophilic balance is a reversed phase sorbent maintaining retention for non-polar and polar analytes. Compared to traditional silica-based reversed phase sorbent (C18), ProElut™ PLS features are as follows:

(1) Real Versatility

- High retention of hydrophilic compounds and lipophilic compounds
- Applications covering the non-polar, weakly polar, and polar compounds to overcome the C18 sorbent poor retention of polar compounds

(2) Higher Stability

- PLS is water-wettable
- Maintaining high retention and capacity after activation even if the SPE cartridge runs dry

(3) Wider pH Range

PLS is a polymer sorbent that can be used in the range of pH 0 - 14 while the silica-based sorbents can only be used in the range of pH 2 - 7.5.

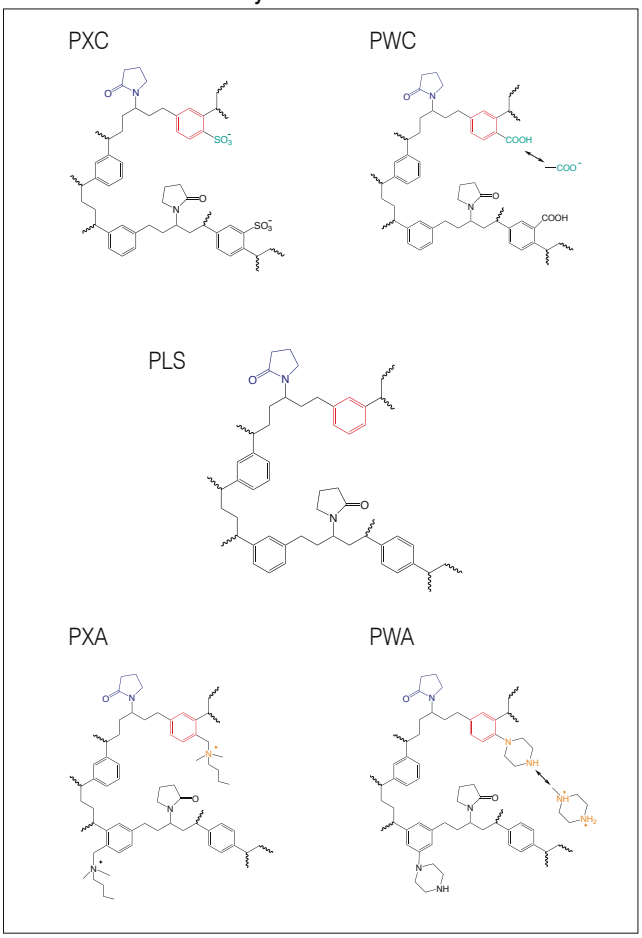
(4) Higher Capacity

The PLS sorbent has greater capacity for more compounds. It reduces breakthrough potential and improves reproducibility.

(5) No Secondary Interaction

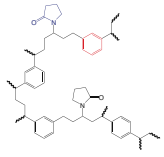
The residue silanols of silica-based sorbents can adsorb basic analytes resulting in low recovery. PLS is a polymer sorbent and there is no silanol activity leading to high recovery.

Structure of ProElut™ Polymer-based Sorbents



ProElut™ PLS

ProElut™ PLS is a highly cross-linked polystyrene-divinylbenzene (PS-DVB) copolymer with high surface area (800 m^2/g) and high capacity. It is an excellent choice for extraction of polar analytes in aqueous solvents where traditional C18 and C8 sorbents are not advisable because they are not "wettable". It is ideal in screening applications where a broad range of analytes can be extracted.

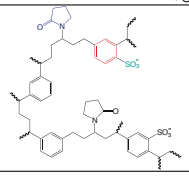
Base material	Porous, highly cross-linked, spherical PS-DVB, Particle Size: 50 μm, Pore Size: 80 Å, Specific Surface Area: 800 m^2/g
Functional group (Pyrrolidinone)	
Retention mechanism	Non-polar and polar interactions
Application	Pharmaceutical residues in animal tissue, such as tetracyclines, chloromycetin, sulfonamides, abamectin, macrolide antibiotics, nitrofurans, and pesticides in vegetables Environmental samples, such as PAHs, PAEs, phenols, and endocrine disruptors Biological samples, pharmaceuticals, and metabolites in plasma, serum, or urine

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ PLS SPE Tubes				
30 mg	1 mL	100	68002	$159
60 mg	1 mL	100	68011	184
60 mg	3 mL	50	68003	221
150 mg	6 mL	30	68004	136
200 mg	6 mL	30	68012	155
500 mg	6 mL	30	68005	195
500 mg	12 mL	20	68007	156
1 g	20 mL	20	68008	242
6 g	60 mL	10	68009	491

ProElut™ PXC

ProElut™ PXC is a highly cross-linked PS-DVB copolymer with sulfonic acid as the functional group. It has both non-polar and cation exchange interactions and is therefore an excellent choice for extraction of basic organic compounds.

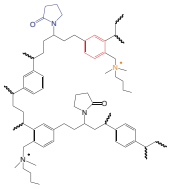
Base material	Porous, highly cross-linked, spherical PS-DVB, Particle Size: 50 μm, Pore Size: 80 Å, Specific Surface Area: 800 m^2/g
Functional group (Sulfonic acid)	
Retention mechanism	Non-polar interaction and cation exchange
Application	Basic compounds, such as sulfonamides and clenbuterol Biological samples, pharmaceuticals, and metabolites in plasma, serum, or urine

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ PXC SPE Tubes				
30 mg	1 mL	100	68202	$143
60 mg	3 mL	50	68203	198
150 mg	6 mL	30	68204	122
200 mg	6 mL	30	68212	139
500 mg	12 mL	20	68207	140
1 g	20 mL	20	68208	218
6 g	60 mL	10	68209	442

ProElut™ PXA

ProElut™ PXA is a highly cross-linked PS-DVB copolymer with a quaternary amino as the functional group. It has both non-polar and anion exchange interactions and is therefore an excellent choice for extraction of acidic organic compounds, especially those containing carboxyl and phenolic hydroxyl.

Base material	Porous, highly cross-linked, spherical PS-DVB, Particle Size: 50 μm, Pore Size: 80 Å, Specific Surface Area: 800 m^2/g
Functional group (Quaternary amino)	
Retention mechanism	Non-polar interaction and anion exchange
Application	Compounds with groups as carboxyl and phenolic hydroxyl

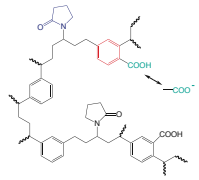
Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ PXA SPE Tubes				
30 mg	1 mL	100	68302	$159
60 mg	3 mL	50	68303	221
150 mg	6 mL	30	68304	136
500 mg	12 mL	20	68307	156
1 g	20 mL	20	68308	242
6 g	60 mL	10	68309	491

ProElut™ SPE

ProElut™ PWC

ProElut™ PWC is a highly cross-linked PS-DVB copolymer with carboxyl as the functional group. It has both non-polar and weak cation exchange interactions and is therefore an excellent choice for extraction of strong basic compounds.

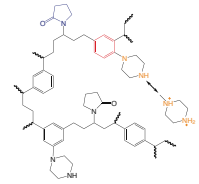
Base material	Porous, highly cross-linked, spherical PS-DVB, Particle Size: 50 μm, Pore Size: 80 Å, Specific Surface Area: 800 m^2/g
Functional group (Carboxyl)	
Retention mechanism	Non-polar interaction and weak cation exchange
Application	Strong basic compounds, quaternary ammonium salts

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ PWC SPE Tubes				
30 mg	1 mL	100	65711	$159
60 mg	3 mL	50	65712	221
150 mg	6 mL	30	65713	136

ProElut™ PWA

ProElut™ PWA is a highly cross-linked PS-DVB copolymer with piperazine as the functional group. It has both non-polar and weak anion exchange interactions and is therefore an excellent choice for extraction of strong acidic compounds.

Base material	Porous, highly cross-linked, spherical PS-DVB, Particle Size: 50 μm, Pore Size: 80 Å, Specific Surface Area: 800 m^2/g
Functional group (Piperazine)	
Retention mechanism	Non-polar interaction and weak anion exchange
Application	For purification of strong acidic compounds

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ PWA SPE Tubes				
30 mg	1 mL	100	65811	$159
60 mg	3 mL	50	65812	221
150 mg	6 mL	30	65813	136

Specific Sorbents

ProElut™ Florisil

Florisil is a highly selective adsorbent that has extensive utility in sample preparation, preparative and analytical chromatography. This sorbent is unique because it is comprised of extremely white, hard-powdered synthetic magnesium-silica gel.

Base material	Magnesium silicate, Particle Size: 150 - 200 μm
Functional group	$MgSiO_3$
Retention mechanism	Polar interaction
Application	For extraction of drugs, dyes, herbicides, pesticides, nitrogen compounds, organic acids, phenols, steroids, PCBs, and PAHs

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ Florisil SPE Tubes				
100 mg	1 mL	100	65002	$125
500 mg	3 mL	50	65004	115
500 mg	6 mL	30	65005	80
1 g	6 mL	30	65006	105
2 g	12 mL	20	65007	120
5 g	20 mL	20	65008	190
10 g	60 mL	10	65009	260
ProElut™ Florisil Bulk Sorbents				
10 g		1	65081	Inquire
100 g		1	65082	Inquire
1 kg		1	65083	Inquire

ProElut™ AL-A

Base material	Al_2O_3 (Acidic), Particle Size: 125 μm
pH	4.5
Retention mechanism	Lewis acid, polar, and ion exchange interactions
Application	Polar and anionic compounds

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ AL-A SPE Tubes				
100 mg	1 mL	100	65102	$125
500 mg	3 mL	50	65104	115
1 g	6 mL	30	65106	105
2 g	12 mL	20	65107	120
5 g	20 mL	20	65108	190
10 g	60 mL	10	65109	260
ProElut™ AL-A Bulk Sorbents				
10 g		1	65181	Inquire
100 g		1	65182	Inquire
1 kg		1	65183	Inquire

ProElut™ CARB

Base material	Graphitized carbon black, Particle Size: 120 - 400 μm
Application	In agriculture residues analysis, used to remove pigments in fruits and vegetables For purification of samples such as groundwater, fruits, and vegetables

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ CARB SPE Tubes				
250 mg	3 mL	50	65403	$200
500 mg	6 mL	30	65405	210

ProElut™ AL-N

Base material	Al_2O_3 (Neutral), Particle Size: 125 μm
pH	7.5
Retention mechanism	Lewis acid, polar, and ion exchange interactions
Application	Extract polar compounds from non-polar matrix Remove polar hydrocarbons, organic acids, and phenols in extracts. Separate compounds with very similar structures (isomers)

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ AL-N SPE Tubes				
100 mg	1 mL	100	65302	$125
500 mg	3 mL	50	65304	115
1 g	6 mL	30	65306	105
2 g	12 mL	20	65307	120
5 g	20 mL	20	65308	190
10 g	60 mL	10	65309	260
ProElut™ AL-N Bulk Sorbents				
10 g		1	65381	Inquire
100 g		1	65382	Inquire
1 kg		1	65383	Inquire

ProElut™ AL-B

Base material	Al_2O_3 (Basic), Particle Size: 125 μm
pH	10.0
Retention mechanism	Lewis acid, polar, and ion exchange interactions
Application	Polar and anionic compounds, amines

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ AL-B SPE Tubes				
100 mg	1 mL	100	65202	$125
500 mg	3 mL	50	65204	115
1 g	6 mL	30	65206	105
2 g	12 mL	20	65207	120
5 g	20 mL	20	65208	190
10 g	60 mL	10	65209	260
ProElut™ AL-B Bulk Sorbents				
10 g		1	65281	Inquire
100 g		1	65282	Inquire
1 kg		1	65283	Inquire

ProElut™ CARB / NH_2

Base material	Packing of equivalent volume of CARB and amine (NH_2)
Application	Widely used in analysis of pesticide residues (many different varieties) in foods To remove pigments, fatty acids, and phenols from analytes

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ CARB / NH_2 SPE Tubes				
500 mg / 500 mg	6 mL	30	64105	$240

ProElut™ SPE

ProElut™ GLASS SPE Tube

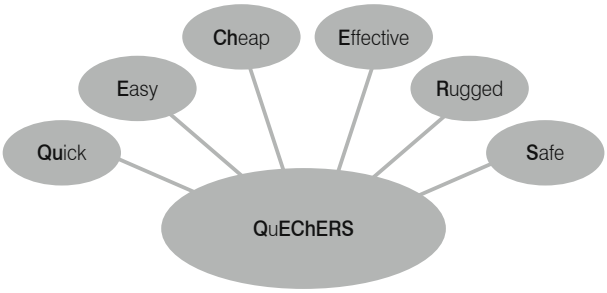
ProElut™ glass cartridges are designed for high-purity extraction as the inert glass body completely eliminates the pollution from plasticizers, such as phthalates. ProElut™ glass SPE tubes are standard size, with high quality sorbent and special purification frits, to assure stability and reproducibility.

Ordering Information

Mass	Volume	Qty	Cat. No.	Price
ProElut™ PLS GLASS SPE Tubes				
200 mg	6 mL	30	68012G	$189
500 mg	6 mL	30	68005G	397
ProElut™ C18 GLASS SPE Tubes				
500 mg	6 mL	30	63105G	228
1 g	6 mL	30	63106G	302
ProElut™ Florisil GLASS SPE Tubes				
500 mg	6 mL	30	65005G	271
1 g	6 mL	30	65006G	302
ProElut™ PSA GLASS SPE Tubes				
500 mg	6 mL	30	63205G	200
1 g	6 mL	30	63206G	270
ProElut™ Silica GLASS SPE Tubes				
500 mg	6 mL	30	63005G	198
1 g	6 mL	30	63006G	254

ProElut™ QuEChERS Kits

In 2003, USDA scientists developed a groundbreaking sample preparation method for multi-pesticide residue analysis in a wide variety of food and agricultural products. The QuEChERS (pronounced “catchers“) procedure entails a number of simple processing steps and is thus fast and easy to perform with little susceptibility to errors. QuEChERS provides high recoveries for a very broad scope of pesticides belonging to various chemical classes and delivers the final extract in acetonitrile, thereby giving full flexibility in the choice of the determinative analysis technique. Direct connection with liquid and gas chromatography is possible.



ProElut™ QuEChERS is an innovative sample preparation method for multi-pesticide residue analysis, standing for **Qu**ick, **E**asy, **Ch**eap, **E**ffective, **R**ugged and **S**afe. Now, QuEChERS has become a standard approach for the determination of pesticide residues in fruits and vegetables across the world. In addition, different fields have started to use this method. Application is developed in a number of different areas, such as meat, blood, wine, and even the antibiotics in soil, drugs, drug abuse, and other contaminants detected. Dikma ProElut™ QuEChERS kits contain extraction and clean-up kits which support AOAC Method 2007.01 and EN Method 15662.

Features of ProElut™ QuEChERS Kits

- Fast, simple sample preparation for multi-residue pesticide analysis
- Wide selection, support AOAC 2007.01 and EN 15662 methods
- Provide guidance to help you choose the right products
- Certified extraction salts and sorbents
- Individually sealed packages for enhanced protection and storage stability

ProElut™ QuEChERS

ProElut™ QuEChERS versus Traditional SPE

The ProElut™ QuEChERS method has almost the same analysis results as traditional SPE, with fewer analytical steps, lower solvent consumption, greater accuracy, wider applicability, and higher sample throughput.

	Traditional SPE	ProElut™ QuEChERS
Time to process 6 samples (min)	100 - 120	< 25
Solvent used (mL)	60 - 90	< 15
Steps	Complex	Simple
Evaporation	Yes	No
Glassware used	Yes	No
Apparatus used	More	Less
Application	Wide	Narrow
Recovery	High	Low (Part of compounds)

ProElut™ QuEChERS Steps

Step 1 Extraction		Step 2 Clean-up	
			
Weigh 10 g sample, add 10 mL acetonitrile, internal standard and shake for 1 min	Add extraction salts (buffer + Na_2SO_4) to extraction sample and centrifuge for 5 min	Transfer supernatant to clean-up tube, shake for 30 sec and centrifuge for 5 min	Transfer cleaned extract to autosampler vial for analysis

Recommended Standard Operation Procedure for ProElut™ QuEChERS Kits

Original QuEChERS

Extraction

1. Add 10 mL MeCN to 10 g sample
2. Add internal standard
3. Add 4 g $MgSO_4$ and 1 g NaCl
4. Shake vigorously for 1 min
5. Centrifuge for 5 min

Dispersive SPE clean-up

6. Remove 1 mL of the upper layer
7. Add 25 mg PSA and 150 mg $MgSO_4$ to the 1 mL removed
8. Mix for 30 sec and centrifuge for 1 min

AOAC 2007.01

Extraction

1. Add 15 mL 1% HOAc in MeCN to 15 g of sample
2. Add internal standard
3. Add 6 g $MgSO_4$ and 1.5 g NaOAc
4. Shake vigorously for 1 min
5. Centrifuge for 5 min

Dispersive SPE clean-up

6. Remove 1 mL of the upper layer
7. Add 25 mg PSA and 150 mg $MgSO_4$ to the 1 mL removed
8. Mix for 30 sec and centrifuge for 1 min

EN 15662

Extraction

1. Add 10 mL MeCN to 10 g of sample
2. Add internal standard
3. Add 4 g $MgSO_4$ + 1 g NaCl + 1 g $Na_3Citr{\cdot}2H_2O$ + 0.5 g $Na_3Citr{\cdot}2H_2O$ (+ 0.6 mL 5 N NaOH for lemons, limes, etc.)
4. Shake vigorously for 1 min
5. Centrifuge for 5 min

Dispersive SPE clean-up

6. Remove 1 mL of the upper layer
7. Add 25 mg PSA and 150 mg $MgSO_4$ (add 2.5 or 7.5 mg GCB for matrices with a high content of carotenoids and chlorophyll)
8. Mix for 30 sec and centrifuge for 1 min

ProElut™ QuEChERS Kits Selection Guide

Step 1: Selected Extraction Salts Kit

Generally, we add solvent and buffer salts to the pulverized fruit or vegetable sample to extract the pesticides of interest into the organic layer. However, adding a food sample with a high percentage of water directly to the salts may create an exothermic reaction that can affect your analyte recoveries. With the separate packaging of ProElut™ QuEChERS extraction salts (pre-weighed, water free), you can add buffered extraction salt after adding solvent.

Method	Material	Qty	Cat. No.	Price
AOAC 2007.01	6 g $MgSO_4$, 1.5 g NaOAc with 50 mL Centrifuge Tube	50/pk	64520	$168
EN 15662	4 g $MgSO_4$,1 g NaCl, 1 g TSCD, 0.5 g DHS with 50 mL Centrifuge Tube	50/pk	64521	178

Step 2 : Selected Dispersive SPE Kit

	Sample Type	Method	2 mL Clean-up Tube	Price	15 mL Clean-up Tube	Price
	**General fruits and vegetables** Major interferences: organic acids, carbohydrates, phenols	AOAC	50 mg PSA 150 mg $MgSO_4$ Cat#64501	$123	400 mg PSA 1200 mg $MgSO_4$ Cat#64502	$118
		EN	25 mg PSA 150 mg $MgSO_4$ Cat#64503	118	150 mg PSA 900 mg $MgSO_4$ Cat#64504	113
	**Fruits and vegetables with fats and waxes** Major interferences: lipids, sterols, organic acids, carbohydrates, phenols	AOAC	50 mg PSA 50 mg C18 150 mg $MgSO_4$ Cat#64505	128	400 mg PSA 400 mg C18 1200 mg $MgSO_4$ Cat#64506	128
		EN	25 mg PSA 25 mg C18 150 mg $MgSO_4$ Cat#64507	123	150 mg PSA 150 mg C18 900 mg $MgSO_4$ Cat#64508	118
	**Highly pigmented fruits and vegetables** Major interferences: chlorophyll, carotenoids, organic acids, carbohydrates, phenols. Not for use with planar pesticides	AOAC	50 mg PSA 50 mg Carb 150 mg $MgSO_4$ Cat#64509	172	400 mg PSA 400 mg Carb 1200 mg $MgSO_4$ Cat#64510	215
		EN	25 mg PSA 7.5 mg Carb 150 mg $MgSO_4$ Cat#64511	158	150 mg PSA 45 mg Carb 900 mg $MgSO_4$ Cat#64512	143
	**Fruits and vegetables with pigments and fats** Major interferences: chlorophyll, carotenoids, lipids, organic acids,carbohydrates, phenols. Not for use with planar pesticides	AOAC	50 mg PSA 50 mg C18 50 mg Carb 150 mg $MgSO_4$ Cat#64513	192	400 mg PSA 400 mg C18 400 mg Carb 1200 mg $MgSO_4$ Cat#64514	238

Note: Sorbent listed in the table has been pre-weighed and placed in centrifuge tube
--PSA: Primary-secondary amine silica bonded sorbent
--C18: Octadecyl silica bonded sorbent
--Carb: Graphitized carbon black.
Tips: For different matrix food samples, we recommend an added amount of PSA and $MgSO_4$ as follows:

Fruits / Vegetables	Example	Recommended Minimum Usage Amount (mg/mL)			
		$MgSO_4$	PSA	C18	Carb
High percentage of water	Lettuce, cucumber, grapes, apples	150 mg	25 mg		
High fat	Avocados, olives, peanuts, oil	150 mg	25 mg	25 mg	
High carotenoids and chlorophyll	Spinach, bean sprouts, artichokes, carrots	150 mg	25 mg		Low pigment: 2.5 mg High pigment: 10 mg

ProElut™ QuEChERS

Clean-up Kit Ordering Information

Material	Method	Qty	Cat. No.	Price
ProElut™ QuEChERS Clean-up Kit (2 mL)				
50 mg PSA / 150 mg $MgSO_4$	AOAC	100/pk	64501	$123
25 mg PSA / 150 mg $MgSO_4$	EN	100/pk	64503	118
50 mg PSA / 50 mg C18 / 150 mg $MgSO_4$	AOAC	100/pk	64505	128
25 mg PSA / 25 mg C18 / 150 mg $MgSO_4$	EN	100/pk	64507	123
50 mg PSA / 50 mg Carb / 150 mg $MgSO_4$	AOAC	100/pk	64509	172
25 mg PSA / 7.5 mg Carb / 150 mg $MgSO_4$	EN	100/pk	64511	158
50 mg PSA / 50 mg C18 / 50 mg Carb / 150 mg $MgSO_4$	AOAC	100/pk	64513	192
25 mg PSA / 2.5 mg Carb / 150 mg $MgSO_4$	EN	100/pk	64515	158
ProElut™ QuEChERS Clean-up Kit (15 mL)				
400 mg PSA / 1200 mg $MgSO_4$	AOAC	50/pk	64502	118
150 mg PSA / 900 mg $MgSO_4$	EN	50/pk	64504	113
400 mg PSA / 400 mg C18 / 1200 mg $MgSO_4$	AOAC	50/pk	64506	128
150 mg PSA / 150 mg C18 / 900 mg $MgSO_4$	EN	50/pk	64508	118
400 mg PSA / 400 mg Carb / 1200 mg $MgSO_4$	AOAC	50/pk	64510	215
150 mg PSA / 45 mg Carb / 900 mg $MgSO_4$	EN	50/pk	64512	143
400 mg PSA / 400 mg C18 / 400 mg Carb / 1200 mg $MgSO_4$	AOAC	50/pk	64514	238
150 mg PSA / 15 mg Carb / 900 mg $MgSO_4$	EN	50/pk	64516	143

Extraction Kit Ordering Information

Material	Method	Qty	Cat. No.	Price
ProElut™ QuEChERS Extraction Kit (Extraction Salt + 50 mL Centrifuge Tube)				
6 g $MgSO_4$ / 1.5 g NaOAc	AOAC	50/pk	64520	$168
4 g $MgSO_4$ / 1 g NaCl / 1 g TSCD / 0.5 g DHS	EN	50/pk	64521	178
ProElut™ QuEChERS Extraction Salts				
6 g $MgSO_4$ / 1.5 g NaOAc	AOAC	50/pk	64520S	172
4 g $MgSO_4$ / 1 g NaCl / 1 g TSCD / 0.5 g DHS	EN	50/pk	64521S	182

ProElut™ LLE+ (Liquid-Liquid Extraction)

Classical liquid-liquid extraction using a separation funnel is often associated with certain disadvantages such as formation of emulsion, poor phase separation, high solvent consumption, low degree of automation, and high personnel cost. However, liquid-liquid extraction is more efficient using ProElut™ LLE+ cartridges. The simple and excellent performance of ProElut™ LLE+ cartridges eliminates emulsions and therefore, results in higher recoveries and cleaner extractions.

How does ProElut™ LLE+ work?

The aqueous sample is applied to the ProElut™ LLE+ sorbent. The sample then distributes itself in the form of a thin film over the chemically inert matrix and thus acts as a stationary phase. Subsequently, elution takes place using organic solvents that are nonmiscible with water, e.g. diethyl ether, ethyl acetate or halogenated hydrocarbons. All the lipophilic substances are extracted from the aqueous into the organic phase. During this process the aqueous phase remains on the stationary phase. The eluate is free from emulsions and can be evaporated for further analysis.

Application of ProElut™ LLE+

ProElut™ LLE+ has been widely applied in the sample preparation of urine, whole blood, plasma, serum, gastric juice, liquor, amniotic fluid, and animal and plant tissue. Other applications are in the areas of environmental and residue analysis, e.g. the analysis of industrial and domestic wastewater.

Ordering Information

Max Sample Volume*	Qty	Cat. No.	Price
ProElut™ LLE+			
1 mL	100/pk	62502	$210
3 mL	100/pk	62503	220
5 mL	100/pk	62504	230
10 mL	100/pk	62505	279
20 mL	100/pk	62506	290
Special Column for 24 Aromatic Amines Originating from Azo Dyes			
ProElut™ AZO	50/pk	62551	260
SS Rack 6-Ports for ProElut™ LLE+	1/pk	4802	129

*The recommended sample volumes must be adhered to: Solutions of smaller volume must be diluted to give indicated volumes.

ProElut™ Diatomaceous Earth Filter Aid

- Improves extraction efficiency
- Adsorbs moisture from samples

Diatomaceous earth is used as a filter aid to improve extraction efficiency of densely packed soils, such as clays. By mixing the sample with diatomaceous earth, recoveries can be improved and excess moisture can be absorbed.

Ordering Information

Description	Qty	Cat. No.	Price
Diatomite Filter Aid	800 g	62591	$100

Determination of Aromatic Amines Originating from Azo Dyes

1. Application

Determination of aromatic amines originating from azo dyes in textile products

2. Preparation

Cut samples into approximately 5 x 5 mm small pieces, and weigh out 1.0 g sample. Add 16 mL 70 ± 2 °C citrate buffer (0.06 M, pH 6)in a reactor, seal the reactor and shake it until the sample is immersed into the liquid. Keep the reactor in a thermostatic water bath for 30 min at 70 ± 2 °C. Add 3.0 mL sodium dithionite solution into the reactor, seal and shake immediately, then keep the reactor in thermostatic water bath for 30 min at 70 ± 2 °C, take it out, and cool it down to room temperature with warm water.

3. Final Extraction

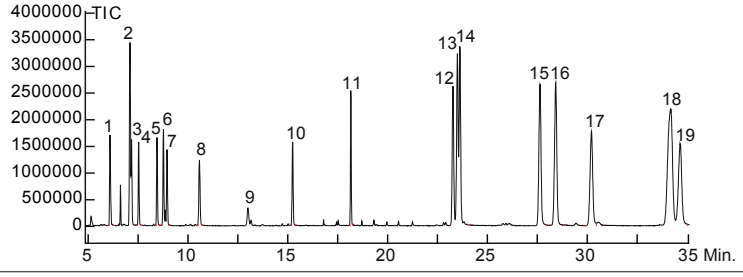
Open the reactor and press the sample by a glass stick, then transfer the liquid to ProElut™ AZO (Cat#62551), let stand for 15 min. Wash the reactor 4 times with 20 mL diethy ether, collect all solutions and transfer to ProElut™ AZO for extraction. Use a control flow rate, and collect the elution solution into a 250 mL flat bottom flask.

4. Concentration

The elution solution is concentrated in a vacuum to 1 mL at 35 °C. Dry the concentrated liquid by N_2, and dissolve the residue by 1 mL MeOH. Use HPLC or GC / MS to analyze.

5. GC / MS Method

Column: DM-5MS 30 m x 0.25 mm x 0.25 μm (Cat#8221)
Injection: Splitless, 250 °C
Sample: Aromatic amines, 1 μL
Carrier gas: He (> 99.999%)
Flow rate: 0.6 mL/min,
Temperature program: 50 °C (0.5 min) to 150 °C at 20 °C/min (hold 8 min) to 230 °C at 20 °C/min (hold 20 min) to 260 °C at 20 °C/min (hold 5 min)
MS Condition
Interface temperature: 270 °C, Scan range: 35 - 350 amu, Ionizaion: EI @ 70 eV



1. *o*-Toluidine
2. 2,4-Dimethylaniline
3. *o*-Anisidine
4. 4-Chloroaniline
5. 2-Methoxy-5-methylaniline
6. 2,4,5-Trimethylaniline
7. 4-Chloro-2-methylaniline
8. 2,4-Diaminotoluene
9. 2, 4-Diaminoanisole
10. 2-Aminonaphthalene
11. 4-Aminobiphenyl
12. 4,4'-Oxydianiline
13. Benzidine
14. 4,4'-Methylenedianiline
15. 3,3'-Dimethyl-4,4'-diaminodiphenylmethane
16. 3,3'-Dimethoxybenzidine
17. 4,4'-Thiodianiline
18. 3,3'-Dichlorobenzidine
19. 3,3'-Dimethoxybenzidine

ProMax™ Syringe Filters

- Broad range of membrane types
- HPLC / GC sample and solvent filtration
- Standard Luer lock
- Ultra-clean polypropylene housing, low dissolution, for trace analysis
- Low residual volume
- Convenient, cost-effective

Particulates can damage expensive equipment, valves, columns and pumps. They can also lead to erratic analytical results. Pre-filtering samples prior to analysis is critical in preventing column and frit blockage, undue wear on valve seals, and abnormally high operating pressures.

ProMax™ syringe filters are designed for economical, rapid filtration of almost any solution prior to analysis. The housing attaches to any standard Luer lock syringe, so the sample can be pushed through the membrane under pressure. The resulting eluent is free from particulates and ready for use in HPLC, GC or other analytical techniques.

ProMax™ syringe filters are available in a broad range of pore sizes and membrane types. All are non-sterile. Filters made with 13 mm or 25 mm membranes are suitable for use with samples of 1 mL or greater. All filters are available in CA, NY, PVDF, PES, GF or PTFE membranes.

ProMax™ Syringe Filters Specifications

Diameter (mm)	4	13	25	33
Filter area (cm^2)	0.1	0.65	3.9	4.6
Mass Capacity (mL)	≤ 1	1 - 10	10 - 100	10 - 200
Residual volume (μL)	< 10	< 25	< 100	< 125
Max pressure (psig)	75	100	100	75
Max temperature (°C)	50	50	50	50
Material	Medical grade polypropylene; Standard Luer lock			

ProMax™ Filter Membrane Selection Guide

Membrane Type	Application
Cellulose Acetate (CA)	Hydrophilic membrane, uniform pore size, high porosity, small resistance, fast filtration rate, minimal adsorption. Mainly used to filter particles and bacteria in biological and water-soluble samples
Nylon (NY)	For general sample and solvent filtration. Nylon has inherent hydrophilic characteristics and works well with aqueous as well as most solvent-based samples. Nylon is excellent for most HPLC and GC sample and solvent preparations
Polysulfone and Polyvinylidene Difluoride (PVDF) - Not Sterilization	Hydrophobic membrane, exhibits very low protein binding. It can be used for general biological sample filtration. PVDF is especially useful in HPLC sample preparation and is highly resistant to most solvents. Polysulfone has very limited resistance to solvents and is generally used for aqueous-based biological samples. This membrane exhibits good flow rate characteristics
Polyethersulfone (PES)	PES hydrophilic membrane with fast flow, high-throughput characteristics, and ultra-low protein binding. It is ideally suited for use in life sciences applications. Recommended for filtering critical biological samples, tissue culture media, additives, and buffers. Ideal for hard-to-filter solutions. Use mainly with aqueous solutions
Polytetrafluoroethylene (PTFE)	An inherently hydrophobic membrane that is good for filtration of organic-based, highly acidic or basic sample and solvents. Widely used for chromatography, and for clarification of non-aqueous samples. Although this membrane is hydrophobic, it can be made hydrophilic by wetting the membrane with alcohol and then flushing with de-ionized water
Glass Fiber (GF)	For general sample and solvent filtration, pore size 10 μm, use for removing larger particulates or filtration of high viscosity sample. Compared with the standard membrane, GF pre-filters can provide higher throughput

Chemical Compatibility

	Acetone	Acetonitrile	Glacial acetic acid	n-Butanol	Chloroform	1,4-Dioxan	N,N-Dimethylformamide	Dimethyl sulfoxide	Ethanol	Ethyl acetate	Ethyl ether	Freon TF	Hydrochloric acid (1N)	n-Hexane	Methanol	Dichloromethane	Methyl ethyl ketone	N-Methylpyrrolidinone	Isopropyl alcohol	Sodium hydroxide (5N)	Tetrahydrofuran	THF / water (50 / 50)	Toluene	Water
Syringe Filter																								
CA	NR	NR	R	R	NR	NR	NR	NR	R	NR	R	NR	NR	R	R	NR	NR	NR	R	LR	NR	NR	NR	R
NY	R*	R	R	R	NR	R	R*	R*	R	R*	NR	R	R	R	R	NR	R*	R*	R	R	NR	LR	R*	R
PVDF	R	NR	NR	R	NR	NR	LR	R	R	NR	NR	R	NR	R	R	NR	R	R	R	NR	R	R	R	R
PES	LR	R	R	R	LR	LR	R	R	R	R	R	R	R	R	R	LR	R	R	-	-	LR	R	R	R
PTFE	R*	R	R	R	R	R	R*	R*	R	R*	R	R	R	R	R	R	R*	R*	R	LR	R	R	R*	R
Membrane																								
NY	R	R	NR	R	NR	R	R	R	R	R	R	LR	NR	R	LR	NR	NR	R	R	R	R	R	NR	R
PTFE	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R

R = Resistant LR = Limited Resistant NR = NOT Resistant *UV absorbance was set at 254 nm

ProMax™ Syringe Filter Ordering Information

Type	Porosity (μm)	Qty	4 mm < 1 mL Sample Volume	Price	13 mm 1 - 10 mL Sample Volume	Price	25 mm 10 - 100 mL Sample Volume	Price
ProMax™ NY	0.22	100/pk	30021	$115	37177	$105	37184	$125
	0.45	100/pk	30022	115	37180	105	37187	125
ProMax™ PTFE	0.22	100/pk	30023	115	37178	105	37185	125
	0.45	100/pk	30024	115	37182	105	37192	125
ProMax™ CA	0.22	100/pk	-	-	30009	105	30011	125
	0.45	100/pk	-	-	30010	105	30012	125
ProMax™ PVDF	0.22	100/pk	-	-	30013	105	30015	125
	0.45	100/pk	-	-	30014	105	30016	125
ProMax™ PES	0.22	100/pk	-	-	30017	105	30019	125
	0.45	100/pk	-	-	30018	105	30020	125

33 mm ProMax™ Syringe Filters

- Large membrane surface area for increased flow rate
- Lower operating pressure, easy for filtering
- Low retention volume
- Low dissolution, lower interference

Type	Porosity (μm)	Qty	33 mm 10 - 200 mL Sample Volume	Price
ProMax™ NY	0.22	50/pk	30026	$84
	0.45	50/pk	30027	84
ProMax™ PTFE	0.22	50/pk	30028	84
	0.45	50/pk	30029	84

2-in-1 Filters

2-in-1 Filters have a two-layered filter in a single housing: the glass fiber pre-filter membrane (1 μm) removes larger particulates and the 0.45 μm membrane performs fine filtration. Compared with standard membrane, this combination can provide greater capacity, especially for filtering of dirty, viscous, or high concentration samples.

Type	Porosity (μm)	Qty	25 mm 10 - 100 mL Sample Volume	Price
ProMax™ GF / NY	0.45	100/pk	54839	$210
ProMax™ GF / PTFE	0.45	100/pk	54840	210
ProMax™ GF / CA	0.45	100/pk	54838	210

2 mL Autosampler Vials

Dikma 2 mL Wide Opening Screw Thread Vials (12 x 32 mm, 9 mm)

- Superior thread design provides a more secure seal to the closure
- 40% larger neck opening versus standard opening screw top vials improve sample accessibility
- Uniformly flat bottom with insert for security
- Write-on patches with graduations at 0.5, 1.0, and 1.5 mL
- Pre-assembled cap and septa, convenient and direct use
- Compatible with most of HPLC / GC autosamplers

2 mL Screw Thread Vials

Desription	Qty	Cat. No.	Price
Clear	100/pk	5320	$16
Clear, with label	100/pk	5321	18
Amber	100/pk	5322	20
Amber, with label	100/pk	5323	22

Screw Cap with Septa for 2 mL Screw Thread Vials

- Cap manufactured from polypropylene
- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Choice of liner

Desription	Qty	Cat. No.	Price
Screw cap, blue, open top, with PTFE / Red rubber septa	100/pk	5324	$18
Screw cap, blue, open top, with PTFE / White silicone septa	100/pk	5325	21
Screw cap, blue, open top, with PTFE / Silicone / PTFE septa	100/pk	5326	24
Screw cap, blue, open top, with Pre-slit PTFE / Silicone septa	100/pk	5327	25
Screw cap, blue, open top, with PTFE / ULB silicone septa	100/pk	5328	28
Screw cap, blue, open top, with Pre-slit PTFE / ULB silicone septa	100/pk	5329	29

Septum Selection Guide

Septum Material	Specification	Temperature
PTFE / Red Rubber	The most popular and economical choice for general gas chromatography applications. These septa are used primarily for routine analysis in gas chromatography. They offer moderate resealing ability, but are not recommended for multiple injections or storage of samples	-40 - 110 °C
PTFE / Silicone	Good for multiple injections or storage of samples due to its excellent resealing capabilities. The white silicone is soft and more easily punctured, and protects the needle in an autosampler accordingly	-60 - 200 °C
PTFE / Silicone Slit	Same as above, with an additional slit in the center providing easier needle puncture, especially for large diameter and blunt tip needles. However, this will result in evaporation of volatile organic solvents, and is thus not recommended for storage of samples	-60 - 200 °C
PTFE / Silicone / PTFE	Recommended for the most critical applications such as ultra trace analysis or where there is a longer period between injections or for internal standard methods	-60 - 200 °C
PTFE / ULB Silicone	Excellent chemical inertness and ultra-low bleed, the interference of a low baseline will make it much more suitable for highly sensitive detectors such as MSDs	-60 - 200 °C
PTFE / ULB Silicone Slit	Same as above, with an additional slit in the center providing easier needle puncture, especially for large diameter and blunt tip needles. However, this will result in evaporation of volatile organic solvents, and is thus not recommended for storage of samples	-60 - 200 °C

Dikma 2 mL Wide Opening Crimp Top Vials (12 x 32 mm, 11 mm)

- Write-on patches with graduations at 0.5, 1.0 and 1.5 mL
- Pre-assembled cap and septa, convenient and direct use
- Compatible with most of HPLC / GC autosamplers
- Uniformly flat bottom with inserts for security

2 mL Crimp Top Vials

Desription	Qty	Cat. No.	Price
Clear	100/pk	3915	$14
Clear, with label	100/pk	3916	16
Amber	100/pk	3917	18
Amber, with label	100/pk	3918	20

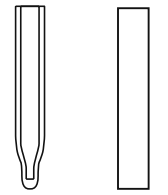
Aluminum Cap with Septa for Crimp Top Vials

Desription	Qty	Cat. No.	Price
Aluminum cap 11 mm, with PTFE / Red rubber septa	100/pk	3919	$12
Aluminum cap 11 mm, with PTFE / White silicone septa	100/pk	3920	18
Aluminum cap 11 mm, magnetic, with PTFE / White silicone septa for CTC autosamplers	100/pk	3921	22

Microvolume Inserts

For 2 mL Screw Thread Vials and 2 mL Crimp Top Vials

Desription	Qty	Cat. No.	Price
100 µL glass conical inserts, clear, 6 x 31 mm	100/pk	3972	$38
100 µL glass conical inserts, clear, 5.7 x 29 mm, with polyspring	100/pk	3973	80
300 µL glass conical inserts, clear, 5.7 x 29 mm, with polyspring	100/pk	3974	60
350 µL glass flat bottom inserts, clear, 6 x 31 mm	100/pk	52385	28



Vial Rack

For all 12 x 32 mm vials, can be cross-stacked

Desription	Qty	Cat. No.	Price
Vial rack 12 mm PP 50 holes white	1/pk	52401A	$24
Vial rack 12 mm PP 50 holes blue	1/pk	52401B	24

Compiled from our years of experience in chromatography, the application compendium contains HPLC, GC and SPE applications to help you find the solution you need.

Applications and Index

HPLC Applications Index

Industry Index

Product Index

Bio-Bond™

Endeavorsil™

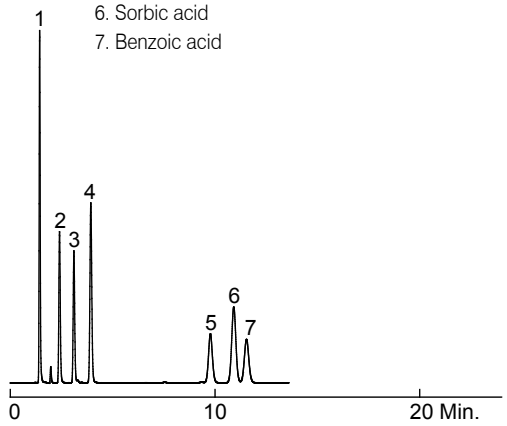
Inspire™

Leapsil™

Spursil™

Acidic Compounds

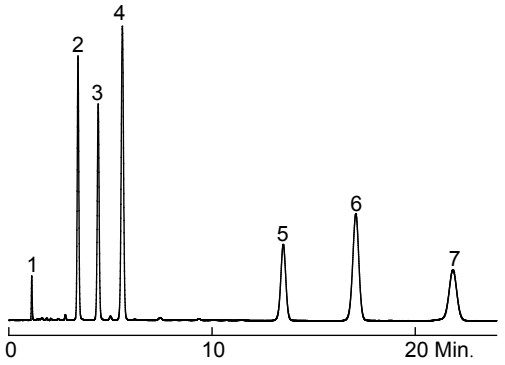
Column: Spursil™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **82001**
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 20:80
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. *L*-Ascorbic acid
2. Acetaminophen
3. *p*-Aminobenzoic acid
4. Homovanillic acid
5. Acetylsalicylic acid
6. Sorbic acid
7. Benzoic acid



AN: S1167

Acidic Compounds

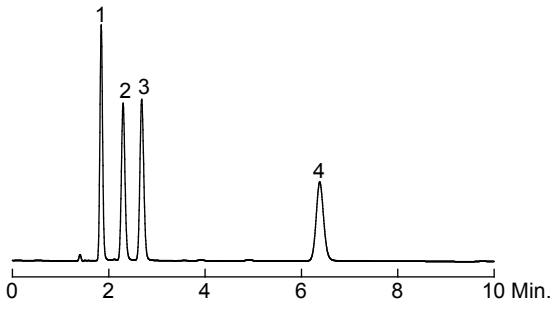
Column: Spursil™ 5 µm C18-EP, 150 x 4.6 mm
Cat. No.: **82101**
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 20:80
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. *L*-Ascorbic acid
2. Acetaminophen
3. *p*-Aminobenzoic acid
4. Homovanillic acid
5. Acetylsalicylic acid
6. Sorbic acid
7. Benzoic acid



AN: S1168

Alkaloids

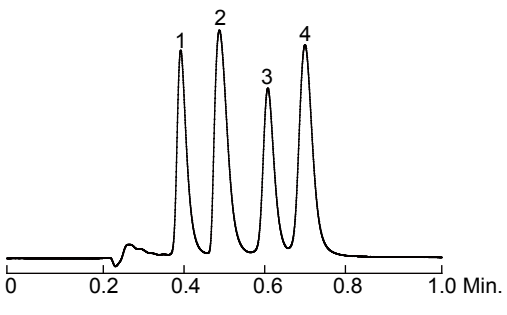
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: MeOH:20 mM KH_2PO_4 (pH 2.3) = 42:58
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Theobromine
2. Quinine
3. Hydrastine
4. Berberine



AN: I1101

Antiulcers

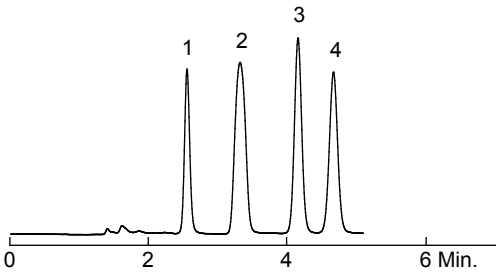
Column: Endeavorsil™ 1.8 µm C18, 50 x 2.1 mm
Cat. No.: **87002**
Mobile Phase: MeOH:10 mM CH_3COONH_4 (pH 7) = 35:65
Flow Rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV 220 nm
Sample:
1. Famotidine
2. Ranitidine
3. Cimetidine
4. Nizatidine



AN: E1101

Antiulcers

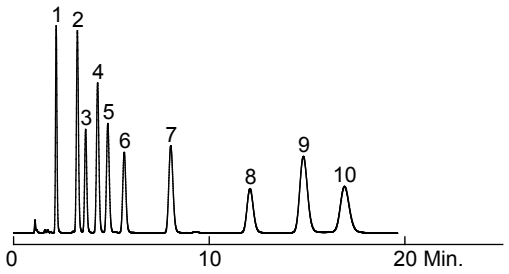
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: MeOH:10 mM CH_3COONH_4 (pH 7) = 35:65
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 220 nm
Sample:
1. Famotidine
2. Ranitidine
3. Cimetidine
4. Nizatidine



AN: I1102

Antibacterials

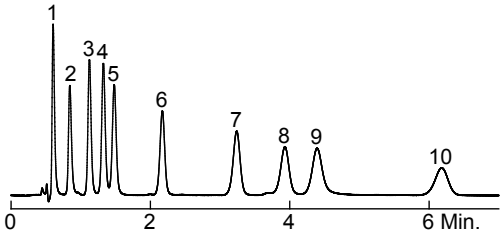
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 20:80
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Sulfanilamide
2. Carbadox
3. Sulfapyridine
4. Sulfamerazine
5. Thiamphenicol
6. Sulfamethoxypyridazine
7. Furazolidone
8. Sulfamethoxazole
9. Sulfisoxazole
10. Oxolinic acid



AN: I1103

Antibacterials

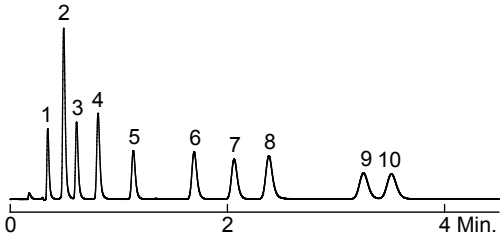
Column: Leapsil™ 2.7 µm C18, 50 x 2.1 mm
Cat. No.: **86004**
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 20:80
Flow Rate: 0.3 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Sulfanilamide
2. Carbadox
3. Sulfamerazine
4. Sulfamethazine
5. Sulfamethoxypyridazine
6. Furazolidone
7. Sulfamethoxazole
8. Sulfisoxazole
9. Oxolinic acid
10. Sulfadimethoxine



AN: L1112

Antibacterials

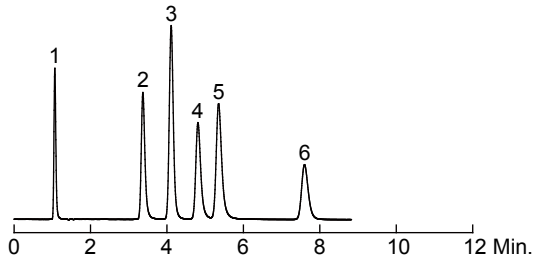
Column: Endeavorsil™ 1.8 µm C18, 50 x 2.1 mm
Cat. No.: **87002**
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 20:80
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Sulfanilamide
2. Carbadox
3. Sulfamerazine
4. Sulfamethoxypyridazine
5. Furazolidone
6. Sulfamethoxazole
7. Sulfisoxazole
8. Oxolinic acid
9. Sulfadimethoxine
10. Sulfaquinoxaline



AN: E1102

Antihistamines

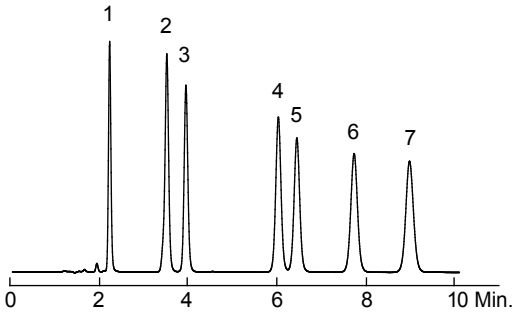
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: MeOH:5 mM NH_4HCO_3 (pH 10) = 75:25
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Maleic acid
2. Pheniramine
3. Doxylamine
4. Chlorpheniramine
5. Brompheniramine
6. Diphenhydramine



AN: I1104

Anti-inflammatories

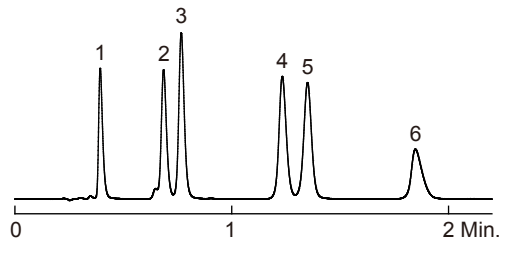
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 55:45
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Phenacetin
2. Tolmetin
3. Ketoprofen
4. Fenoprofen
5. Flurbiprofen
6. Diclofenac
7. Ibuprofen



AN: I1105

Anti-inflammatories

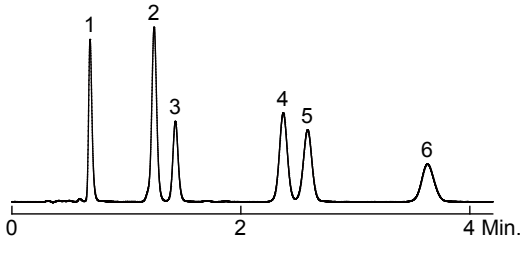
Column: Endeavorsil™ 1.8 µm C18, 50 x 2.1 mm
Cat. No.: **87002**
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 50:50
Flow Rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample:
1. Phenacetin
2. Tolmetin
3. Ketoprofen
4. Fenoprofen
5. Flurbiprofen
6. Ibuprofen



AN: E1103

Anti-inflammatories

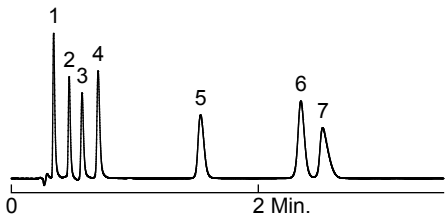
Column: Leapsil™ 2.7 µm C18, 50 x 2.1 mm
Cat. No.: **86004**
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 50:50
Flow Rate: 0.3 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Phenacetin
2. Tolmetin
3. Ketoprofen
4. Fenoprofen
5. Flurbiprofen
6. Ibuprofen



AN: L1102

β-Blockers at Low pH

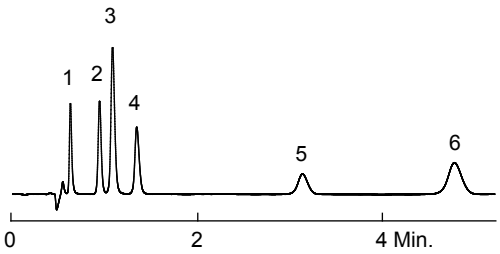
Column: Endeavorsil™ 1.8 μm C18, 50 x 2.1 mm
Cat. No.: **87002**
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 25:75
Flow Rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV 220 nm
Sample:
1. Nadolol
2. Pindolol
3. Acebutolol
4. Metoprolol
5. Labetolol
6. Propranolol
7. Alprenolol



AN: E1104

β-Blockers at Low pH

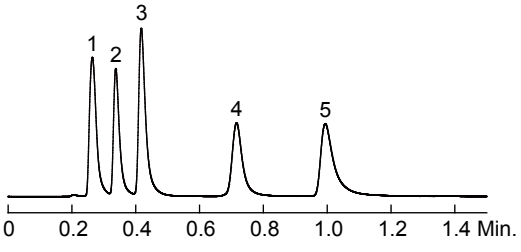
Column: Leapsil™ 2.7 μm C18, 50 x 2.1 mm
Cat. No.: **86004**
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 25:75
Flow Rate: 0.3 mL/min
Temperature: 30 °C
Detection: UV 220 nm
Sample:
1. Nadolol
2. Pindolol
3. Acebutolol
4. Metoprolol
5. Labetolol
6. Propranolol



AN: L1103

β-Blockers at Neutral pH

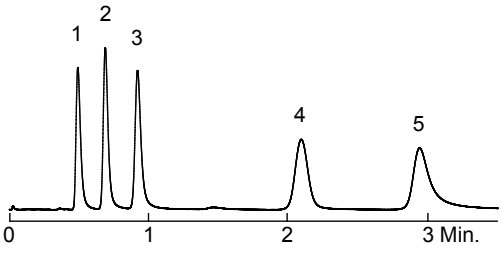
Column: Endeavorsil™ 1.8 μm C18, 50 x 2.1 mm
Cat. No.: **87002**
Mobile Phase: MeCN:20 mM phosphate buffer (pH 7) = 30:70
Flow Rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV 220 nm
Sample:
1. Nadolol
2. Pindolol
3. Metoprolol
4. Labetolol
5. Propranolol



AN: E1105

β-Blockers at Neutral pH

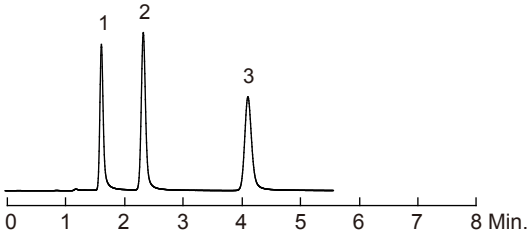
Column: Leapsil™ 2.7 μm C18, 50 x 2.1 mm
Cat. No.: **86004**
Mobile Phase: MeCN:20 mM phosphate buffer (pH 7) = 25:75
Flow Rate: 0.3 mL/min
Temperature: Ambient
Detection: UV 220 nm
Sample:
1. Nadolol
2. Pindolol
3. Metoprolol
4. Labetolol
5. Propranolol



AN: L1104

Catecholamines

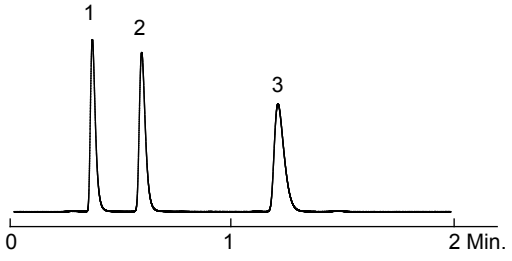
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: 20 mM KH_2PO_4, pH 7
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 270 nm
Sample: 1. Norepinephrine
2. Epinephrine
3. Dopamine



AN: I1106

Catecholamines

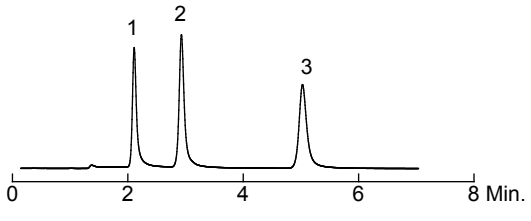
Column: Endeavorsil™ 1.8 µm C18, 50 x 2.1 mm
Cat. No.: **87002**
Mobile Phase: 0.1% TFA in H_2O
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 270 nm
Sample: 1. Norepinephrine
2. Epinephrine
3. Dopamine



AN: E1106

Catecholamines

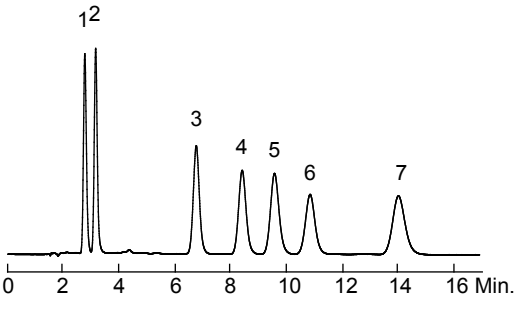
Column: Spursil™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **82001**
Mobile Phase: 20 mM KH_2PO_4, pH 7
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 270 nm
Sample: 1. Norepinephrine
2. Epinephrine
3. Dopamine



AN: S1152

Cephalosporin Antibiotics

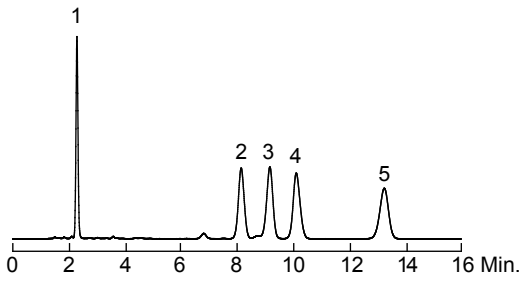
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: MeOH:0.1% TFA in H_2O = 30:70
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 230 nm
Sample: 1. Ceftazidime
2. Cefadroxil
3. Cefazoline
4. Cefaclor
5. Cephalexin
6. Cefoxitin
7. Cefradine



AN: I1123

Cephalosporin Antibiotics

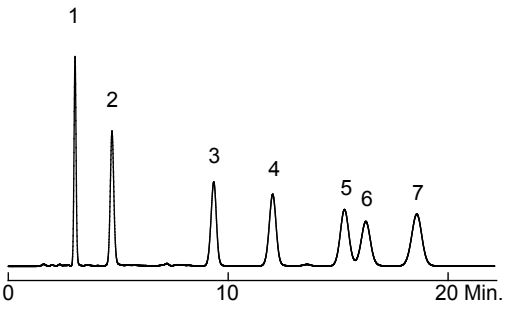
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: MeOH:100 mM acetate buffer = 20:80
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Cefadroxil
2. Cefuroxime
3. Cefaclor
4. Cefoxitin
5. Cefradine



AN: I1107

Cephalosporin Antibiotics

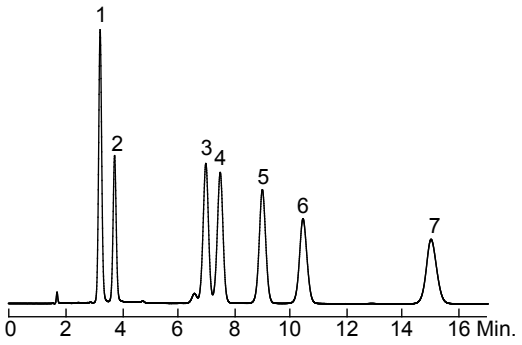
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: MeOH:25 mM phosphate buffer (pH 3) = 20:80
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 230 nm
Sample:
1. Cefadroxil
2. Ceftazidime
3. Cefaclor
4. Cephalexin
5. Cefazoline
6. Cefoxitin
7. Cefradine



AN: I1108

Cephalosporin Antibiotics

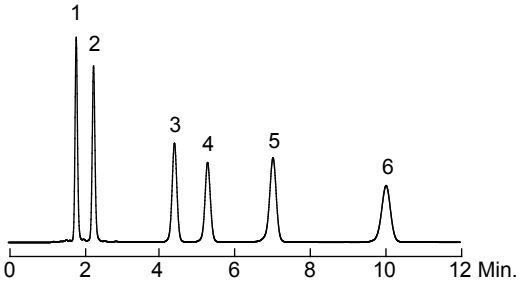
Column: Spursil™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **82001**
Mobile Phase: MeOH:0.1% TFA in H_2O = 30:70
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 230 nm
Sample:
1. Ceftazidime
2. Cefadroxil
3. Cefuroxime
4. Cefazoline
5. Cefaclor
6. Cephalexin
7. Cefradine



AN: I1127

Cephalosporin Antibiotics

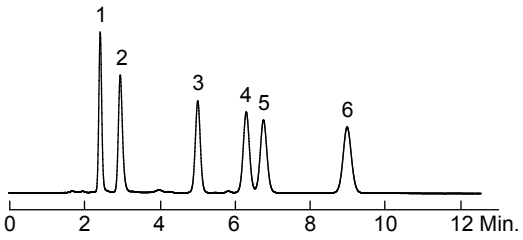
Column: Spursil™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **82001**
Mobile Phase: MeOH:100 mM acetate buffer = 20:80
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Ceftazidime
2. Cefadroxil
3. Cefuroxime
4. Cefoxitin
5. Cefaclor
6. Cefradine



AN: E1113

Cephalosporin Antibiotics

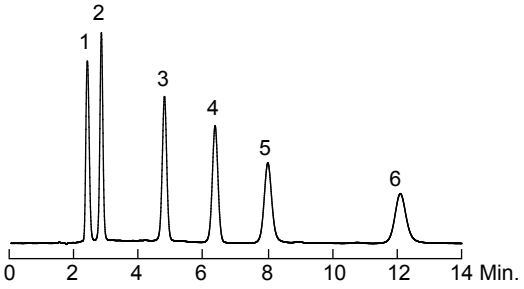
Column: Spursil™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **82001**
Mobile Phase: MeOH:25 mM phosphate buffer (pH 3) = 25:75
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 230 nm
Sample:
1. Cefadroxil
2. Ceftazidime
3. Cefaclor
4. Cephalexin
5. Cefazoline
6. Cefradine



AN: S1170

Cephalosporin Antibiotics

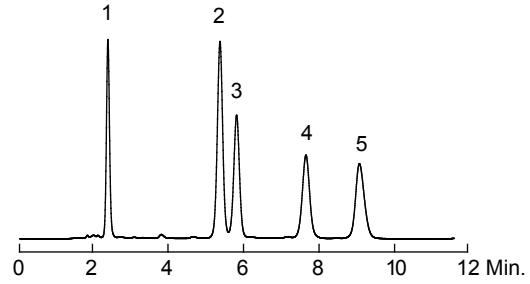
Column: Spursil™ 5 µm C18-EP, 150 x 4.6 mm
Cat. No.: **82101**
Mobile Phase: MeOH:0.1% TFA in H_2O = 30:70
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 230 nm
Sample:
1. Ceftazidime
2. Cefadroxil
3. Cephalexin
4. Cefradine
5. Cefazoline
6. Cefoxitin



AN: S1171

Cephalosporin Antibiotics

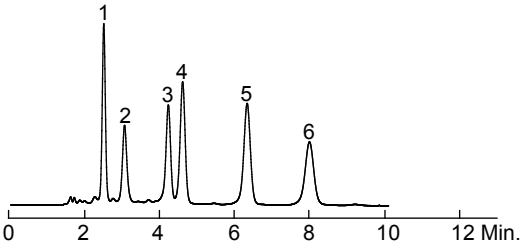
Column: Spursil™ 5 µm C18-EP, 150 x 4.6 mm
Cat. No.: **82101**
Mobile Phase: MeOH:100 mM acetate buffer = 20:80
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Ceftazidime
2. Cephalexin
3. Cefaclor
4. Cefradine
5. Cefoxitin



AN: S1172

Cephalosporin Antibiotics

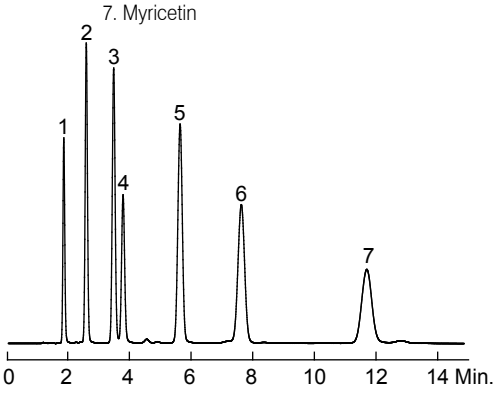
Column: Spursil™ 5 µm C18-EP, 150 x 4.6 mm
Cat. No.: **82101**
Mobile Phase: MeOH:25 mM phosphate buffer (pH 3) = 25:75
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 230 nm
Sample:
1. Cefadroxil
2. Ceftazidime
3. Cefaclor
4. Cephalexin
5. Cefradine
6. Cefazoline



AN: S1173

Flavonoids

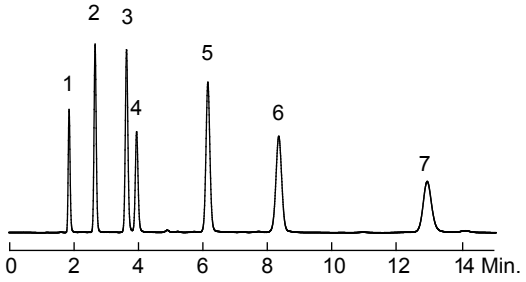
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: MeCN:0.085% H_3PO_4 = 20:80
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 280 nm
Sample: 1. Gallic acid
2. Catechin
3. Caffeic acid
4. Vanillic acid
5. *p*-Coumaric acid
6. Quercitrin
7. Myricetin



AN: I1109

Flavonoids

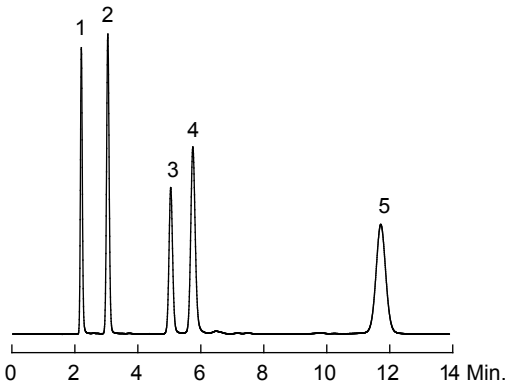
Column: Spursil™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **82001**
Mobile Phase: MeCN:0.085% H_3PO_4 = 20:80
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 280 nm
Sample: 1. Gallic acid
2. Catechin
3. Caffeic acid
4. Vanillic acid
5. *p*-Coumaric acid
6. Quercitrin
7. Myricetin



AN: S1154

Flavonoids

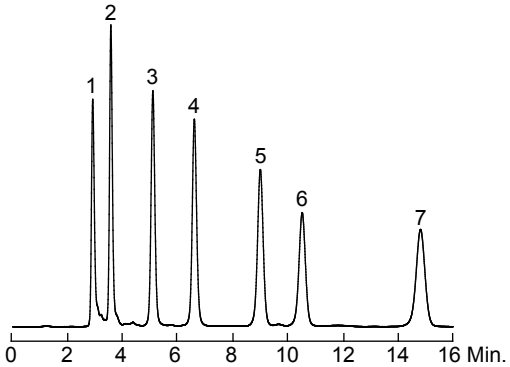
Column: Spursil™ 5 µm C18-EP, 150 x 4.6 mm
Cat. No.: **82101**
Mobile Phase: MeCN:0.085% H_3PO_4 = 25:75
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 280 nm
Sample: 1. Gallic acid
2. Catechin
3. Vanillic acid
4. Caffeic acid
5. *p*-Coumaric acid



AN: S1169

Penicillins

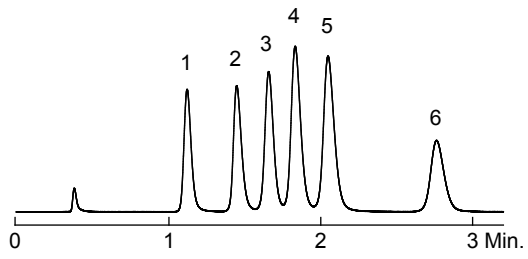
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: MeOH:25 mM KH_2PO_4 = 55:45
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 220 nm
Sample: 1. Amoxicillin
2. Ampicillin
3. Piperacilin
4. Penicillin G
5. Oxacillin
6. Cloxacillin
7. Dicloxacillin



AN: I1125

Polar Bases

Column: Leapsil™ 2.7 µm C18, 50 x 2.1 mm
Cat. No.: **86004**
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 40:60
Flow Rate: 0.3 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Doxepin
2. Protriptyline
3. Nortriptyline
4. Amitriptyline
5. Trimipramine
6. Clomipramine



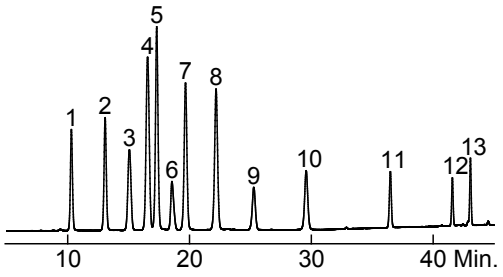
AN: L1105

Quinolones

Column: Inspire™ 5 µm C18, 250 x 4.6 mm
Cat. No.: **81006**
Mobile Phase A: MeOH
Mobile Phase B: 0.2% H_3PO_4 in H_2O
Flow Rate: 1.0 mL/min
Temperature: 35 °C
Detection: UV 254 nm

t / min.	0	25	40	42	50
A / %	22	33	65	22	22
B / %	78	67	35	78	78

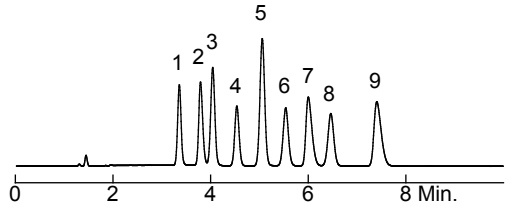
Sample:
1. Marbofloxacin
2. Ofloxacin
3. Norfloxacin
4. Enrofloxacin
5. Ciprofloxacin
6. Pazufloxacin
7. Difloxacin
8. Sarafloxacin
9. Gatifloxacin
10. Sparfloxacin
11. Oxolinic acid
12. Nalidixic acid
13. Flumequine



AN: I1124

TCAs and Benzos

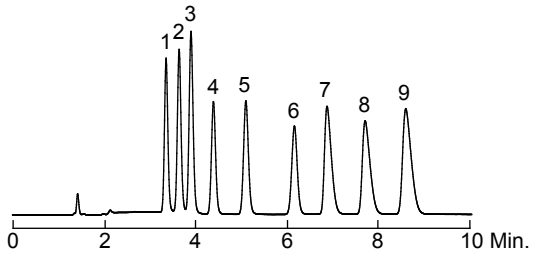
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 40:60
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Nitrozepam
2. Nordoxepin
3. Alprazolam
4. Diazepam
5. Oxazepam
6. Triazolam
7. Nortriptyline
8. Clonazepam
9. Trimipramine



AN: I1112

TCAs and Benzos

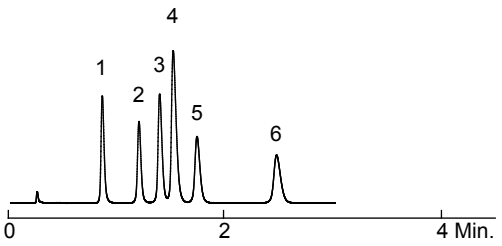
Column: Spursil™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **82001**
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 40:60
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Nitrozepam
2. Estazolam
3. Alprazolam
4. Diazepam
5. Triazolam
6. Clonazepam
7. Nortriptyline
8. Amitriptyline
9. Trimipramine



AN: S1155

TCAs at Low pH

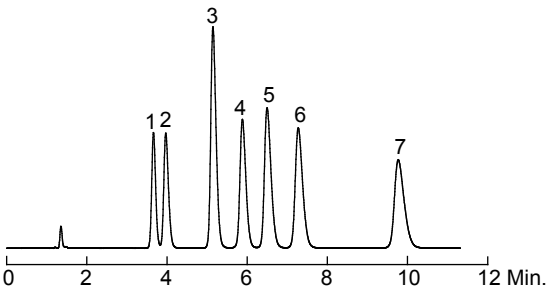
Column: Endeavorsil™ 1.8 µm C18, 50 x 2.1 mm
Cat. No.: **87002**
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 35:65
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Doxepin
2. Desipramine
3. Nortriptyline
4. Amitriptyline
5. Trimipramine
6. Clomipramine



AN: E1107

TCAs at Low pH

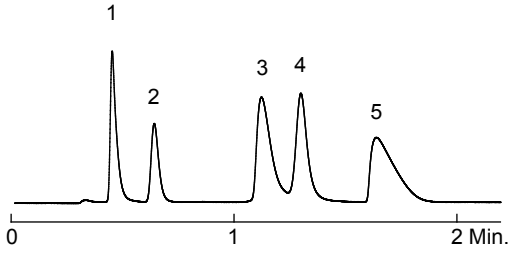
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 40:60
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Nordoxepin
2. Doxepin
3. Desipramine
4. Nortriptyline
5. Amitriptyline
6. Trimipramine
7. Clomipramine



AN: I1126

Water-Soluble Vitamins

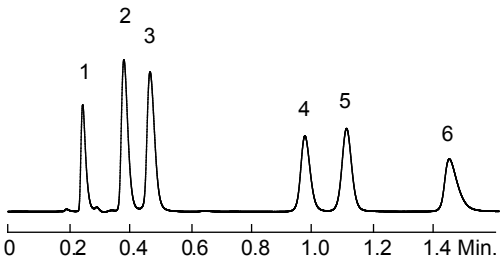
Column: Leapsil™ 2.7 µm C18, 50 x 2.1 mm
Cat. No.: **86004**
Mobile Phase: 10 mM $HCOONH_4$, pH 3
Flow Rate: 0.3 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Pyridoxamine
2. *L*-Ascorbic acid
3. Pyridoxal
4. Nicotinamide
5. Pyridoxol



AN: L1106

Acidic Compounds

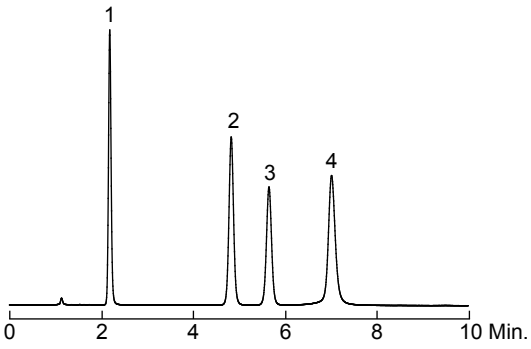
Column: Endeavorsil™ 1.8 µm C18, 50 x 2.1 mm
Cat. No.: **87002**
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 25:75
Flow Rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample: 1. *L*-Ascorbic acid
2. *p*-Aminobenzoic acid
3. Homovanillic acid
4. Acetylsalicylic acid
5. Sorbic acid
6. Salicylic acid



AN: E1108

Antifungals

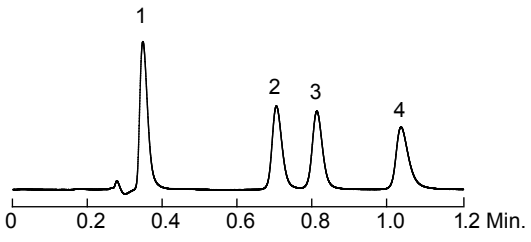
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 30:70
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. *p*-Aminobenzoic acid
2. Acetylsalicylic acid
3. Benzoic acid
4. Salicylic acid



AN: I1114

Antifungals

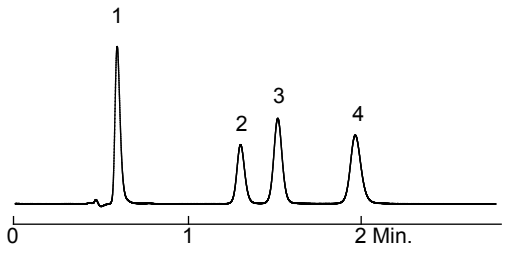
Column: Endeavorsil™ 1.8 µm C18, 50 x 2.1 mm
Cat. No.: **87002**
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 30:70
Flow Rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample: 1. *p*-Aminobenzoic acid
2. Acetylsalicylic acid
3. Benzoic acid
4. Salicylic acid



AN: E1109

Antifungals

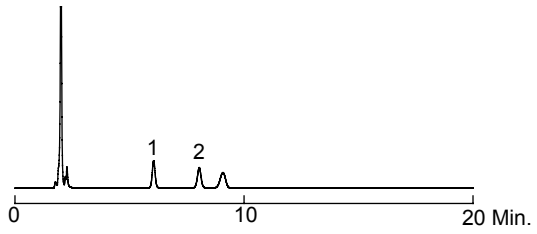
Column: Leapsil™ 2.7 µm C18, 50 x 2.1 mm
Cat. No.: **86004**
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 30:70
Flow Rate: 0.3 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample: 1. *p*-Aminobenzoic acid
2. Acetylsalicylic acid
3. Benzoic acid
4. Salicylic acid



AN: L1110

Benzoic Acid and Sorbic Acid in milk

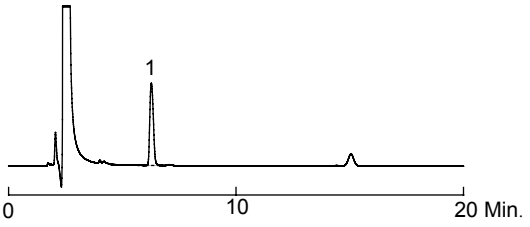
Column: Spursil™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **82006**
Mobile Phase: MeOH:phosphate buffer = 10:90
Flow Rate: 1.2 mL/min
Injection Volume: 10 µL
Temperature: 40 °C
Detection: UV 227 nm
Sample: 1. Benzoic acid
2. Sorbic acid



AN: S1156

Benzoyl Peroxide in Wheat Flour

Column: Spursil™ 5 µm C18, 250 x 4.6 mm
Cat. No.: **82006**
Mobile Phase: MeOH:20 mM acetate buffer = 10:90
Flow Rate: 1.0 mL/min
Injection Volume: 10 µL
Temperature: 30 °C
Detection: UV 230 nm
Sample: 1. Benzoyl peroxide

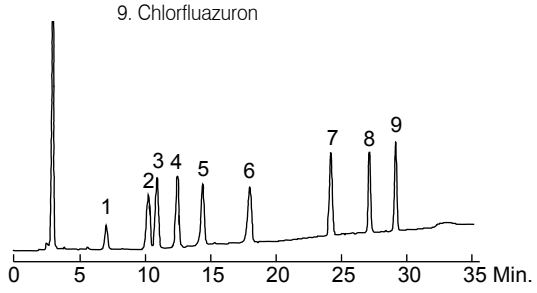


AN: S1157

Benzoylurea and Bishydrazide Mixture

Column: Inspire™ 5 µm C18, 250 x 4.6 mm
Cat. No.: **81006**
Mobile Phase A: MeOH
Mobile Phase B: H_2O
Flow Rate: 1.0 mL/min
Temperature: 30 °C
Detection: UV 248 nm
Sample: 1. Methoxyfenozide
2. Tebufenozide
3. Diflubenzuron
4. Chlorbenzuron
5. Triflumuron
6. Hexaflumuron
7. Teflubenzuron
8. Flufenoxuron
9. Chlorfluazuron

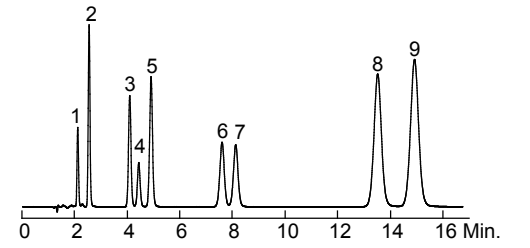
t / min.	0	5	15	30	32	40
A / %	75	75	80	95	75	75
B / %	25	25	20	5	25	25



AN: I1115

Caffeine Metabolites

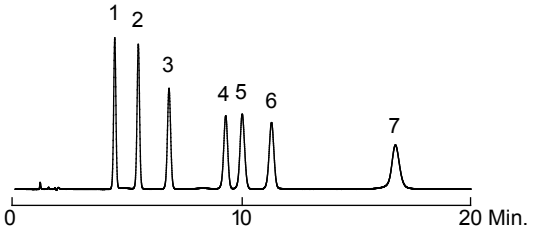
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: MeOH:1% CH_3COOH in H_2O = 10:90
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Uric acid
2. Xanthine
3. 7-Methylxanthine
4. 1-Methyluric acid
5. 3-Methylxanthine
6. 1,3-Dimethyluric acid
7. Theobromine
8. 1,7-Dimethylxanthine
9. Theophylline



AN: I1123

Catechols and Resorcinols

Column: Spursil™ 5 µm C18-EP, 150 x 4.6 mm
Cat. No.: **82101**
Mobile Phase: MeCN:0.1% HCOOH in H_2O = 25:75
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 270 nm
Sample:
1. Resorcinol
2. Catechol
3. 2-Methylresorcinol
4. 4-Methylcatechol
5. 2,5-Dimethylresorcinol
6. 3-Methylcatechol
7. 4-Nitrocatechol



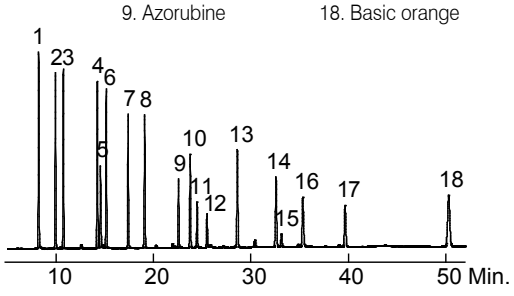
AN: S1158

Colorants

Column: Inspire™ 5 µm C18, 250 x 4.6 mm
Cat. No.: **81006**
Mobile Phase A: MeCN
Mobile Phase B: 0.05 M CH_3COONH_4
Flow Rate: 1.0 mL/min
Temperature: 35 °C
Detection: UV 254 nm

t / min.	0	20	50	52	60
A / %	5	30	50	5	5
B / %	95	70	50	95	95

Sample:
1. Tartrazine
2. Amaranth
3. Indigotin
4. Carmine
5. Brilliant black
6. Sunset yellow
7. Fancy red
8. Acid red 2G
9. Azorubine
10. Lissamine green B
11. Brilliant blue
12. Acid orange I
13. Erythrosine
14. Acid orange II
15. Patent blue V
16. Auramine
17. Acid yellow 36
18. Basic orange



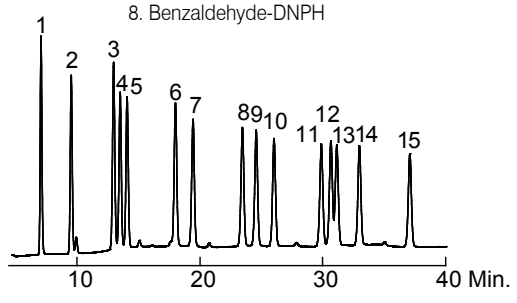
AN: I1117

Derivatized Carbonyl Compounds

Column: Inspire™ 5 µm C18, 250 x 4.6 mm
Cat. No.: **81006**
Mobile Phase A: MeOH
Mobile Phase B: H_2O
Flow Rate: 1.0 mL/min
Temperature: 35 °C
Detection: UV 360 nm
Injection Volume: 20 µL

t / min.	0	35	40	41	50
A / %	70	80	80	70	70
B / %	30	20	20	30	30

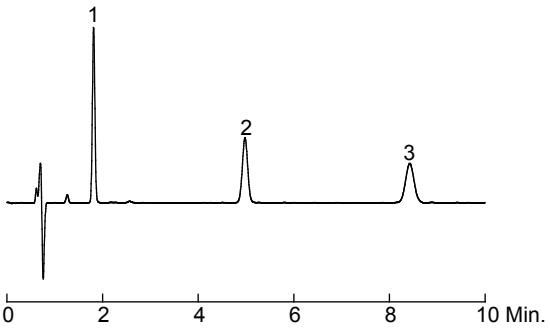
Sample:
1. Formaldehyde-DNPH
2. Acetaldehyde-DNPH
3. Acrolein-DNPH
4. Acetone-DNPH
5. Propionaldehyde-DNPH
6. Crotonaldehyde-DNPH
7. Butyraldehyde-DNPH
8. Benzaldehyde-DNPH
9. Isovaleraldehyde-DNPH
10. Valeraldehyde-DNPH
11. *o*-Tolualdehyde-DNPH
12. *m*-Tolualdehyde-DNPH
13. *p*-Tolualdehyde-DNPH
14. 2,5-Dimethylbenzaldehyde-DNPH
15. Hexaldehyde-DNPH



AN: I1118

Herbicides

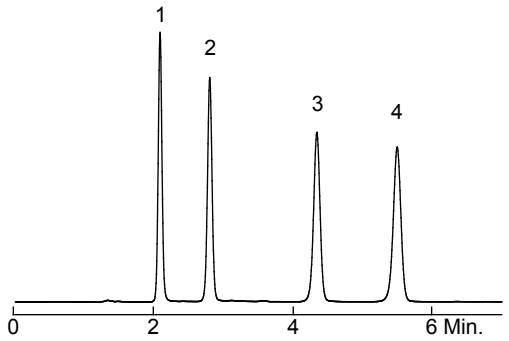
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 40:60
Flow Rate: 2.0 mL/min
Temperature: Ambient
Detection: UV 214 nm
Sample:
1. Dalapon
2. 2,4-D
3. 2,4,5-T



AN: I1119

Herbicides

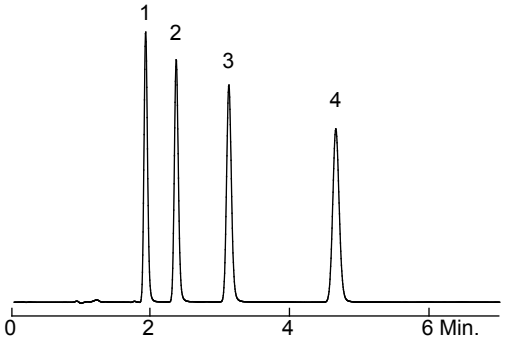
Column: Spursil™ 5 µm C18-EP, 150 x 4.6 mm
Cat. No.: **82101**
Mobile Phase: MeCN:H_2O = 60:40
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 214 nm
Sample: 1. Fenuron
2. Monuron
3. Diuron
4. Linuron



AN: S1159

Herbicides

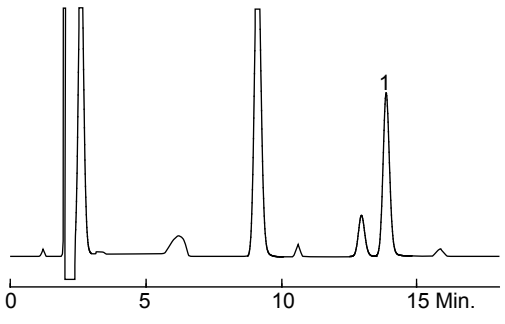
Column: Spursil™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **82001**
Mobile Phase: MeCN:H_2O = 60:40
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 214 nm
Sample: 1. Fenuron
2. Monuron
3. Diuron
4. Linuron



AN: S1160

Melamine

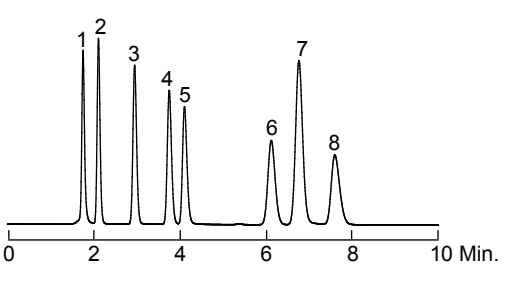
Column: Inspire™ 5 µm C18, 250 x 4.6 mm
Cat. No.: **81006**
Mobile Phase: MeCN:Buffer = 8:92
Flow Rate: 1.0 mL/min
Temperature: 30 °C
Detection: UV 214 nm
Sample: 1. Melamine



AN: I1110

Organic Acids

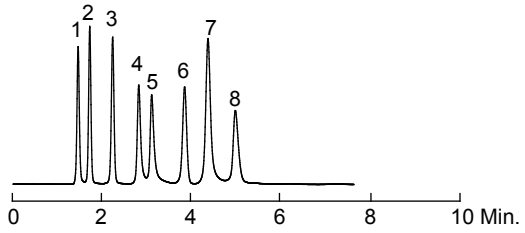
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: 25 mM KH_2PO_4, pH 2.5
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 210 nm
Sample: 1. Oxalic acid
2. Tartaric acid
3. Malic acid
4. Lactic acid
5. Acetic acid
6. Citric acid
7. Fumaric acid
8. Succinic acid



AN: I1112

Organic Acids

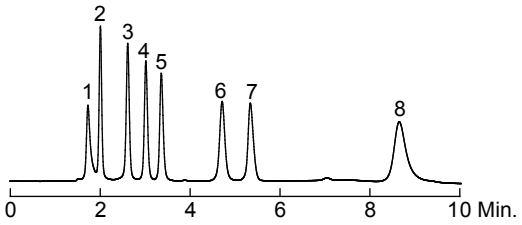
Column: Spursil™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **82001**
Mobile Phase: 25 mM KH_2PO_4, pH 2.5
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 210 nm
Sample:
1. Oxalic acid
2. Tartaric acid
3. Malic acid
4. Lactic acid
5. Acetic acid
6. Citric acid
7. Fumaric acid
8. Succinic acid



AN: S1161

Organic Acids

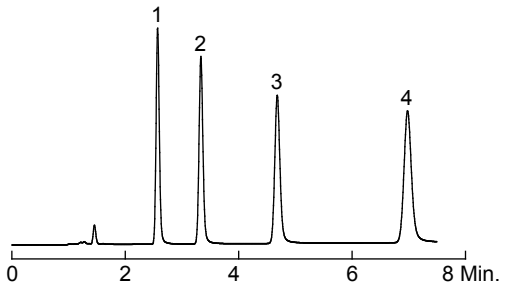
Column: Spursil™ 5 µm C18-EP, 150 x 4.6 mm
Cat. No.: **82101**
Mobile Phase: 25 mM KH_2PO_4, pH 2.5
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 210 nm
Sample:
1. Oxalic acid
2. Tartaric acid
3. Malic acid
4. Lactic acid
5. Acetic acid
6. Citric acid
7. Succinic acid
8. Fumaric acid



AN: S1162

Parabens

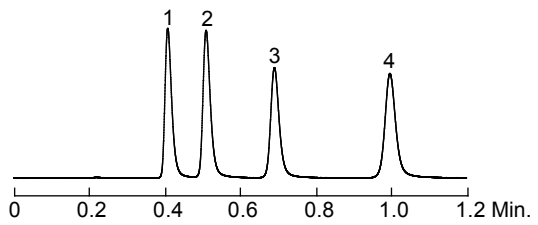
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: MeCN:20 mM K_2HPO_4 (pH 7) = 50:50
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:
1. Methyl paraben
2. Ethyl paraben
3. Propyl paraben
4. Butyl paraben



AN: I1113

Parabens

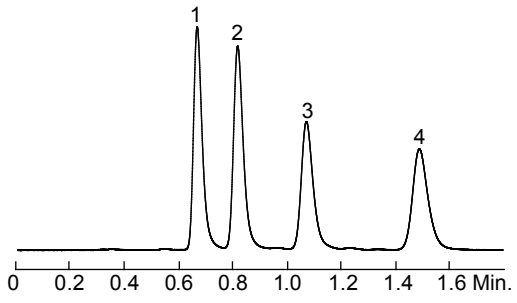
Column: Endeavorsil™ 1.8 µm C18, 50 x 2.1 mm
Cat. No.: **87002**
Mobile Phase: MeCN:20 mM K_2HPO_4 (pH 7) = 50:50
Flow Rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample:
1. Methyl paraben
2. Ethyl paraben
3. Propyl paraben
4. Butyl paraben



AN: E1110

Parabens

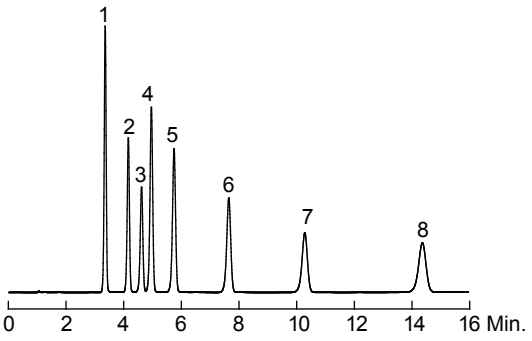
Column: Leapsil™ 2.7 µm C18, 50 x 2.1 mm
Cat. No.: **86004**
Mobile Phase: MeCN:20 mM K_2HPO_4 (pH 7) = 55:45
Flow Rate: 0.3 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample: 1. Methyl paraben
2. Ethyl paraben
3. Propyl paraben
4. Butyl paraben



AN: L1108

Phenols

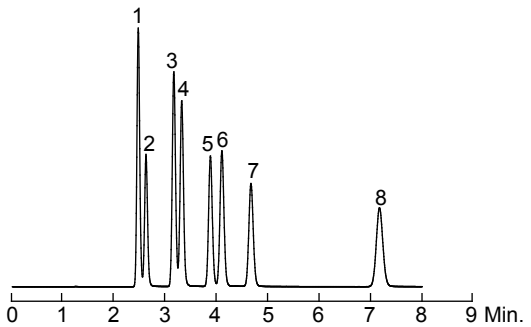
Column: Spursil™ 5 µm C18-EP, 150 x 4.6 mm
Cat. No.: **82101**
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 55:45
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 280 nm
Sample: 1. Phenol
2. 2-Nitrophenol
3. 4-Nitrophenol
4. 2-Chlorophenol
5. 4-Chlorophenol
6. 4-Chloro-3-methylphenol
7. 2,4-Dichlorophenol
8. 2,4,6-Trichlorophenol



AN: S1163

Phenols

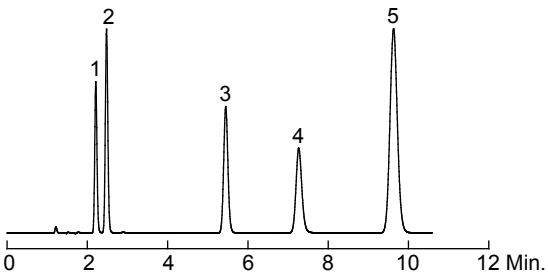
Column: Spursil™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **82001**
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 55:45
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 280 nm
Sample: 1. Phenol
2. 4-Nitrophenol
3. 2-Chlorophenol
4. 4-Chlorophenol
5. 2-Nitrophenol
6. 4-Chloro-3-methylphenol
7. 2,4-Dichlorophenol
8. 2,4,6-Trichlorophenol



AN: S1174

Polar Acids

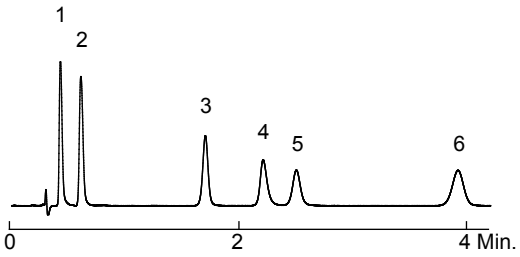
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 30:70
Flow Rate: 0.3 mL/min
Detection: UV 254 nm
Sample: 1. *p*-Aminobenzoic acid
2. Homovanillic acid
3. Sorbic acid
4. *p*-Nitrobenzoic acid
5. *p*-Toluic acid



AN: I1125

Polar Acids

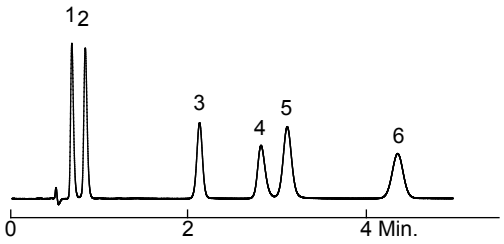
Column: Endeavorsil™ 1.8 µm C18, 50 x 2.1 mm
Cat. No.: **87002**
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 20:80
Flow Rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample:
1. *p*-Aminobenzoic acid
2. Homovanillic acid
3. Sorbic acid
4. Salicylic acid
5. *p*-Chlorobenzoic acid
6. *p*-Nitrobenzoic acid



AN: E1111

Polar Acids

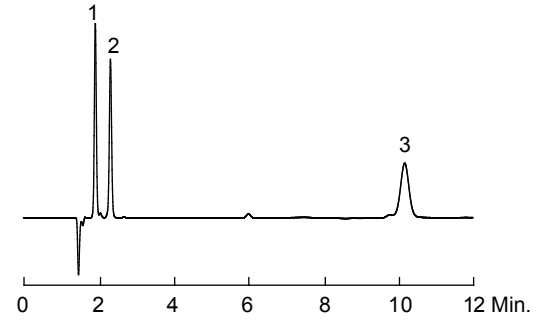
Column: Leapsil™ 2.7 µm C18, 50 x 2.1 mm
Cat. No.: **86004**
Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H_2O = 25:75
Flow Rate: 0.3 mL/min
Detection: UV 254 nm
Sample:
1. *p*-Aminobenzoic acid
2. Homovanillic acid
3. Sorbic acid
4. Salicylic acid
5. *p*-Nitrobenzoic acid
6. *p*-Toluic acid



AN: L1109

Sweeteners

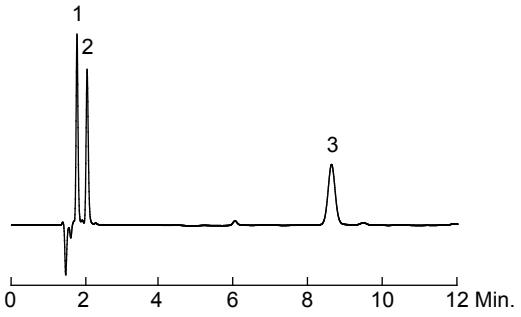
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: MeOH:20 mM CH_3COONH_4 (pH 5) = 30:70
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 210 nm
Sample:
1. Acesulfame K
2. Sodium saccharin
3. Aspartame



AN: I1120

Sweeteners

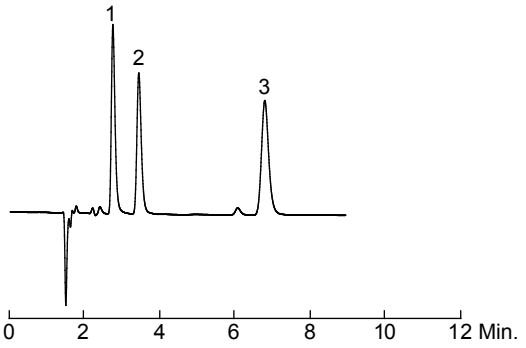
Column: Spursil™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **82001**
Mobile Phase: MeOH:20 mM CH_3COONH_4 (pH 5) = 30:70
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 210 nm
Sample:
1. Acesulfame K
2. Sodium saccharin
3. Aspartame



AN: S1164

Sweeteners

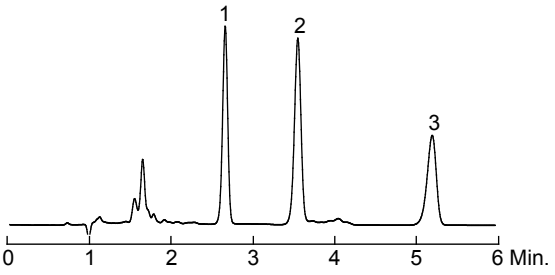
Column: Spursil™ 5 µm C18-EP, 150 x 4.6 mm
Cat. No.: **82101**
Mobile Phase: MeOH:20 mM CH_3COONH_4 (pH 5) = 30:70
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 210 nm
Sample: 1. Acesulfame K
2. Sodium saccharin
3. Aspartame



AN: S1165

Unsaturated Fatty Acids

Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H_2O = 95:5
Flow Rate: 1.5 mL/min
Temperature: Ambient
Detection: UV 214 nm
Sample: 1. Linolenic acid
2. Linoleic acid
3. Oleic acid

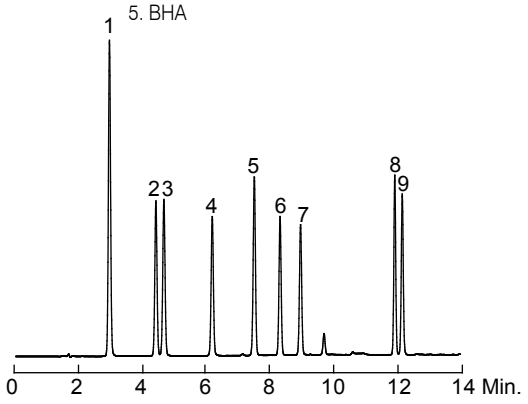


AN: I1121

Antioxidants

Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase A: 5% CH_3COOH in H_2O
Mobile Phase B: MeCN:MeOH = 50:50
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 280 nm
Sample: 1. Propyl gallate
2. TBHQ
3. THBP
4. NDGA
5. BHA
6. Ionox 100
7. Octyl gallate
8. BHT
9. Lauryl gallate

t / min.	0	10
A / %	50	0
B / %	50	100

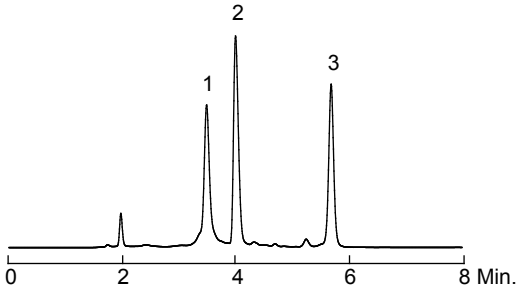


AN: I1122

Proteins

Column: Bio-Bond™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **84001**
Mobile Phase A: 0.1% TFA in H_2O
Mobile Phase B: 0.1% TFA in MeCN
Flow Rate: 1.0 mL/min
Detection: UV 280 nm
Sample: 1. Cytochrome C
2. Insulin
3. Lysozymes

t / min.	0	10
A / %	70	50
B / %	30	50



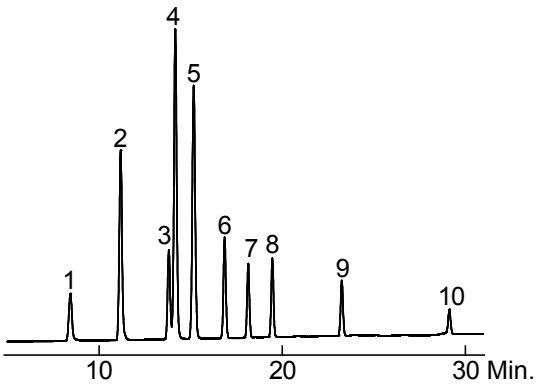
AN: B1101

Others

Phenols

Column: Spursil™ 5 μm C18-EP, 150 x 4.6 mm
Cat. No.: **82101**
Mobile Phase: MeCN:0.1% HCOOH in H_2O = 25:75
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 270 nm
Sample:

1. Phenol
2. 4-Nitrophenol
3. 2-Chlorophenol
4. 2,4-Dinitrophenol
5. 2-Nitrophenol
6. 2,4-Dimethylphenol
7. 4-Chloro-3-methylphenol
8. 2,4-Dichlorophenol
9. 2,4,6-Trichlorophenol
10. Pentachlorophenol

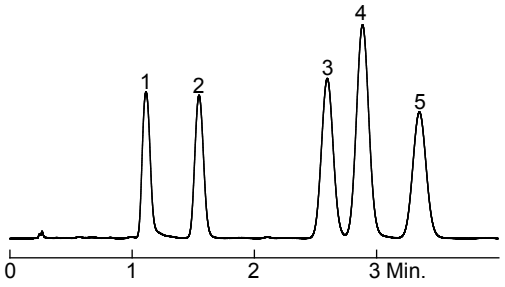


AN: S1166

Steroids

Column: Endeavorsil™ 1.8 μm C18, 50 x 2.1 mm
Cat. No.: **87002**
Mobile Phase: MeOH:H_2O = 50:50
Flow Rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample:

1. Prednisone
2. Prednisolone
3. Dexamethasone
4. Hydrocortisone 21-acetate
5. 11-α-Hydroprogesterone

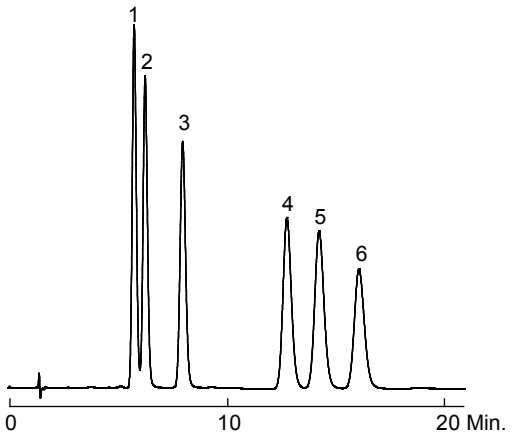


AN: E1112

Steroids

Column: Inspire™ 5 μm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: MeOH:H_2O = 55:45
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample:

1. Prednisone
2. Cortisone
3. Prednisolone
4. Dexamethasone
5. Hydrocortisone 21-acetate
6. 11-α-Hydroxyprogesterone



AN: I1123

Industry Index

Product Index

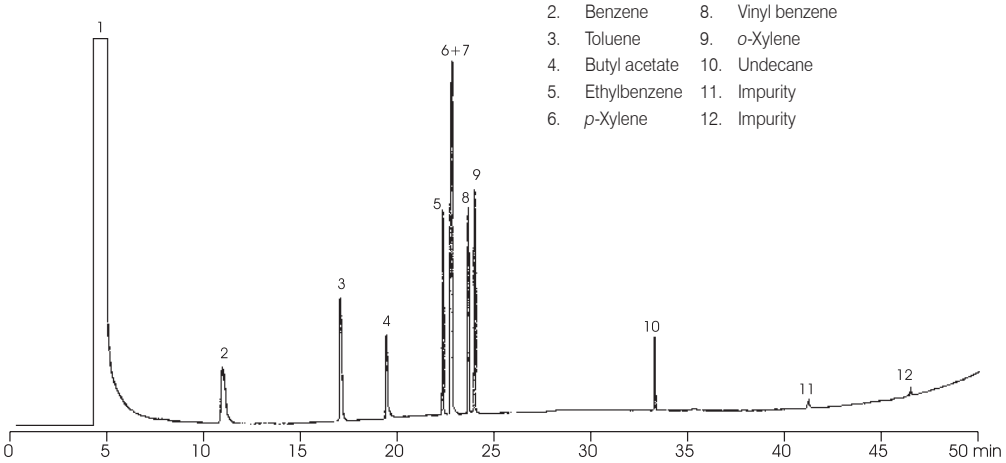
GC Applications Index

Volatiles

TVOCs

Column:	DM-TVOC, 50 m x 0.32 mm x 1.00 μm
Cat. No.:	**7831**
Index:	CEO00010
Carrier Gas:	N_2
Oven Temp.:	50 °C (hold 10 min) to 250 °C at 5 °C/min
Injection:	Split, 10:1, 250 °C 1 μL
Detector:	FID, 250 °C

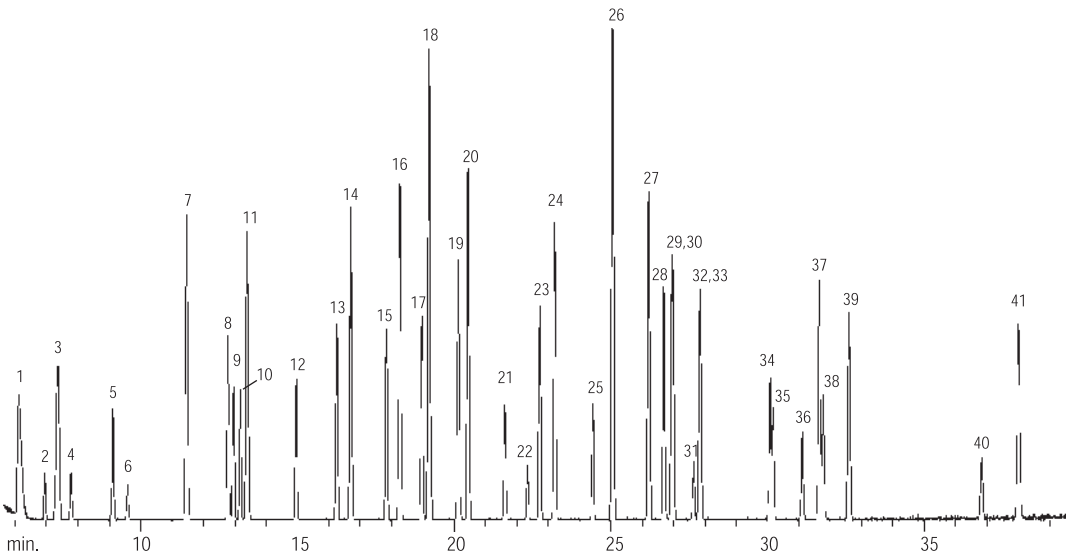
1. Methanol
2. Benzene
3. Toluene
4. Butyl acetate
5. Ethylbenzene
6. *p*-Xylene
7. *m*-Xylene
8. Vinyl benzene
9. *o*-Xylene
10. Undecane
11. Impurity
12. Impurity



Air Sample: TO-14

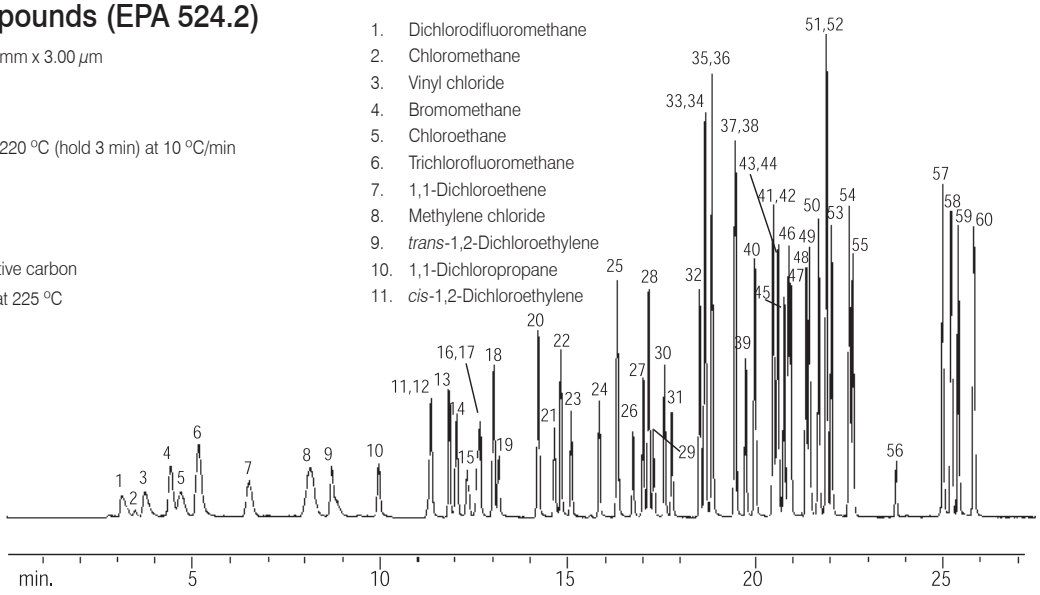
Column:	DM-1, 60 m x 0.32 mm x 3.00 μm
Cat. No.:	**7142**
Index:	CER00018
Oven Temp.:	30 °C (hold 4 min) to 250 °C (hold 15 min) at 7 °C/min
Carrier Gas:	He, 21 cm/sec, 30 °C
Detector:	MS, 250 °C
Ionization:	EI
Scan Range:	34-280 AMU
Cryotrap Temp.:	-160 °C
Cryotrap Desorb Temp.:	150 °C

1. Dichlorodifluoromethane
2. Chloromethane
3. 1,2- Dichlorotetrafluoroethane
4. Vinyl chloride
5. Bromomethane
6. Chloroethane
7. Trichlorofluoromethane
8. 1,1-Dichloroethene
9. Methylene chloride
10. 3-Chloropropene
11. 1,1,2-Trichloro-1,2,2-trifluoroethane
12. 1,1-Dichloroethane
13. *cis*-1,2-Dichloroethene
14. Chloroform
15. 1,2-Dichloroethane
16. 1,1,1-Trichloroethane
17. Benzene
18. Carbon tetrachloride
19. 1,2-Dichloropropane
20. Trichloroethylene
21. *cis*-1,3-Dichloropropene
22. *trans*-1,3-Dichloropropene
23. 1,1,2-Trichloroethane
24. Toluene
25. 1,2-Dibromoethane
26. Tetrachloroethene
27. Chlorobenzene
28. Ethylbenzene
29. *m*-Xylene
30. *p*-Xylene
31. Styrene
32. *o*-Xylene
33. 1,1,2,2-Tetrachloroethane
34. 4-Methyltoluene
35. 1,3,5-Trimethylbenzene
36. 1,2,4-Trimethylbenzene
37. 1,3-Dichlorobenzene
38. 1,4-Dichlorobenzene
39. 1,2-Dichlorobenzene
40. 1,2,4-Trichlorobenzene
41. Hexachlorobutadiene



Volatile Organic Compounds (EPA 524.2)

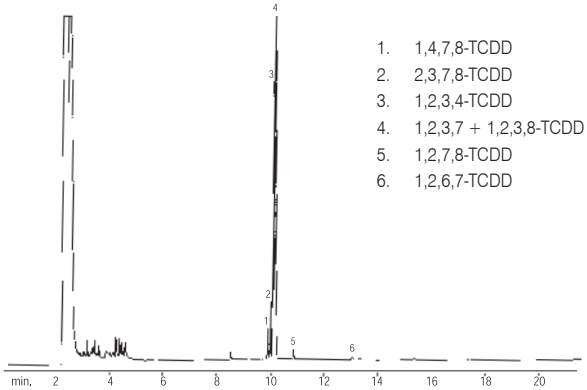
Column:	DM-624, 75 m x 0.53 mm x 3.00 µm
Cat. No.:	**7752**
Index:	CER00011
Oven Temp.:	35 °C (hold 8 min) to 220 °C (hold 3 min) at 10 °C/min
Detector:	MS, 250 °C
Scan Range:	45 - 300 AMU
Purging Time:	11 min
Sorbent Tube:	Tenax / Silica gel / Active carbon
Desorb Temp.:	220 °C (hold 2 min), at 225 °C
Desorb Speed.:	10 mL/min



1. Dichlorodifluoromethane
2. Chloromethane
3. Vinyl chloride
4. Bromomethane
5. Chloroethane
6. Trichlorofluoromethane
7. 1,1-Dichloroethene
8. Methylene chloride
9. *trans*-1,2-Dichloroethylene
10. 1,1-Dichloropropane
11. *cis*-1,2-Dichloroethylene
12. 2,2-Dichloropropane
13. Chlorobromomethane
14. Chloroform
15. 1,1,1-Trichloroethane
16. Tetrachloromethane
17. 1,1-Dichloropropene
18. Benzene
19. 1,2-Dichloroethane
20. Trichloroethylene
21. 1,2-Dichloropropane
22. Dibromomethane
23. Bromodichloromethane
24. *cis*-1,3-Dichloropropene
25. Toluene
26. *trans*-1,3-Dichloropropene
27. 1,1,2-Trichloroethane
28. Tetrachloroethylene
29. 1,3-Dichloropropane
30. Dibromochloromethane
31. 1,2-Dibromoethane
32. Chlorobenzene
33. 1,1,1,2-Tetrachloroethane
34. Ethylbenzene
35. *m*-Xylene
36. *p*-Xylene
37. *o*-Xylene
38. Styrol
39. Bromoform
40. Anisoxide
41. Bromobenzene
42. 1,1,2,2-Tetrachloroethane
43. 1,2,3-Trichloropropane
44. Propylbenzene
45. 2-Chlorotoluene
46. 1,3,5-Trimethylbenzene
47. 4-Chlorotoluene
48. *tert*-Butylbenzene
49. 1,2,4-Trimethylbenzene
50. *sec*-Butylbenzene
51. 1,3-Dichlorobenzene
52. *p*-Isopropyl toluene
53. 1,4-Dichlorobenzene
54. *n*-Butylbenzene
55. 1,2-Dichlorobenzene
56. 1,2-Dibromo-3-chloropropane
57. 1,2,4-Trichlorobenzene
58. Hexachlorobutadiene
59. Naphthalene
60. 1,2,3-Trichlorobenzene

Dioxins

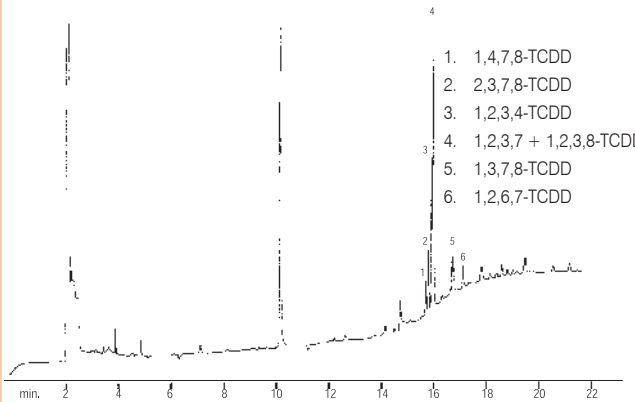
Column:	DM-2330, 60 m x 0.25 mm x 0.20 µm
Cat. No.:	**8624**
Index:	CER00108
Oven Temp.:	200 °C (hold 1 min) to 250 °C (hold 15 min) at 8 °C/min, to 275 °C (hold 5 min) at 15 °C/min
Carrier Gas:	H_2, 40 cm/sec
Injection:	Splitless, 275 °C
Sample:	TCDD isomers, 2.0 µL
Detector:	ECD, 21 kHz full scale, 275 °C



1. 1,4,7,8-TCDD
2. 2,3,7,8-TCDD
3. 1,2,3,4-TCDD
4. 1,2,3,7 + 1,2,3,8-TCDD
5. 1,2,7,8-TCDD
6. 1,2,6,7-TCDD

Dioxins

Column:	DM-2330, 60 m x 0.32 mm x 0.20 µm
Cat. No.:	**8634**
Index:	CER00109
Oven Temp.:	200 °C (hold 1 min) to 240 °C (hold 6 min) at 3 °C/min, to 275 °C (hold 30 min) at 15 °C/min
Carrier Gas:	H_2, 40 cm/sec
Injection:	Cold on-column, 275 °C
Sample:	TCDD isomers, 1.5 µL
Detector:	ECD, 5 kHz full scale, 275 °C

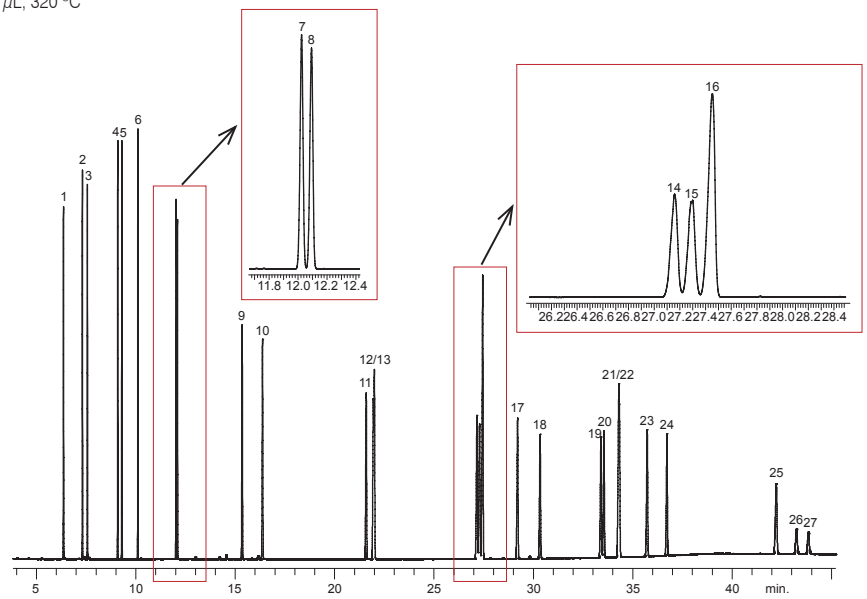


1. 1,4,7,8-TCDD
2. 2,3,7,8-TCDD
3. 1,2,3,4-TCDD
4. 1,2,3,7 + 1,2,3,8-TCDD
5. 1,3,7,8-TCDD
6. 1,2,6,7-TCDD

PAHs

Column:	DM-PAH, 30 m x 0.25 mm x 0.25 μm
Cat. No.:	**8862**
Index:	CER1160
Sample:	EPA 8310 PAHs in dichloromethane solution, 10 ppm
Oven Temp.:	65 °C (hold 0.5 min) to 220 °C at 15 °C/min, to 330 °C (hold 15 min) at 4 °C/min
Carrier Gas:	He, 2.0 mL/min
Injection:	Splitless (hold 1.75 min), 0.5 μL, 320 °C
Makeup Gas:	75 mL/min
Detector:	FID, 320 °C

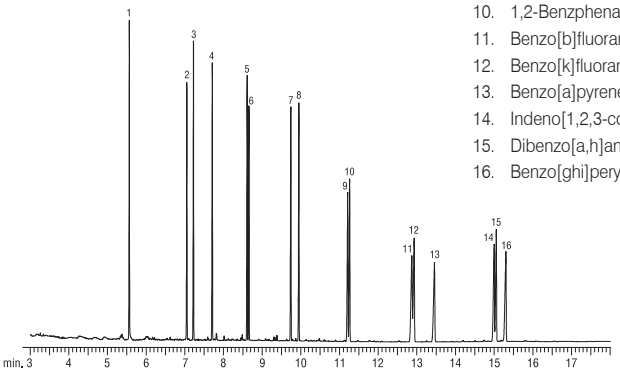
1. Naphthalene
2. 2-Methylnaphthalene
3. 1-Methylnaphthalene
4. Acenaphthylene
5. Acenaphthene
6. Fluorene
7. Phenanthrene
8. Anthracene
9. Fluoranthene
10. Pyrene
11. Benzo[a]anthracene
12. Chrysene
13. Triphenylene
14. Benzo[b]fluoranthene
15. Benzo[k]fluoranthene
16. Benzo[j]fluoranthene
17. Benzo[a]pyrene
18. 3-Methylcholanthrene
19. Dibenzo[a,h]acridine
20. Dibenzo[a,j]acridine
21. Indeno[1,2,3-cd]pyrene
22. Dibenzo[a,h]anthracene
23. Benzo[ghi]perylene
24. 7H-Dibenzo[c,g]carbazole
25. Dibenzo[a,e]pyrene
26. Dibenzo[a,i]pyrene
27. Dibenzo[a,h]pyrene



PAHs (EPA 610)

Column:	DM-5 MS / LB, 30 m x 0.25 mm x 0.25 μm
Cat. No.:	**8721**
Index:	CER00595
Oven Temp.:	40 °C (hold 2 min) to 250 °C at 25 °C/min to 265 °C at 5 °C/min , to 300 °C (hold 4 min) at 25 °C/min
Carrier Gas:	H_2, 4 mL/min constant flow
Injection:	Splitless hold 2 min, 330 °C 2 mm splitless inlet liner w / wool
Sample:	PAHs standard, 1.0 μL, 50 μg/mL
Detector:	FID, 350 °C

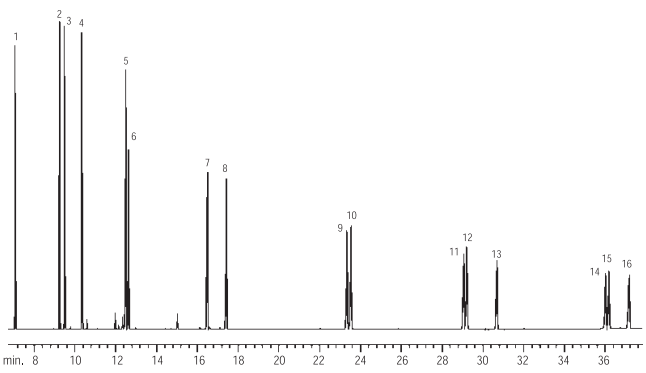
1. Naphthalene
2. Acenaphthylene
3. Acenaphthene
4. Fluorene
5. Phenanthrene
6. Anthracene
7. Fluoranthene
8. Pyrene
9. Benzo[a]anthracene
10. 1,2-Benzphenanthrene
11. Benzo[b]fluoranthene
12. Benzo[k]fluoranthene
13. Benzo[a]pyrene
14. Indeno[1,2,3-cd]pyrene
15. Dibenzo[a,h]anthracene
16. Benzo[ghi]perylene



V.S.

PAHs (EPA 610)

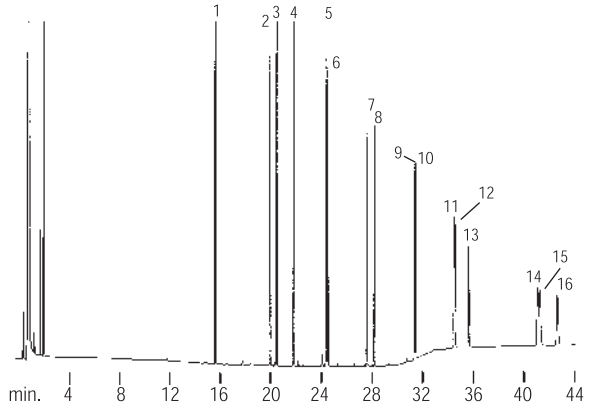
Column:	DM-5 MS / LB, 30 m x 0.25 mm x 0.50 μm
Cat. No.:	**8723**
Index:	CER00549
Oven Temp.:	40 °C (hold 1 min) to 200 °C at 20 °C/min to 310 °C (hold 5 min) at 4 °C/min
Carrier Gas:	H_2, 40 cm/sec
Injection:	Splitless hold 1 min, 300 °C
Sample:	PAHs standard, 1.0 μL, 20 ng/μL
Detector:	FID, 310 °C



PAHs (EPA 610)

Column: DM-5, 30 m x 0.53 mm x 1.50 µm
Cat. No.: **7251**
Index: CER00043
Oven Temp.: 4 °C (hold 6 min) to 300 °C (hold 15 min) at 10 °C/min
Carrier Gas: H_2, 80 cm/sec
Injection: Direct, 300 °C
Sample: PAHs standard, 2.5 µL
Detector: FID, 8 x 10^{-11} AFS, 300 °C

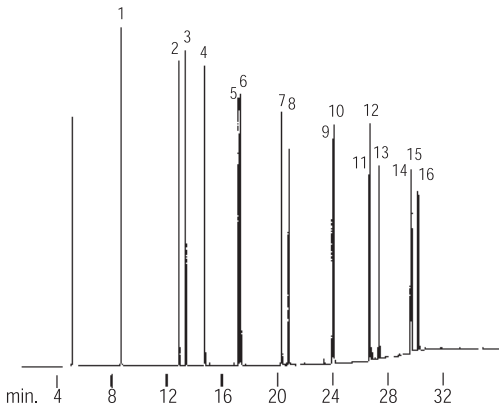
1. Naphthalene
2. Acenaphthylene
3. Acenaphthene
4. Fluorene
5. Phenanthrene
6. Anthracene
7. Fluoranthene
8. Pyrene
9. Benzo[a]anthracene
10. 1,2-Benzphenanthrene
11. Benzo[b]fluoranthene
12. Benzo[k]fluoranthene
13. Benzo[a]pyrene
14. Indeno[1,2,3-cd]pyrene
15. Dibenzo[a,h]anthracene
16. Benzo[ghi]perylene



PAHs (EPA 610)

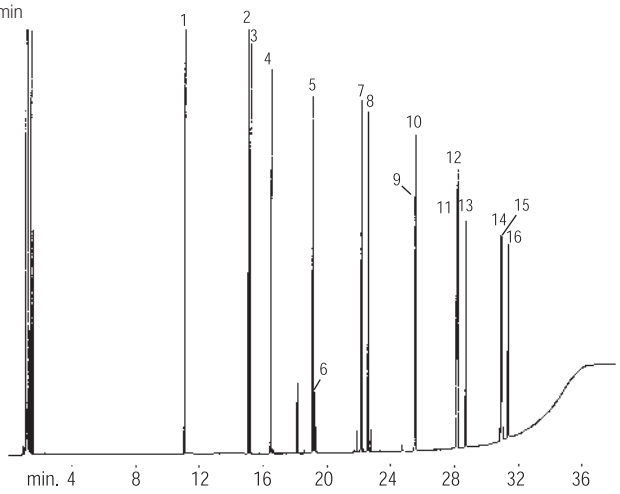
Column: DM-5, 30 m x 0.32 mm x 0.25 µm
Cat. No.: **7231**
Index: CER00376
Oven Temp.: 35 °C (hold 4 min) to 325 °C at 10 °C/min
Carrier Gas: H_2, 40 cm/sec
Injection: Direct, cold on-column
Sample: PAHs standard, 0.5 µL
Detector: FID, 8 x 10^{-11} AFS, 325 °C

1. Naphthalene
2. Acenaphthylene
3. Acenaphthene
4. Fluorene
5. Phenanthrene
6. Anthracene
7. Fluoranthene
8. Pyrene
9. Benzo[a]anthracene
10. 1,2-Benzphenanthrene
11. Benzo[b]fluoranthene
12. Benzo[k]fluoranthene
13. Benzo[a]pyrene
14. Indeno[1,2,3-cd]pyrene
15. Dibenzo[a,h]anthracene
16. Benzo[ghi]perylene



PAHs (EPA 610)

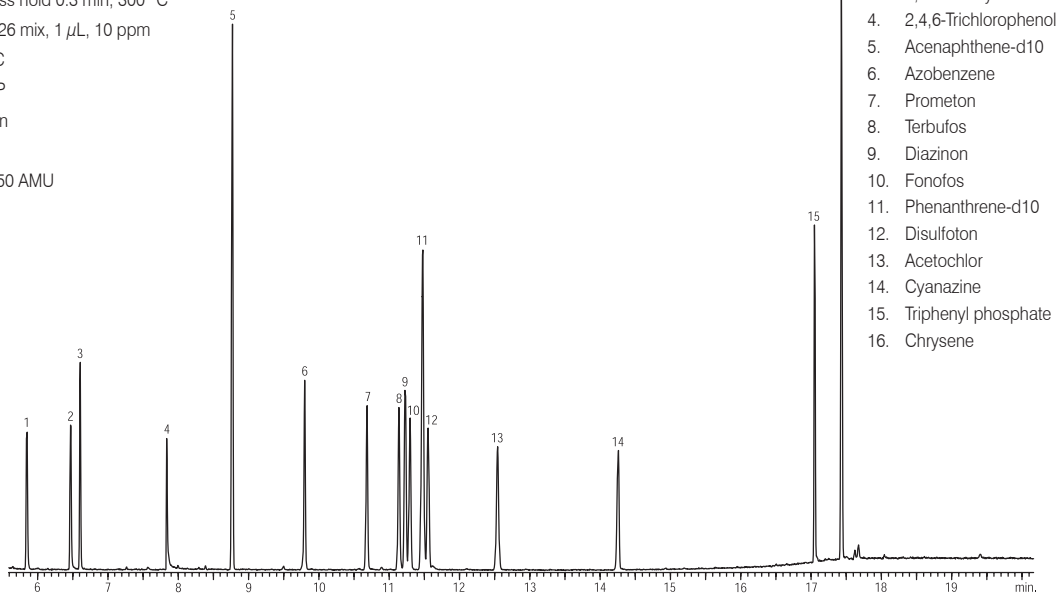
Column: DM-200, 30 m x 0.25 mm x 0.25 µm
Cat. No.: **8321**
Index: CER00044
Oven Temp.: 40 °C (hold 4 min) to 340 °C at 10 °C/min
Carrier Gas: H_2, 40 cm/sec
Injection: Split, 40:1, 340 °C
Sample: PAHs standard, 1.2 µL
Detector: FID, 16 x 10^{-11} AFS, 340 °C



1. Naphthalene
2. Acenaphthylene
3. Acenaphthene
4. Fluorene
5. Phenanthrene
6. Anthracene
7. Fluoranthene
8. Pyrene
9. Benzo[a]anthracene
10. 1,2-Benzphenanthrene
11. Benzo[b]fluoranthene
12. Benzo[k]fluoranthene
13. Benzo[a]pyrene
14. Indeno[1,2,3-cd]pyrene
15. Dibenzo[a,h]anthracene
16. Benzo[ghi]perylene

Volatile Organic Compounds (EPA 526)

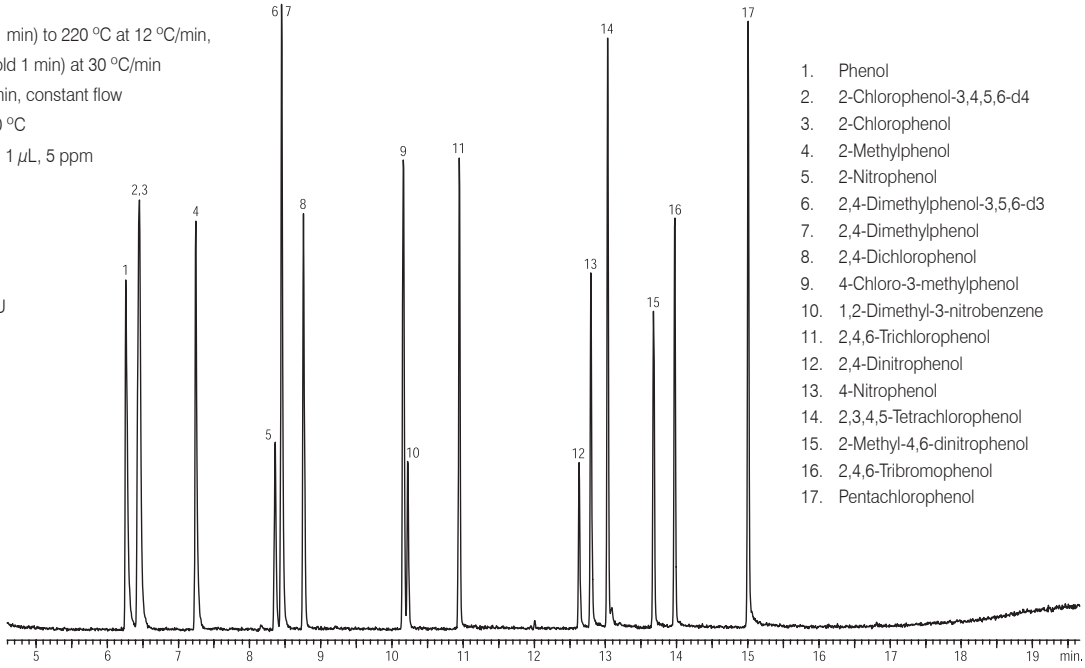
Column:	DM-5 MS / LB, 30 m x 0.25 mm x 0.25 μm
Cat. No.:	**8721**
Index:	CER00656
Oven Temp.:	50 °C (hold 1 min) to 200 °C (hold 5 min) at 20 °C/min, to 310 °C (hold 3 min) at 30 °C/min
Carrier Gas:	He, 0.8 mL/min
Injection:	Splitless hold 0.3 min, 300 °C
Sample:	EPA 526 mix, 1 μL, 10 ppm
Transfer line Temp.:	280 °C
Tune:	DFTPP
Solvent Delay:	5.5 min
Ionization:	EI
Scan Range:	35 - 550 AMU
Detector:	MS



1. Nitrobenzene
2. 2,4-Dichlorophenol
3. 1,3-Dimethyl-2-nitrobenzene
4. 2,4,6-Trichlorophenol
5. Acenaphthene-d10
6. Azobenzene
7. Prometon
8. Terbufos
9. Diazinon
10. Fonofos
11. Phenanthrene-d10
12. Disulfoton
13. Acetochlor
14. Cyanazine
15. Triphenyl phosphate
16. Chrysene

Phenols (EPA 528)

Column:	DM-5 MS / LB, 30 m x 0.25 mm x 0.25 μm
Cat. No.:	**8721**
Index:	CER00664
Oven Temp.:	40 °C (hold 1 min) to 220 °C at 12 °C/min, to 300 °C (hold 1 min) at 30 °C/min
Carrier Gas:	He, 1.3 mL/min, constant flow
Injection:	Splitless, 220 °C
Sample:	EPA 528 mix, 1 μL, 5 ppm
Transfer line Temp.:	280 °C
Tune:	DFTPP
Solvent Delay:	5.5 min
Ionization:	EI
Scan Range:	35 - 550 AMU
Detector:	MS

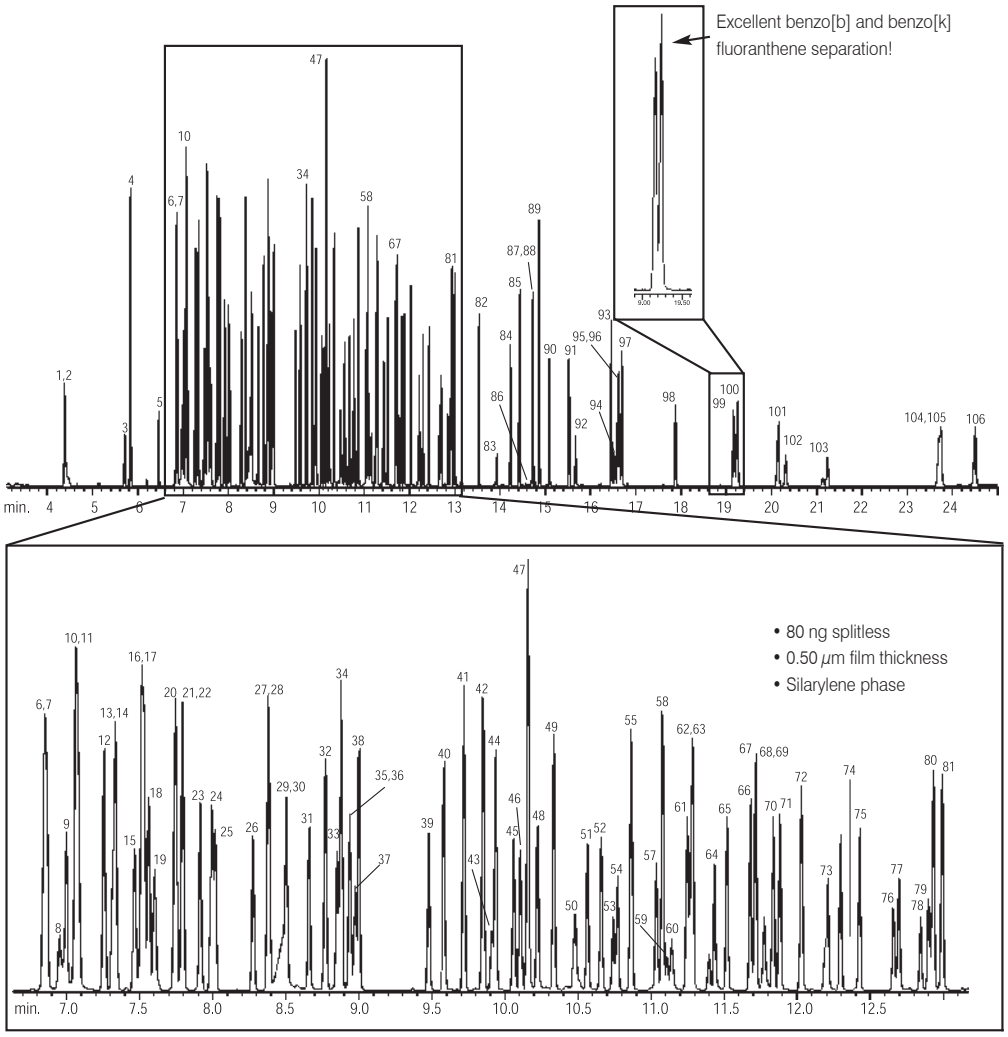


1. Phenol
2. 2-Chlorophenol-3,4,5,6-d4
3. 2-Chlorophenol
4. 2-Methylphenol
5. 2-Nitrophenol
6. 2,4-Dimethylphenol-3,5,6-d3
7. 2,4-Dimethylphenol
8. 2,4-Dichlorophenol
9. 4-Chloro-3-methylphenol
10. 1,2-Dimethyl-3-nitrobenzene
11. 2,4,6-Trichlorophenol
12. 2,4-Dinitrophenol
13. 4-Nitrophenol
14. 2,3,4,5-Tetrachlorophenol
15. 2-Methyl-4,6-dinitrophenol
16. 2,4,6-Tribromophenol
17. Pentachlorophenol

Semi-volatile Organic Compounds

Column:	DM-5MS / LB, 30 m x 0.25 mm x 0.50 μm
Cat. No.:	**8723**
Index:	CER00532
Oven Temp.:	40 °C (hold 2 min) to 290 °C at 20 °C/min, to 303 °C at 2 °C/min, to 330 °C (hold 1 min) at 6 °C/min
Carrier Gas:	He, 1.0 mL/min, constant flow
Injection:	Splitless, 300 °C
Sample:	EPA 8270 standard, 80 ng
Scan Range:	35 - 550 AMU
Detector:	MS, 280 °C

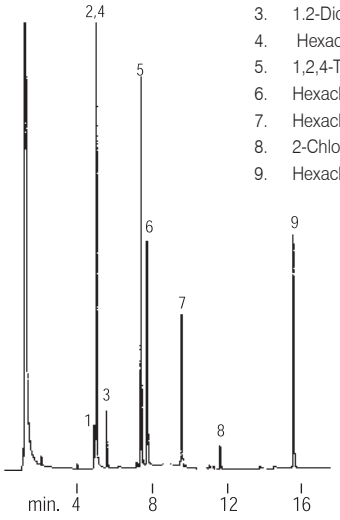
1. *N*-nitrosodimethylamine
2. Pyridine
3. Methyl methanesulfonate
4. 2-Fluorophenol
5. Ethyl methanesulfonate
6. Phenol-d6
7. Phenol
8. Aniline
9. *bis*(2-Chloroethyl)ether
10. 2-Chlorophenol-d4
11. 2-Chlorophenol
12. 1,3-Dichlorobenzene
13. 1,4-Dichlorobenzene-d4
14. 1,4-Dichlorobenzene
15. Benzyl alcohol
16. 1,2-Dichlorobenzene-d4
17. 1,2-Dichlorobenzene
18. 2-Methylphenol
19. *bis*(2-Chloroisopropyl)ether
20. 4-Methylphenol / 3-Methylphenol
21. *N*-Nitroso-*di*-*n*-propylamine
22. Acetophenone
23. Hexachloroethane
24. Nitrobenzene-d5
25. Nitrobenzene
26. Isophorone
27. 2,4-Dimethylphenol
28. 2-Nitrophenol
29. Benzoic acid
30. *bis*(2-Chloroethoxy)methane
31. 2,4-Dichlorophenol
32. 1,2,4-Trichlorobenzene
33. Naphthalene-d8
34. Naphthalene
35. 2,6-Dichlorophenol
36. 4-Chloroaniline
37. Hexachloropropene
38. Hexachlorobutadiene
39. 4-Chloro-3-methylphenol
40. Isosafrole
41. 2-Methylnaphthalene
42. 1-Methylnaphthalene
43. Hexachlorocyclopentadiene
44. 1,2,4,5-Tetrachlorobenzene
45. 2,4,6-Trichlorophenol
46. 2,4,5-Trichlorophenol
47. 2-Fluorobiphenyl
48. Safrole
49. 2-Chloronaphthalene
50. 2-Nitroaniline
51. 1,4-Naphthoquinone
52. Dimethylphthalate
53. 1,3-Dinitrobenzene
54. 2,6-Dinitrotoluene
55. Acenaphthylene
56. 3-Nitroaniline
57. Acenaphthene-d10
58. Acenaphthene
59. 2,4-Dinitrophenol
60. 4-Nitrophenol
61. Pentachlorobenzene
62. 2,4-Dinitrotoluene
63. Dibenzofuran
64. 2,3,4,6-Tetrachlorophenol
65. Diethyl phthalate
66. 4-Chlorophenyl phenyl ether
67. Fluorene
68. 4-Nitroaniline
69. 4,6-Dinitro-2-methylphenol
70. Diphenylamine
71. Azobenzene
72. 2,4,6-Tribromophenol
73. Phenacetin
74. 4-Bromophenyl phenyl ether
75. Hexachlorobenzene
76. Pentachlorophenol
77. Pentachloronitrobenzene
78. Dinoseb
79. Phenanthrene-d10
80. Phenanthrene
81. Anthracene
82. *di*-*n*-Butylphthalate
83. 4-Nitroquinoline-1-oxide
84. Isodrin
85. Fluoranthene
86. Benzidine
87. Pyrene
88. Aramite
89. *p*-Terphenyl-d14
90. Chlorbenzilate
91. Benzyl butyl phthalate
92. Kepone
93. *bis*(2-Ethylhexyl)phthalate
94. 3,3'-Dichlorobenzidine
95. Benzo[a]anthracene
96. Chrysene-d12
97. Chrysene
98. *di*-*n*-Octyl phthalate
99. Benzo[b]fluoranthene
100. Benzo[k]fluoranthene
101. Benzo[a]pyrene
102. Perylene-d12
103. 3-Methylcholanthrene
104. Indeno[1,2,3-cd]pyrene
105. Dibenzo[a,h]anthracene
106. Benzo[ghi]perylene



Chlorinated Hydrocarbons (EPA 612)

Column:	DM-200, 30 m x 0.53 mm x 0.50 μm
Cat. No.:	**8347**
Index:	CER00051
Oven Temp.:	40 °C to 280 °C (hold 5 min) at 8 °C/min
Carrier Gas:	He, 40 cm/sec, 40 °C
Injection:	Direct, 275 °C
Sample:	Chlorinated hydrocarbons mix, 0.5 μL
Detector:	220 °C

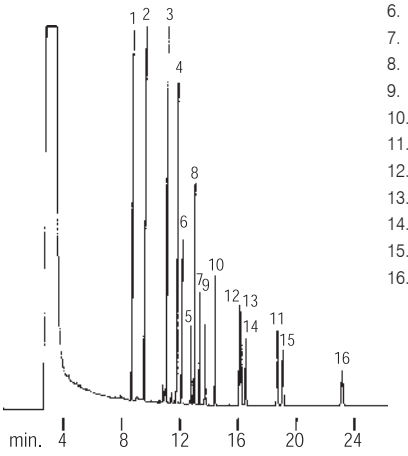
1. 1,3-Dichlorobenzene
2. 1,4-Dichlorobenzene
3. 1.2-Dichlorobenzene
4. Hexachloroethane
5. 1,2,4-Trichlorobenzene
6. Hexachlorobutadiene
7. Hexachlorocyclopentadiene
8. 2-Chloronaphthalene
9. Hexachlorobenzene



PAEs (EPA 8060)

Column:	DM-17, 30 m x 0.32 mm x 1.00 μm
Cat. No.:	**7451**
Index:	CER00037
Oven Temp.:	100 °C to 275 °C (hold 10 min) at 15 °C/min
Carrier Gas:	He, 20 cm/sec
Injection:	Direct, 275 °C
Sample:	PAEs, 1.5 μL, 60 μg/mL
Detector:	FID, 64 x 10^{-11} AFS, 275 °C

1. DMP
2. DEP
3. DIBP
4. DBP
5. DMEP
6. BMPP
7. BEEP
8. DPP
9. DOP
10. DNHP
11. BBP
12. DBEP
13. DCHP
14. DEHP
15. DNOP
16. DNNP



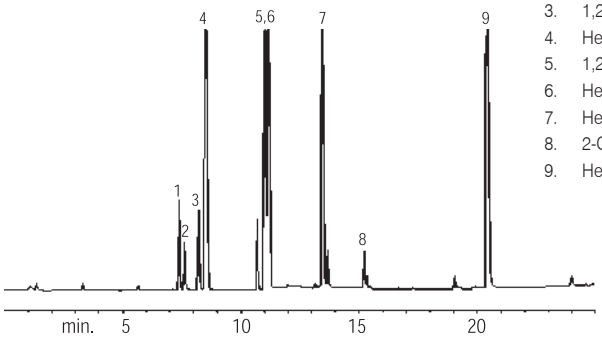
Chlorinated Hydrocarbons (EPA 612)

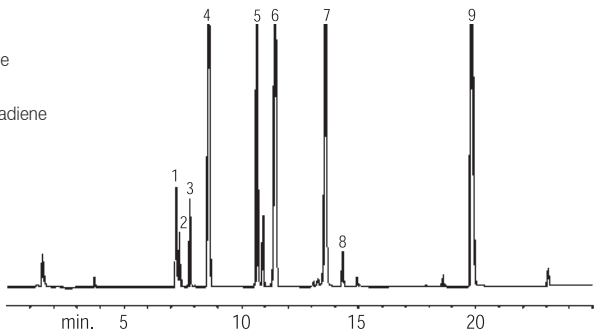
Column:	DM-35, 30 m x 0.53 mm x 1.00 μm
Cat. No.:	**7951**
Index:	CER00052
Oven Temp.:	40 °C to 250 °C (hold 5 min) at 8 °C/min
Carrier Gas:	He, 35 cm/sec, 40 °C
Injection:	Direct , 250 °C
Sample:	Chlorinated hydrocarbons, 0.1 μL
Detector:	300 °C

V.S.

Column:	DM-5, 30 m x 0.53 mm x 0.50 μm
Cat. No.:	**7247**
Index:	CER00053
Oven Temp.:	40 °C to 250 °C (hold 5 min) at 8 °C/min
Carrier Gas:	He, 35 cm/sec, 40 °C
Injection:	Direct, 250 °C
Sample:	Chlorinated hydrocarbons, 0.1 μL
Detector:	300 °C

1. 1,3-Dichlorobenzene
2. 1,4-Dichlorobenzene
3. 1,2-Dichlorobenzene
4. Hexachloroethane
5. 1,2,4-Trichlorobenzene
6. Hexachlorobutadiene
7. Hexachlorocyclopentadiene
8. 2-Chloronaphthalene
9. Hexachlorobenzene

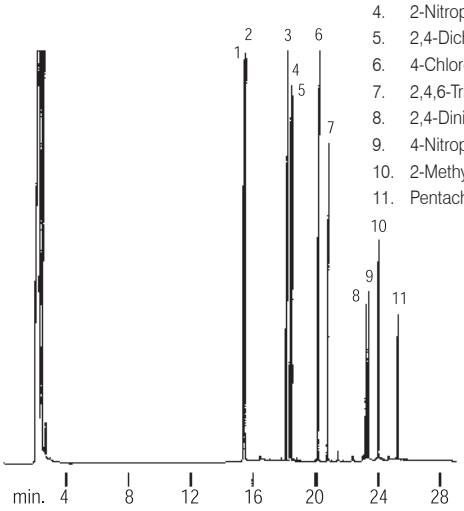




Phenols (EPA 604)

Column: DM-17, 30 m x 0.25 mm x 0.25 μm
Cat. No.: **7421**
Index: CER00029
Oven Temp.: 50 °C (hold 10 min) to 250 °C (hold 15 min) at 15 °C/min
Carrier Gas: He, 20 cm/sec
Injection: Split, 40 cc/min, 280 °C
Sample: Phenols mix, 1.0 μL, 3 - 5 ng/μL
Detector: FID, 32 x 10^{-11} AFS, 280 °C

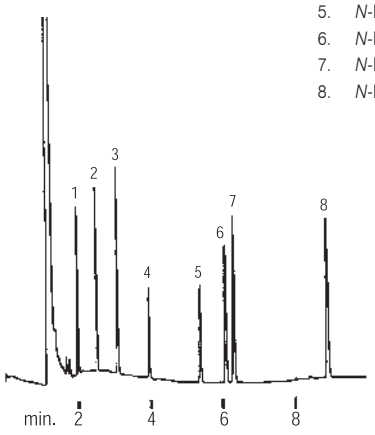
1. Phenol
2. 2-Chlorophenol
3. 2,4-Dimethylphenol
4. 2-Nitrophenol
5. 2,4-Dichlorophenol
6. 4-Chloro-3-methylphenol
7. 2,4,6-Trichlorophenol
8. 2,4-Dinitrophenol
9. 4-Nitrophenol
10. 2-Methyl-4,6-dinitrophenol
11. Pentachlorophenol



Nitrosamines

Column: DM-200, 30 m x 0.53 mm x 0.50 μm
Cat. No.: **8347**
Index: CER00040
Oven Temp.: 100 °C (hold 1 min) to 200 °C at 5 °C/min
Carrier Gas: H_2, 40 cm/sec
Injection: Split, 40 cc/min, 250 °C
Sample: Nitrosamines mix, 1.0 μL, 10 μg/mL
Detector: FID, 16 x 10^{-12} AFS, 250 °C

1. *N*-Nitrosodimethylamine
2. *N*-Nitrosomethylethylamine
3. *N*-Nitrosodiethylamine
4. *N*-Nitrosoazetidine
5. *N*-Nitrosopiperidine
6. *N*-Nitrosomorpholine
7. *N*-Nitrosopyrrolidine
8. *N*-Nitrosohexamethyleneimine



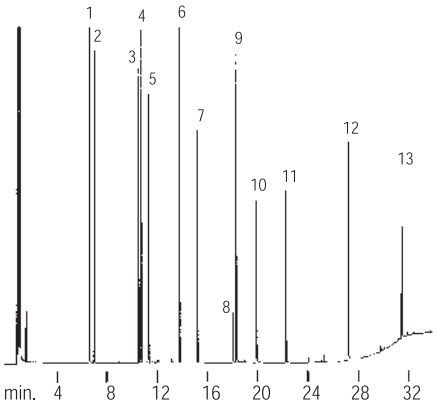
Benzidines / Phenols (EPA 604 / 605)

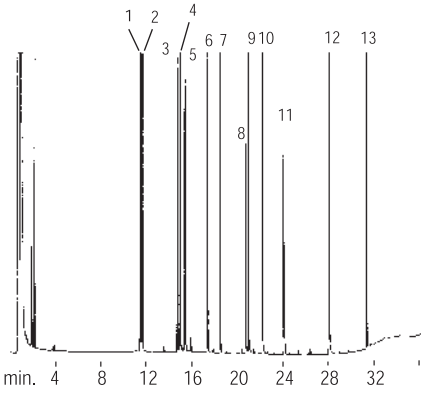
Column: DM-5, 30 m x 0.32 mm x 1.00 μm
Cat. No.: **7235**
Index: CER00032
Oven Temp.: 110 °C to 290 °C at 8 °C/min
Carrier Gas: H_2, 40 cm/sec
Injection: Split, 100:1, 310 °C
Sample: Phenols / Benzidines mix, 1.5 μL
Detector: FID, 2 x 10^{-11} AFS, 310 °C

V.S.

Column: DM-5, 30 m x 0.53 mm x 1.50 μm
Cat. No.: **7251**
Index: CER00033
Oven Temp.: 40 °C (hold 6 min) to 300 °C (hold 15 min) at 10 °C/min
Carrier Gas: H_2, 80 cm/sec
Injection: Direct, 300 °C
Sample: Phenols / Benzidines mix, 2.5 μL
Detector: FID, 8 x 10^{-11} AFS, 300 °C

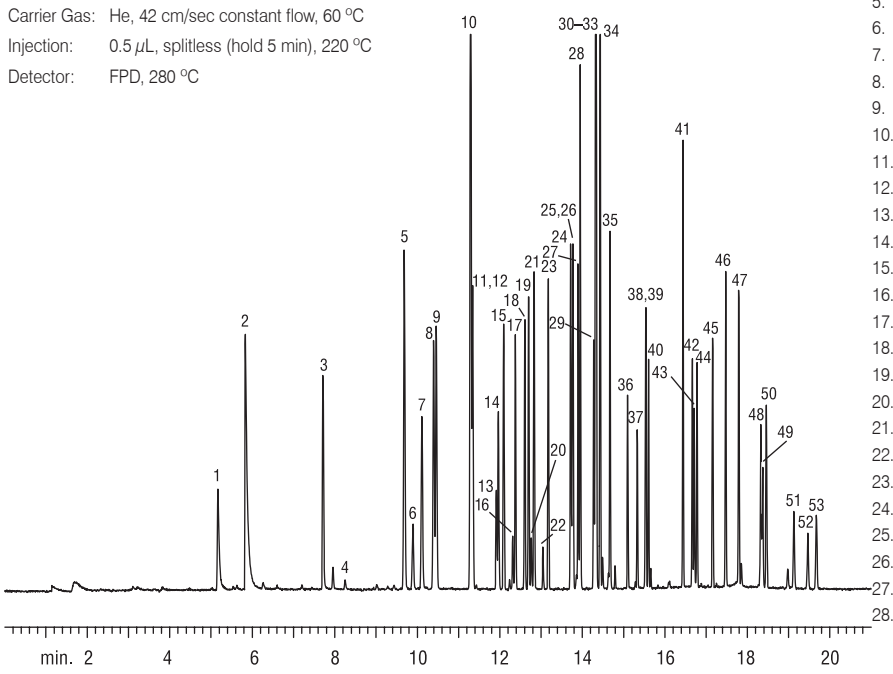
1. Phenol
2. 2-Chlorophenol
3. 2-Nitrophenol
4. 2,4-Dimethylphenol
5. 2,4-Dichlorophenol
6. 4-Chloro-3-methylphenol
7. 2,4,6-Trichlorophenol
8. 2,4-Dinitrophenol
9. 4-Nitrophenol
10. 2-Methyl-4,6-dinitrophenol
11. Pentachlorophenol
12. Benzidine
13. 3,3'-Dichlorobenzidine





Organophosphorus Pesticides (EPA 8140 / 8141 / 8141A)

Column:	DM-35, 30 m x 0.32 mm x 0.25 μm
Cat. No.:	**7931**
Index:	CER00696
Oven Temp.:	100 °C to 180 °C (hold 2 min) at 10 °C/min to 300 °C at 18 °C/min
Carrier Gas:	He, 42 cm/sec constant flow, 60 °C
Injection:	0.5 μL, splitless (hold 5 min), 220 °C
Detector:	FPD, 280 °C

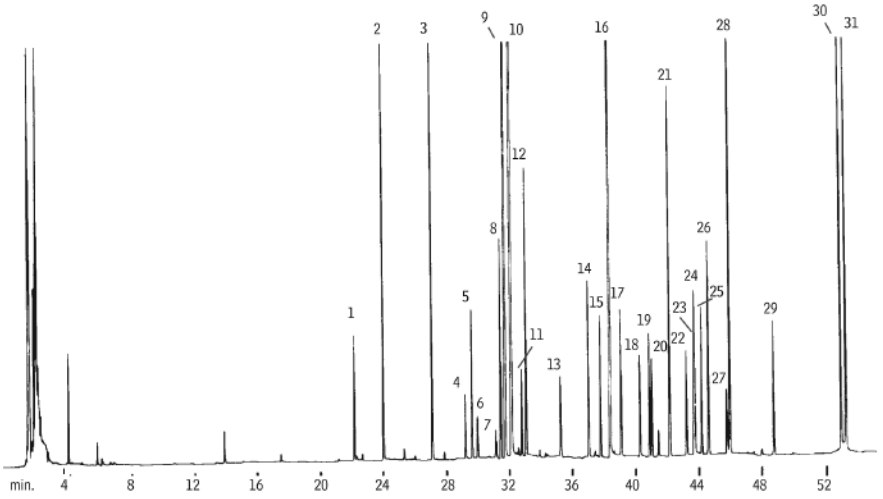


1. Dichlorvos
2. Hexamethylphosphoramide
3. Mevinphos
4. Trichlorfon
5. Tributyl phosphate
6. Demeton-O
7. TEPP
8. Thionazin
9. Ethoprop
10. Sulfotepp
11. Naled
12. Phorate
13. Dicrotophos
14. Demeton-S
15. Terbufos
16. Monocrotophos
17. Diazinon
18. Fonophos
19. Disulfoton
20. Dioxathion
21. Dimethoate
22. Phosphamidon isomer
23. Dichlorofenthion
24. Chlorpyrifos methyl
25. Phosphamidon
26. Ronnel
27. Parathion-methyl
28. Aspon
29. Trichloronate
30. Chlorpyrifos
31. Fenitrothion
32. Merphos
33. Malathion
34. Parathion-ethyl
35. Fenthion
36. Chlorfenvinphos
37. Crotoxyphos
38. Merphos oxone
39. Tokuthion
40. Stirofos
41. Ethion
42. Bolstar
43. Fensulfothion
44. Carbofenothion
45. Famphur
46. Triphenyl phosphate
47. EPN
48. Phosmet
49. Leptophos
50. *tri-o*-Cresyl phosphate
51. Azinphos-methyl
52. Azinphos-ethyl
53. Coumaphos

Organochlorine Pesticides

Column:	DM-5, 30 m x 0.25 mm x 0.25 μm
Cat. No.:	**7221**
Index:	CER00083
Oven Temp.:	60 °C to 300 °C (hold 10 min) at 4 °C/min
Carrier Gas:	He, 30 cm/sec
Injection:	Splitless, 250 °C
Sample:	Pesticides mix, 2.0 μL
Detector:	320 °C

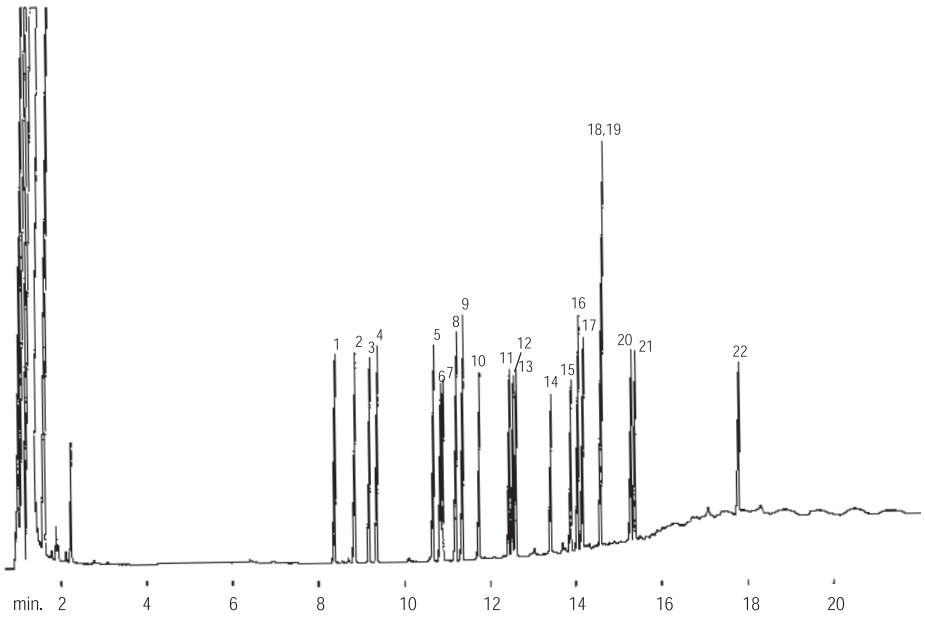
1. Etridiazole 50 pg/μL
2. Chlorneb 1000 pg/μL
3. Propachlor 1000 pg/μL
4. Trifluralin 50 pg/μL
5. α-BHC 20 pg/μL
6. Hexachlorobenzene 10 pg/μL
7. γ-BHC 30 pg/μL
8. β-BHC 20 pg/μL
9. PCNB 100 pg/μL
10. PCNB (IS) 100 pg/μL
11. δ-BHC 20 pg/μL
12. Chlorothalonil 50 pg/μL
13. Heptachlor 20 pg/μL
14. Aldrin 30 pg/μL
15. DCPA 50 pg/μL
16. DCB 5000 pg/μL
17. Heptachlor epoxide 30 pg/μL
18. γ-Chlordane 30 pg/μL
19. Endosulfan I 30 pg/μL
20. α-Chlordane 30 pg/μL
21. Dieldrin 40 pg/μL
22. Endrin 30 pg/μL
23. Endosulfan II 30 pg/μL
24. Chlorobenzilate 1000 pg/μL
25. 4,4'-DDD 50 pg/μL
26. Endrin aldehyde 50 pg/μL
27. Endosulfan sulfate 30 pg/μL
28. 4,4'-DDT 120 pg/μL
29. Methoxychlor 100 pg/μL
30. *cis*-Permethrin 1000 pg/μL
31. *trans*-Permethrin 1000 pg/μL



Nitrogen-Containing Herbicides

Column: DM-35, 30 m x 0.53 mm x 1.00 μm
Cat. No.: **7951**
Index: CER00088
Oven Temp.: 60 °C (hold 1 min) to 290 °C (hold 5 min) at 15 °C/min
Carrier Gas: He, 40 cm/sec
Injection: Direct, 290 °C
Sample: Nitrogen-containing herbicides, 0.2 μL
Detector: FID, 16 x 10^{-11} AFS, 290 °C

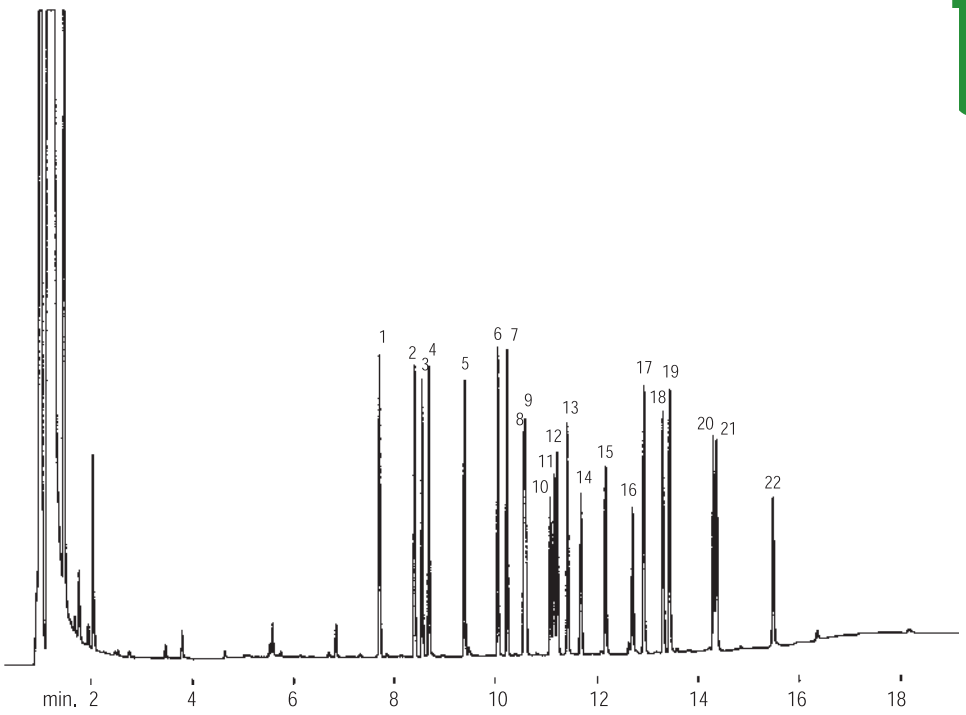
1. Eptam
2. Sutan
3. Vernam
4. Tillam
5. Ordram
6. Treflan
7. Balan
8. Ro-Neet
9. Propachlor
10. Tolban
11. Propazine
12. Atrazine
13. Simazine
14. Terbacil
15. Sencor
16. Dual
17. Paarlan
18. Prowl
19. Bromacil
20. Oxadiazon
21. GOAL
22. Hexazinone



Nitrogen-Containing Herbicides

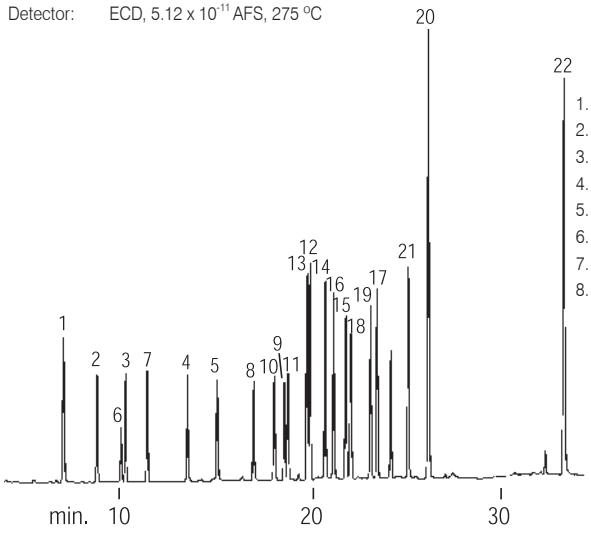
Column: DM-5, 30 m x 0.53 mm x 0.50 μm
Cat. No.: **7247**
Index: CER00087
Oven Temp.: 60 °C (hold 1 min) to 290 °C (hold 5 min) at 15 °C/min
Carrier Gas: He, 40 cm/sec
Injection: Direct, 290 °C
Sample: Nitrogen-containing herbicides, 0.2 μL
Detector: FID, 16 x 10^{-11} AFS, 290 °C

1. Eptam
2. Sutan
3. Vernam
4. Tillam
5. Ordram
6. Propachlor
7. Ro-Neet
8. Treflan
9. Balan
10. Simazine
11. Atrazine
12. Propazine
13. Tolban
14. Terbacil
15. Sencor
16. Bromacil
17. Dual
18. Paarlan
19. Prowl
20. Oxadiazon
21. GOAL
22. Hexazinone



Organochlorine Pesticides (EPA 8081)

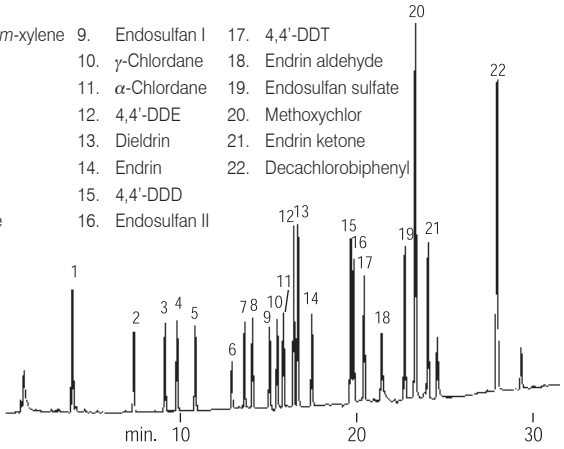
Column: DM-5, 30 m x 0.53 mm x 0.50 μm
Cat. No.: **7247**
Index: CER00408
Oven Temp.: 150 °C (hold 5 min) to 275 °C (hold 5 min) at 4 °C/min
Carrier Gas: He, 40 cm/sec
Injection: Direct, 200 °C
Sample: Pesticides mix, 1.0 μL, 80 - 800 ng/mL
Detector: ECD, 5.12 x 10^{-11} AFS, 275 °C



1. 2,4,5,6-Tetrachloro-*m*-xylene
2. α-BHC
3. γ-BHC
4. Heptachlor
5. Aldrin
6. β-BHC
7. δ-BHC
8. Heptachlor epoxide
9. Endosulfan I
10. γ-Chlordane
11. α-Chlordane
12. 4,4'-DDE
13. Dieldrin
14. Endrin
15. 4,4'-DDD
16. Endosulfan II
17. 4,4'-DDT
18. Endrin aldehyde
19. Endosulfan sulfate
20. Methoxychlor
21. Endrin ketone
22. Decachlorobiphenyl

Organochlorine Pesticides (EPA 8081)

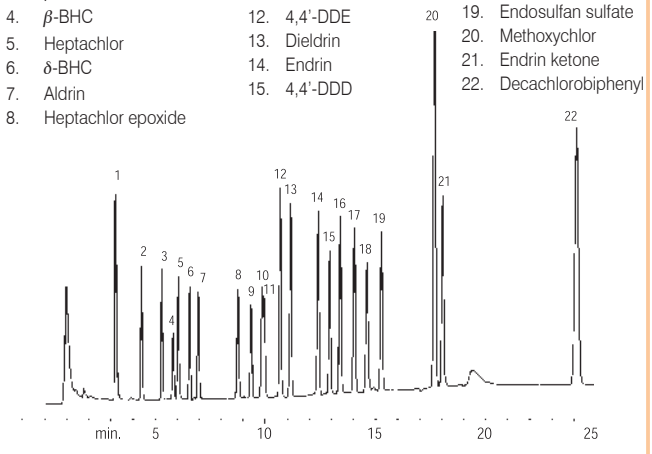
Column: DM-1701, 30 m x 0.53 mm x 0.50 μm
Cat. No.: **7347**
Index: CER00409
Oven Temp.: 150 °C (hold 5 min) to 275 °C (hold 5 min) at 4 °C/min
Carrier Gas: He, 40 cm/sec, 150 °C
Injection: Direct, 200 °C
Sample: Organochlorine pesticides, 1.0 μL, 80 - 800 ng/mL
Detector: ECD, 5.12 x 10^{-10} AFS, 275 °C



Organochlorine Pesticides (EPA 8081)

Column: DM-17, 30 m x 0.53 mm x 1.00 μm
Cat. No.: **7451**
Index: CER00410
Oven Temp.: 150 °C (hold 5 min) to 275 °C (hold 5 min) at 8 °C/min
Carrier Gas: He, 40 cm/sec, 150 °C
Injection: Direct, 200 °C
Sample: Pesticides, 1.0 μL
Detector: ECD, 5.12 X 10^{-10} AFS, 275 °C

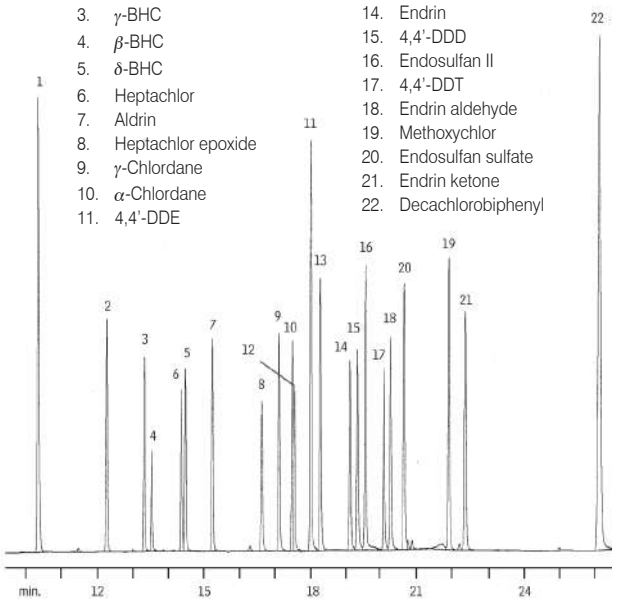
1. 2,4,5,6-Tetrachloro-*m*-xylene
2. α-BHC
3. γ-BHC
4. β-BHC
5. Heptachlor
6. δ-BHC
7. Aldrin
8. Heptachlor epoxide
9. γ-Chlordane
10. α-Chlordane
11. Endosulfan I
12. 4,4'-DDE
13. Dieldrin
14. Endrin
15. 4,4'-DDD
16. Endosulfan II
17. 4,4'-DDT
18. Endrin aldehyde
19. Endosulfan sulfate
20. Methoxychlor
21. Endrin ketone
22. Decachlorobiphenyl



Organochlorine Pesticides (EPA 8081)

Column: DM-35, 30 m x 0.32 mm x 0.50 μm
Cat. No.: **7933**
Index: CER00079
Oven Temp.: 120 °C (hold 1 min) to 285 °C (hold 6 min) at 8.5 °C/min
Carrier Gas: He, 2.1 mL/min, 120 °C
Injection: Direct, 200 °C
Detector: ECD 300 °C with anode purge

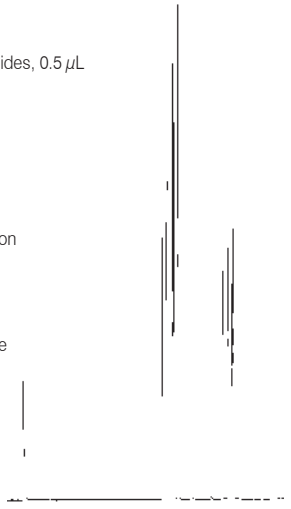
1. 2,4,5,6-Tetrachloro-*m*-xylene
2. α-BHC
3. γ-BHC
4. β-BHC
5. δ-BHC
6. Heptachlor
7. Aldrin
8. Heptachlor epoxide
9. γ-Chlordane
10. α-Chlordane
11. 4,4'-DDE
12. Endosulfan I
13. Dieldrin
14. Endrin
15. 4,4'-DDD
16. Endosulfan II
17. 4,4'-DDT
18. Endrin aldehyde
19. Methoxychlor
20. Endosulfan sulfate
21. Endrin ketone
22. Decachlorobiphenyl



Triazine Herbicides (EPA 619)

Column: DM-17, 30 m x 0.53 mm x 0.50 µm
Cat. No.: **7451**
Index: CER00058
Oven Temp.: 150 °C to 250 °C (hold 5 min) at 4 °C/min
Carrier Gas: He, 40 cm/sec, 150 °C
Injection: Direct, 250 °C
Sample: EPA Method 619 triazine herbicides, 0.5 µL
Detector: TSD, 275 °C

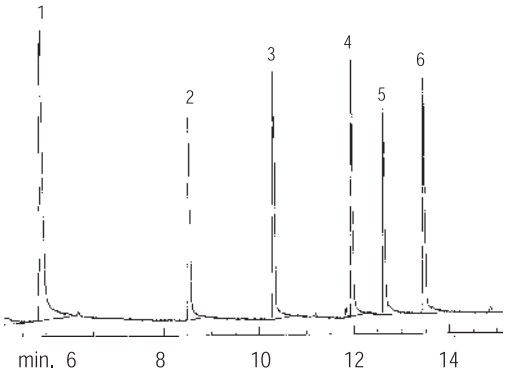
1. Atraton
2. Prometon
3. Terbutylazine
4. Atrazine
5. Simazine
6. Propazine
7. Secbumeton
8. Terbutryne
9. Ametryne
10. Simetryne
11. Prometryne



Butyl Tins

Column: DM-5, 30 m x 0.32 mm x 0.50 µm
Cat. No.: **7233**
Index: CER00047
Oven Temp.: 100 °C (hold 1 min) to 285 °C at 10 °C/min
Carrier Gas: He, 45 cm/sec
Injection: 500 pg on-clumn direct, 250 °C
Detector: FPD with 610 nm filter, 250 °C

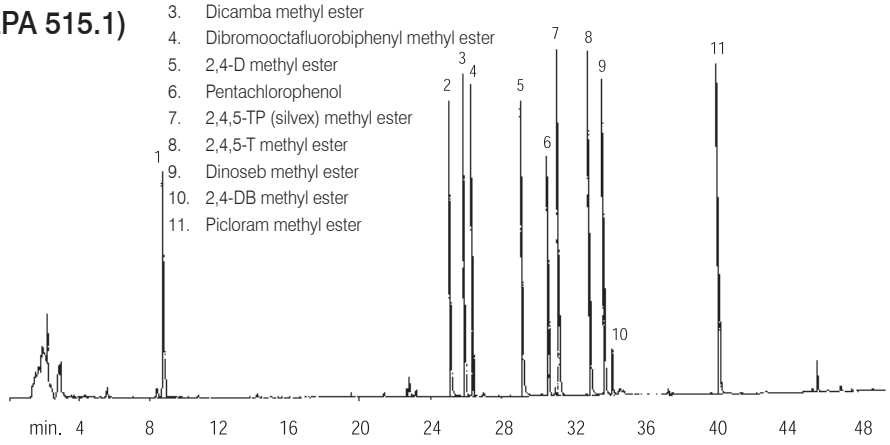
1. Tetrapropyltin
2. Tetrabutyltin
3. Tributyltin
4. Dibutyltin
5. Tripentyltin
6. Monobutyltin



Chlorophenoxyacid Herbicides (EPA 515.1)

Column: DM-17, 30 m x 0.25 mm x 0.50 µm
Cat. No.: **7423**
Index: CER00093
Oven Temp.: 50 °C (hold 0.75 min) to 84 °C at 4 °C/min, to 165 °C at 10 °C/min to 270 °C at 4 °C/min, to 300 °C (hold 6 min) at 20 °C/min
Carrier Gas: He, 30 cm/sec constant flow, 50 °C
Injection: Splitless, 0.75 min, 220 °C
Sample: Chlorophenoxyacid herbicides, 2.0 µL
Detector: ECD, 320 °C

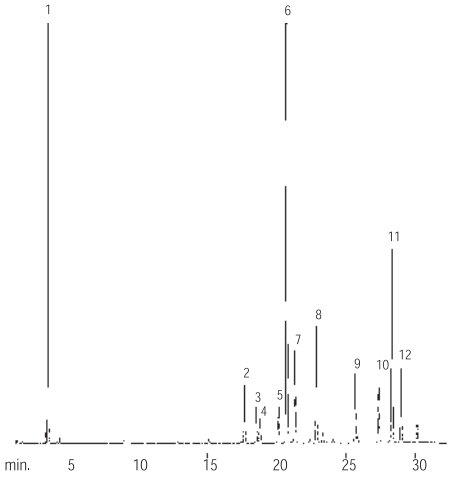
1. Dalapon methyl ester
2. 2,4-Dichlorophenylacetic acid methyl ester
3. Dicamba methyl ester
4. Dibromooctafluorobiphenyl methyl ester
5. 2,4-D methyl ester
6. Pentachlorophenol
7. 2,4,5-TP (silvex) methyl ester
8. 2,4,5-T methyl ester
9. Dinoseb methyl ester
10. 2,4-DB methyl ester
11. Picloram methyl ester



Chlorophenoxyacid Herbicides (EPA 615)

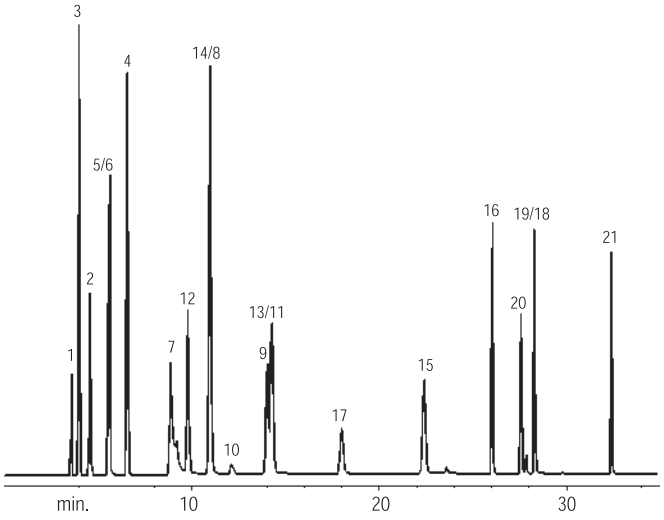
Column: DM-35, 30 m x 0.53 mm x 1.00 µm
Cat. No.: **7951**
Index: CER00094
Oven Temp.: 60 °C to 150 °C (hold 5 min) at 8 °C/min, to 210 °C at 4 °C/min
Carrier Gas: He, 35 cm/sec, 60 °C
Injection: Direct, 250 °C
Sample: Chlorophenoxyacid herbicides, 0.5 µL
Detector: ECD w / anode purge, 275 °C

1. Dalapon
2. DCAA (SS)
3. Dicamba
4. MCPP
5. MCPA
6. DBOB (IS)
7. Dichlorprop
8. 2,4-D
9. 2,4,5-TP
10. 2,4,5-T
11. Dinoseb
12. 2,4-DB



Volatile Organic Compounds in Water (EPA 551.1)

Column: DM-200, 30 m x 0.25 mm x 1.00 μm
Cat. No.: **8325**
Index: CER00024
Oven Temp.: 35 °C (hold 22 min) to 200 °C at 10 °C/min,
Carrier Gas: He, 30 cm/sec, 50 °C
Injection: 1 ng on-column, 200 °C
Split Ratio: 10:1
Detector: ECD, 20 kHz full scale, 290 °C

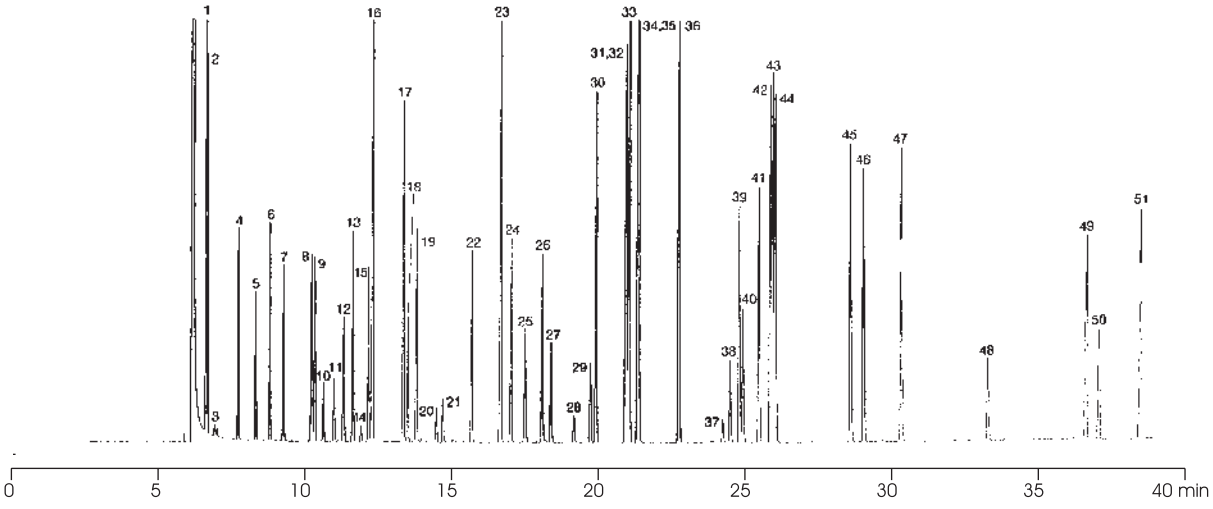


1. Chloroform
2. 1,1,1-Trichloroethane
3. Carbon tetrachloride
4. Trichloroacetonitrile
5. Trichloroethylene
6. Bromodichloromethane
7. Chloral hydrate
8. Dichloroacetonitrile
9. 1,1-Dichloro-2-propanone
10. 1,1,2-Trichloroethane
11. Chloropicrin
12. Dibromochloromethane
13. 1,2-Dibromoethane
14. Tetrachloroethylene
15. Bromochloroacetonitrile
16. 1,1,1-Trichloro-2-propanone
17. Bromoform
18. Dibromoacetonitrile
19. 1,2,3-Trichloropropane
20. 4-Bromofluorobenzene
21. 1,2-Dibromo-3-chloropropane

Volatile Organic Compounds in Water

Column: DM-AQUA, 60 m x 0.25 mm x 1.00 μm
Cat.No.: **7801**
Index: CEO04281
Carrier Gas: He, 25 cm/sec, 150 °C
Oven Temp.: 40 °C to 200 °C at 4 °C/min
Injection: Split, 1:100, 0.5 μL
Detector: FID

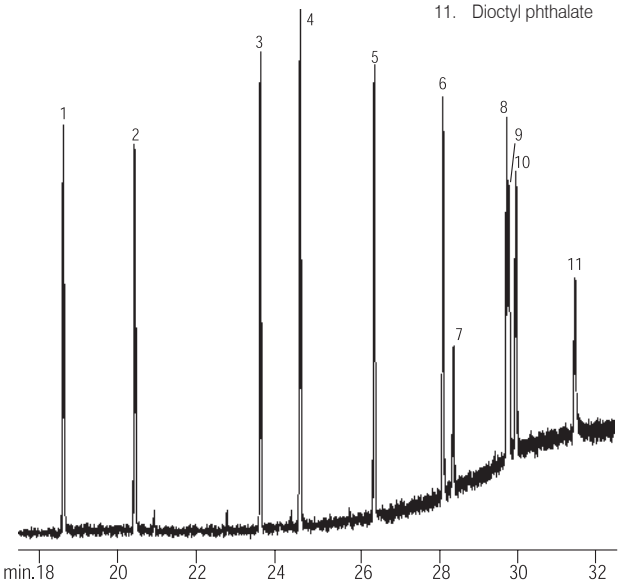
1. Bromomethane
2. Chloroethane
3. Trichlorofluoromethane
4. 1,1–Dichloroethylene
5. Dichloromethane
6. *trans*-1,2-Dichloroethylene
7. 1,1-Dichloroethane
8. 2,2–Dichloropropane
9. *cis*-1,2-Dichloroethylene
10. Chloroform
11. Bromochloromethane
12. 1,1,1-Trichloroethane
13 .1,1-Dichloropropene
14 Tetrachloromethane
15. 1,2 – Dichloroethane
16. Benzene
17. Benzotrifluoride
18. Trichloroethylene
19. 1,2-Dichloropropane
20. Bromodichloromethane
21. Dibromomethane
22. *cis*-1,3-Dichloropropylene
23. Toluene
24. *trans*-1,3-Dichloropropylene
25. 1,1,2-Trichloroethane
26. 1,3-Dichloropropane
27. Tetrachloroethylene
28. Dibromochloromethane
29. 1-Chlorohexane
30. 1,2-Dibromoethane
31. Chlorobenzene
32. 1,1,1,2-Tetrachloroethane
33. Ethylbenzene
34. *m*-Xylene
35. *p*-Xylene
36. *o*-Xylene
37. Bromoform
38. 1,1,2,2-Tetrachloroethane
39. 4-Bromofluorobenzene
40. 1,2,3-Trichloropropane
41. Bromobenzene
42. *o*-Chlorotoluene
43. *m*-Chlorotoluene
44. *p*-Chlorotoluene
45. 1,3-Dichlorobenzene
46. 1,4-Dichlorobenzene
47. 1,2-Dichlorobenzene
48. 1,2-Dibromo-3-chloropropane
49. 1,2,4-Trichlorobenzene
50. 1,1,2,3,4,4-Hexachloro-1,2-butadiene
51. 1,2,3-Trichlorobenzene



PAEs

Column:	DM-5MS, 30 m x 0.25 mm x 0.50 μm
Cat. No.:	**8223**
Index:	CER00049
Oven Temp.:	35 °C (hold 1 min) to 285 °C at 10 °C/min
Pressure:	7.5 psi
Injection:	100 pg on-column
Detector:	MS-SIM

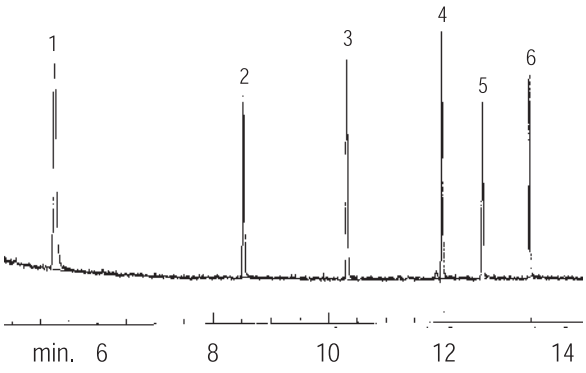
1. Dimethyl phthalate
2. Diethyl phthalate
3. Isobutyl phthalate
4. Dibutyl phthalate
5. Dipentyl phthalate
6. Dihexyl phthalate
7. Benzyl ethyl phthalate
8. Diheptyl phthalate
9. 2-Ethylhexyl phthalate
10. Cyclohexyl phthalate
11. Dioctyl phthalate



Endocrine Disruptors Butyl Tins (Hexyl Derivatives)

Column:	DM-35, 30 m x 0.32 mm x 0.50 μm
Cat. No.:	**7933**
Index:	CER00048
Oven Temp.:	100 °C (hold 1 min) to 285 °C at 10 °C/min
Carrier Gas:	He, 45 cm/sec
Injection:	500 pg on-column, 250 °C
Detector:	FPD with 610 nm filter, 250 °C

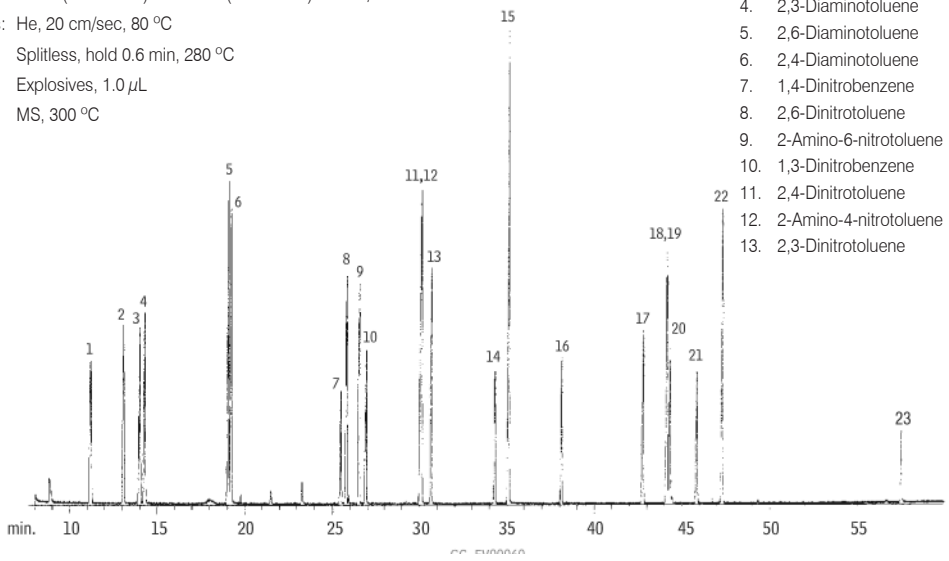
1. Tetrapropyltin
2. Tetrabutyltin
3. Tributyltin
4. Dibutyltin
5. Tripentyltin
6. Monobutyltin



Explosives

Column:	DM-200, 30 m x 0.25 mm x 0.25 μm
Cat. No.:	**8321**
Index:	CER00060
Oven Temp.:	80 °C (hold 2 min) to 260 °C (hold 2 min) at 3 °C/min
Carrier Gas:	He, 20 cm/sec, 80 °C
Injection:	Splitless, hold 0.6 min, 280 °C
Sample:	Explosives, 1.0 μL
Detector:	MS, 300 °C

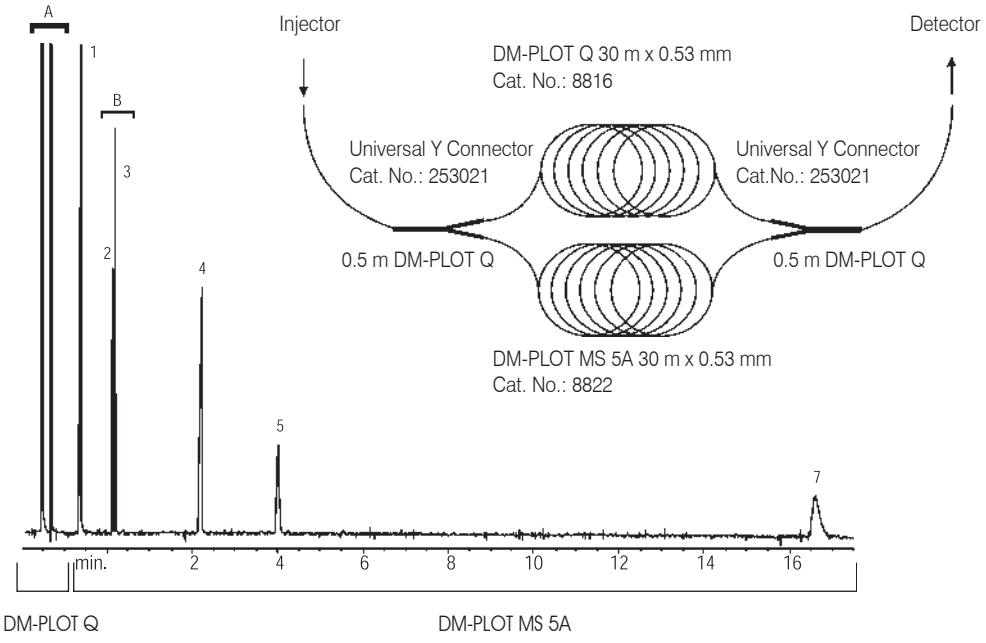
1. 2-Nitrotoluene
2. 3-Nitrotoluene
3. 4-Nitrotoluene
4. 2,3-Diaminotoluene
5. 2,6-Diaminotoluene
6. 2,4-Diaminotoluene
7. 1,4-Dinitrobenzene
8. 2,6-Dinitrotoluene
9. 2-Amino-6-nitrotoluene
10. 1,3-Dinitrobenzene
11. 2,4-Dinitrotoluene
12. 2-Amino-4-nitrotoluene
13. 2,3-Dinitrotoluene
14. 3,4-Dinitrotoluene
15. 3-Nitrobiphenyl
16. 2,4,6-Trinitrotoluene
17. 2,4,5-Trinitrotoluene
18. 4-Amino-2,6-dinitrotoluene
19. 2,3,4-Trinitrotoluene
20. 1,3-Dinitronaphthalene
21. 2,6-Diamino-4-nitrotoluene
22. 2-Amino-4,6-dinitrotoluene
23. 2,2'-Dinitrobiphenyl



Permanent Gases

Column:	DM-PLOT Q + DM-PLOT MS 5A,
	A: 30 m x 0.53 mm x 20.00 µm
	B: 30 m x 0.32 mm x 30.00 µm
Cat. No.:	**8816 + 8822 = A + B**
Index:	CSR00171
Carrier Gas:	H_2, 8 psi
Injection:	Split, 10:1, 20 µL
Detector:	TCD, 200 °C

1. Helium
2. Argon
3. Oxygen
4. Nitrogen
5. Methane
6. Carbon dioxide
7. Carbon monoxide

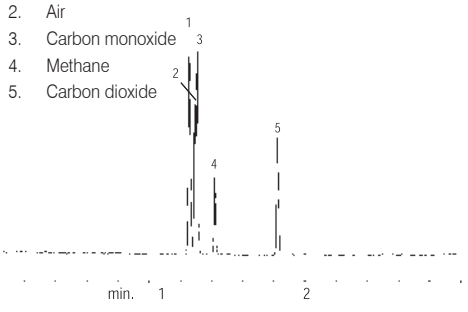


Applications

Permanent Gases

Column:	DM-PLOT Q,
	30 m x 0.32 mm x 10.00 µm
Cat. No.:	**8818**
Index:	CSR00169
Oven Temp.:	30 °C
Carrier Gas:	H_2, 38 cm/sec
Injection:	Split, 40:1, 30 °C
Sample Concentration:	2 - 5 mol %, 30 µL
Detector:	TCD, 200 °C

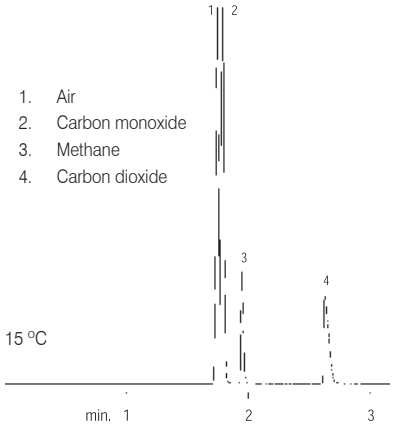
1. Helium
2. Air
3. Carbon monoxide
4. Methane
5. Carbon dioxide



Permanent Gases

Column:	DM-PLOT Q,
	30 m x 0.32 mm x 10.00 µm
Cat. No.:	**8818**
Index:	CSR00174L
Carrier Gas:	H_2, 34 cm/sec
Injection Temp.:	15 °C
Split Ratio:	40:1
Sample Concentration:	2 - 5 mol %
Detector:	TCD, 15 °C

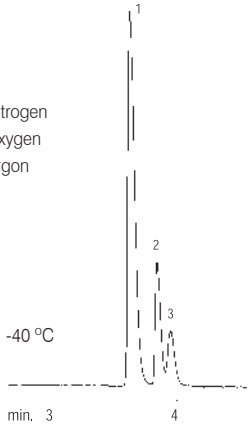
1. Air
2. Carbon monoxide
3. Methane
4. Carbon dioxide



Permanent Gases

Column:	DM-PLOT Q,
	30 m x 0.32 mm x 10.00 µm
Cat. No.:	**8818**
Index:	CSR00174R
Carrier Gas:	H_2, 20 cm/sec
Injection Temp.:	-40 °C
Split Ratio:	40:1
Sample Concentration:	2 - 5 mol %
Detector:	TCD, -40 °C

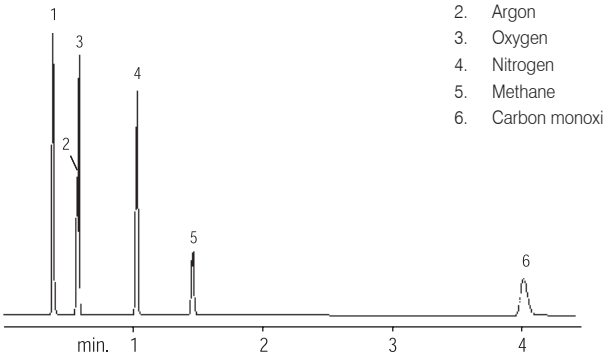
1. Nitrogen
2. Oxygen
3. Argon



Permanent Gases

Column:	DM-PLOT MS 5A, 30 m x 0.32 mm x 30.00 µm
Cat. No.:	**8822**
Index:	CSR00165
Oven Temp.:	70 °C
Carrier Gas:	H_2, 64 cm/sec
Injection Temp.:	Split, 70 °C
Sample Concentration:	2 - 5 mol%, 20 µL
Detector:	TCD, high senstivity, 200 °C

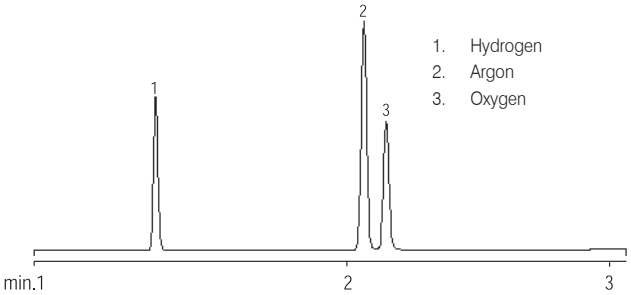
1. Helium
2. Argon
3. Oxygen
4. Nitrogen
5. Methane
6. Carbon monoxide



Permanent Gases

Column:	DM-PLOT MS 5A, 30 m x 0.53 mm x 20.00 µm
Cat. No.:	**8823**
Index:	CSR00170
Oven Temp.:	27 °C
Carrier Gas:	He, 34 cm/sec
Injection:	Sample loop, 0.5 mL
Detector:	Valco HID

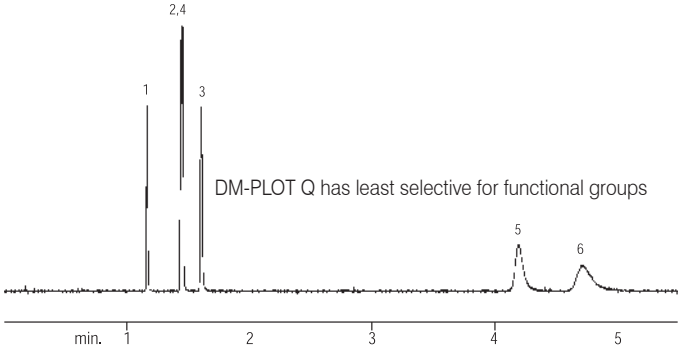
1. Hydrogen
2. Argon
3. Oxygen



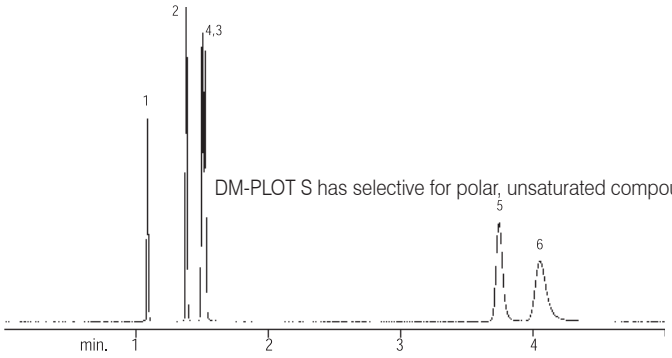
Permanent Gases

Column:	DM-PLOT Q / DM-PLOT S / DM-PLOT U, 30 m x 0.32 mm x 10.00 µm
Cat. No.:	**8818** / **8810** / **8824**
Index:	CSR00180
Oven Temp.:	50 °C
Carrier Gas:	H_2
Injection:	Split, 20:1, 200 °C
Sample:	1000 ppm (v / v) in He, 100 µL
Detector:	FID, 200 °C

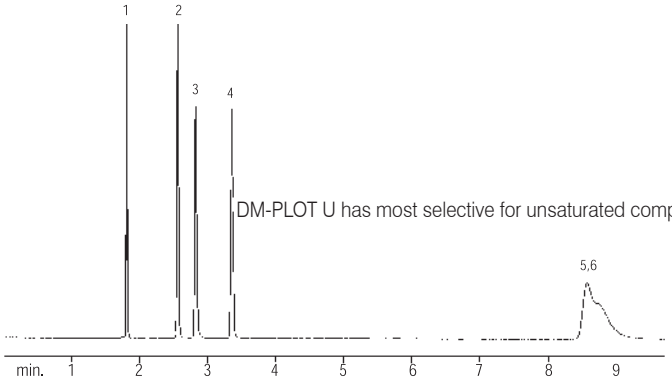
1. Methane
2. Ethylene
3. Ethane
4. Acetylene
5. Propylene
6. Propane



DM-PLOT Q has least selective for functional groups



DM-PLOT S has selective for polar, unsaturated compounds



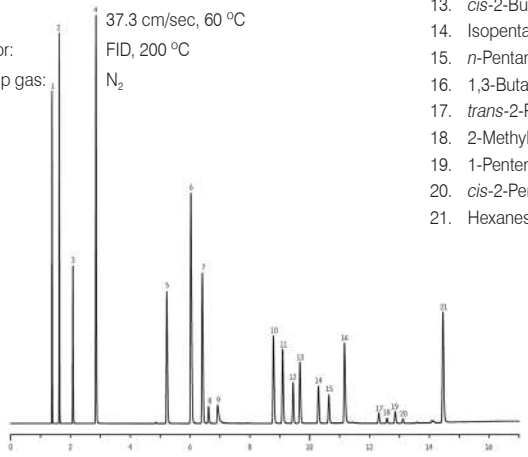
DM-PLOT U has most selective for unsaturated compounds

Applications

Refinery Gas

Column: DM-PLOT Alumina / Na_2SO_4, 30 m ×0.53 mm ×10.00 µm
Sample: Refinery gas
Cat. No.: **8806**
Index: CSR01139
Injection: Split, 10 µL, 200 °C
Split Vent Flow Rate: 40 mL/min
Oven Temp.: 60 °C (hold 2 min) to 200 °C (hold 1 min) at 10 °C/min
Carrier Gas: He, constant pressure (5.0 psi, 34.5 kPa), 37.3 cm/sec, 60 °C
Detector: FID, 200 °C
Make up gas: N_2

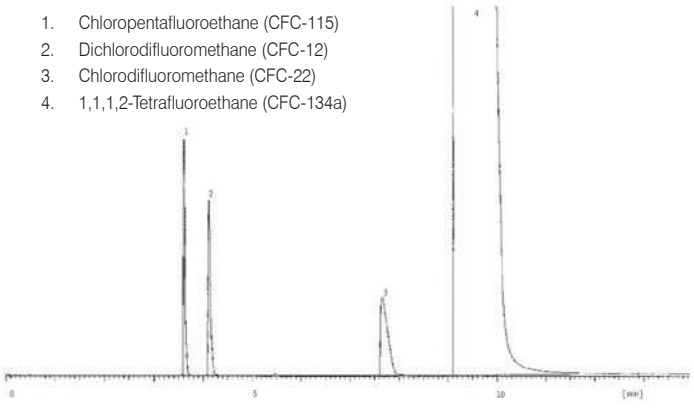
1. Methane
2. Ethane
3. Ethylene
4. Propane
5. Propylene
6. Isobutane
7. *n*-Butane
8. Propadiene
9. Acetylene
10. trans-2-Butene
11. 1-Butene
12. Isobutylene
13. *cis*-2-Butene
14. Isopentane
15. *n*-Pentane
16. 1,3-Butadiene
17. *trans*-2-Pentene
18. 2-Methyl-2-butene
19. 1-Pentene
20. *cis*-2-Pentene
21. Hexanes



Impurity Analysis of 1,1,1,2-Tetrafluoroethane

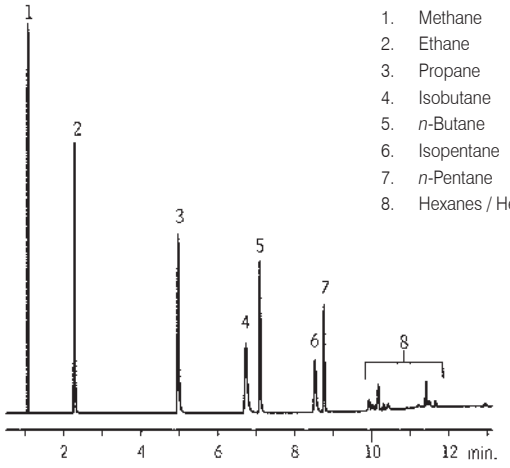
Column: DM-PLOT CFC, 30 m x 0.53 mm x 10.00 µm
Cat. No.: **8859**
Index: CGR1155
Sample: 1,1,1,2-Tetrafluoroethane
Injection: Split, 500 µL
Oven Temp.: 80 °C (hold 6 min) to 140 °C (hold 2 min) at 10 °C/min
Carrier Gas: He
Detector: FID

1. Chloropentafluoroethane (CFC-115)
2. Dichlorodifluoromethane (CFC-12)
3. Chlorodifluoromethane (CFC-22)
4. 1,1,1,2-Tetrafluoroethane (CFC-134a)



Natural Gas #2

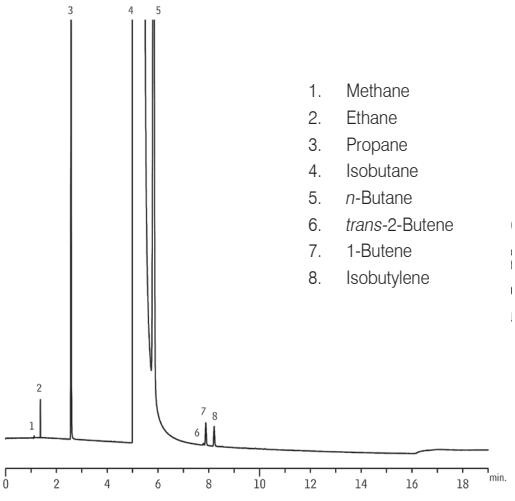
Column: DM-PLOT QS, 30 m x 0.53 mm x 20.00 µm
Cat. No.: **8830**
Index: CSR01013
Oven Temp.: 40 °C (hold 2 min) to 225 °C (hold 5 min) at 20 °C/min
Carrier Gas: He, 5.7 mL/min
Injection: 20 µL split (split ratio 10:1), 240 °C
Sample: Natural gas mix (mol%)
Detector: FID, 240 °C



1. Methane
2. Ethane
3. Propane
4. Isobutane
5. *n*-Butane
6. Isopentane
7. *n*-Pentane
8. Hexanes / Hexenes

Butane Lighter Fluid

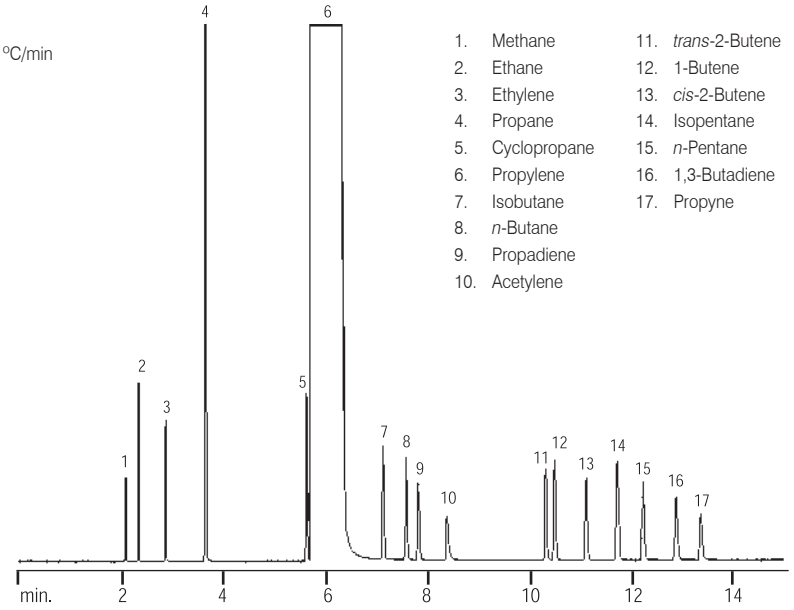
Column: DM-PLOT Alumina / KCl, 50 m×0.53 mm×10.00 µm
Cat. No.: **8813**
Index: CSR01086
Sample: Butane lighter fluid
Injection: Valve, 100 µL, 200 °C
Oven Temp.: 45 °C (hold 1 min) to 200 °C (hold 3.5 min) at 10 °C/min
Carrier Gas: H_2, constant pressure (8.0 psi, 55.2 kPa) 74 cm/sec 45 °C
Detector: FID, 200 °C



1. Methane
2. Ethane
3. Propane
4. Isobutane
5. *n*-Butane
6. *trans*-2-Butene
7. 1-Butene
8. Isobutylene

Propylene Purity

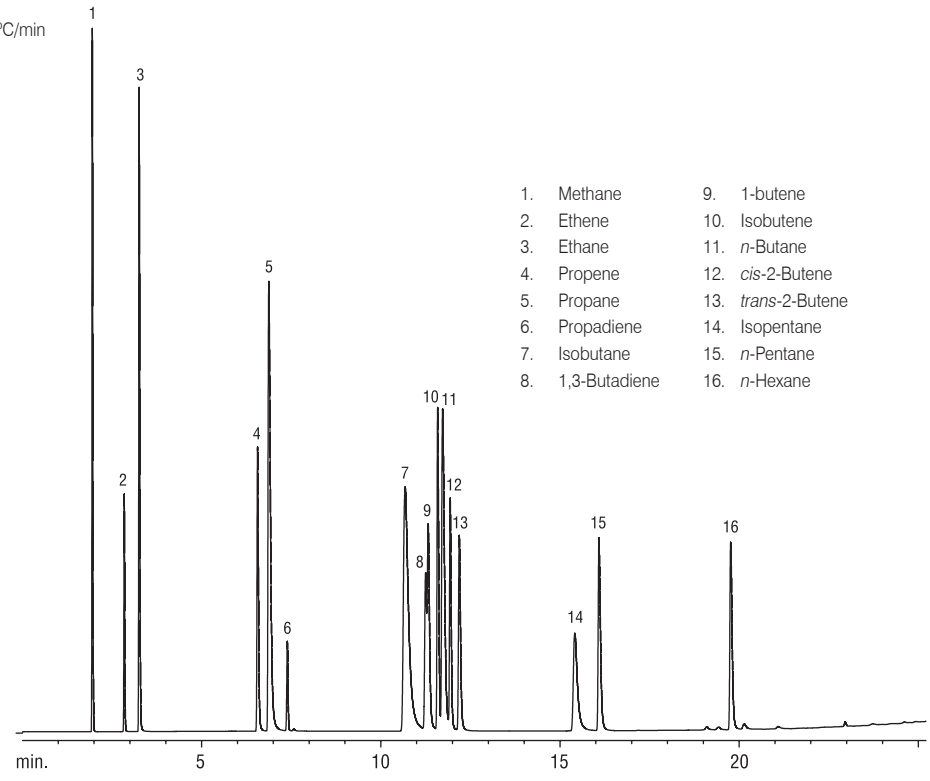
Column:	DM-PLOT Alumina, 50 m x 0.53 mm x 6.00 μm
Cat. No.:	**8801**
Index:	CSR00185
Oven Temp.:	40 °C (hold 3 min) to 120 °C (hold 5 min) at 10 °C/min
Carrier Gas:	He, 37.5 cm/sec, 80 °C
Injection:	Gas-tight syringe, 60 mL/min, 200 °C
Sample:	Hydrocarbons mix, 100 μL
Detector:	FID, 1.28 x 10^{-10} AFS, 200 °C



1. Methane
2. Ethane
3. Ethylene
4. Propane
5. Cyclopropane
6. Propylene
7. Isobutane
8. *n*-Butane
9. Propadiene
10. Acetylene
11. *trans*-2-Butene
12. 1-Butene
13. *cis*-2-Butene
14. Isopentane
15. *n*-Pentane
16. 1,3-Butadiene
17. Propyne

Hydrocarbon Gases

Column:	DM-PLOT Q, 30 m x 0.32 mm x 10.00 μm
Cat. No.:	**8818**
Index:	CSR00521
Oven Temp.:	40 °C to 240 °C (hold 10 min) at 8 °C/min
Carrier Gas:	He, 35 cm/sec, 40 °C
Injection:	Split, 20:1, 250 °C
Head Pressure:	18.0 psi
Column flow rate:	1.5 mL/min, 40 °C
Sample:	Hydrocarbon gases mix, 30 μL
Detector:	FID, 240 °C

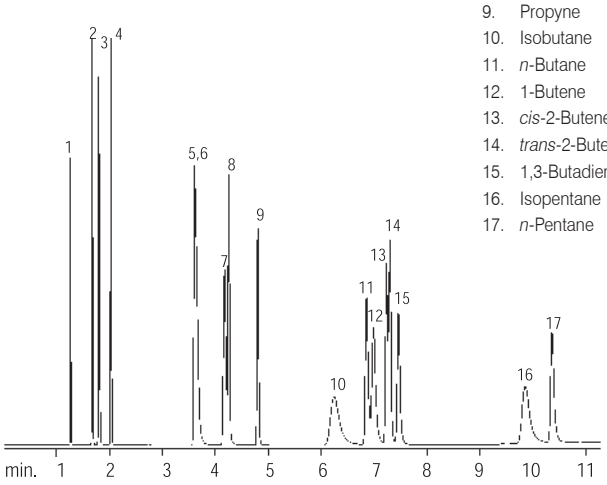


1. Methane
2. Ethene
3. Ethane
4. Propene
5. Propane
6. Propadiene
7. Isobutane
8. 1,3-Butadiene
9. 1-butene
10. Isobutene
11. *n*-Butane
12. *cis*-2-Butene
13. *trans*-2-Butene
14. Isopentane
15. *n*-Pentane
16. *n*-Hexane

Hydrocarbon Gases

Column: DM-PLOT U, 30 m x 0.32 mm x 10.00 µm
Cat. No.: **8824**
Index: CSR00177
Oven Temp.: 50 °C to 190 °C at 10 °C/min
Carrier Gas: He, 42 cm/sec, 80 °C
Injection: Split, 300 µL, 40 mL/min, 40:1, 250 °C
Detector: FID, 1.28 x 10^{-10} AFS, 250 °C

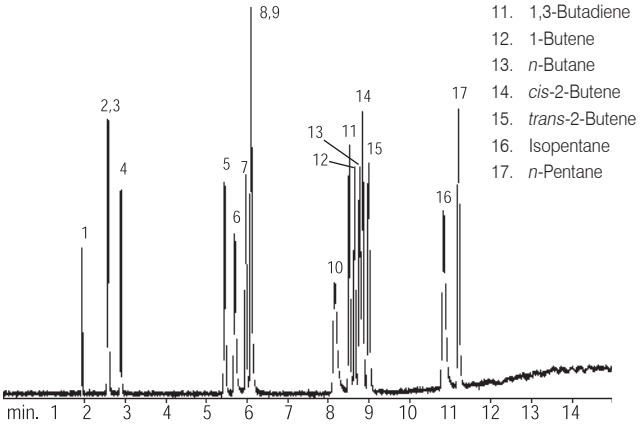
1. Methane
2. Ethylene
3. Ethane
4. Acetylene
5. Propane
6. Propylene
7. Cyclopropane
8. Propadiene
9. Propyne
10. Isobutane
11. *n*-Butane
12. 1-Butene
13. *cis*-2-Butene
14. *trans*-2-Butene
15. 1,3-Butadiene
16. Isopentane
17. *n*-Pentane



Hydrocarbon Gases

Column: DM-PLOT Q, 30 m x 0.32 mm x 10.00 µm
Cat. No.: **8818**
Index: CSR00176
Oven Temp.: 50 °C (hold 2 min) to 220 °C at 15 °C/min
Carrier Gas: He, 42 cm/sec, 80 °C
Injection: Split, 300 µL, 40 mL/min, 40:1, 250 °C
Detector: FID, 1.28 x 10^{-10} AFS, 250 °C

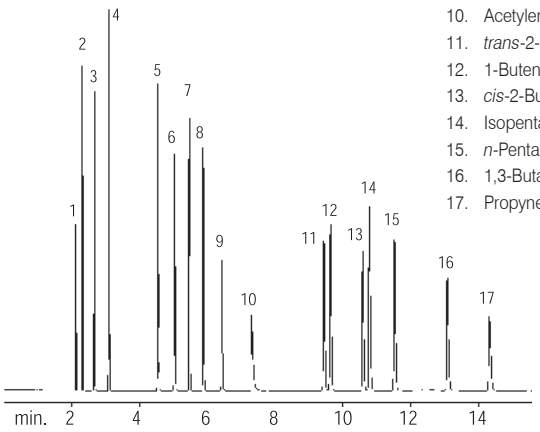
1. Methane
2. Ethylene
3. Acetylene
4. Ethane
5. Propylene
6. Propane
7. Cyclopropane
8. Propadiene
9. Propyne
10. Isobutane
11. 1,3-Butadiene
12. 1-Butene
13. *n*-Butane
14. *cis*-2-Butene
15. *trans*-2-Butene
16. Isopentane
17. *n*-Pentane



Refinery Gas

Column: DM-PLOT Alumina, 50 m x 0.53 mm x 6.00 µm
Cat. No.: **8801**
Index: CSR00183
Oven Temp.: 40 °C to 120 °C (hold 5 min) at 5 °C/min
Carrier Gas: He, 37.5 cm/sec, 80 °C
Injection: Split (gastight syringe) 60 mL/min, 200 °C
Sample: Hydrocarbons mix, 100 µL, 1,000 ppm
Detector: FID, 1.28 x 10^{-10} AFS, 200 °C

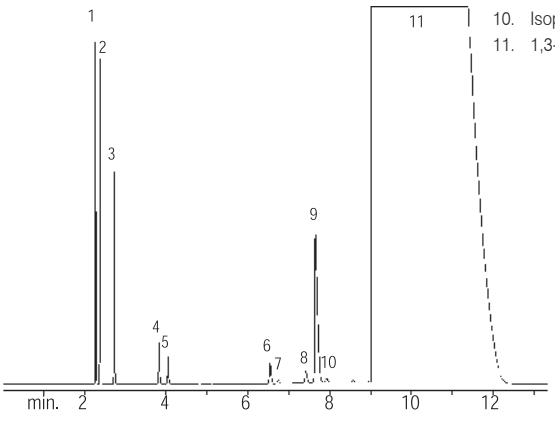
1. Methane
2. Ethane
3. Ethylene
4. Propane
5. Cyclopropane
6. Propylene
7. Isobutane
8. *n*-Butane
9. Propadiene
10. Acetylene
11. *trans*-2-Butene
12. 1-Butene
13. *cis*-2-Butene
14. Isopentane
15. *n*-Pentane
16. 1,3-Butadiene
17. Propyne



1,3-Butadiene Purity

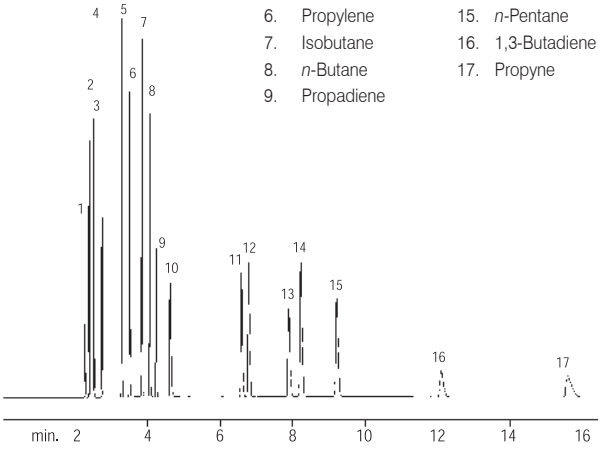
Column: DM-PLOT Alumina, 50 m x 0.53 mm x 6.00 µm
Cat. No.: **8801**
Index: CSR00186
Oven Temp.: 80 °C
Carrier Gas: He, 42 cm/sec, 80 °C
Injection: Gastight syringe, 40 mL/min, 200 °C
Sample: 99+% 1,3-Butadiene , 500 µL
Detector: FID, 1.28 x 10^{-10} AFS, 200 °C

1. Methane
2. Ethane
3. Propane
4. Isobutane
5. *n*-Butane
6. *trans*-2-Butene
7. 1-Butene
8. Isobutylene
9. *cis*-2-Butene
10. Isopentane
11. 1,3-Butadiene



Hydrocarbons

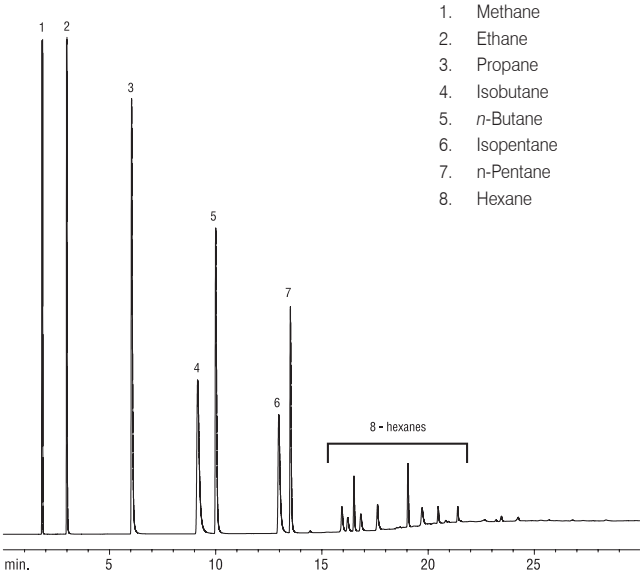
Column:	DM-PLOT Alumina, 50 m x 0.53 mm x 6.00 µm
Cat. No.:	**8801**
Index:	CSR00551
Oven Temp.:	80 °C
Carrier Gas:	He, 42 cm/sec, 80 °C
Injection:	Gastight syringe, 40 mL/min, 200 °C
Sample:	200 µL, 1,000 ppm
Detector:	FID, 1.28 x 10^{-10} AFS, 200 °C



1. Methane
2. Ethane
3. Ethylene
4. Propane
5. Cyclopropane
6. Propylene
7. Isobutane
8. *n*-Butane
9. Propadiene
10. Acetylene
11. *trans*-2-Butene
12. 1-Butene
13. *cis*-2-Butene
14. Isopentane
15. *n*-Pentane
16. 1,3-Butadiene
17. Propyne

Hydrocarbon Gases

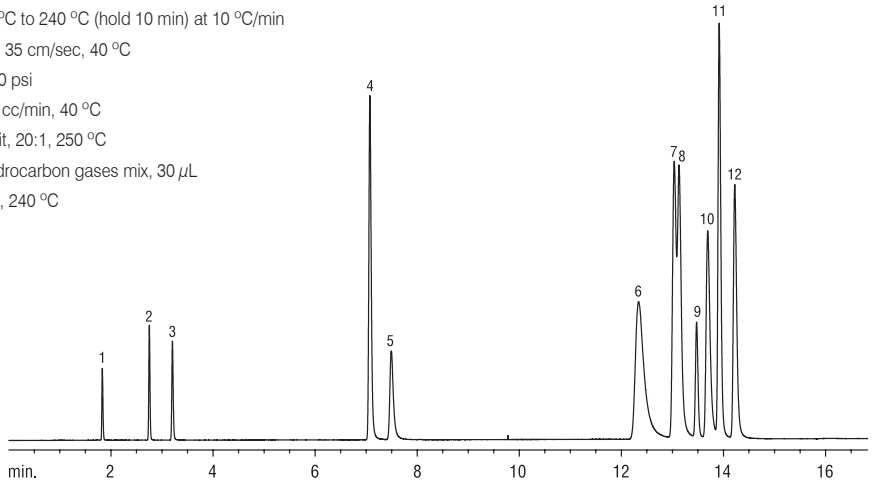
Column:	DM-PLOT Q, 30 m x 0.32 mm x 10.00 µm
Cat. No.:	**8818**
Index:	CSR00523
Oven Temp.:	40 °C to 240 °C (hold 10 min) at 10 °C/min
Carrier Gas:	He, 35 cm/sec, 40 °C
Head Pressure:	18.0 psi
Column flow rate:	1.5 mL/min, 40 °C
Injection:	Split, 20:1, 250 °C
Sample:	Hydrocarbon gases mix, 30 µL
Detector:	FID, 240 °C



1. Methane
2. Ethane
3. Propane
4. Isobutane
5. *n*-Butane
6. Isopentane
7. n-Pentane
8. Hexane

Hydrocarbon Gases

Column:	DM-PLOT Q, 30 m x 0.32 mm x 10.00 µm
Cat. No.:	**8818**
Index:	CSR00522
Oven Temp.:	35 °C to 240 °C (hold 10 min) at 10 °C/min
Carrier Gas:	He, 35 cm/sec, 40 °C
Head Pressure:	18.0 psi
Column flow rate:	1.5 cc/min, 40 °C
Injection:	Split, 20:1, 250 °C
Sample:	Hydrocarbon gases mix, 30 µL
Detector:	FID, 240 °C

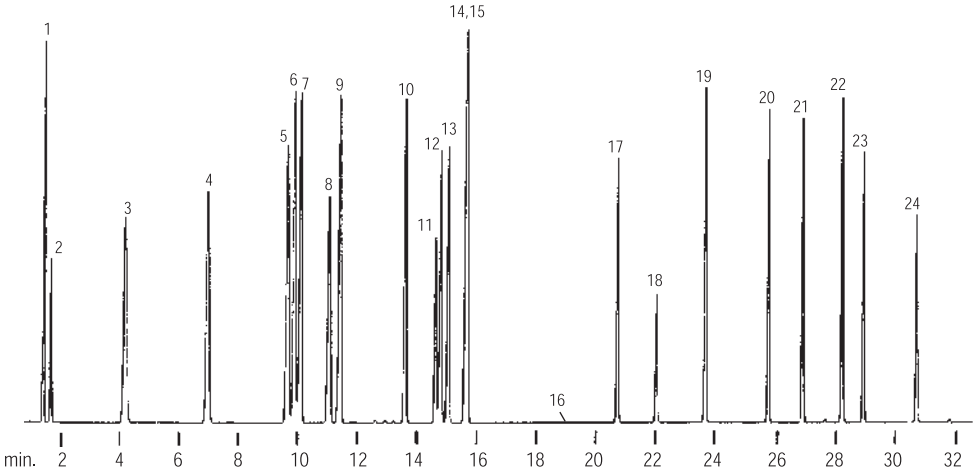


1. Methane
2. Ethylene
3. Ethane
4. Propylene
5. Propane
6. Isobutane
7. 1,3-Butadiene
8. 1-Butene
9. Isobutene
10. *n*-Butane
11. *cis*-2-Butene
12. *trans*-2-Butene

Petroleum Oxygenates

Column:	DM-Wax, 30 m x 0.53 mm x 1.00 μm
Cat. No.:	**7551**
Index:	CSR00196
Oven Temp.:	45 °C (hold 4 min) to 220 °C at 6 °C/min
Carrier Gas:	H_2, 40 cm/sec
Injection:	Direct, 220 °C
Sample:	Synthetic blend, 0.2 μL, 15 - 30 ng/μL
Detector:	FID, 16 x 10^{-11} AFS, 220 °C

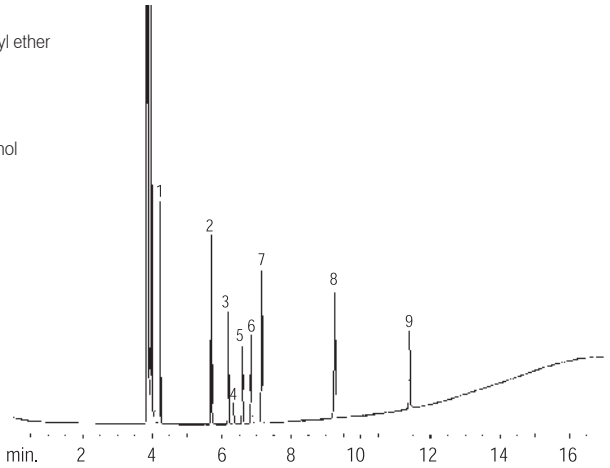
1. Heptane
2. C3 oxide
3. Benzene
4. Toluene
5. Ethylbenzene
6. *p*-Xylene
7. *m*-Xylene
8. Cumene
9. *o*-Xylene
10. Styrene
11. 2-Methylpentanol
12. *p*-Diethylbenzene
13. *m*-Diethylbenzene
14. α-Methylstyrene
15. *o*-Diethylbenzene
16. Phenylacetylene
17. Benzaldehyde
18. Monopropylene glycol
19. Acetophenone
20. 2-Phenyl-2-propanol
21. α-Methylbenzyl alcohol
22. Benzyl alcohol
23. Phenylethyl alcohol
24. Phenol



Petroleum Oxygenates

Column:	DM-TCEP, 60 m x 0.25 mm x 0.40 μm
Cat. No.:	**7809**
Index:	CSR00195
Oven Temp.:	60 °C (hold 5 min) to 100 °C (hold 10 min) at 5 °C/min
Carrier Gas:	He, 30 cm/sec, 80 °C
Injection:	Split, 46 mL/min, 200 °C
Sample:	1.0 μL, 500 ppm
Detector:	FID, 6.4 x 10^{-11} AFS, 200 °C

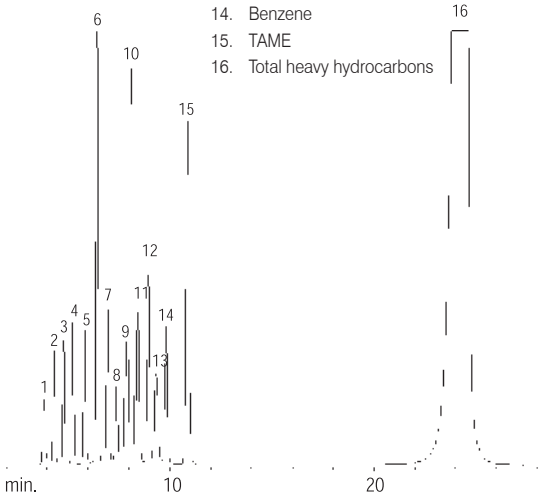
1. Methyl *tert*-butyl ether
2. *n*-Undecane
3. *tert*-Butanol
4. Methanol
5. Isopropyl alcohol
6. Ethanol
7. *n*-Dodecane
8. *n*-Tridecane
9. *n*-Butanol



Petroleum Oxygenates

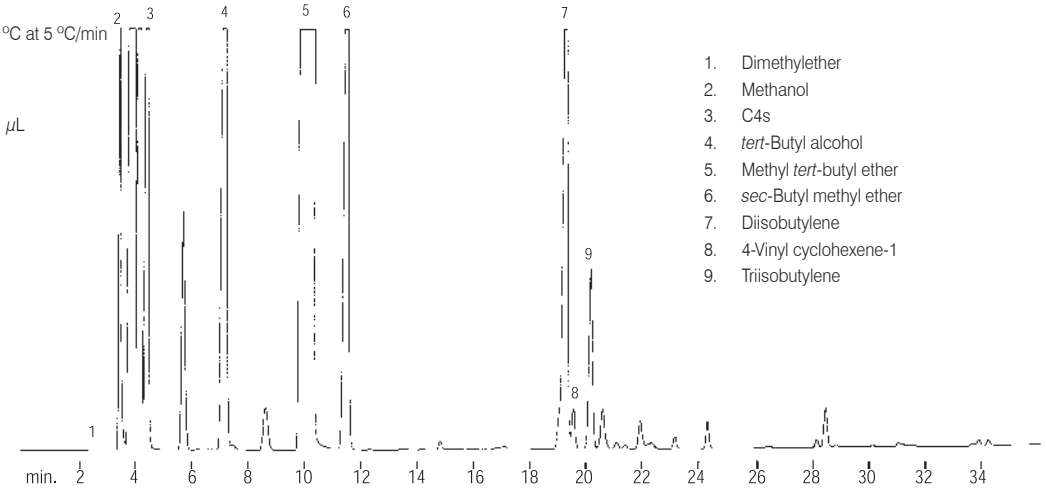
Column:	DM-1, 30 m x 0.53 mm x 3.00 μm
Cat. No.:	**7155**
Index:	CSR00194
Oven Temp.:	60 °C
Carrier Gas:	He, 5 mL/min, 60 °C
Injection:	Split, 15:1, 200 °C
Sample:	Oxygenates blend 1 - 10 % wt in surrogate gasoline, 0.5 μL
Detector:	FID, 250 °C

1. Methanol
2. Ethanol
3. Isopropanol
4. *tert*-butanol
5. *n*-Propanol
6. Methyl *tert*-butyl ether
7. *sec*-Butanol
8. DIPE
9. Isobutanol
10. Ethyl *tert*-butyl ether
11. *tert*-Amyl ether
12. Dimethoxyethane
13. *n*-Butanol
14. Benzene
15. TAME
16. Total heavy hydrocarbons



Oxygenates MTBE

Column:	DM-1, 30 m x 0.53 mm x 5.00 μm
Cat. No.:	**7157**
Index:	CSR00197
Oven Temp.:	40 °C (hold 8 min) to 200 °C at 5 °C/min
Carrier Gas:	H_2, 40 cm/sec
Injection:	Direct, 200 °C
Sample:	Methyl *tert*-butyl ether, 0.1 μL
Detector:	FID, 8 x 10^{-11} AFS, 200 °C

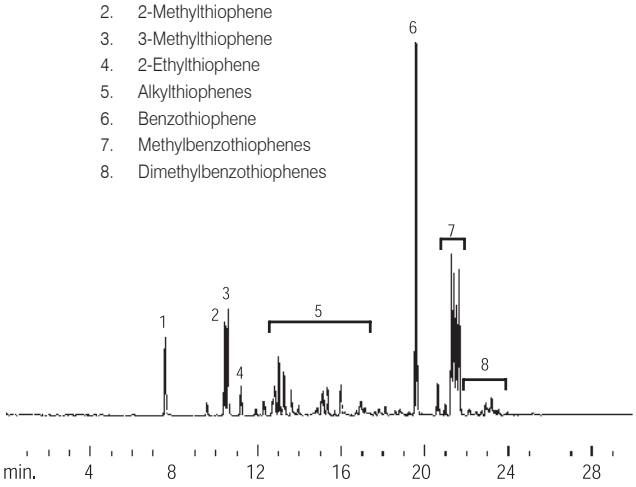


1. Dimethylether
2. Methanol
3. C4s
4. *tert*-Butyl alcohol
5. Methyl *tert*-butyl ether
6. *sec*-Butyl methyl ether
7. Diisobutylene
8. 4-Vinyl cyclohexene-1
9. Triisobutylene

Sulfur in Gasoline

Column:	DM-1, 30 m x 0.32 mm x 4.00 µm
Cat. No.:	**7143**
Index:	CSR00198
Oven Temp.:	40 °C (hold 3 min) to 275 °C (hold 5 min) at 10 °C/min
Carrier Gas:	He, 70 cm/sec
Injection:	Split, 10:1, 275 °C
Sample:	Sulfur in gasoline, 1.0 µL, 300 ppm
Detector:	SCD, 275 °C

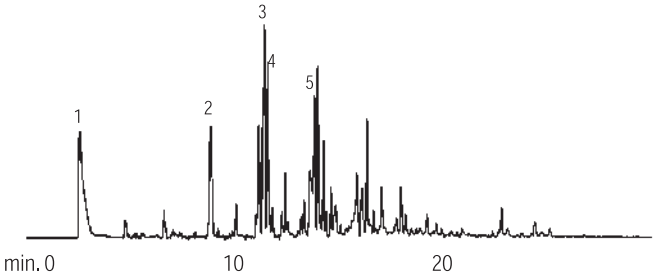
1. Thiophene
2. 2-Methylthiophene
3. 3-Methylthiophene
4. 2-Ethylthiophene
5. Alkylthiophenes
6. Benzothiophene
7. Methylbenzothiophenes
8. Dimethylbenzothiophenes



Sulfur in Naphtha

Column:	DM-1, 30 m x 0.32 mm x 4.00 µm
Cat. No.:	**7143**
Index:	CSR00199
Oven Temp.:	35 °C to 275 °C (hold 5 min) at 10 °C/min
Carrier Gas:	He, 24 cm/sec
Injection:	Split, 10:1, 275 °C
Sample:	Sulfur in naphtha, 1.0 µL, 500 ppm
Detector:	AED, 181 nm, 275 °C

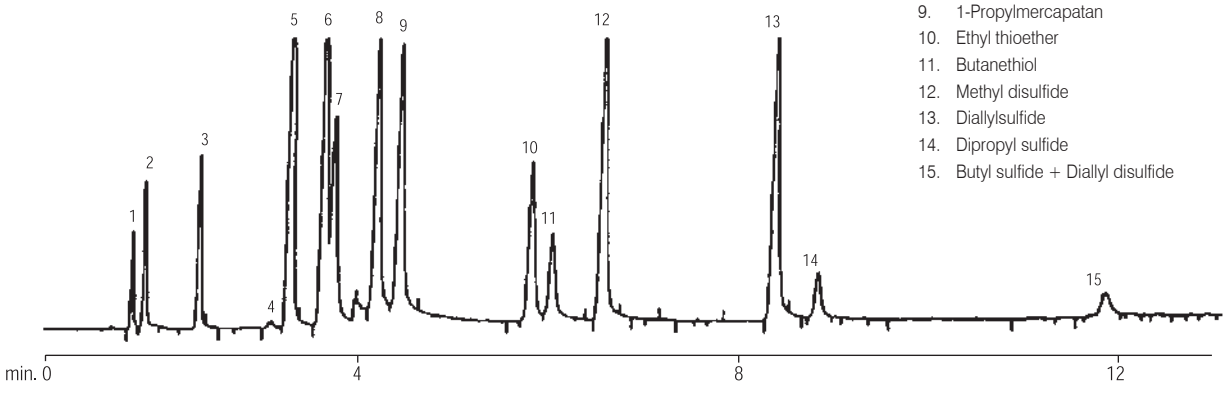
1. Hydrogen sulfide
2. Thiophene
3. 2-Methylthiophene
4. 3-Methylthiophene
5. 2-Ethylthiophene



Sulfide

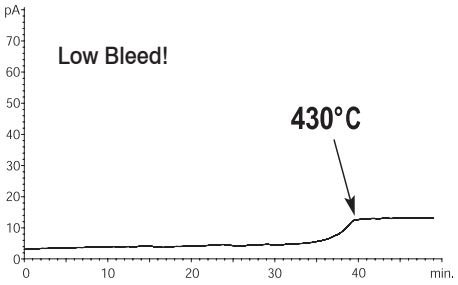
Column:	DM-1, 60 m x 0.53 mm x 5.00 µm
Cat. No.:	**7158**
Index:	CSR00200
Oven Temp.:	50 °C to 200 °C at 15 °C/ min
Carrier Gas:	He, 30 cm/sec, 50 °C
Injection:	Direct, 50 °C
Sample:	Sulfide mix, 100 µL
Detector:	FPD, 230 °C

1. Hydrogen sulfide
2. Sulfur dioxide + Carbonyl sulfide
3. Methanthiol
4. Ethanethiol
5. Carbon disulfide
6. Methyl sulfide
7. 2-Propylmercapatan
8. Allylmercaptan
9. 1-Propylmercapatan
10. Ethyl thioether
11. Butanethiol
12. Methyl disulfide
13. Diallylsulfide
14. Dipropyl sulfide
15. Butyl sulfide + Diallyl disulfide



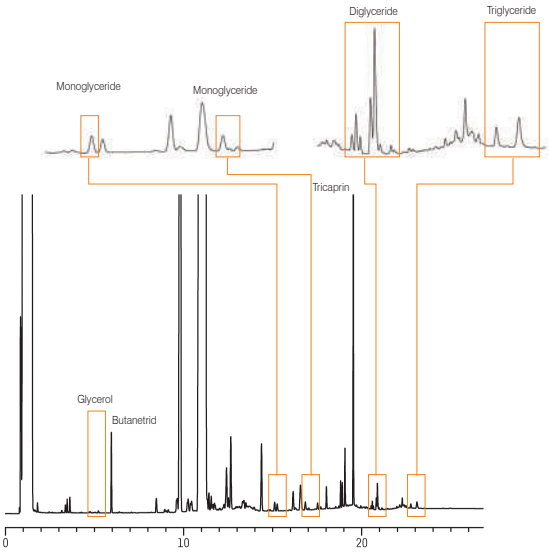
Bleed Profile

Column:	DM-HT SimDist Metal, 5 m x 0.53 mm x 0.10 µm
Cat.No.:	**7806**
Index:	CSR00527
Oven Temp.:	40 °C to 430 °C (hold 30 min) at 10 °C/min
Carrier Gas:	He, 60 cm/sec
Injection:	On-column
Flow Rate:	7.8 mL/min
Head Pressure:	1.0 psi
Detector:	FID, 430 °C



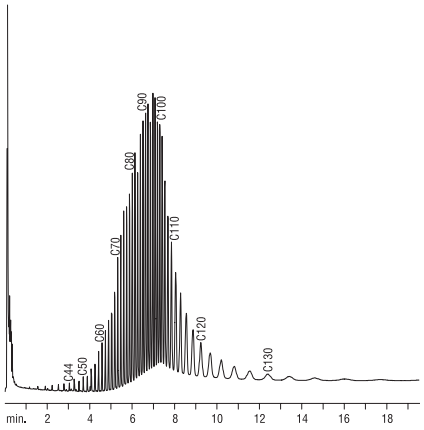
Glycerin in Biodiesel (ASTM D6584)

Column:	DM-BDTG Metal, 14 m x 0.53 mm x 0.16 µm (with 2 m Integra-Gap,total length 16 m)
Cat. No.:	**8864**
Index:	CSR00969
Sample:	Biodiesel (B100) in *n*-hexane
Injection:	1 µL cold on-column
Oven Temp.:	50 °C (hold 1 min) to 180 °C at 15 °C/min to 230 °C at 7 °C/min, to 380 °C (hold 5 min) at 30 °C/min
Carrier Gas:	H_2, 4 mL/min
Detector:	FID, 380 °C



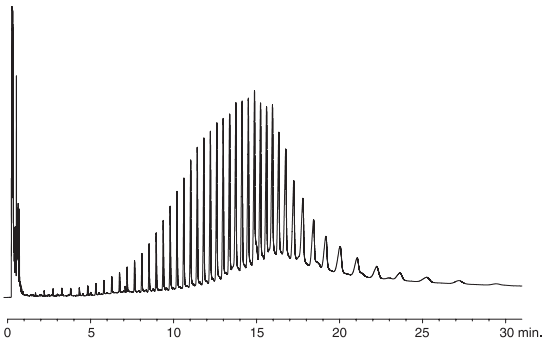
Hydrocarbons, C44 - C100

Column:	DM-HT SimDist Metal, 5 m x 0.53 mm x 0.10 µm
Cat. No.:	**7806**
Index:	CSR00543
Solvent:	Carbon disulfide
Injection:	On-column
Oven Temp.:	40 °C to 430 °C (hold 30 min) at 60 °C/ min
Carrier Gas:	H_2, 1.0 psi
Sample:	Polywax 1000, 0.2 µL
Detector:	FID, 430 °C



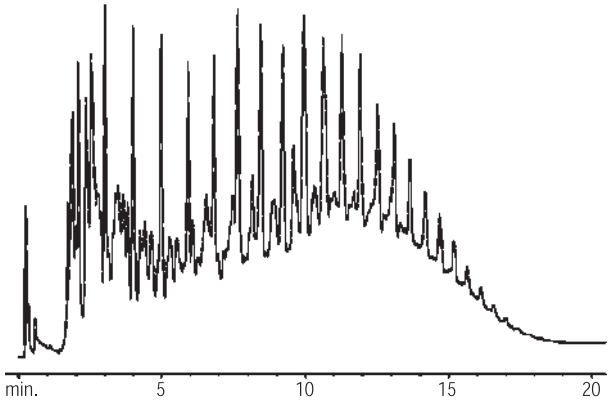
Hydrocarbons, C44 - C100

Column:	DM-HT SimDist Metal, 5 m x 0.53 mm x 0.10 µm
Cat. No.:	**7806**
Index:	CSR00531
Injection:	On-column, 0.2 µL
Oven Temp.:	40 °C to 430 °C (hold 25 min) at 60 °C/min
Carrier Gas:	He, 60 cm/sec, 1.0 psi
Sample:	Polywax 1000, 0.2 µL
Flow Rate:	7.8 mL/min
Detector:	FID, 430 °C



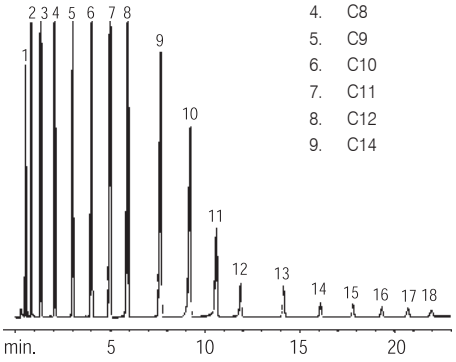
Simulated Distillation

Column:	DM-2887, 10 m x 0.53 mm x 2.65 µm
Cat. No.:	**7808**
Index:	CSR00227
Oven Temp.:	35 °C to 360 °C (hold 5 min) at 15 °C/min
Carrier Gas:	N_2, 112 cm/sec
Injection:	Direct, 360 °C
Sample:	0.1 - 0.01 wt% Hydrocarbon in CS_2 solvent, 1.0 µL



Simulated Distillation

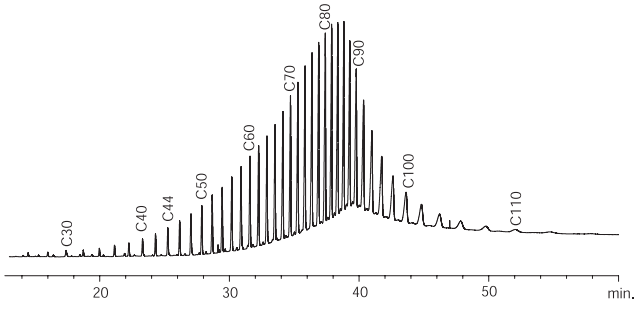
Column:	DM-2887, 10 m x 0.53 mm x 2.65 µm
Cat. No.:	**7808**
Index:	CSR00226
Oven Temp.:	35 °C to 360 °C (hold 5 min) at 15 °C/min
Carrier Gas:	N_2, 112 cm/sec
Injection:	Direct, 360 °C
Sample:	0.1 - 0.01 wt% Hydrocarbon in CS_2 solvent, 1.0 µL



1. C5
2. C6
3. C7
4. C8
5. C9
6. C10
7. C11
8. C12
9. C14
10. C16
11. C18
12. C20
13. C24
14. C28
15. C32
16. C36
17. C40
18. C44

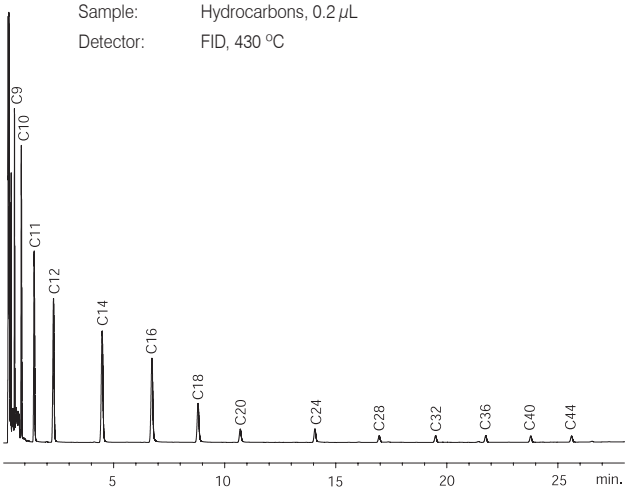
Hydrocarbons, C30 - C110

Column:	DM-HT SimDist Metal, 5 m x 0.53 mm x 0.10 µm
Cat. No.:	**7806**
Index:	CSR00530
Oven Temp.:	40 °C to 430 °C (hold 30 min) at 10 °C/min
Carrier Gas:	He, 60 cm/sec
Injection:	On-column
Flow Rate:	7.8 mL/min
Head Pressure:	1.0 psi
Solvent:	CS_2
Sample:	Polywax 1000, 0.2 µL
Detector:	FID, 430 °C



Hydrocarbons, C10 - C44

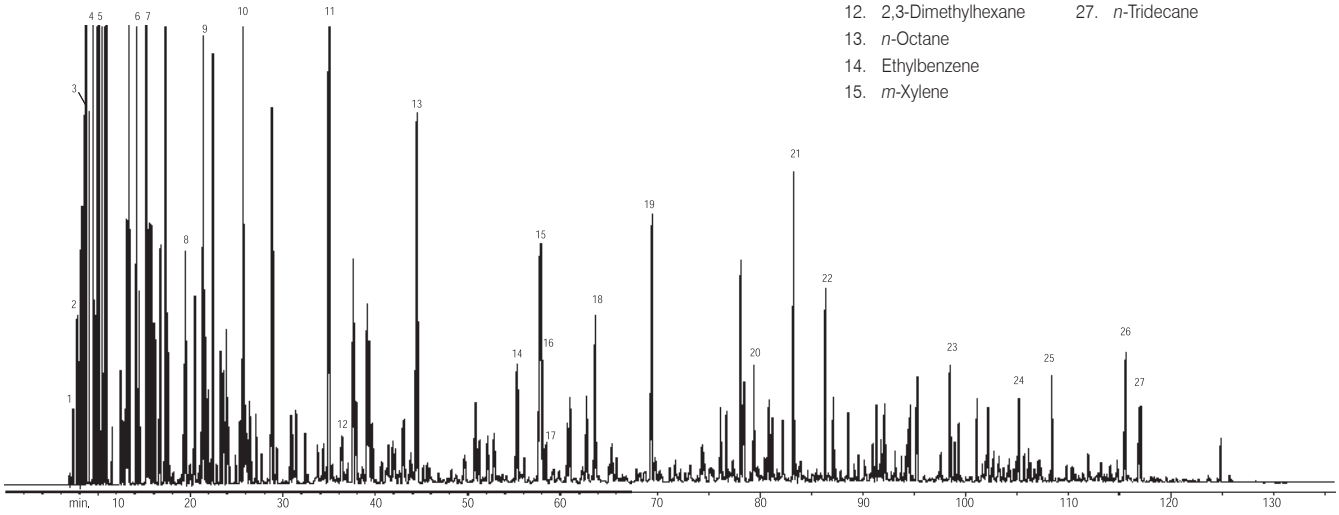
Column:	DM-HT SimDist Metal, 5 m x 0.53 mm x 0.10 µm
Cat. No.:	**7806**
Index:	CSR00529
Oven Temp.:	40° C to 430 °C (hold 30 min) at 10 °C/min
Carrier Gas:	He, 60 cm/sec
Injection:	On-column
Flow Rate:	7.8 mL/min
Head Pressure:	1.0 psi
Solvent:	CS_2
Sample:	Hydrocarbons, 0.2 µL
Detector:	FID, 430 °C



Detailed Hydrocarbons Analysis

Column:	DM-PONA, 100 m x 0.25 mm x 0.50 μm
Cat. No.:	**7805**
Index:	CSR00209
Oven Temp.:	35 °C (hold 13 min) to 45 °C (hold 15 min) at 10 °C/min to 60 °C (hold 15 min) at 1 °C/min to 200 °C (hold 5 min) at 1.9 °C/min
Carrier Gas:	He, 24 cm/sec, 35 °C
Injection:	Split, 100:1, 250 °C
Sample:	Reformulated gasoline, 0.5 μL
Detector:	FID, 4 x 10^{-12} AFS, 250 °C

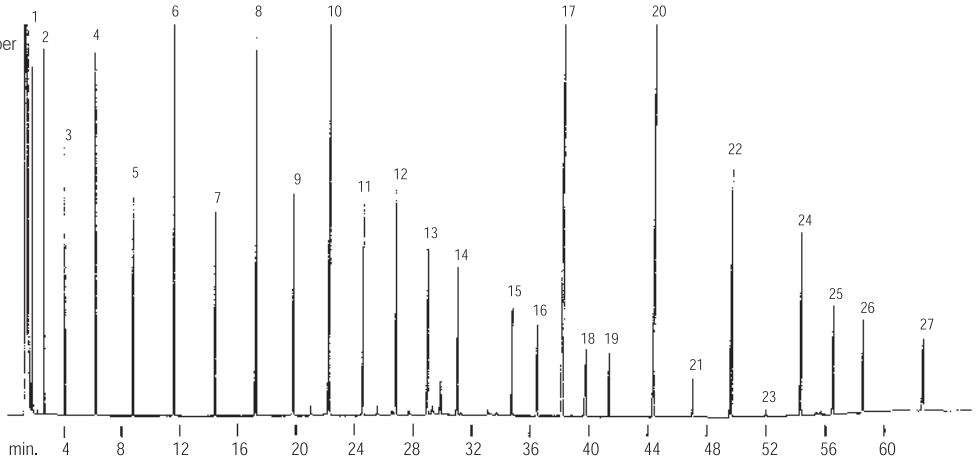
1. Propane
2. *iso*-Butane / Methanol
3. *n*-Butane
4. *iso*-Pentane
5. *n*-Pentane
6. 3-Methylpentane
7. *n*-Hexane
8. Benzene
9. 2-Methylhexane
10. *n*-Heptane
11. Toluene
12. 2,3-Dimethylhexane
13. *n*-Octane
14. Ethylbenzene
15. *m*-Xylene
16. *p*-Xylene
17. 2,3-Dimethylheptane
18. *o*-Xylene
19. *n*-Nonane
20. 1,3,5-Trimethylbenzene
21. 1,2,4-Trimethylbenzene
22. *n*-Decane
23. *n*-Undecane
24. Naphthalene
25. *n*-Dodecane
26. 2-Methylnaphthalene
27. *n*-Tridecane



Hydrocarbons, C7 - C42

Column:	DM-1, 30 m x 0.25 mm x 0.10 μm
Cat. No.:	**7119**
Index:	CSR00216
Oven Temp.:	40 °C to 340 °C at 5 °C/min
Carrier Gas:	H_2, 40 cm/sec, 40 °C
Injection:	Direct, 340 °C
Sample:	0.2 μL Injection of a synthetic hydrocarbons mix, 0.1 mg/mL per component
Detector:	FID, 64 x 10^{-11} AFS, 340 °C

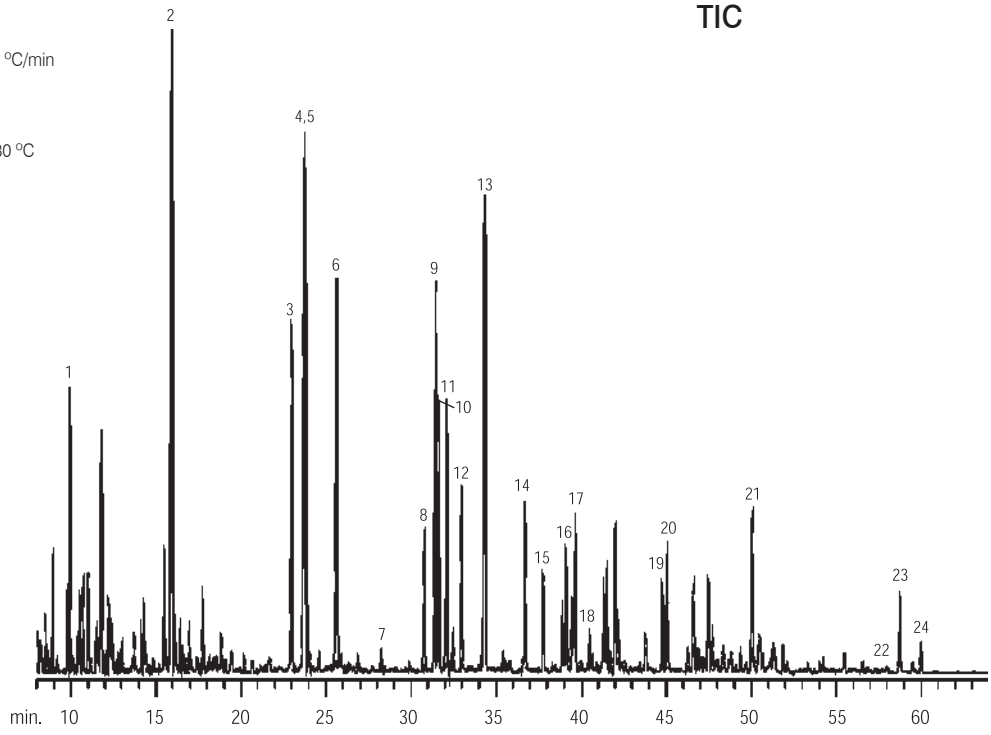
1. C7
2. C8
3. C9
4. C10
5. C11
6. C12
7. C13
8. C14
9. C15
10. C16
11. C17
12. C18
13. C19
14. C20
15. C22
16. C23
17. C24
18. C25
19. C26
20. C28
21. C30
22. C32
23. C34
24. C36
25. C38
26. C40
27. C42

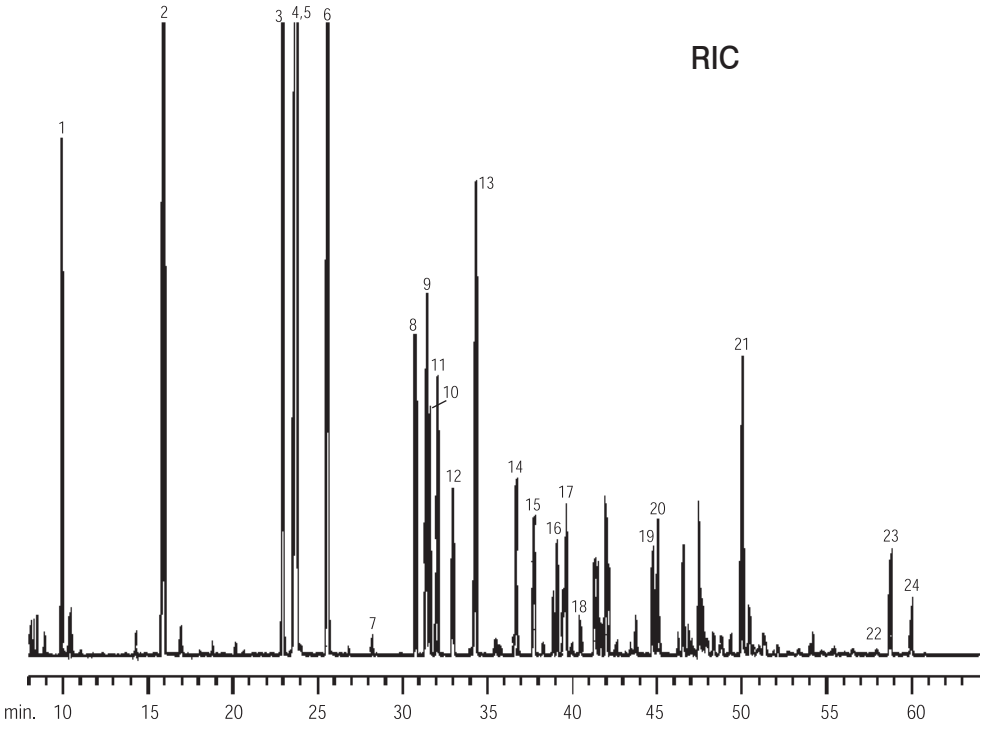


Gasoline Aromatics

Column:	DM-1, 60 m x 0.25 mm x 1.00 μm
Cat. No.:	**7126**
Index:	CSR00215
Oven Temp.:	50 °C (hold 1 min) to 190 °C at 2 °C/min
Injection:	Split, 200:1, 250 °C
Sample:	Neat gasoline, 1.0 μL
Detector:	MS, 45 - 300 m/e, 1 scan/sec, 280 °C

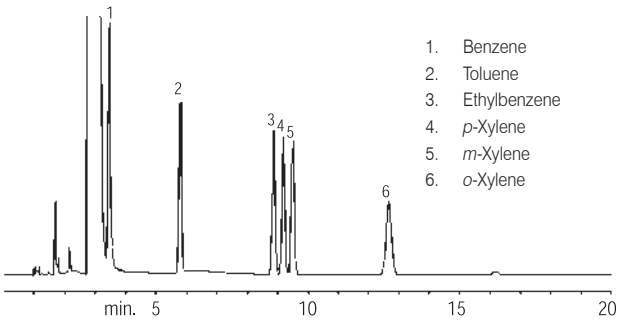
1. Benzene
2. Toluene
3. Ethylbenzene
4. *m*-Xylene
5. *p*-Xylene
6. *o*-Xylene
7. Isopropyl benzene
8. *n*-Propylbenzene
9. 1-Methyl-3-ethylbenzene
10. 1-Methyl-4-ethylbenzene
11. 1,3,5-Trimethylbenzene
12. 1-Methyl-2-ethylbenzene
13. 1,2,4-Trimethylbenzene
14. 1,2,3-Trimethylbenzene
15. Indane
16. 1,4-Diethylbenzene
17. Butylbenzene
18. 1,2-Diethylbenzene
19. 1,2,4,5-Tetramethylbenzene
20. 1,2,3,5-Tetramethylbenzene
21. Pentamethylbenzene
22. Naphthalene
23. 2-Methylnaphthalene
24. 1-Methylnaphthalene





Aromatics (Benzene / Toluene / Xylene)

Column: DM-Wax, 30 m x 0.53 mm x 1.00 μm
Cat. No.: **7551**
Index: CSR00191
Oven Temp.: 50 °C
Carrier Gas: H_2, 40 cm/sec
Injection: Direct, 250 °C
Sample: Benzene, toluene, xylene, 0.1 μL
Detector: FID, 16 x 10^{-11} AFS, 250 °C

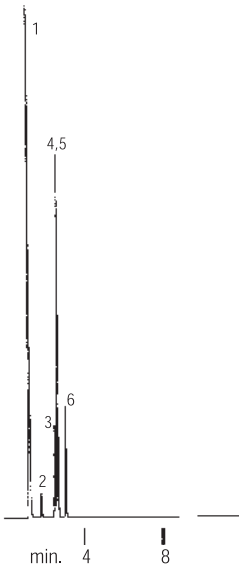


1. Benzene
2. Toluene
3. Ethylbenzene
4. *p*-Xylene
5. *m*-Xylene
6. *o*-Xylene

Aromatics (Benzene / Toluene / Xylene)

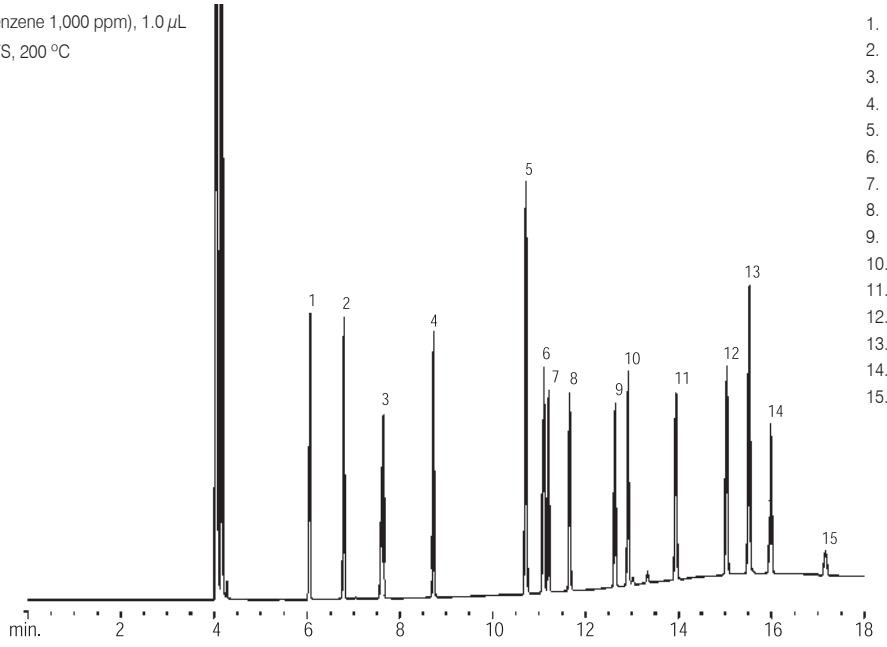
Column: DM-200, 30 m x 0.53 mm x 0.50 μm
Cat. No.: **8347**
Index: CSR00189
Oven Temp.: 60 °C
Carrier Gas: He, 40 cm/sec
Injection: Direct, 250 °C
Sample: Benzene, toluene, xylene standard, 0.1 μL
Detector: FID, 4 X 10^{-11} AFS, 250 °C

1. Benzene
2. Toluene
3. Ethylbenzene
4. *m*-Xylene
5. *p*-Xylene
6. *o*-Xylene



Aromatics

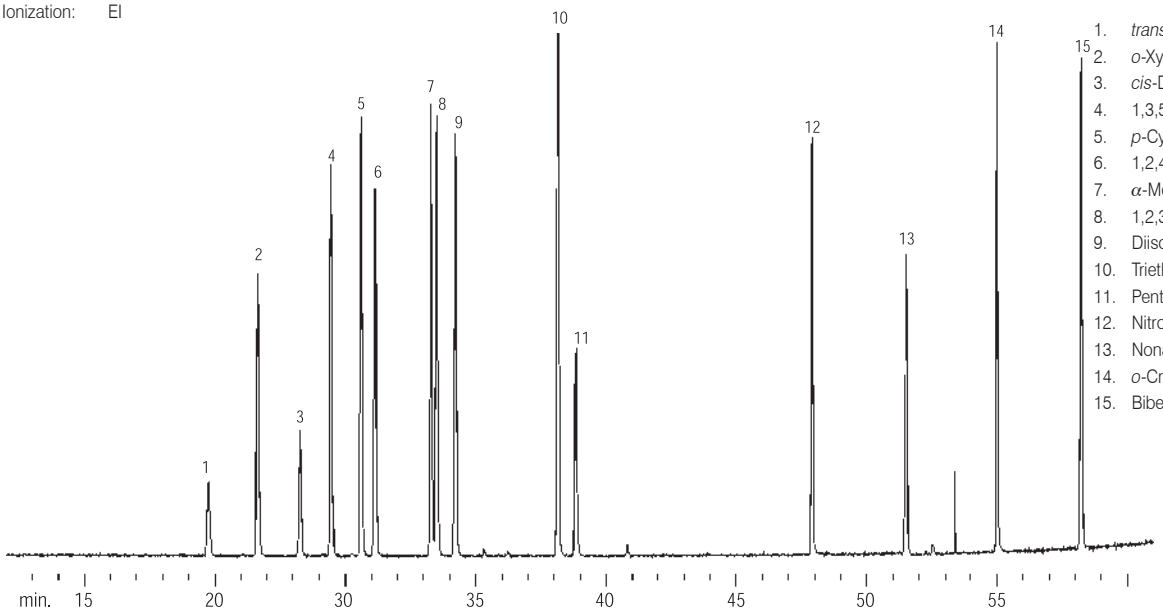
Column: DM-TCEP, 60 m x 0.25 mm x 0.40 μm
Cat. No.: **7809**
Index: CSR00211
Oven Temp.: 60 °C (hold 5 min) to 100 °C (hold 10 min) at 5 °C/min
Carrier Gas: He, 30 cm/sec, 80 °C
Injection: Split, 46 mL/min, 200 °C
Sample: 500 ppm (Ethylbenzene 1,000 ppm), 1.0 μL
Detector: FID, 6.4 x 10^{-11} AFS, 200 °C



1. *n*-Undecane
2. Benzene
3. *n*-Dodecane
4. Toluene
5. Ethylbenzene
6. *p*-Xylene
7. *m*-Xylene
8. Cumene
9. *n*-Propylbenzene
10. *o*-Xylene
11. Mesitylene
12. 1-Ethyl-2-methylbenzene
13. *m*-Diethylbenzene
14. *p*-Diethylbenzene
15. *o*-Diethylbenzene

Petrochemicals

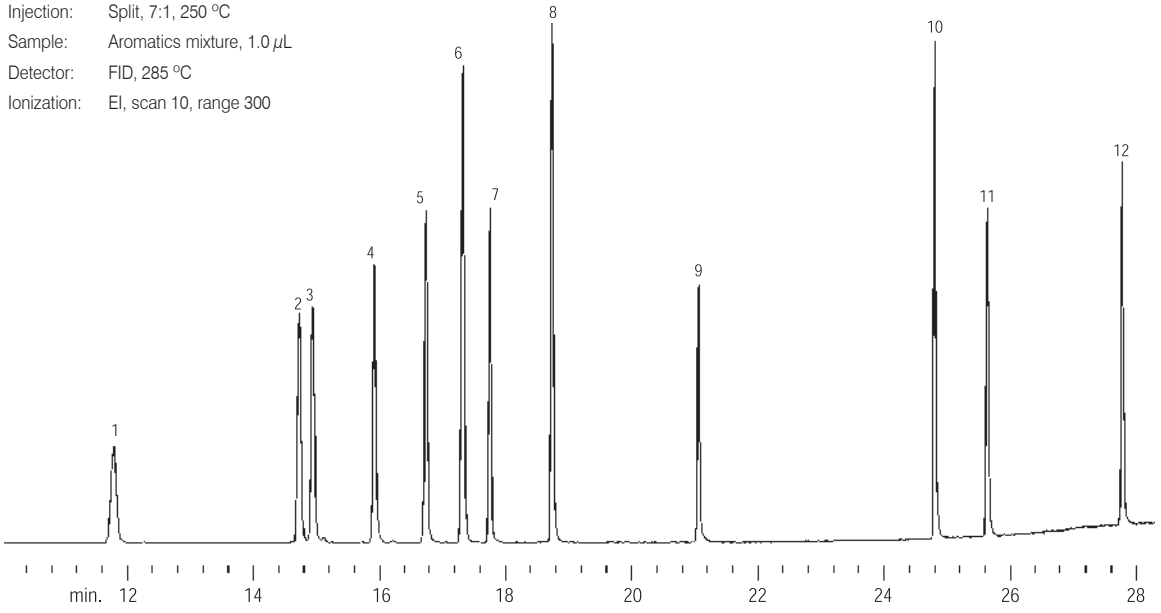
Column: DM-Wax, 60 m x 0.53 mm x 1.00 µm
Cat. No.: **7552**
Index: CCR00309
Oven Temp.: 40 °C (hold 10 min) to 245 °C (hold 20 min) at 4 °C/min
Carrier Gas: He, 50 cm/sec, 50 °C
Injection: Split, 7:1, 250 °C
Sample: Aromatics mixture, 1.0 µL
Detector: MS, 280 °C
Ionization: EI



1. *trans*-Decahydronaphthalene
2. *o*-Xylene
3. *cis*-Decahydronaphthalene
4. 1,3,5-Trimethylbenzene
5. *p*-Cymene
6. 1,2,4-Trimethylbenzene
7. α-Methylbenzene
8. 1,2,3-Trimethylbenzene
9. Diisopropylbenzene
10. Triethylbenzene
11. Pentadecane
12. Nitrobenzene
13. Nonadecane
14. *o*-Cresol
15. Bibenzyl

Aromatics

Column: DM-Wax, 60 m x 0.53 mm x 1.00 µm
Cat. No.: **7552**
Index: CCR00311
Oven Temp.: 45 °C (hold 10 min) to 250 °C (hold 20 min) at 12 °C/min
Carrier Gas: He, 50 cm/sec, 50 °C
Injection: Split, 7:1, 250 °C
Sample: Aromatics mixture, 1.0 µL
Detector: FID, 285 °C
Ionization: EI, scan 10, range 300

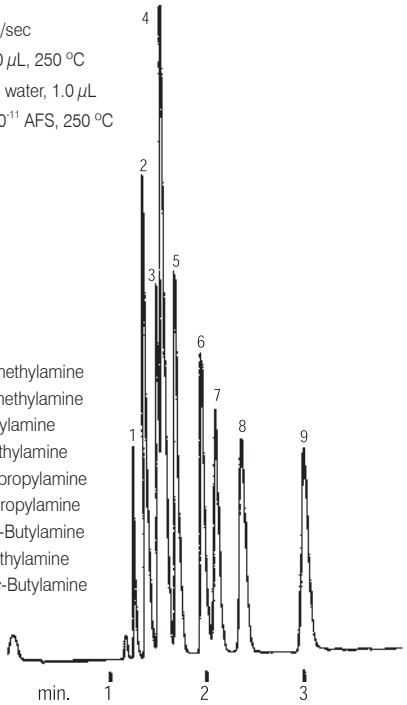


1. Toluene
2. Ethylbenzene
3. *p*-Xylene
4. Isopropyl benzene
5. Propylbenzene
6. *tert*-Butylbenzene
7. Styrene
8. Butylbenzene
9. Pentadecane
10. Naphthalene
11. Nonadecane
12. *p*-Cresol

Primary Amines (Low MW)

Column: DM-Wax Amine, 30 m x 0.53 mm x 1.00 µm
Cat. No.: **7833**
Index: CCR00304
Oven Temp.: 45 °C
Carrier Gas: H_2, 40 cm/sec
Injection: Direct, 1.0 µL, 250 °C
Sample: Amines in water, 1.0 µL
Detector: FID, 1 x 10^{-11} AFS, 250 °C

1. Trimethylamine
2. Dimethylamine
3. Ethylamine
4. Methylamine
5. Isopropylamine
6. *n*-Propylamine
7. *tert*-Butylamine
8. Diethylamine
9. *sec*-Butylamine



Amines (Low MW)

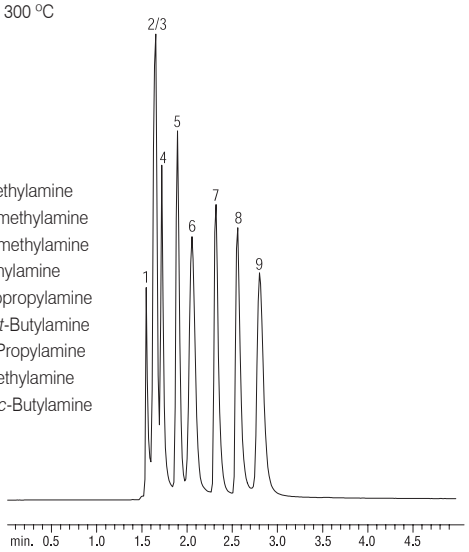
Column: DM-Wax Amine, 30 m x 0.53 mm x 1.00 µm
Cat. No.: **7833**
Index: CCR00305
Oven Temp.: 50 °C
Carrier Gas: H_2, 47 cm/sec
Injection: Split, 40:1, 200 °C
Sample: Methanol in water, 0.6 µL, 500 ng/µL
Detector: FID, 4 x 10^{-11} AFS, 200 °C

1. Trimethylamine
2. Diethylamine
3. Methanol

Primary Amines

Column: DM-35 Amine, 30 m x 0.53 mm x 1.00 µm
Cat. No.: **7825**
Index: CCR00578
Oven Temp.: 35 °C (hold 5 min)
Carrier Gas: He, 35.7 cm/sec constant pressure
Injection: Split, 10:1
Sample: Primary amines in water, 50 ppm, 1.0 µL
Detector: FID, 300 °C

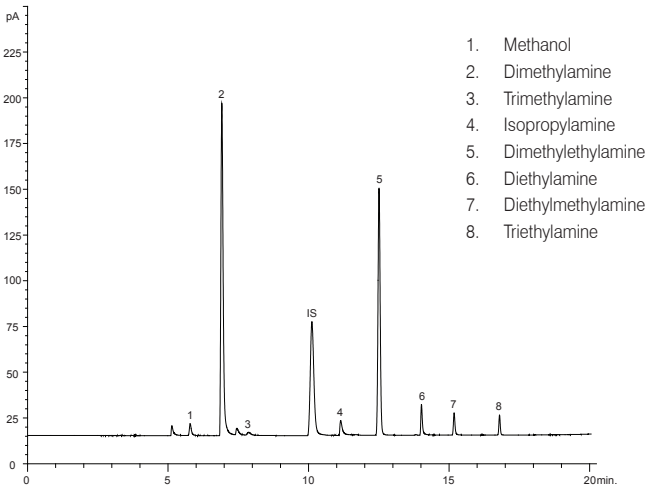
1. Methylamine
2. Dimethylamine
3. Trimethylamine
4. Ethylamine
5. Isopropylamine
6. *tert*-Butylamine
7. *n*-Propylamine
8. Diethylamine
9. *sec*-Butylamine



Short Chain Amaines in Water

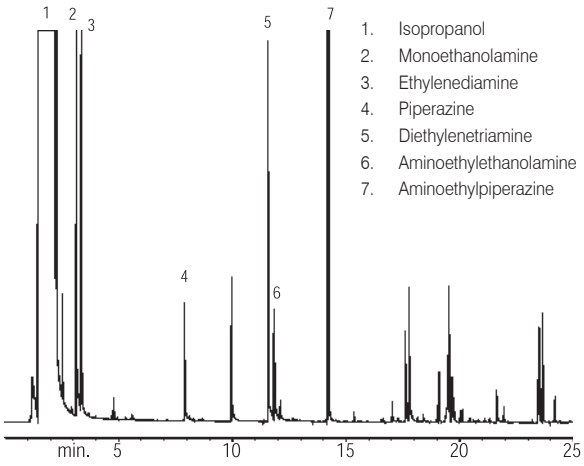
Column: DM-Volatile Amine, 60 m x 0.32 mm
Cat. No.: **8857**
Index: CGN1154
Sample: 200 - 1,000 ppm Short chain amines in water
Injection: Split, 15:1, 1.0 µL, 220 °C
Oven Temp.: 40 °C (hold 10 min) to 250 °C (hold 10 min) at 20 °C/min
Carrier Gas: H_2, 2.0 mL/min, 35 cm/sec, 40 °C
Detector: FID, 250 °C

1. Methanol
2. Dimethylamine
3. Trimethylamine
4. Isopropylamine
5. Dimethylethylamine
6. Diethylamine
7. Diethylmethylamine
8. Triethylamine



Ethylenediamines

Column:	DM–5 Amine, 30 m x 0.25 mm x 0.50 μm
Cat. No.:	**7815**
Index:	CCR00298
Oven Temp.:	40 °C (hold 4 min) to 315 °C (hold 5 min) at 10 °C/min
Carrier Gas:	H_2, 43 cm/sec, 40 °C
Injection:	Split, 20:1, 315 °C
Sample:	Ethylenediamines, 3.0 μL, 5 – 80 ng
Detector:	FID, 6.4 x 10^{-11} AFS, 315 °C

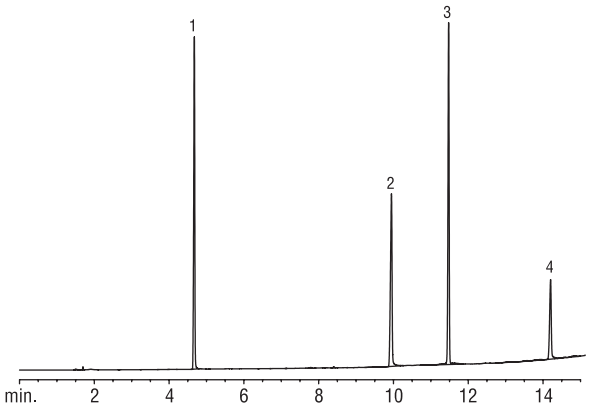


1. Isopropanol
2. Monoethanolamine
3. Ethylenediamine
4. Piperazine
5. Diethylenetriamine
6. Aminoethylethanolamine
7. Aminoethylpiperazine

Ethanolamines

Column:	DM-35 Amine, 30 m x 0.32 mm x 1.00 μm
Cat. No.:	**7823**
Index:	CCR00585
Oven Temp.:	50 °C (hold 0.5 min) to 280 °C at 15 °C/min
Carrier Gas:	He, 40 cm/sec constant pressure, 50 °C
Injection:	Split, 10:1, 300 °C
Sample:	500 μg/mL Ethanolamines standard in water, 1.0 μL
Detector:	FID, 300 °C

1. Monoethanolamine
2. Diethanolamine
3. Triethylene glycol monomethylether
4. Triethanolamine

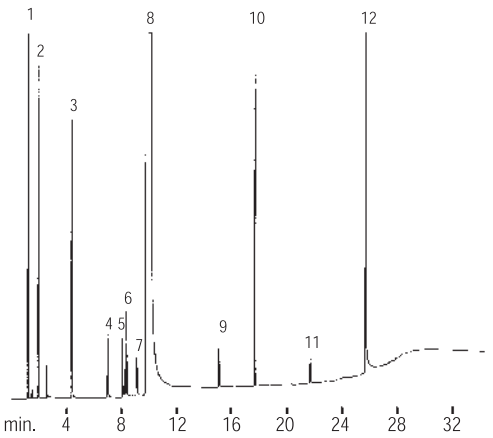


Hexamethylenediamine

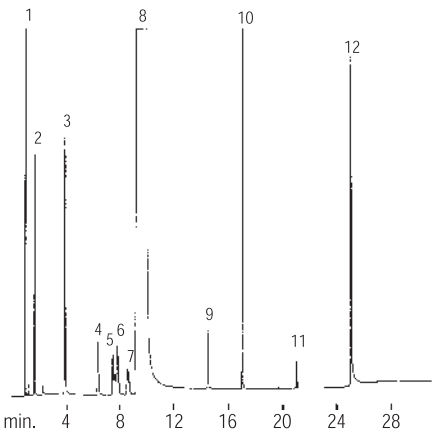
Column:	DM-Wax Amine, 30 m x 0.32 mm x 0.25 μm
Cat. No.:	**7829**
Index:	CCR00302
Oven Temp.:	95 °C (hold 6 min) to 235 °C (hold 4 min) at 7 °C/min
Carrier Gas:	H_2, 40 cm/sec
Injection:	Direct, 250 °C
Sample:	Hexamethylenediamine, 0.4 μL, 10 - 100 ng
Detector:	FID, 2 x 10^{-11} AFS, 250 °C

V.S.

Column:	DM-Wax Amine, 30 m x 0.53 mm x 0.50 μm
Cat. No.:	**7837**
Index:	CCR00303
Oven Temp.:	95 °C (hold 6 min) to 235 °C (hold 2 min) at 7 °C/min
Carrier Gas:	H_2, 40 cm/sec
Injection:	Direct, 255 °C
Sample:	Hexamethylenediamine, 0.2 μL
Detector:	FID, 64 x 10^{-11}, 255 °C



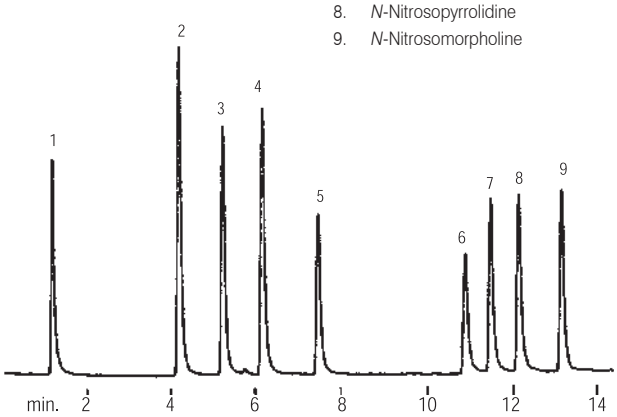
1. Cyclohexane
2. Hexamethyleneimine
3. 1,4-Diaminobutane
4. Pentamethylenediamine
5. 1,2-Diaminocyclohexane
6. 1,5-Diamino-2-Methylpentane
7. Aminomethylcyclopentylamine
8. Hexamethylenediamine
9. 6-Aminocapronitrile
10. *n*-Valeramide
11. Adiponitrile
12. *bis*-Hexamethylenetriamine



Nitrosamines

Column:	DM–Wax Amine, 60 m x 0.53 mm x 1.00 μm
Cat. No.:	**7836**
Index:	CCR00306
Oven Temp.:	100 °C (hold 1 min) to 170 °C at 5 °C/min
Carrier Gas:	He, 100 cm/sec
Injection:	Direct, 200 °C
Sample:	Nitrosamines, 1.0 μg/mL
Detector:	TSD, 200 °C

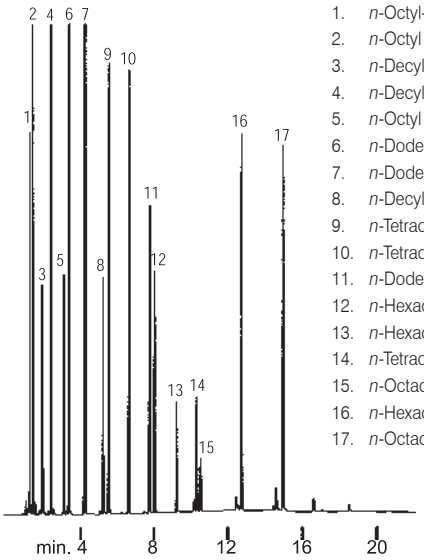
1. Solvent
2. *N*-Nitrosodimethylamine
3. *N*-Nitrosodiethylamine
4. *N*-Nitrosodiisopropylamine
5. *N*-Nitrosodipropylamine
6. *N*-Nitrosodibutylamine
7. *N*-Nitrosopiperidine
8. *N*-Nitrosopyrrolidine
9. *N*-Nitrosomorpholine



Amines / Alcohols / Chlorides

Column:	DM-Wax, 30 m x 0.53 mm x 0.50 μm
Cat. No.:	**7547**
Index:	CCR00307
Oven Temp.:	100 °C to 250 °C (hold 5 min) at 8 °C/min
Carrier Gas:	H_2, 40 cm/sec
Injection:	Split, 40:1, 250 °C
Sample:	Mix, 0.5 μL
Detector:	FID, 128 x 10^{-11} AFS, 250 °C

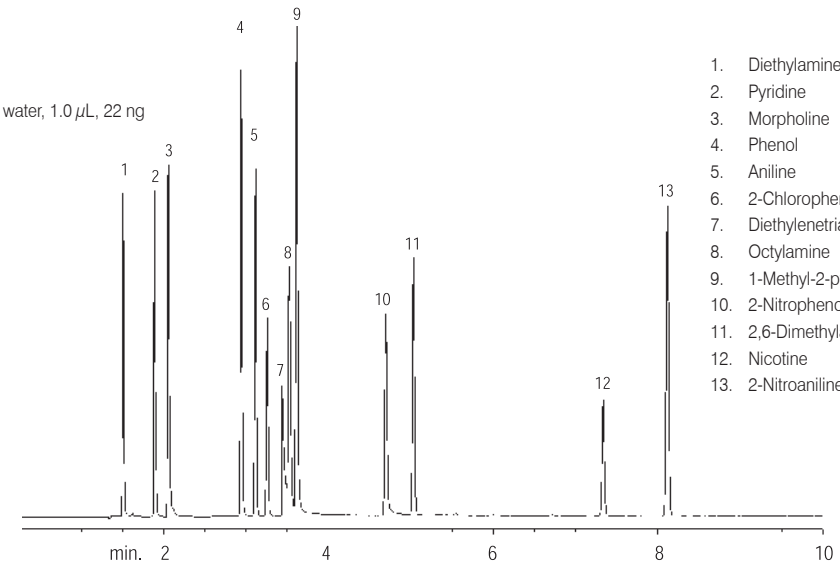
1. *n*-Octyl-*N*,*N*-dimethylamine
2. *n*-Octyl chloride
3. *n*-Decyl-*N*,*N*-dimethylamine
4. *n*-Decyl chloride
5. *n*-Octyl alcohol
6. *n*-Dodecyl-*N*,*N*-dimethylamine
7. *n*-Dodecyl chloride
8. *n*-Decyl alcohol
9. *n*-Tetradecyl-*N*,*N*-dimethylamine
10. *n*-Tetradecyl chloride
11. *n*-Dodecyl alcohol
12. *n*-Hexadecyl-*N*,*N*-dimethylamine
13. *n*-Hexadecyl chloride
14. *n*-Tetradecyl alcohol
15. *n*-Octadecyl-*N*,*N*-dimethylamine
16. *n*-Hexadecyl alcohol
17. *n*-Octadecyl alcohol



Amines / Phenols

Column:	DM-5 Amine, 30 m x 0.32 mm x 1.00 μm
Cat. No.:	**7817**
Index:	CCR00301
Oven Temp.:	120 °C to 220 °C at 10 °C/min
Carrier Gas:	H_2, 38 cm/sec, 120 °C
Injection:	Split, 25:1, 305 °C
Sample:	Miscellaneous amines and phenols in water, 1.0 μL, 22 ng
Detector:	FID, 6.4 x 10^{-11} AFS, 305 °C

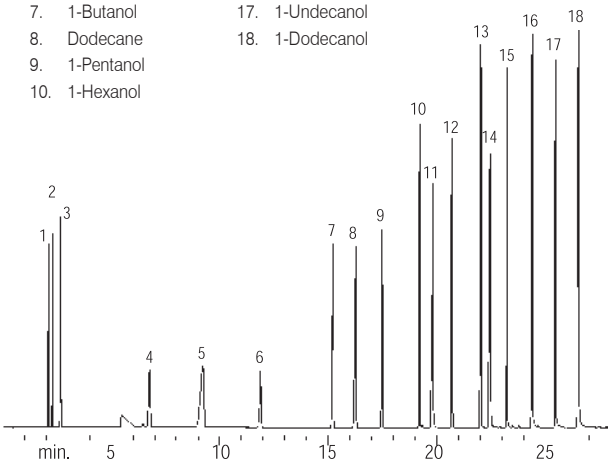
1. Diethylamine
2. Pyridine
3. Morpholine
4. Phenol
5. Aniline
6. 2-Chlorophenol
7. Diethylenetriamine
8. Octylamine
9. 1-Methyl-2-pyrrolidinone
10. 2-Nitrophenol
11. 2,6-Dimethylaniline
12. Nicotine
13. 2-Nitroaniline



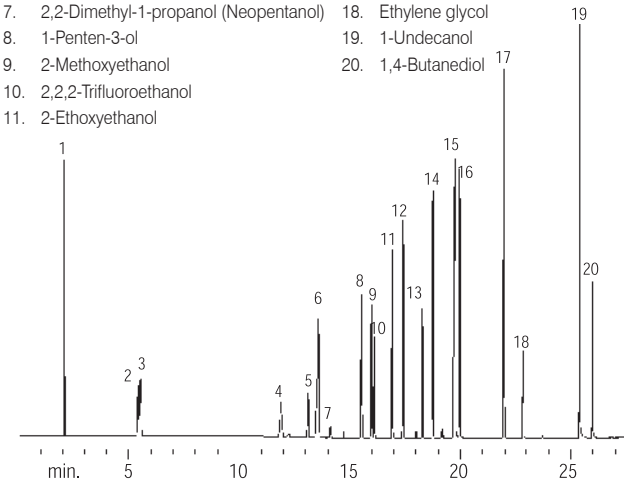
Alcohols

Column: DM-Wax, 60 m x 0.53 mm x 1.00 µm
Cat. No.: **7552**
Index: CCR00288
Oven Temp.: 45 °C (hold 10 min) to 250 °C (hold 20 min) at 12 °C/min
Carrier Gas: He, 51 cm/sec, 50 °C
Injection: Split, 8:1, 250 °C
Sample: Alcohols, 1.0 µL
Detector: MS, 250 °C
Ionization EI

1. Pentane
2. Hexane
3. Heptane
4. Ethanol
5. Decane
6. 1-Propanol
7. 1-Butanol
8. Dodecane
9. 1-Pentanol
10. 1-Hexanol
11. Tetradecane
12. 1-Heptanol
13. 1-Octanol
14. Hexadecane
15. 1-Nonanol
16. 1-Decanol
17. 1-Undecanol
18. 1-Dodecanol

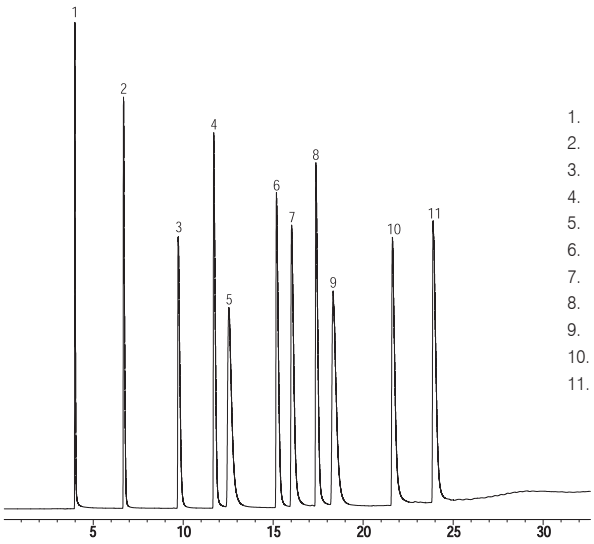


1. Pentane
2. Methanol
3. 2-Methyl-2-propanol (*tert*-Butylalcohol)
4. 2-Methyl-3-buten-2-ol
5. 3-Buten-2-ol
6. Undecane
7. 2,2-Dimethyl-1-propanol (Neopentanol)
8. 1-Penten-3-ol
9. 2-Methoxyethanol
10. 2,2,2-Trifluoroethanol
11. 2-Ethoxyethanol
12. 1-Pentanol
13. 2-Methyl-1-pentanol
14. 2,2-Dimethyl-1-pentanol
15. Tetradecane
16. *trans*-2-Hexen-1-ol
17. 1-Octanol
18. Ethylene glycol
19. 1-Undecanol
20. 1,4-Butanediol



Alcohols

Column: DM-PLOT Q, 30 m x 0.32 mm x 10.00 µm
Cat. No.: **8818**
Index: CCR00495
Oven Temp.: 100 °C to 240 °C (hold 10 min) at 5 °C/min
Carrier Gas: He, 31 cm/sec, 100 °C
Head Pressure: 18.0 psi
Column Flow Rate: 1.1 cc/min, 100 °C
Injection: Split, 70:1, 250 °C
Sample: Alcohols, 1.0 µL
Detector: FID, 270 °C

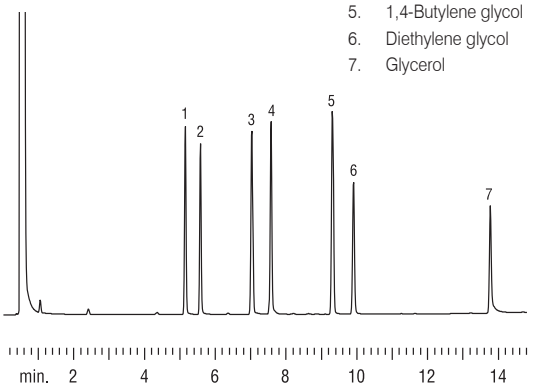


1. Methanol
2. Ethanol
3. 2-Propanol
4. 1-Propanol
5. *tert*-Butanol
6. 2-Butanol
7. Isobutyl alcohol
8. 1-Butanol
9. 2-Methyl-2-butanol
10. 3-Methyl-1-butanol
11. 4-Methyl-2-pentanol

Glycols

Column:	DM-Wax, 30 m x 0.53 mm x 1.00 μm
Cat. No.:	**7551**
Index:	CER00476
Oven Temp.:	80 °C to 200 °C (hold 10 min) at 8 °C/min
Solvent:	H_2O:MeOH = 50:50
septa purge	5.0 cc/min
Carrier Gas:	He, 50 cm/sec
Injection:	Direct
Flow Rate:	6.9 mL/min
Sample:	Glycol mix, 1.0 μL, 150 ppm
Detector:	FID, 270 °C

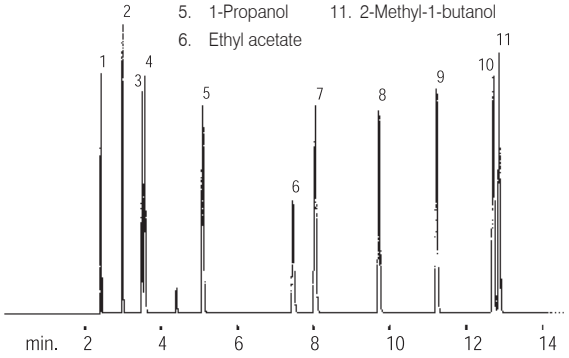
1. 1,2-Propylene glycol
2. Ethylene glycol
3. 1,3-Butylene glycol
4. 1,3-Propylene glycol
5. 1,4-Butylene glycol
6. Diethylene glycol
7. Glycerol



Alcohols

Column:	DM-5, 60 m x 0.32 mm x 1.00 μm
Cat. No.:	**7236**
Index:	CCR00292
Oven Temp.:	25 °C (hold 4 min) to 80 °C (hold 5 min) at 8 °C/min
Carrier Gas:	H_2, 40 cm/sec
Injection:	Split, 40:1, 200 °C
Sample:	Alcohol mix , 0.03 μL
Detector:	FID, 128 x 10^{-11} AFS, 200 °C

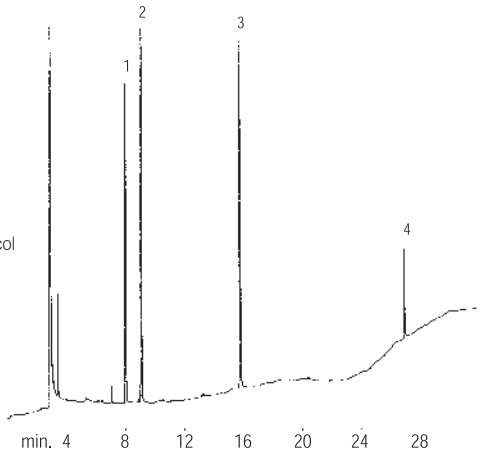
1. Methanol
2. Ethanol
3. Acetone
4. Isopropanol
5. 1-Propanol
6. Ethyl acetate
7. 2-Methyl-1-propanol
8. 1-Butanol
9. 3-Pentanol
10. 3-Methyl-1-butanol
11. 2-Methyl-1-butanol



Glycols

Column:	DM-200, 60 m x 0.53 mm x 3.00 μm
Cat. No.:	**8356**
Index:	CCR00326
Oven Temp.:	40 °C to 250 °C (hold 15 min) at 8 °C/min
Carrier Gas:	H_2, 40 cm/sec
Injection:	Split, 19:1, 200 °C
Sample:	Glycols, 1.0 μL, 50 ng on-column
Detector:	FID, 6.4 x 10^{-11} AFS, 250 °C

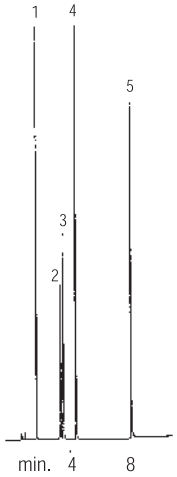
1. Ethylene glycol
2. Propylene glycol
3. Diethylene glycol
4. Tetraethylene glycol



Glycols / Alcohols

Column:	DM-5, 30 m x 0.53 mm x 1.00 μm
Cat. No.:	**7249**
Index:	CCR00327
Oven Temp.:	40 °C to 185 °C (hold 5 min) at 15 °C/min
Carrier Gas:	He, 40 cm/sec
Injection:	Direct, 150 °C
Sample:	Glycols and alcohols, 1.0 μL, 100 ppm
Detector:	FID, 8 x 10^{-11} AFS, 200 °C

1. *n*-Butyl alcohol
2. Ethylene glycol
3. Propylene glycol
4. Butyl cellosolve
5. Butyl carbitol

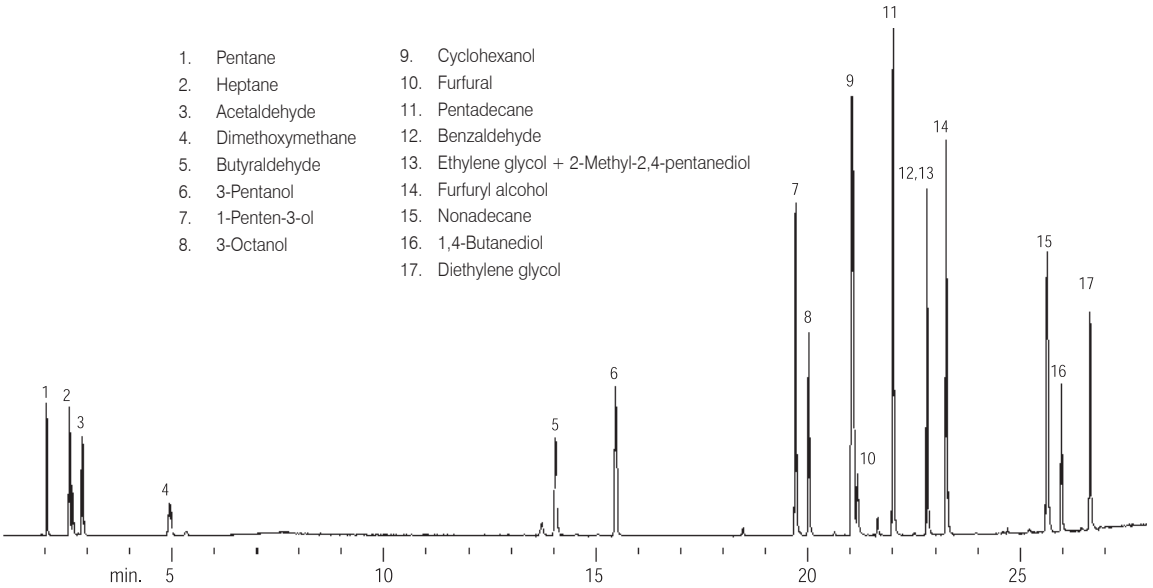


Aldehydes / Ketones

Alcohols / Aldehydes

Column: DM-Wax, 60 m x 0.53 mm x 1.00 μm
Cat. No.: **7552**
Index: CCR00295
Oven Temp.: 45 °C (hold 10 min) to 250 °C (hold 20 min) at 12 °C/min
Carrier Gas: He, 50 cm/sec, 50 °C
Injection: Split, 7:1, 250 °C
Sample: Alcohols and aldehydes, 1.0 μL
Detector: FID, 285 °C
Ionization: EI, scan 10, range 300

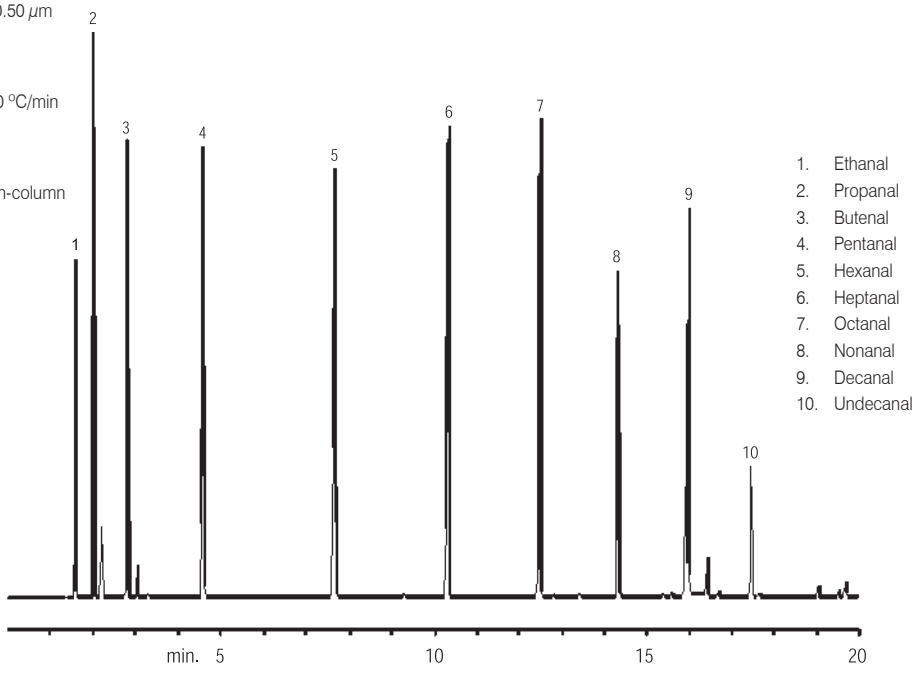
1. Pentane
2. Heptane
3. Acetaldehyde
4. Dimethoxymethane
5. Butyraldehyde
6. 3-Pentanol
7. 1-Penten-3-ol
8. 3-Octanol
9. Cyclohexanol
10. Furfural
11. Pentadecane
12. Benzaldehyde
13. Ethylene glycol + 2-Methyl-2,4-pentanediol
14. Furfuryl alcohol
15. Nonadecane
16. 1,4-Butanediol
17. Diethylene glycol



Aldehydes

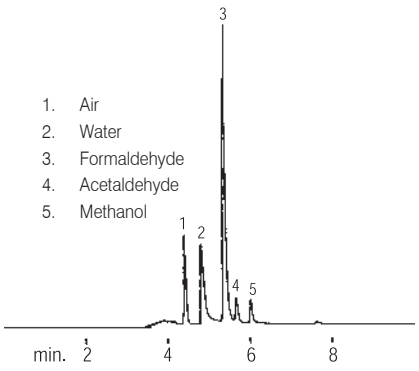
Column: DM-InertWax, 30 m x 0.25 mm x 0.50 μm
Cat. No.: **8523**
Index: CCR00300
Oven Temp.: 40 °C (hold 5 min) to 200 °C at 10 °C/min
Carrier Gas: H_2, 35 cm/sec, 40 °C
Injection: Split, 100:1, 200 °C
Sample: C2-C11 Aldehydes mix, 250 ng on-column
Detector: FID, 82 x 10^{-11} AFS, 200 °C

1. Ethanal
2. Propanal
3. Butenal
4. Pentanal
5. Hexanal
6. Heptanal
7. Octanal
8. Nonanal
9. Decanal
10. Undecanal



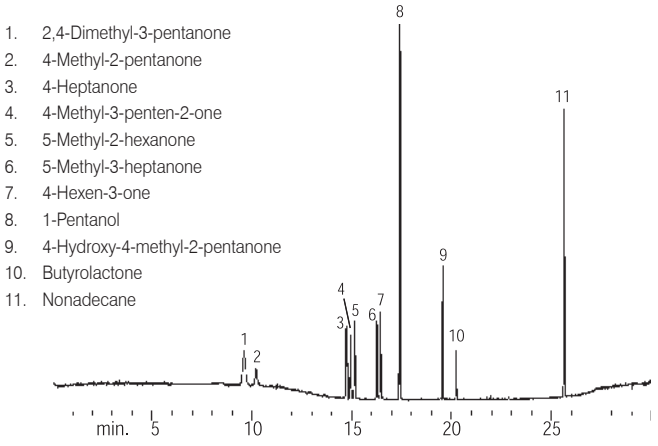
Formaldehyde

Column:	DM–1701, 60 m x 0.25 mm x 1.00 µm
Cat. No.:	**7324**
Index:	CCR00313
Oven Temp.:	40 °C constant
Carrier Gas:	He, 20 cm/sec
Injection:	Split, 30 mL/min, 150 °C
Sample:	Formaldehyde, 0.5 µL
Detector:	TCD, 8 mV, 175 °C



Ketones

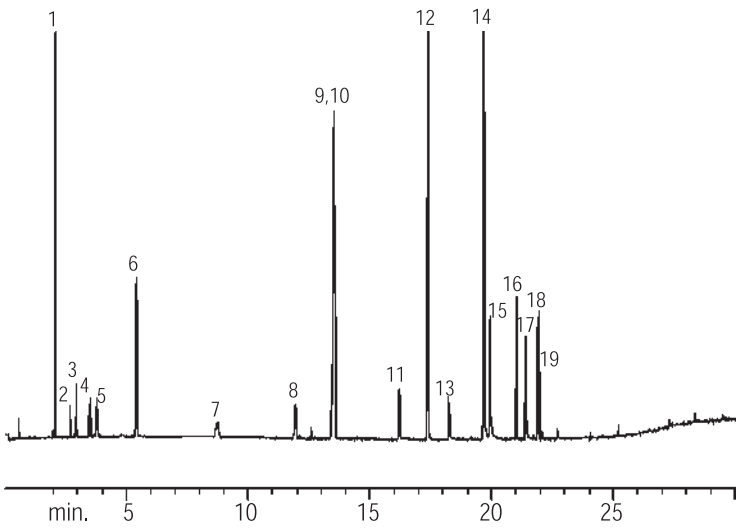
Column:	DM–Wax, 60 m x 0.53 mm x 1.00 µm
Cat. No.:	**7552**
Index:	CCR00316
Oven Temp.:	45 °C (hold 10 min) to 250 °C (hold 20 min) at 12 °C/min
Carrier Gas:	He, 51 cm/sec, 50 °C
Injection:	Split, 8:1, 250 °C
Sample:	Ketones, 1.0 µL
Detector:	MSD, 250 °C
Ionization:	EI



Aldehydes

Column:	DM-Wax, 60 m x 0.53 mm x 1.00 µm
Cat. No.:	**7552**
Index:	CCR00315
Oven Temp.:	45 °C (hold 10 min) to 250 °C (hold 20 min) at 12 °C/min
Carrier Gas:	He, 51 cm/sec, 50 °C
Injection:	Split, 8:1, 250 °C
Sample:	Aldehydes, 1.0 µL
Detector:	MSD, 250 °C
Ionization:	EI

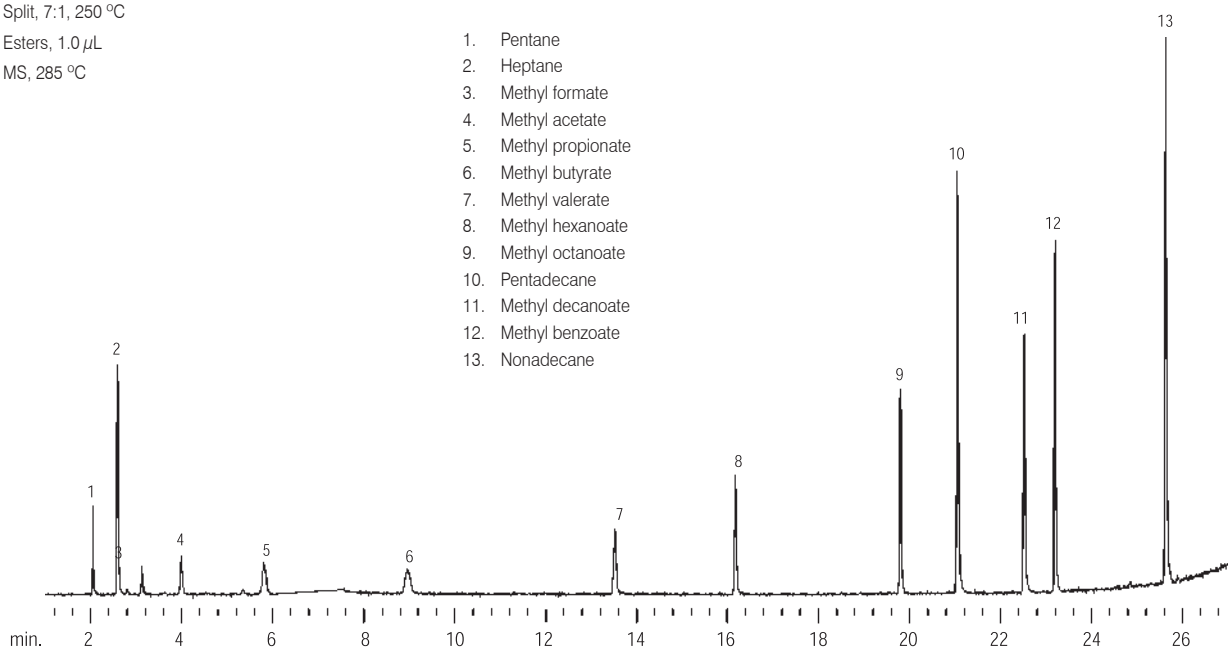
1. Pentane
2. Acetaldehyde
3. Dimethoxymethane
4. Propanal
5. 2-Methyl propanal
6. Methanol
7. Pentanal
8. 2-Butenal
9. Hexanal
10. Undecane
11. Heptanal
12. 1-Pentanol
13. Octanal
14. Tetradecane
15. Nonanal
16. 2-Furancarboxaldehyde
17. Decanal
18. Benzaldehyde
19. 1-Octanol



Esters

Column:	DM-Wax, 60 m x 0.53 mm x 1.00 µm
Cat. No.:	**7552**
Index:	CCR00314
Oven Temp.:	45 °C (hold 10 min) to 250 °C (hold 20 min) at 12 °C/min
Carrier Gas:	He, 50 cm/sec, 50 °C
Injection:	Split, 7:1, 250 °C
Sample:	Esters, 1.0 µL
Detector:	MS, 285 °C

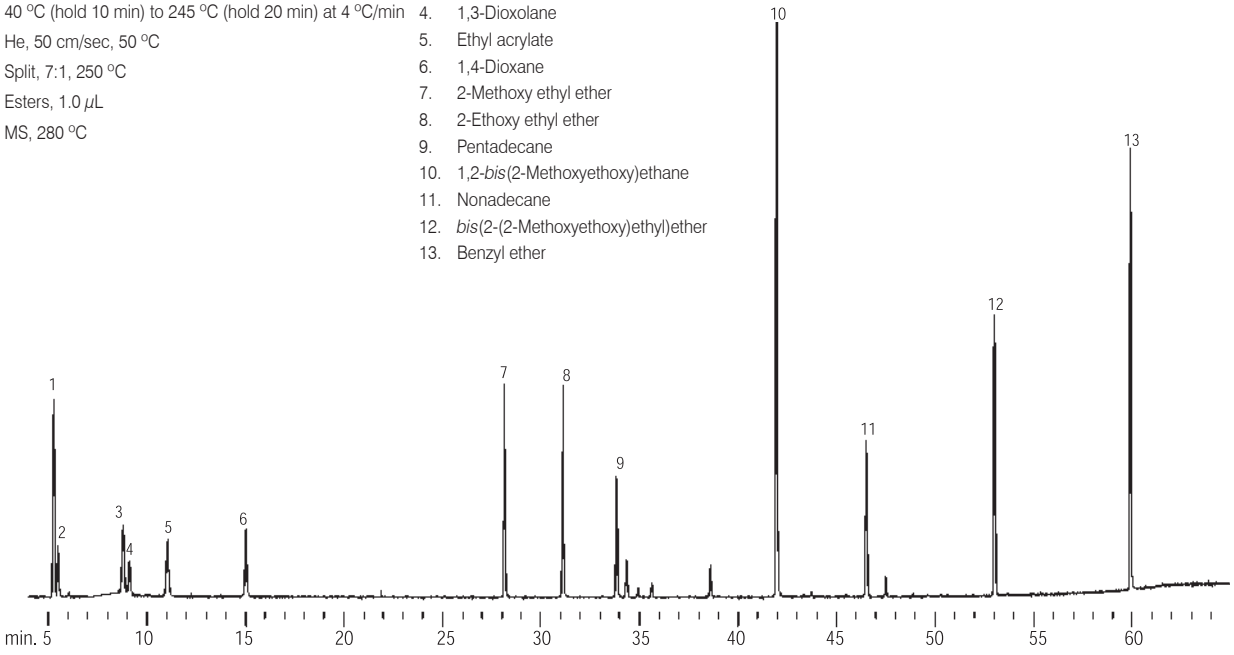
1. Pentane
2. Heptane
3. Methyl formate
4. Methyl acetate
5. Methyl propionate
6. Methyl butyrate
7. Methyl valerate
8. Methyl hexanoate
9. Methyl octanoate
10. Pentadecane
11. Methyl decanoate
12. Methyl benzoate
13. Nonadecane



Esters

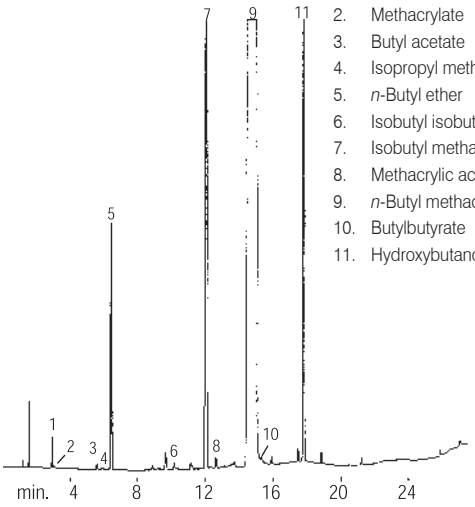
Column:	DM-Wax, 60 m x 0.53 mm x 1.00 µm
Cat. No.:	**7552**
Index:	CCR00318
Oven Temp.:	40 °C (hold 10 min) to 245 °C (hold 20 min) at 4 °C/min
Carrier Gas:	He, 50 cm/sec, 50 °C
Injection:	Split, 7:1, 250 °C
Sample:	Esters, 1.0 µL
Detector:	MS, 280 °C

1. Tetrahydro-2-methyl furan
2. Butyraldehyde
3. Butyl ether
4. 1,3-Dioxolane
5. Ethyl acrylate
6. 1,4-Dioxane
7. 2-Methoxy ethyl ether
8. 2-Ethoxy ethyl ether
9. Pentadecane
10. 1,2-*bis*(2-Methoxyethoxy)ethane
11. Nonadecane
12. *bis*(2-(2-Methoxyethoxy)ethyl)ether
13. Benzyl ether



Acrylic Esters

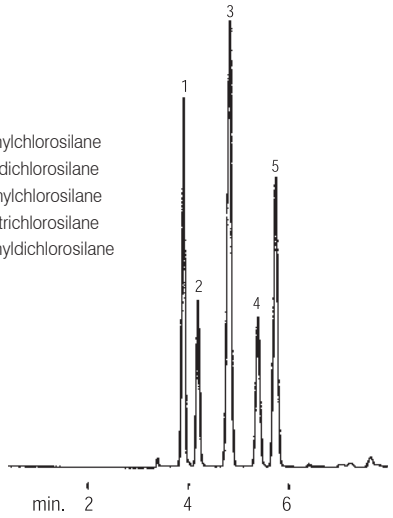
Column: DM-1701, 30 m x 0.32 mm x 1.00 μm
Cat. No.: **7333**
Index: CCR00312
Oven Temp.: 70 °C (hold 10 min) to 120 °C at 5 °C/min to 250 °C at 15 °C/min
Carrier Gas: H_2, 40 cm/sec
Injection: Split, 56:1, 250 °C
Sample: Acrylic esters, 0.5 μL
Detector: FID, 4 x 10^{-11} AFS, 250 °C



1. Butyl alcohol
2. Methacrylate
3. Butyl acetate
4. Isopropyl methacrylate
5. *n*-Butyl ether
6. Isobutyl isobutyrate
7. Isobutyl methacrylate
8. Methacrylic acid *n*-butyl ester
9. *n*-Butyl methacrylate
10. Butylbutyrate
11. Hydroxybutanoic acid *n*-butyl ester

Silanes

Column: DM-200, 60 m x 0.53 mm x 3.00 μm
Cat. No.: **8356**
Index: CCR00362
Oven Temp.: 40 °C to 250 °C (hold 5 min) at 8 °C/min
Carrier Gas: H_2, 40 cm/sec
Injection: Split, 40 mL/min, 200 °C
Sample: Silanes, 0.5 μL
Detector: FID, 1.02 x 10^{-9} AFS, 270 °C

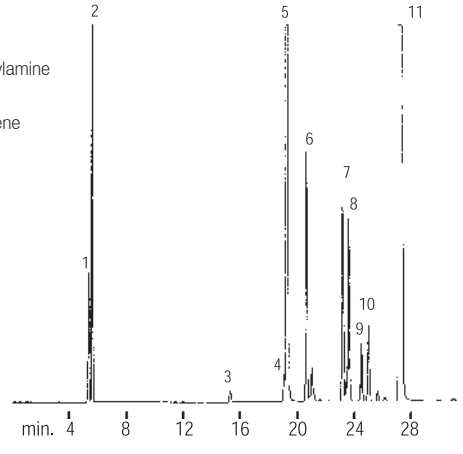


1. Dimethylchlorosilane
2. Methyldichlorosilane
3. Trimethylchlorosilane
4. Methyltrichlorosilane
5. Dimethyldichlorosilane

Styrene Impurities

Column: DM-Wax, 30 m x 0.53 mm x 0.50 μm
Cat. No.: **7547**
Index: CCR00356
Oven Temp.: 40 °C (hold 10 min) to 150 °C (hold 15 min) at 10 °C/min
Carrier Gas: He, 20 cm/sec, 40 °C
Injection: Split, 40 cc/min, 150 °C
Sample: 95% Styrene, 0.5 mL
Detector: FID, 16 x 10^{-11} AFS, 150 °C

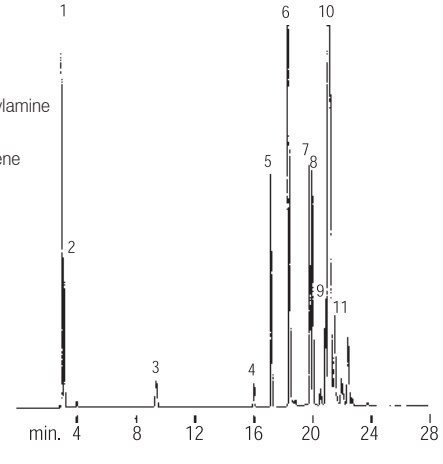
1. Butene
2. 1,3-Butadiene
3. Diethylhydroxylamine
4. Acrylonitrile
5. Vinylcyclohexene
6. Toluene
7. Ethylbenzene
8. *m*-Xylene
9. Cumene
10. *o*-Xylene
11. Styrene



Styrene Impurities

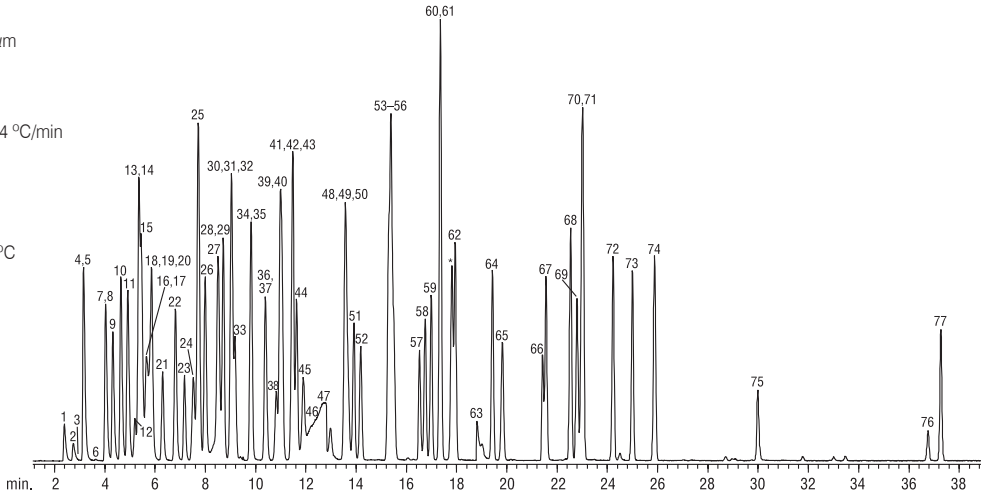
Column: DM-1701, 30 m x 0.53 mm x 3.00 μm
Cat. No.: **7355**
Index: CCR00357
Oven Temp.: 40 °C (hold 10 min) to 150 °C (hold 15 min) at 12 °C/min
Carrier Gas: He, 20 cm/sec, 40 °C
Injection: Split, 40 cc/min, 150 °C
Sample: 95% Styrene, 0.5 mL
Detector: FID, 16 x 10^{-11} AFS, 150 °C

1. 1,3-Butadiene
2. Butene
3. Acrylonitrile
4. Diethylhydroxylamine
5. Toluene
6. Vinylcyclohexene
7. Ethylbenzene
8. *m*-Xylene
9. *o*-Xylene
10. Styrene
11. Cumene



USP Solvents

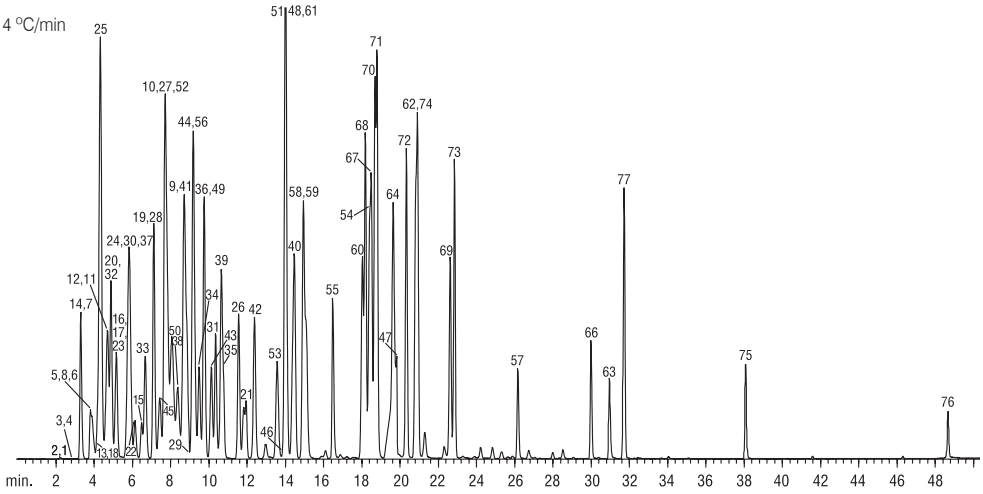
Column:	DM-1, 60 m x 0.53 mm x 3.00 µm
Cat. No.:	**7156**
Index:	CER00463
Oven Temp.:	35 °C (hold 4min) to 250 °C at 4 °C/min
septa purge	5 mL/min
Carrier Gas:	He, 45.6 cm/sec, 35 °C
Head Pressure:	11.0 psi constant pressune
Injection:	Split, 100 mL/min, ~1:13, 250 °C
Sample:	Solvents, ~1.3% each
Detector:	MS
Scan Range:	10 AMU - 260 AMU



1. Formaldehyde
2. Water
3. Chloromethane
4. Methanol
5. Acetaldehyde
6. Ethylene oxide
7. Chloroethane
8. Ethanol
9. Acetonitrile
10. Acetone
11. 2-Propanol
12. 2-Chloropropane
13. Diethyl ether
14. Pentane
15. Ethyl formate
16. Formic acid
17. Methylal
18. 1,1-Dichloroethene
19. Methyl acetate
20. Methylene chloride
21. Nitromethane
22. 1-Propanol
23. *trans*-1,2-Dichloroethene
24. Methyl *tert*-butyl ether
25. 2-Methylpentane (spiked at 9%)
26. 2-Butanone
27. 2-Butanol
28. *cis*-1,2-Dichloroethene
29. Acetic acid
30. Isopropyl ether
31. Ethyl acetate
32. Hexane
33. Chloroform
34. Tetrahydrofuran
35. 2-Methoxyethanol
36. 1,2-Dichloroethane
37. Methyl cyclopentane
38. 1,1,1-Trichloroethane
39. 1,2-Dimethoxyethane
40. Methyl isopropyl ketone
41. 2,2-Dimethoxypropane
42. Isopropyl acetate
43. 1-Butanol
44. Benzene
45. Carbon tetrachloride
46. Ethylene glycol
47. Formamide
48. 1,4-Dioxane
49. Trichloroethylene
50. Isooctane
51. 2-Ethoxyethanol
52. *n*-Heptane
53. Isoamyl alcohol
54. Hexanone
55. Pyridine
56. Methyl cyclohexane
57. Dimethyl formamide
58. 1,1,2-Trichloroethane
59. 1-Pentanol
60. Isobutyl acetate
61. Toluene
62. 2-Hexanone
63. Dimethyl sulfoxide
64. Butyl acetate
65. 1,1-Diethoxypropane
66. *N,N*-Dimethylacetamide
67. Chlorobenzene
68. Ethylbenzene
69. Isoamyl acetate
70. *p*-Xylene
71. *m*-Xylene
72. *o*-Xylene
73. Anisole
74. Isopropyl benzene (Cumene)
75. 1-Methyl-2-pyrrolidinone
76. Sulfolane
77. 1,2,3,4-Tetrahydronaphthalene

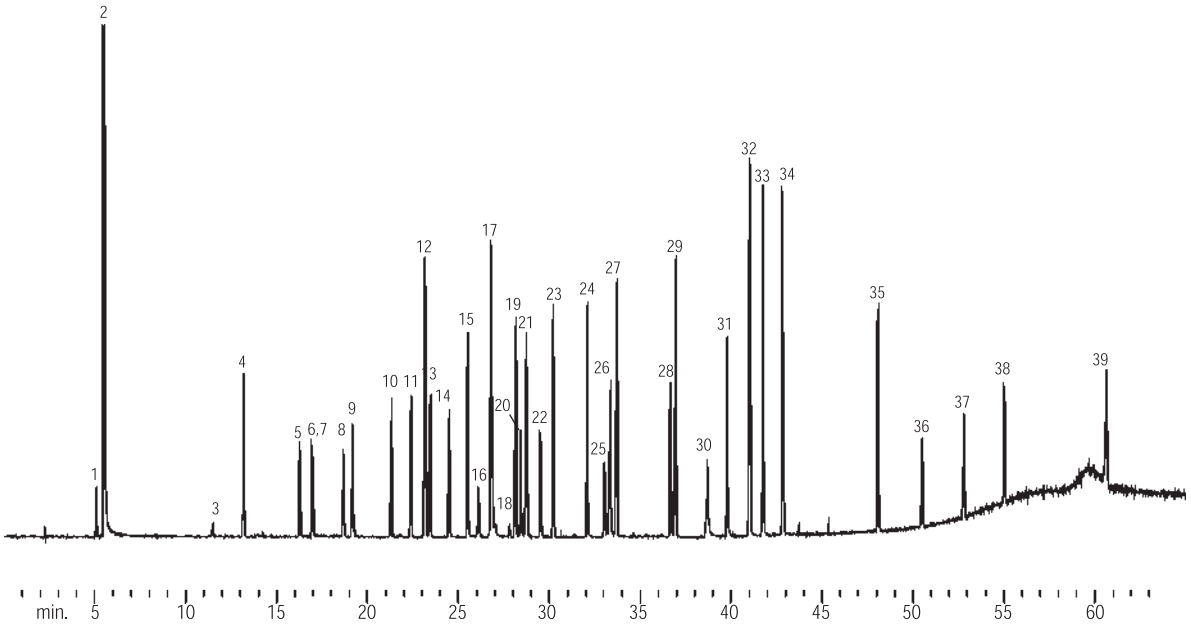
USP Solvents

Column:	DM-200, 60 m x 0.53 mm x 3.00 µm
Cat. No.:	**8356**
Index:	CER00464
Oven Temp.:	35 °C (hold 4 min) to 250 °C at 4 °C/min
Head Pressure:	11.0 psi constant pressure
Carrier Gas:	He, 45.6 cm/sec, 35 °C
Injection:	Split, 100 mL/min, 1:13, 250 °C
Sample:	Solvents, ~1.3% each
Detector:	MS
Scan Range:	10 AMU - 260 AMU



Solvents Mixture #1

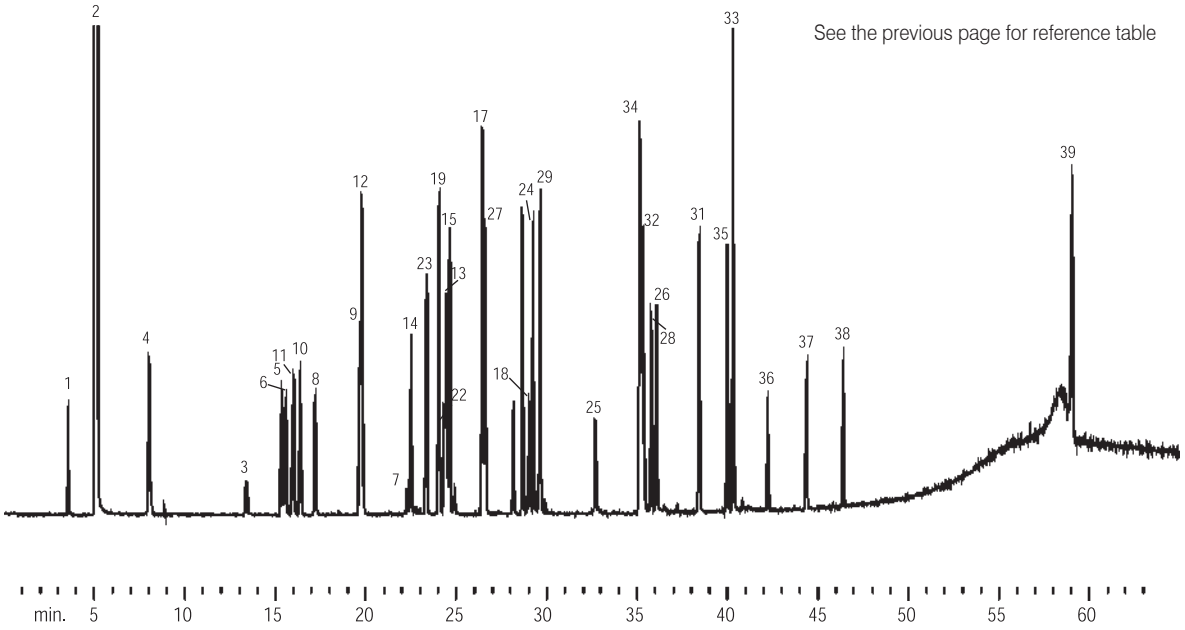
Column:	DM-1, 60 m x 0.53 mm x 3.00 μm
Cat. No.:	**7156**
Index:	CCR00335
Oven Temp.:	40 °C (hold 5 min) to 285 °C at 5 °C/min
Carrier Gas:	He, 40 cm/sec
Injection:	Split, 50 mL/min, 275 °C
Sample:	Solvents mixture #1, 1.0 μL
Detector:	MS full scan, 285 °C



1. Pentane
2. Methylene chloride
3. Ethylene glycol
4. Heptane
5. Cyclopentanol
6. 3-Hexanol
7. Acetamide
8. 2-Methyl-1-pentanol
9. Furfuryl alcohol
10. Butyl ether
11. Nonane
12. Cume ne
13. Ethyl amyl ketone
14. Heptanol
15. Butyl butanoate
16. -
17. Benzyl alcohol
18. Dipropylene glycol
19. Diethylbenzene
20. -
21. -
22. Hexachloroethane
23. Undecane
24. 1-Nonanol
25. *p*-Methoxyphenol
26. Triethylene glycol
27. Dodecane
28. Undecanal
29. Tridecane
30. -
31. Dodecanal
32. Dicyclohexylamine
33. *bis*(2,2-Methoxy)ethyl ether
34. Pentadecane
35. Heptadecane
36. Octadecane
37. Nonadecane
38. Eicosane
39. Acetyl tributyl citrate
40. 2-Buten-1-ol
41. Formamide
42. 3-Pentanol
43. 1-Nitropropane
44. Dimethyl formamide
45. 2-Methyl-3-pentanol
46. Toluene
47. Ethyl chloroacetate
48. Dimethylacetamide
49. *p*-Xylene
50. *sec*-Tetrachloroethane
51. Benzaldehyde
52. *o*-Chlorotoluene
53. 2,6-Dimethyl-4-heptanone
54. 2-Octanone
55. *o*-Cresol
56. α-Methylbenzyl alcohol
57. 5-Nonanone
58. Nonanal
59. Decanal
60. -
61. 1-Decanol
62. 1-Undecanol
63. 2-Dodecanone
64. 1-Dodecanol
65. Tetraethylene glycol
66. Dibenzyl
67. Diethyl phthalate
68. Tributyl phosphate
69. Diphenyl sulfone
70. Allyl alcohol
71. -
72. Isopropyl acetate
73. Benzene
74. 2-Nitropropane
75. Nitroethane
76. Pentanal
77. 2-Bromobutane
78. 1-Chloropentane
79. Cyclopentanone
80. 2-Hexanol
81. Butyl acetate
82. 2-Ethyl-1-butanol
83. 3-Ethyl-3-pentanol
84. 1,4-Dichlorobutane
85. 2-Methyl-2,4-pentanediol
86. Butoxyethanol
87. 1,2,3-Trichloropropane
88. 1,4-Butanediol
89. Methyl hexanoate
90. 1,2,4-Trimethylbenzene
91. 2-Ethyl-1-hexanol
92. Dipentene
93. Tetrahydrofurfuryl acetate
94. -
95. Decahydronaphthalene
96. -
97. -
98. 2-Decanol
99. 1,2-*bis*(2-Methoxyethoxy)ethane
100. 2-Phenoxyethanol
101. -
102. Benzyl ether

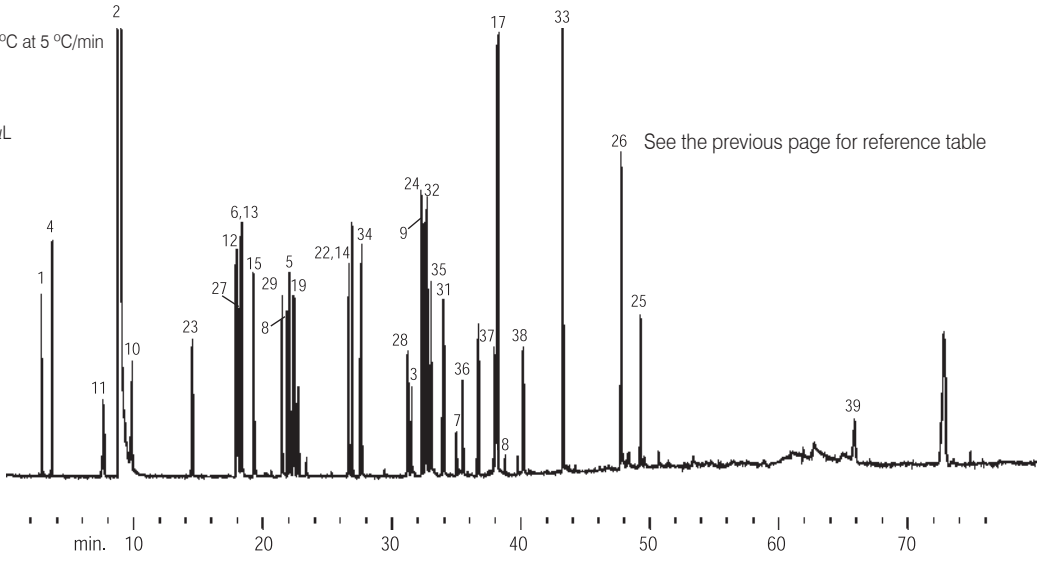
Solvents Mixture #1

Column: DM-200, 60 m x 0.53 mm x 3.00 μm
Cat. No.: **8356**
Index: CCR00336
Oven Temp.: 40 °C (hold 5 min) to 285 °C at 5 °C/min
Carrier Gas: He, 40 cm/sec
Injection: Split, 50 mL/min, 275 °C
Sample: Solvents mixture #1, 1.0 μL
Detector: MS, TIC mode, 285 °C



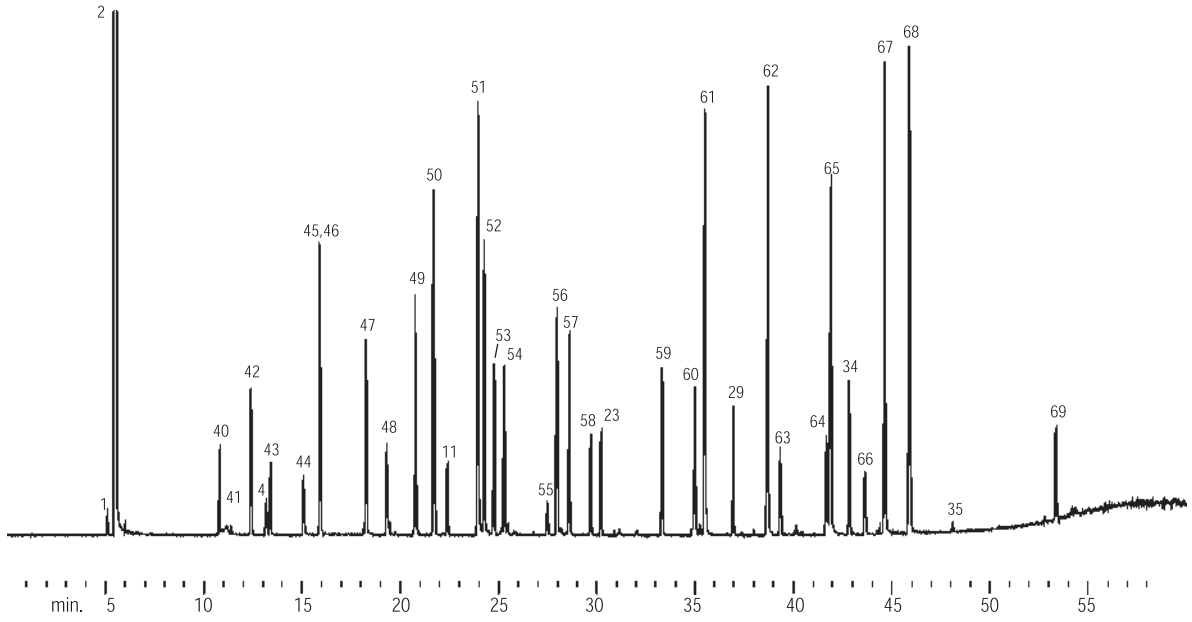
Solvents Mixture #1

Column: DM-Wax, 60 m x 0.53 mm x 1.00 μm
Cat. No.: **7552**
Index: CCR00337
Oven Temp.: 40 °C (hold 5 min) to 250 °C at 5 °C/min
Carrier Gas: He, 40 cm/sec
Injection: Split, 50 mL/min, 275 °C
Sample: Solvents mixture #1, 1.0 μL
Detector: MS full scan, 285 °C



Solvents Mixture #2

Column:	DM-1, 60 m x 0.53 mm x 3.00 μm
Cat. No.:	**7156**
Index:	CCR00338
Oven Temp.:	40 °C (hold 5 min) to 250 °C at 5 °C/min
Carrier Gas:	He, 40 cm/sec
Injection:	Split, 50 mL/min, 275 °C
Sample:	Solvents mixture #2, 1.0 μL
Detector:	MS full scan, 285 °C

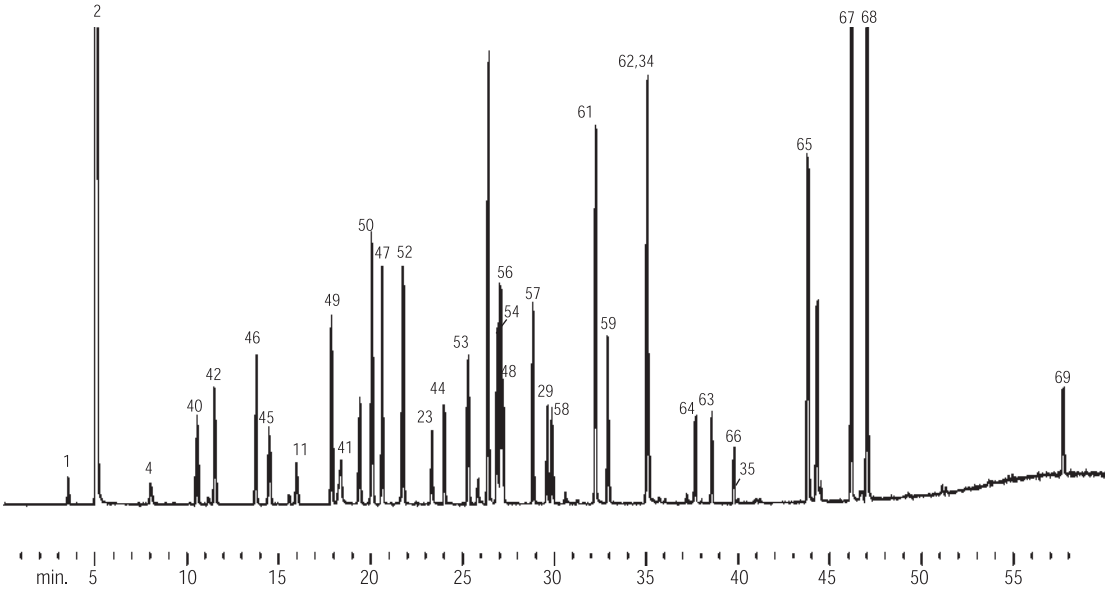


1. Pentane
2. Methylene chloride
3. Ethylene glycol
4. Heptane
5. Cyclopentanol
6. 3-Hexanol
7. Acetamide
8. 2-Methyl-1-pentanol
9. Furfuryl alcohol
10. Butyl ether
11. Nonane
12. Cume ne
13. Ethyl amyl ketone
14. Heptanol
15. Butyl butanoate
16. -
17. Benzyl alcohol
18. Dipropylene glycol
19. Diethylbenzene
20. -
21. -
22. Hexachloroethane
23. Undecane
24. 1-Nonanol
25. *p*-Methoxyphenol
26. Triethylene glycol
27. Dodecane
28. Undecanal
29. Tridecane
30. -
31. Dodecanal
32. Dicyclohexylamine
33. *bis*(2,2-Methoxy)ethyl ether
34. Pentadecane
35. Heptadecane
36. Octadecane
37. Nonadecane
38. Eicosane
39. Acetyl tributyl citrate
40. 2-Buten-1-ol
41. Formamide
42. 3-Pentanol
43. 1-Nitropropane
44. Dimethyl formamide
45. 2-Methyl-3-pentanol
46. Toluene
47. Ethyl chloroacetate
48. Dimethylacetamide
49. *p*-Xylene
50. *sec*-Tetrachloroethane
51. Benzaldehyde
52. *o*-Chlorotoluene
53. 2,6-Dimethyl-4-heptanone
54. 2-Octanone
55. *o*-Cresol
56. α-Methylbenzyl alcohol
57. 5-Nonanone
58. Nonanal
59. Decanal
60. -
61. 1-Decanol
62. 1-Undecanol
63. 2-Dodecanone
64. 1-Dodecanol
65. Tetraethylene glycol
66. Dibenzyl
67. Diethyl phthalate
68. Tributyl phosphate
69. Diphenyl sulfone
70. Allyl alcohol
71. -
72. Isopropyl acetate
73. Benzene
74. 2-Nitropropane
75. Nitroethane
76. Pentanal
77. 2-Bromobutane
78. 1-Chloropentane
79. Cyclopentanone
80. 2-Hexanol
81. Butyl acetate
82. 2-Ethyl-1-butanol
83. 3-Ethyl-3-pentanol
84. 1,4-Dichlorobutane
85. 2-Methyl-2,4-pentanediol
86. Butoxyethanol
87. 1,2,3-Trichloropropane
88. 1,4-Butanediol
89. Methyl hexanoate
90. 1,2,4-Trimethylbenzene
91. 2-Ethyl-1-hexanol
92. Dipentene
93. Tetrahydrofurfuryl acetate
94. -
95. Decahydronaphthalene
96. -
97. -
98. 2-Decanol
99. 1,2-*bis*(2-Methoxyethoxy)ethane
100. 2-Phenoxyethanol
101. -
102. Benzyl ether

Solvents Mixture #2

Column: DM-200, 60 m x 0.53 mm x 3.00 µm
Cat. No.: **8356**
Index: CCR00339
Oven Temp.: 40 °C (hold 5 min) to 285 °C at 5 °C/min
Carrier Gas: He, 40 cm/sec
Injection: Split, 50 mL/min, 275 °C
Sample: Solvents mixture #2, 1.0 µL
Detector: MS full scan, 285 °C

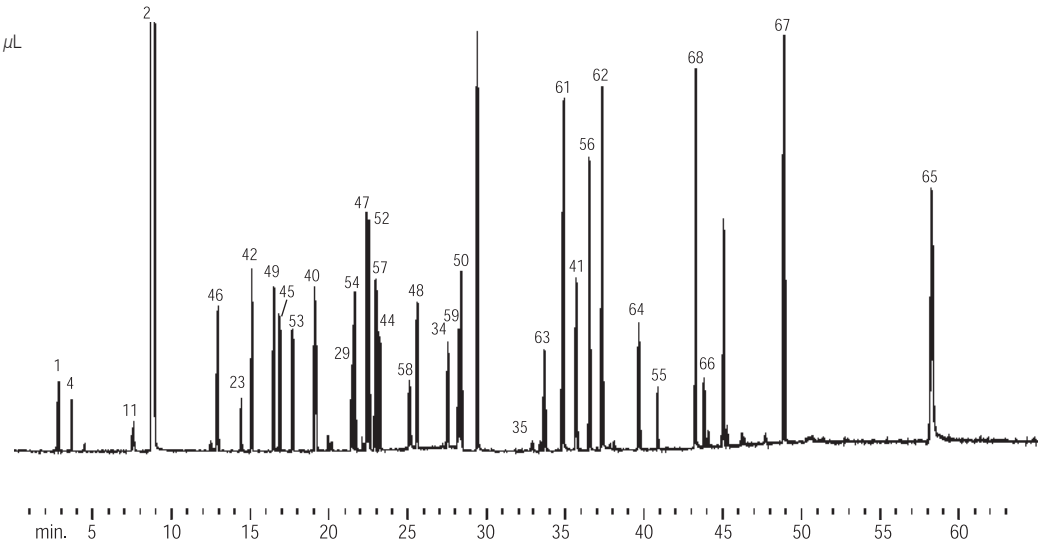
See the previous page for reference table



Solvents Mixture #2

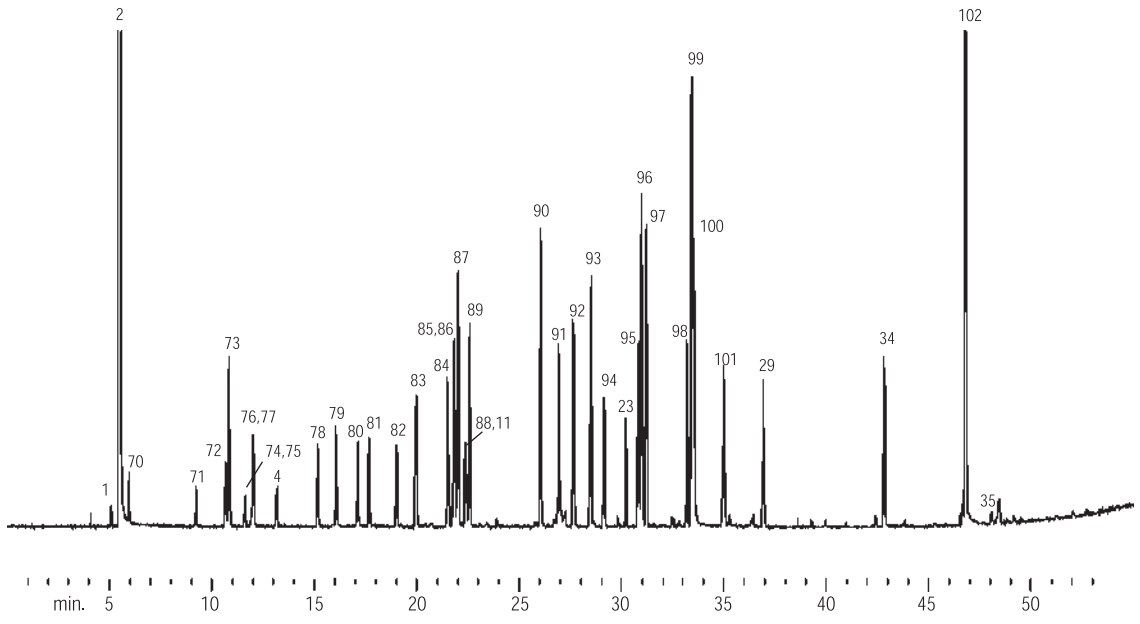
Column: DM-Wax, 60 m x 0.53 mm x 1.00 µm
Cat. No.: **7552**
Index: CCR00340
Oven Temp.: 40 °C (hold 5 min) to 250 °C at 5 °C/min
Carrier Gas: He, 40 cm/sec
Injection: Split, 50 mL/min, 275 °C
Sample: Solvents mixture #2, 1.0 µL
Detector: MS full scan, 285 °C

See the previous page for reference table



Solvents Mixture #3

Column:	DM-1, 60 m x 0.53 mm x 3.00 μm
Cat. No.:	**7156**
Index:	CCR00341
Oven Temp.:	40 °C (hold 5 min) to 285 °C at 5 °C/min
Carrier Gas:	He, 40 cm/sec
Injection:	Split, 50 mL/min, 275 °C
Sample:	Solvents mixture #3, 1.0 μL
Detector:	MS full scan, 285 °C

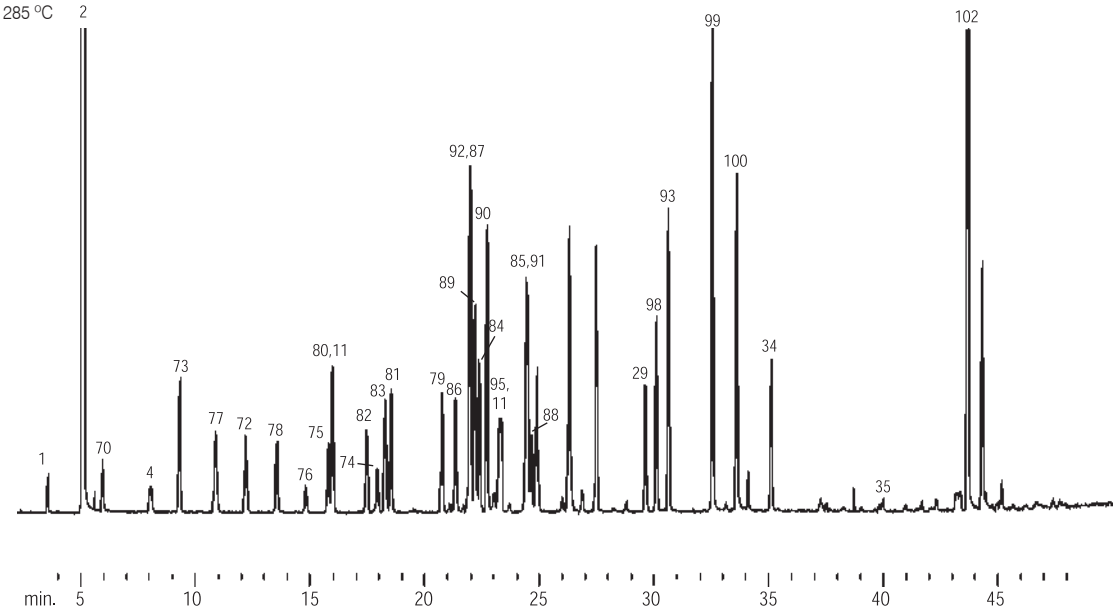


1. Pentane
2. Methylene chloride
3. Ethylene glycol
4. Heptane
5. Cyclopentanol
6. 3-Hexanol
7. Acetamide
8. 2-Methyl-1-pentanol
9. Furfuryl alcohol
10. Butyl ether
11. Nonane
12. Cume ne
13. Ethyl amyl ketone
14. Heptanol
15. Butyl butanoate
16. -
17. Benzyl alcohol
18. Dipropylene glycol
19. Diethylbenzene
20. -
21. -
22. Hexachloroethane
23. Undecane
24. 1-Nonanol
25. *p*-Methoxyphenol
26. Triethylene glycol
27. Dodecane
28. Undecanal
29. Tridecane
30. -
31. Dodecanal
32. Dicyclohexylamine
33. *bis*(2,2-Methoxy)ethyl ether
34. Pentadecane
35. Heptadecane
36. Octadecane
37. Nonadecane
38. Eicosane
39. Acetyl tributyl citrate
40. 2-Buten-1-ol
41. Formamide
42. 3-Pentanol
43. 1-Nitropropane
44. Dimethyl formamide
45. 2-Methyl-3-pentanol
46. Toluene
47. Ethyl chloroacetate
48. Dimethylacetamide
49. *p*-Xylene
50. *sec*-Tetrachloroethane
51. Benzaldehyde
52. *o*-Chlorotoluene
53. 2,6-Dimethyl-4-heptanone
54. 2-Octanone
55. *o*-Cresol
56. α-Methylbenzyl alcohol
57. 5-Nonanone
58. Nonanal
59. Decanal
60. -
61. 1-Decanol
62. 1-Undecanol
63. 2-Dodecanone
64. 1-Dodecanol
65. Tetraethylene glycol
66. Dibenzyl
67. Diethyl phthalate
68. Tributyl phosphate
69. Diphenyl sulfone
70. Allyl alcohol
71. -
72. Isopropyl acetate
73. Benzene
74. 2-Nitropropane
75. Nitroethane
76. Pentanal
77. 2-Bromobutane
78. 1-Chloropentane
79. Cyclopentanone
80. 2-Hexanol
81. Butyl acetate
82. 2-Ethyl-1-butanol
83. 3-Ethyl-3-pentanol
84. 1,4-Dichlorobutane
85. 2-Methyl-2,4-pentanediol
86. Butoxyethanol
87. 1,2,3-Trichloropropane
88. 1,4-Butanediol
89. Methyl hexanoate
90. 1,2,4-Trimethylbenzene
91. 2-Ethyl-1-hexanol
92. Dipentene
93. Tetrahydrofurfuryl acetate
94. -
95. Decahydronaphthalene
96. -
97. -
98. 2-Decanol
99. 1,2-*bis*(2-Methoxyethoxy)ethane
100. 2-Phenoxyethanol
101. -
102. Benzyl ether

Solvents Mixture #3

Column:	DM-200, 60 m x 0.53 mm x 3.00 µm
Cat. No.:	**8356**
Index:	CCR00342
Oven Temp.:	40 °C (hold 5 min) to 285 °C at 5 °C/min
Carrier Gas:	He, 40 cm/sec
Injection:	Split, 50 mL/min, 275 °C
Sample:	Solvents mixture #3, 1.0 µL
Detector:	MS full scan, 285 °C

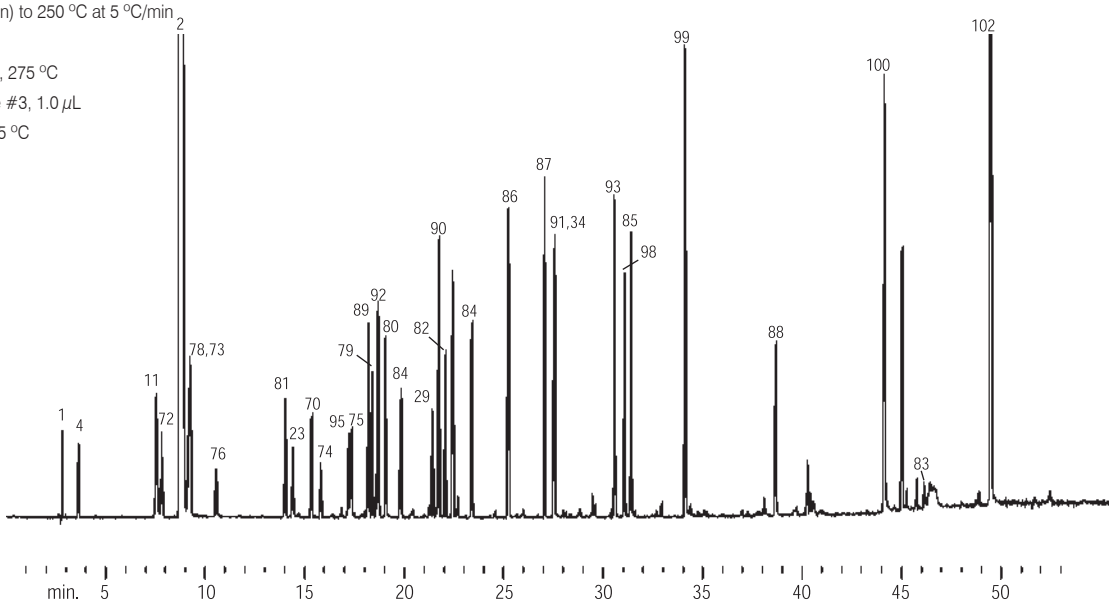
See the previous page for reference table



Solvents Mixture #3

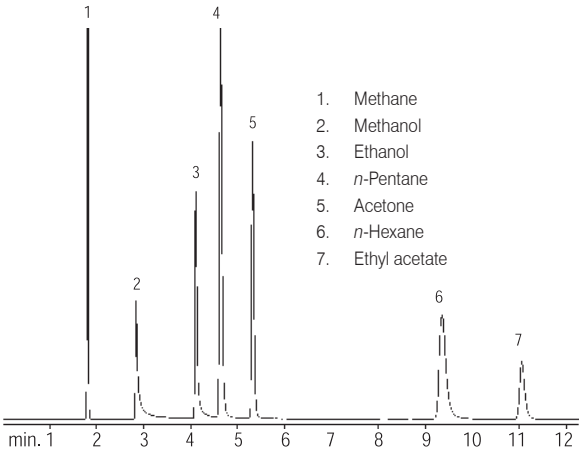
Column:	DM-Wax, 60 m x 0.53 mm x 1.00 µm
Cat. No.:	**7552**
Index:	CCR00343
Oven Temp.:	40 °C (hold 5 min) to 250 °C at 5 °C/min
Carrier Gas:	He, 40 cm/sec
Injection:	Split, 50 mL/min, 275 °C
Sample:	Solvents mixture #3, 1.0 µL
Detector:	MS full scan, 285 °C

See the previous page for reference table



Polar Solvents

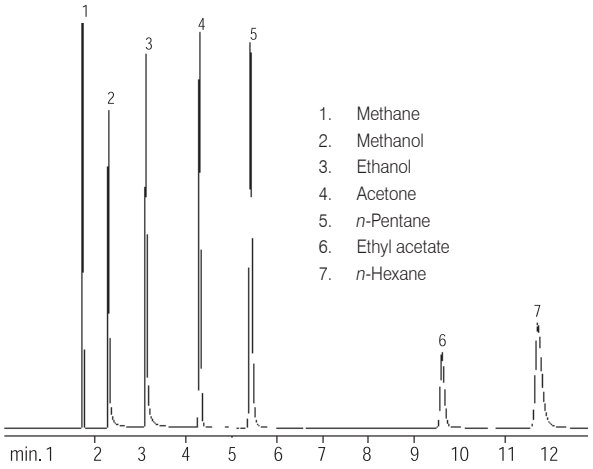
Column:	DM-PLOT U, 30 m x 0.32 mm x 10.00 µm
Cat. No.:	**8824**
Index:	CSR00182
Oven Temp.:	150 °C constant
Carrier Gas:	H_2
Injection:	Split, 20:1, 200 °C
Sample:	50 ppm (w / v) each in He, 20 µL
Detector:	FID, 200 °C



1. Methane
2. Methanol
3. Ethanol
4. *n*-Pentane
5. Acetone
6. *n*-Hexane
7. Ethyl acetate

Polar Solvents

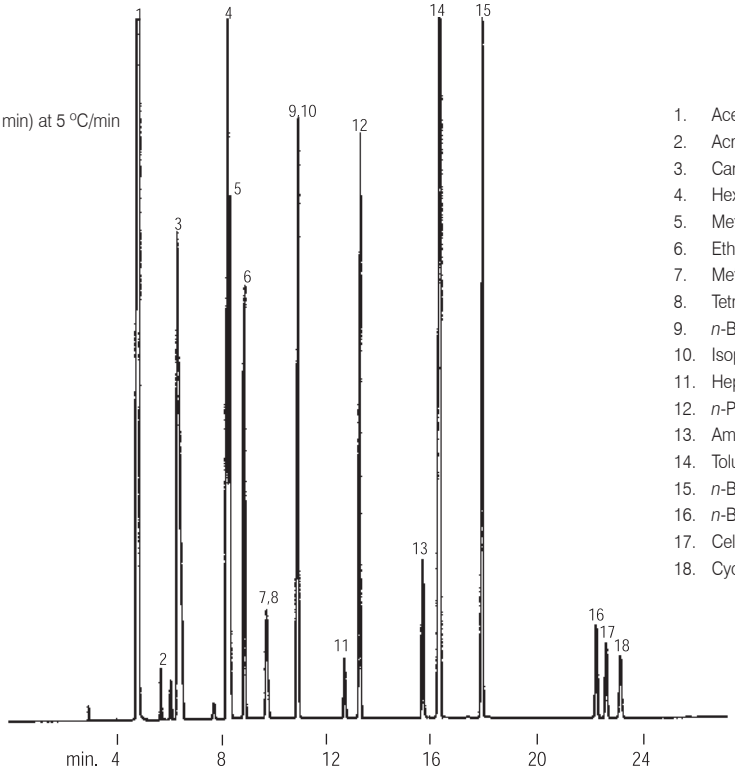
Column:	DM-PLOT Q, 30 m x 0.32 mm x 10.00 µm
Cat. No.:	**8818**
Index:	CSR00181
Oven Temp.:	150 °C constant
Carrier Gas:	H_2
Injection:	Split, 20:1, 200 °C
Sample:	50 ppm (w / v) each in He, 20 µL
Detector:	FID, 200 °C



1. Methane
2. Methanol
3. Ethanol
4. Acetone
5. *n*-Pentane
6. Ethyl acetate
7. *n*-Hexane

Solvents

Column:	DM-5, 60 m x 0.32 mm x 3.00 µm
Cat. No.:	**7242**
Index:	CCR00346
Oven Temp.:	50 °C (hold 4 min) to 120 °C (hold 20 min) at 5 °C/min
Carrier Gas:	H_2, 40 cm/sec, 50 °C
Injection:	Split, 300 °C
Sample:	in CS_2 solvent, 1.0 µL
Detector:	FID, 128 x 10^{-12} AFS, 300 °C

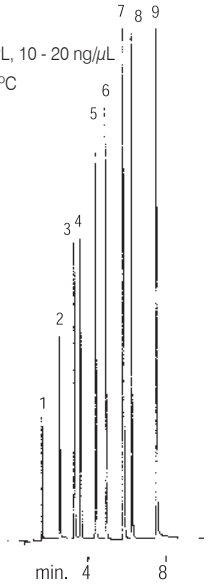


1. Acetone
2. Acrylonitrile
3. Carbon disulfide impurity
4. Hexane
5. Methyl ethyl ketone
6. Ethyl acetate
7. Methyl cellosolve
8. Tetrahydrofuran
9. *n*-Butyl alcohol
10. Isopropyl acetate
11. Heptane
12. *n*-Propyl acetate
13. Amyl alcohol
14. Toluene
15. *n*-Butyl acetate
16. *n*-Butyl acrylate
17. Cellosolve acetate
18. Cyclohexanone

Fatty Acids (Free)

Column: DM-1, 30 m x 0.53 mm x 5.00 µm
Cat. No.: **7157**
Index: CCR00281
Oven Temp.: 60 °C to 180 °C at 15 °C/min
Carrier Gas: H_2, 50 cm/sec
Injection: Direct, 250 °C
Sample: Fatty acids (free), 0.2 µL, 10 - 20 ng/µL
Detector: FID, 4 x 10^{-11} AFS, 250 °C

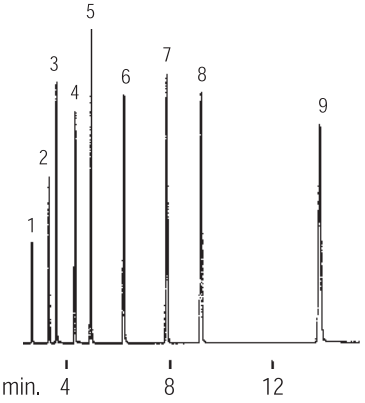
1. Acetic acid
2. Propionic acid
3. Isobutyric acid
4. *n*-Butyric acid
5. Isovaleric acid
6. *n*-Valeric acid
7. Isocaproic acid
8. Caproic acid
9. Heptanoic acid



Fatty Acids (Free)

Column: DM-FFAP, 30 m x 0.25 mm x 0.25 µm
Cat. No.: **7621**
Index: CCR00280
Oven Temp.: 145 °C, constant
Carrier Gas: H_2, 40 cm/sec
Injection: Split, 50:1, 250 °C
Sample: Fatty acids (free), 1.0 µL, 10 - 20 ng/µL
Detector: FID, 2 x 10^{-11} AFS, 250 °C

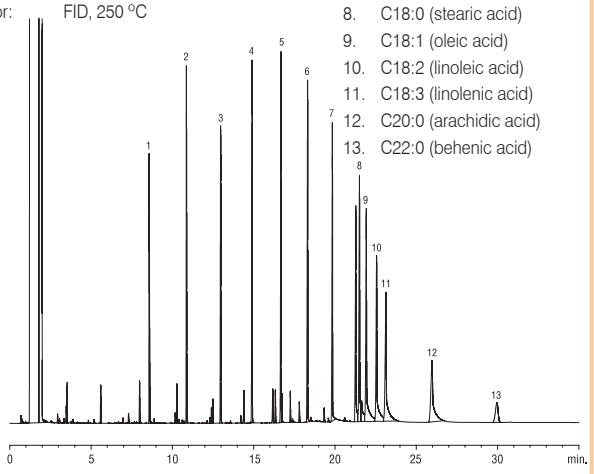
1. Acetic acid
2. Propionic acid
3. Isobutyric acid
4. *n*-Butyric acid
5. Isovaleric acid
6. *n*-Valeric acid
7. Isocaproic acid
8. Caproic acid
9. Heptanoic acid



Fatty Acids (Free)

Column: DM-FFAP, 30 m x 0.32 mm x 0.25 µm
Cat. No.: **7631**
Index: CFR00653
Oven Temp.: 40°C to 250°C (hold 15 min) at 10°C/min
Carrier Gas: H_2
Injection: Splitless, 0.25 min, 250 °C
Sample: Free fatty acid mix, 1.0 µL
Flow Rate: 6.0 mL/min
Make up gas: 75 mL/min
Solvent: H_2O
Concentration: 5 mg/mL in MeOH
Detector: FID, 250 °C

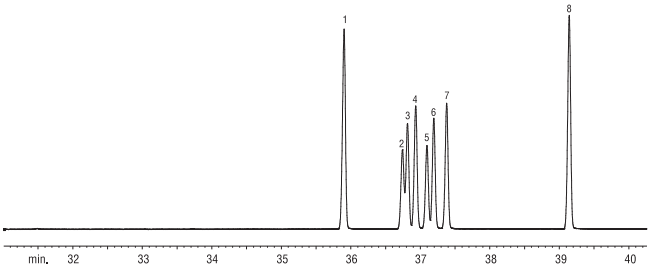
1. C4:0 (butyric acid)
2. C6:0 (caproic acid)
3. C8:0 (caprylic acid)
4. C10:0 (capric acid)
5. C12:0 (lauric acid)
6. C14:0 (myristic acid)
7. C16:0 (palmitic acid)
8. C18:0 (stearic acid)
9. C18:1 (oleic acid)
10. C18:2 (linoleic acid)
11. C18:3 (linolenic acid)
12. C20:0 (arachidic acid)
13. C22:0 (behenic acid)



FAMEs (*cis* / *trans* Isomers)

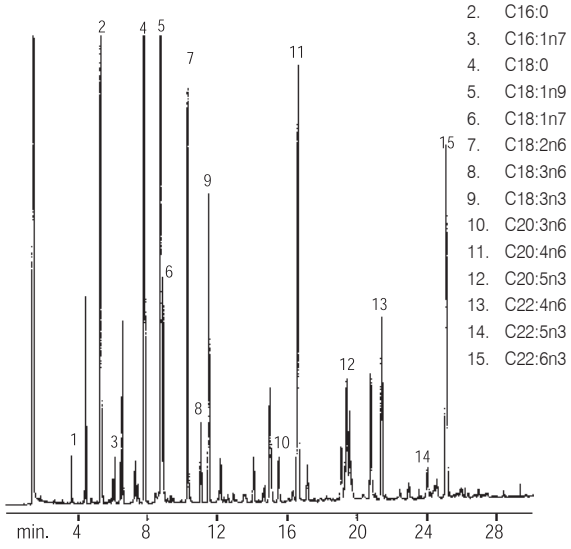
Column: DM-2560, 100 m x 0.25 mm x 0.20 µm
Cat. No.: **8858**
Index: CFR00652
Sample: 10 mg/mL *cis* / *trans* FAMEs mix in methylene chloride
Injection: Split, 20:1, 1 µL, 225 °C
Oven Temp.: 100 °C (hold 4 min) to 240 °C (hold 10 min) at 3 °C/min
Carrier Gas: H_2, 1.2 mL/min
Detector: FID, 250 °C

1. C18:0 (methyl stearate)
2. C18:1 (methyl petroselaidate (*trans*-6))
3. C18:1 (methyl elaidate (*trans*-9))
4. C18:1 (methyl transvaccenate (*trans*-11))
5. C18:1 (methyl petroselinate (*cis*-6))
6. C18:1 (methyl oleate (*cis*-9))
7. C18:1 (methyl vaccenate (*cis*-11))
8. C18:2 (methyl linoleate (*cis*-9,12))



PUFA (Animal Source)

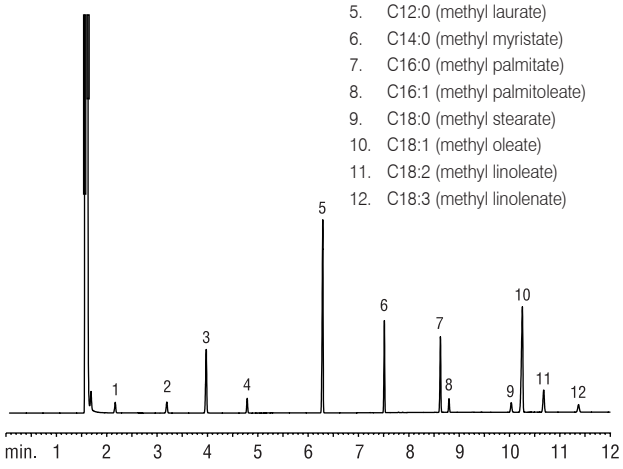
Column:	DM-2330, 30 m x 0.32 mm x 0.20 µm
Cat. No.:	**8633**
Index:	CFR00119
Oven Temp.:	160 °C to 250 °C (hold 10 min) at 2 °C/min
Carrier Gas:	H_2, 40 cm/sec
Injection:	Split, 260 °C
Sample:	PUFA (animal source) mix, 0.1 µL
Detector:	FID, 8 x 10^{-11} AFS, 260 °C



1. C14:0
2. C16:0
3. C16:1n7
4. C18:0
5. C18:1n9
6. C18:1n7
7. C18:2n6
8. C18:3n6
9. C18:3n3
10. C20:3n6
11. C20:4n6
12. C20:5n3
13. C22:4n6
14. C22:5n3
15. C22:6n3

FAMEs

Column:	DM-InertWax, 30 m x 0.25 mm x 0.25 µm
Cat. No.:	**8521**
Index:	CFR00538
Oven Temp.:	120 °C (hold 3 min) to 220 °C (hold 12 min) at 20 °C/min
Carrier Gas:	He, 34 cm/sec, 1 mL/min
Injection:	Split, 100:1, 250 °C
Sample:	Saw palmetto, 1.0 µL
Detector:	FID, 300 °C

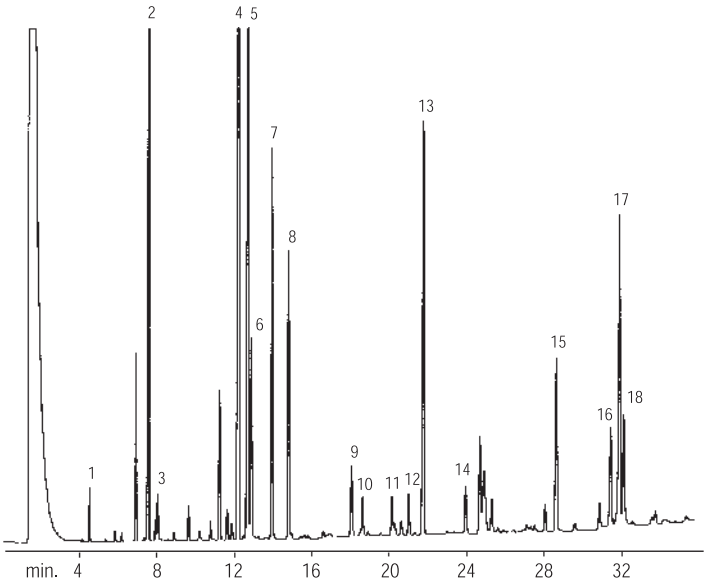


1. C6:0 (methyl caproate)
2. C8:0 (methyl caprylate)
3. C9:0 (methyl nonanoate)
4. C10:0 (methyl caprate)
5. C12:0 (methyl laurate)
6. C14:0 (methyl myristate)
7. C16:0 (methyl palmitate)
8. C16:1 (methyl palmitoleate)
9. C18:0 (methyl stearate)
10. C18:1 (methyl oleate)
11. C18:2 (methyl linoleate)
12. C18:3 (methyl linolenate)

PUFA (Animal Source)

Column:	DM-Wax, 30 m x 0.25 mm x 0.25 µm
Cat. No.:	**7521**
Index:	CFR00117
Oven Temp.:	160 °C to 250 °C (hold 10 min) at 2 °C/min
Carrier Gas:	H_2, 40 cm/sec
Injection:	Split, 20:1, 260 °C
Sample:	PUFA mix, 0.1 µL
Detector:	FID, 8 x 10^{-11} AFS, 260 °C

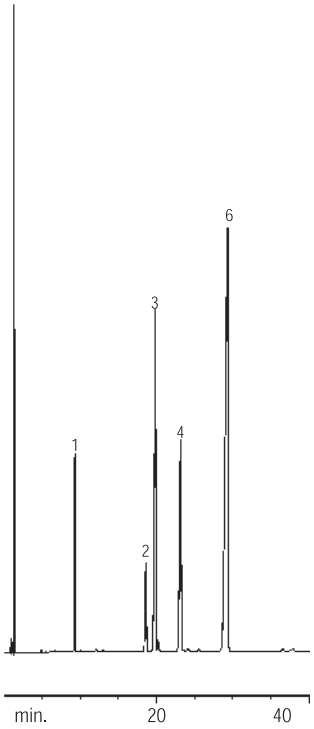
1. C14:0
2. C16:0
3. C16:1n7
4. C18:0
5. C18:1n9
6. C18:1n7
7. C18:2n6
8. C18:3n3
9. C18:4n3
10. C20:1n9
11. C20:2n6
12. C20:3n6
13. C20:4n6
14. C20:5n3
15. C22:4n6
16. C22:5n3
17. C22:6n3
18. C24:1n9



FAMEs (Flax Seed Oil)

Column:	DM-FAMEWAX, 30 m x 0.25 mm x 0.25 µm
Cat. No.:	**7811**
Index:	CFR00364
Oven Temp.:	165 °C (hold 30 min) to 220 °C (hold 15 min) at 1.5 °C/min
Carrier Gas:	He, 40 cm/sec
Injection Temp.:	225 °C
Detector:	FID, 230 °C

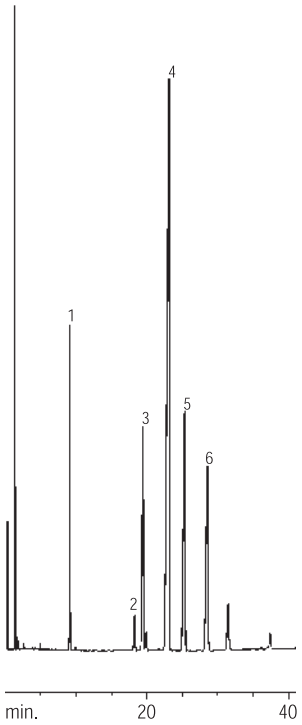
1. C16:0
2. C18:0
3. C18:1n9
4. C18:2n6
5. C18:3n6
6. C18:3n3



FAMEs (Black Currant Seed Oil)

Column:	DM-FAMEWAX, 30 m x 0.25 mm x 0.25 µm
Cat. No.:	**7811**
Index:	CFR00365
Oven Temp.:	165 °C (hold 30 min) to 220 °C (hold 15 min) at 1.5 °C/min
Carrier Gas:	He, 40 cm/sec
Injection Temp.:	225 °C
Detector:	FID, 230 °C

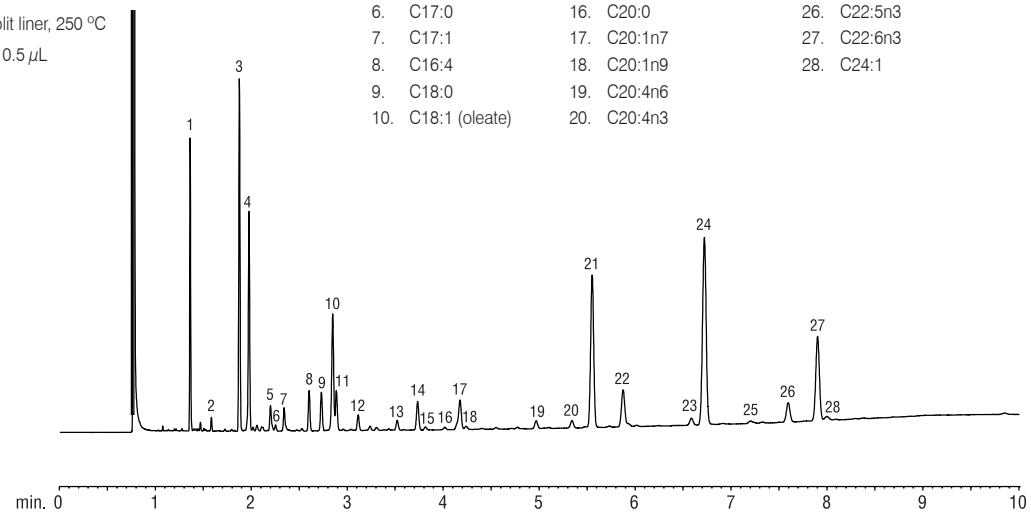
1. C16:0
2. C18:0
3. C18:1n9
4. C18:2n6
5. C18:3n6
6. C18:3n3



FAMEs (Marine Oil Standard)

Column:	DM-FAMEWAX, 30 m x 0.32 mm x 0.25 µm
Cat. No.:	**7813**
Index:	CFR00568
Oven Temp.:	195 °C to 240 °C (hold 1 min) at 5 °C/min
Carrier Gas:	H_2, 62 cm/sec
Injection:	Split, 150:1, 3 mm ID split liner, 250 °C
Sample:	12 mg/mL total FAMEs, 0.5 µL
Detector:	FID, 250 °C

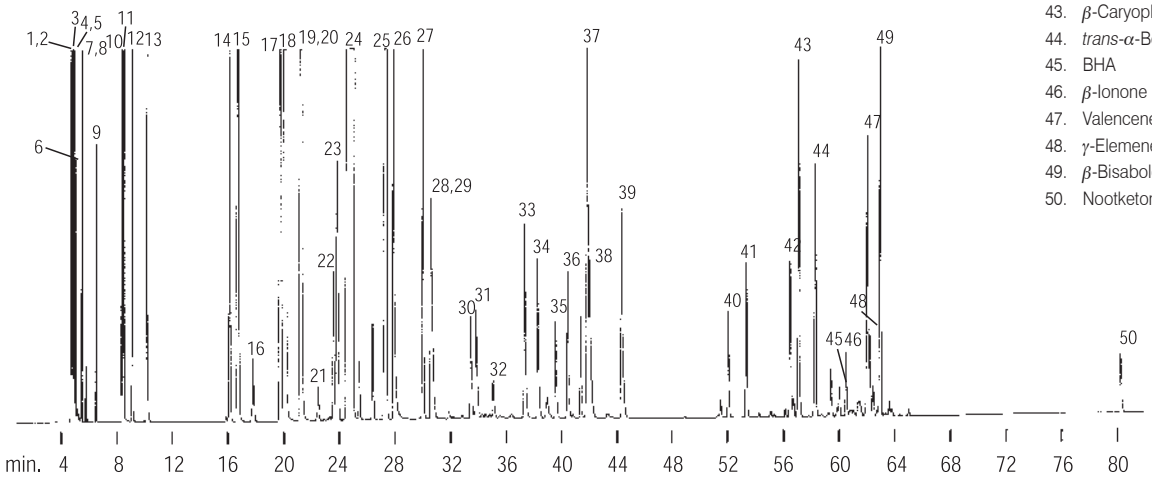
1. C14:0
2. C15:0
3. C16:0
4. C16:1
5. C16:2
6. C17:0
7. C17:1
8. C16:4
9. C18:0
10. C18:1 (oleate)
11. C18:1 (vaccenate)
12. C18:2n6*cis*
13. C18:3n3
14. C18:4n6
15. C18:4n3
16. C20:0
17. C20:1n7
18. C20:1n9
19. C20:4n6
20. C20:4n3
21. C20:5n3
22. C22:1n7
23. C21:5n3
24. C23:0 (IS)
25. C22:5n6
26. C22:5n3
27. C22:6n3
28. C24:1



Flavor Volatiles

Column:	DM-1, 60 m x 0.32 mm x 0.50 μm
Cat. No.:	**7148**
Index:	CFR00536
Oven Temp.:	70 °C (hold 15 min) to 190 °C (hold 5 min) at 2 °C/min
Carrier Gas:	He, 20 cm/sec, 70 °C
Injection:	Split, 20:1, 220 °C
Sample:	Flavor volatiles mix, 0.8 μL
Detector:	FID, 64 x 10^{-11} AFS, 260 °C

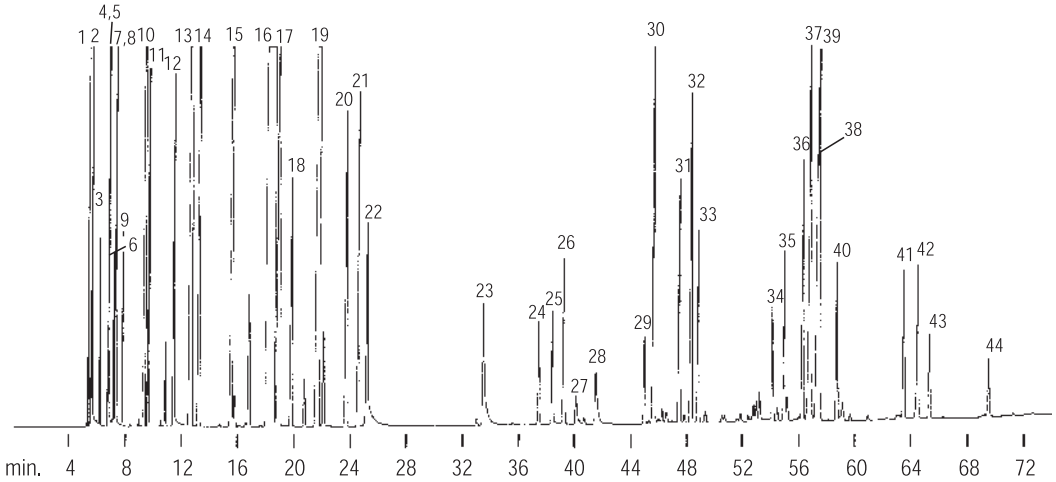
1. Methanol
2. Acetaldehyde
3. Ethanol
4. Acetone
5. Isopropyl alcohol
6. Methylene chloride
7. Hexane
8. Ethyl acetate
9. Ethyl propionate
10. *n*-Hexanal
11. Ethyl butyrate
12. Furfural
13. *trans*-2-Hexenal
14. α-Thujene
15. α-Pinene
16. Camphene
17. Sabinene
18. β-Pinene
19. Octanal
20. Myrcene
21. α-Phellandrene
22. α-Terpinene
23. *p*-Cymene
24. δ-Limonene
25. γ-Terpinene
26. Octanol
27. Terpinolene
28. Nonanal
29. Linalool
30. *cis*-Limonene monoxide
31. *trans*-Limonene monoxide
32. Citronellal
33. Terpinene-4-ol
34. α-Terpineol
35. Decanal
36. *d* / *l* Carveol
37. Neral
38. Carvone
39. Geranial
40. Neryl acetate
41. Geranyl acetate
42. α-Ionone
43. β-Caryophyllene
44. *trans*-α-Bergamotene
45. BHA
46. β-Ionone
47. Valencene
48. γ-Elemene
49. β-Bisabolene
50. Nootketone



Flavor Volatiles

Column:	DM-Wax, 60 m x 0.53 mm x 1.00 μm
Cat. No.:	**7552**
Index:	CFR00537
Oven Temp.:	70 °C (hold 15 min) to 190 °C (hold 5 min) at 2 °C/min
Carrier Gas:	He, 20 cm/sec, 70 °C
Injection:	Split, 20:1, 220 °C
Sample:	Flavor volatiles mix, 0.8 μL
Detector:	FID, 64 X 10^{-11} AFS, 260 °C

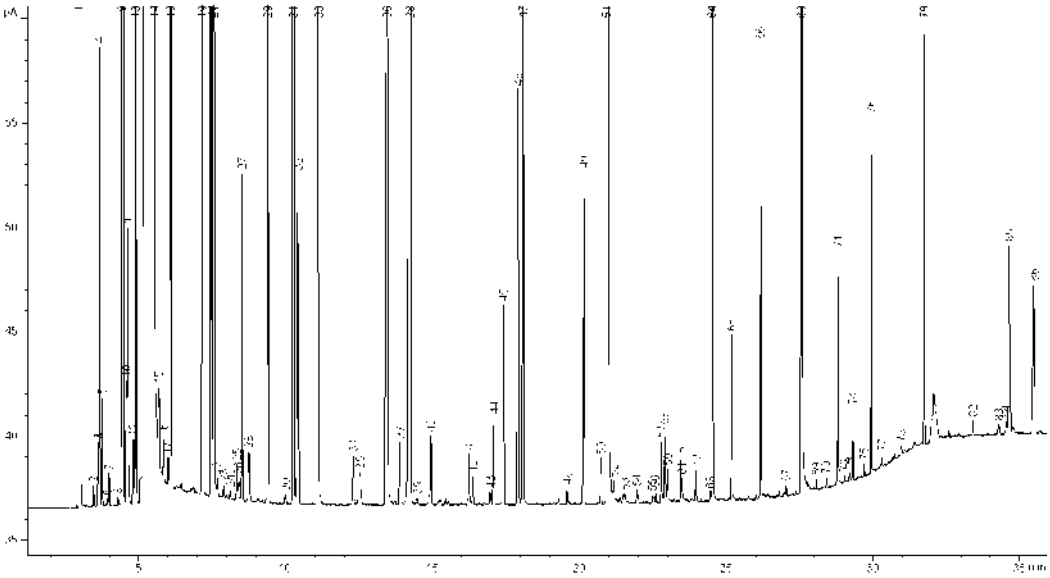
1. Hexane
2. Acetaldehyde
3. Acetone
4. Methanol
5. Ethyl acetate
6. Isopropyl alcohol
7. Ethanol
8. Methylene chloride
9. Ethyl propionate
10. α-Pinene
11. Ethyl butyrate
12. *n*-Hexanal
13. β-Pinene
14. Sabinene
15. Myrcene
16. δ-Limonene
17. 1,8-Cineole
18. *trans*-2-Hexenal
19. γ-Terpinene
20. *p*-Cymene
21. Terpinolene
22. Octanal
23. Nonanal
24. *cis*-Limonene monoxide
25. *trans*-Limonene
26. Furfural
27. Citronellal
28. Decanal
29. Linalool
30. Octanol
31. *trans*-α-Bergamotene
32. β-Caryophyllene
33. Terpinene-4-ol
34. Neral
35. α-Terpineol
36. Neryl acetate
37. Valencene
38. Geranial
39. Carvone
40. Geranyl acetate
41. *d* / *l* Carveol
42. α-Ionone
43. *d* / *l* Carveol
44. β-Ionone



Concentrated Liquors

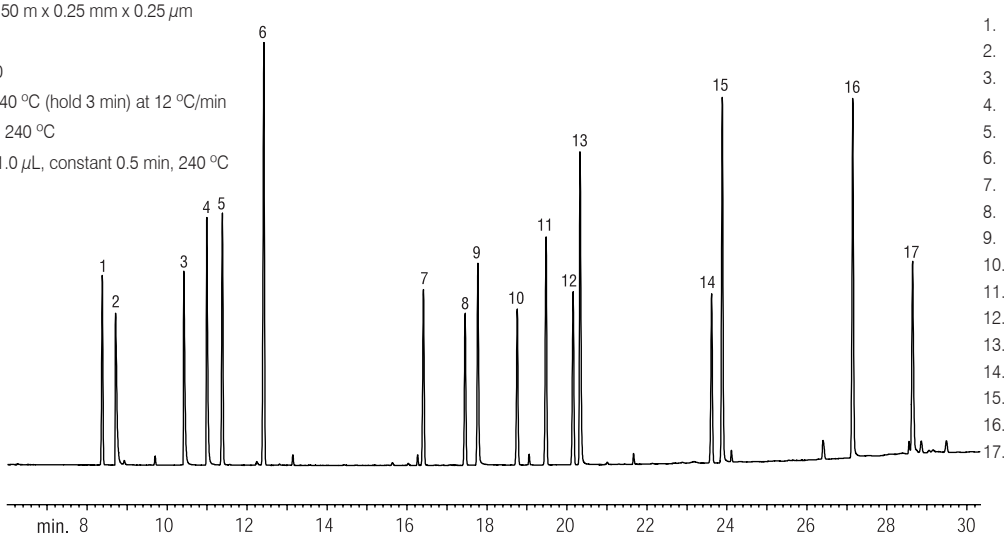
Column:	DM-Wax, 30 m×0.25 mm×0.25 μm
Cat. No.:	**7521**
Index:	CFO00011
Oven Temp.:	37 °C (hold 2 min) to 70 °C at 3 °C/min 70 °C (hold 1 min) to 130 °C at 6 °C/min 130 °C to 220 °C at 10 °C/min to 220 °C (hold 10 min)
Carrier Gas:	High purity nitrogen, 1 mL/min
Injection:	260 °C, Split ratio 30:1
Detector:	FID, 260 °C

1. Acetaldehyde
2. Propanal
3. Isobutanal
4. Acetone
5. Ethyl formate
6. -
7. -
8. -
9. Ethyl acetate + Acetal
10. Methanol
11. 2-Butanone
12. 2-Methyl butyraldehyde
13. 3-Methyl butyraldehyde
14. Ethanol
15. Ethyl propionate
16. Ethyl isobutyrate
17. 2-Ethoxy butane
18. 2-Pentanone
19. *sec*-Butyl alcohol
20. Ethyl butyrate
21. *n*-Propanol
22. -
23. -
24. -
25. Ethyl isovalerate
26. Diethoxy isopentane
27. Diethoxy-3-methylbutane
28. -
29. Isobutyl alcohol
30. Isoamyl acetate
31. *sec*-Pentanol
32. Ethyl valerate
33. *n*-Butanol
34. -
35. -
36. Isoamyl alcohol
37. -
38. Ethyl caproate
39. -
40. *n*-Pentanol
41. Acetoin
42. -
43. Propyl hexanoate
44. 2-Heptanol
45. Ethyl heptanoate
46. Ethyl lactate
47. *n*-Hexanol
48. Butyl hexanoate
49. Ethyl octanoate
50. -
51. Acetic acid
52. Furfural
53. -
54. -
55. Benzaldehyde
56. Ethyl nonanoate
57. Propionic acid
58. *L*-2,3-Butanediol
59. Capryl alcohol
60. Isobutyric acid
61. *meso*-2,3-Butanediol
62. Hexyl hexanoate
63. Ethyl caprate
64. *n*-Butanoic acid
65. Isovaleric acid
66. Valeric acid
67. -
68. *n*-Hexanoic acid
69. Benzenepropanoic acid ethyl ester
70. *β*-Phenethyl alcohol
71. Heptanoic acid
72. -
73. -
74. Ethyl myristate
75. -
76. Octylic acid
77. -
78. -
79. Ethyl palmitate
80. -
81. -
82. -
83. -
84. -
85. Ethyl oleate
86. Ethyl linoleate



Alcoholic Standard: Acids and Esters

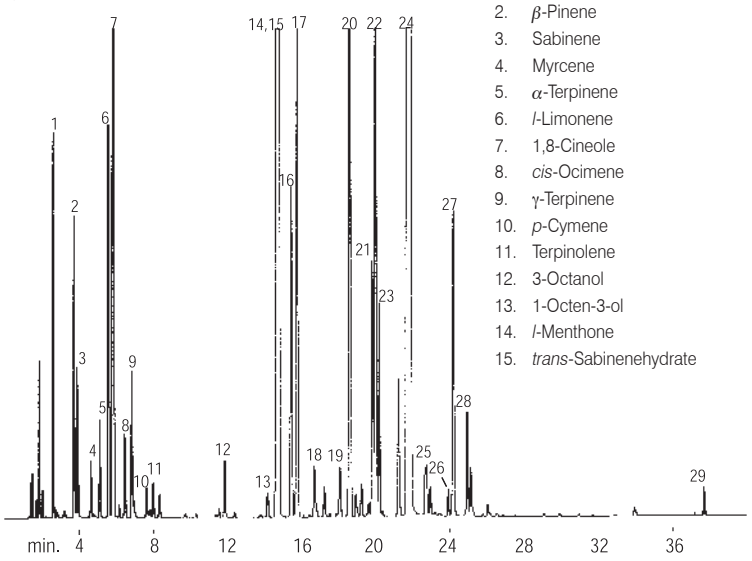
Column:	DM-FFAP, 50 m x 0.25 mm x 0.25 μm
Cat. No.:	**7672**
Index:	CFR00500
Oven Temp.:	70 °C to 240 °C (hold 3 min) at 12 °C/min
Carrier Gas:	H_2, 28 psi, 240 °C
Injection:	Splitless, 1.0 μL, constant 0.5 min, 240 °C
Detector:	FID



1. Ethyl octanoate
2. Acetic acid
3. Propionic acid
4. Isobutyric acid
5. 3-Decanol
6. Ethyl decanoate
7. Ethyl laurate
8. *cis*-Lactone
9. 2-Phenylethanol
10. *trans*-Lactone
11. Methyl myristate
12. Ethyl myristate
13. Octanoic acid
14. Ethyl palmitate
15. Decanoic acid
16. Dodecanoic acid
17. Vanillin

Peppermint Oil

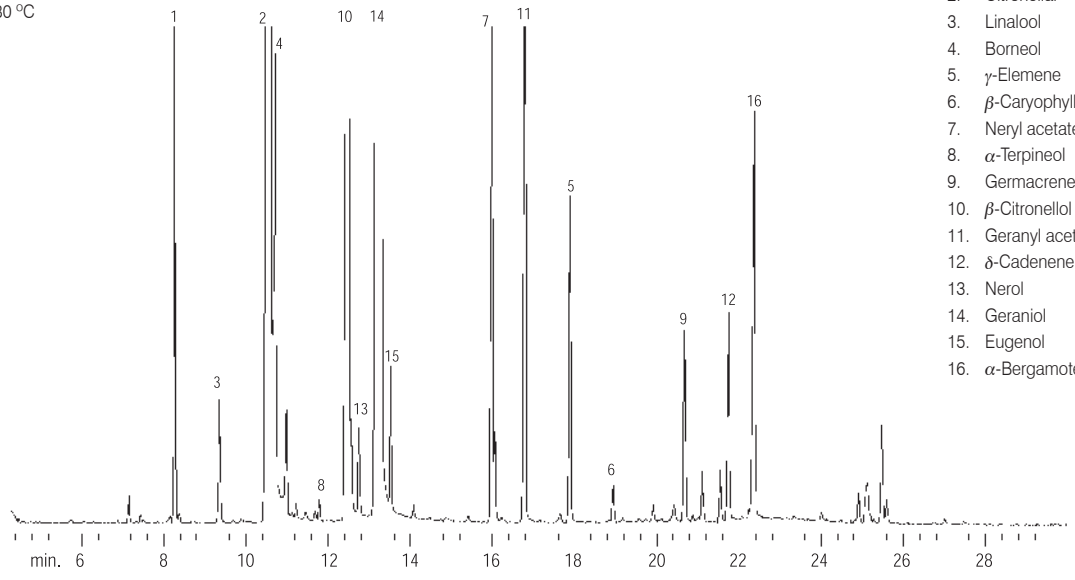
Column:	DM-Wax, 30 m x 0.25 mm x 0.50 μm
Cat. No.:	**7521**
Index:	CFR00141
Oven Temp.:	75 °C (hold 4 min) to 240 °C at 4 °C/min
Carrier Gas:	H_2, 40 cm/sec, 75 °C
Injection:	Split, 1.0 μL, 50:1, 250 °C
Sample:	Peppermint oil, 1.0 μL
Detector:	FID, 16 x 10^{-11} AFS, 250 °C



1. α-Pinene
2. β-Pinene
3. Sabinene
4. Myrcene
5. α-Terpinene
6. *l*-Limonene
7. 1,8-Cineole
8. *cis*-Ocimene
9. γ-Terpinene
10. *p*-Cymene
11. Terpinolene
12. 3-Octanol
13. 1-Octen-3-ol
14. *l*-Menthone
15. *trans*-Sabinenehydrate
16. Menthofuran
17. *d*-Isomenthone
18. β-Bourbonene
19. Linalool
20. Menthyl acetate
21. neo-Menthol
22. β-Caryophyllene
23. Terpinene-4-ol
24. *l*-Menthol
25. Pulegone
26. α-Terpineol
27. Germacrene-Δ
28. Piperitone
29. Viridiflorol

Citronella Java Oil

Column:	DM-1, 60 m x 0.25 mm x 0.25 μm
Cat. No.:	**7122**
Index:	CFR00144
Oven Temp.:	100 °C to 260 °C (hold 1 min) at 4 °C/min
Carrier Gas:	He, 30 cm/sec, 50 °C
Injection:	Split, 100 cc/min, 250 °C
Sample:	Citronella java oil, 1.0 μL
Detector:	MS, 280 °C

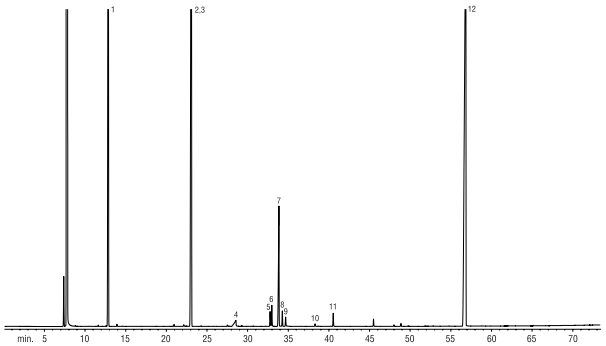


1. Limonene
2. Citronellal
3. Linalool
4. Borneol
5. γ-Elemene
6. β-Caryophyllene
7. Neryl acetate
8. α-Terpineol
9. Germacrene-Δ
10. β-Citronellol
11. Geranyl acetate
12. δ-Cadenene
13. Nerol
14. Geraniol
15. Eugenol
16. α-Bergamotene

Fragrance

Column:	DM-1, 60 m x 0.25 mm x 0.25 µm
Cat. No.:	**7122**
Index:	CFR00657
Oven Temp.:	50 °C to 270 °C at 3 °C/min
Carrier Gas:	He
Injection:	Split, 40:1, 285 °C
Flow rate:	0.6 mL/min
Sample:	5% FMA mix in acetone, 1.0 µL
Detector:	FID, 300 °C

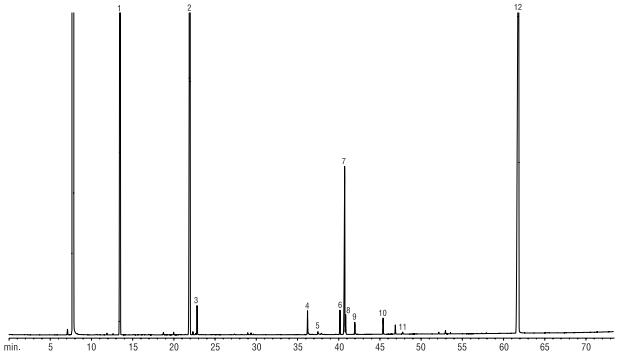
1. Ethyl butyrate
2. Limonene
3. Eucalyptol
4. Benzoic acid
5. Cinnamic aldehyde
6. Geraniol
7. Hydroxycitronellal
8. Thymol
9. Cinnamyl alcohol
10. Vanillin
11. Cinnamyl acetate
12. Benzyl salicylate



Fragrance

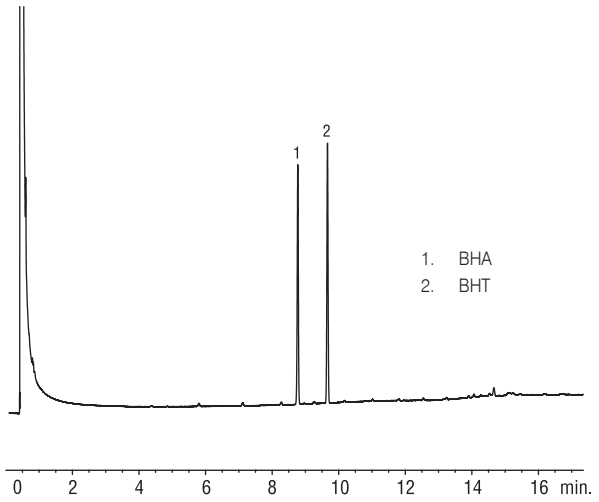
Column:	DM-1701, 60 m x 0.25 mm x 0.25 µm
Cat. No.:	**7322**
Index:	CFR00658
Oven Temp.:	50 °C to 270 °C at 3 °C/min
Carrier Gas:	He
Injection:	Split, 40:1, 285 °C
Sample:	5% FMA mix in acetone, 1.0 µL
Detector:	FID, 300 °C

1. Ethyl butyrate
2. Limonene
3. Eucalyptol
4. Geraniol
5. Benzoic acid
6. Cinnamic aldehyde
7. Hydroxycitronellal
8. Thymol
9. Cinnamyl alcohol
10. Cinnamyl acetate
11. Vanillin
12. Benzyl salicylate



BHA / BHT

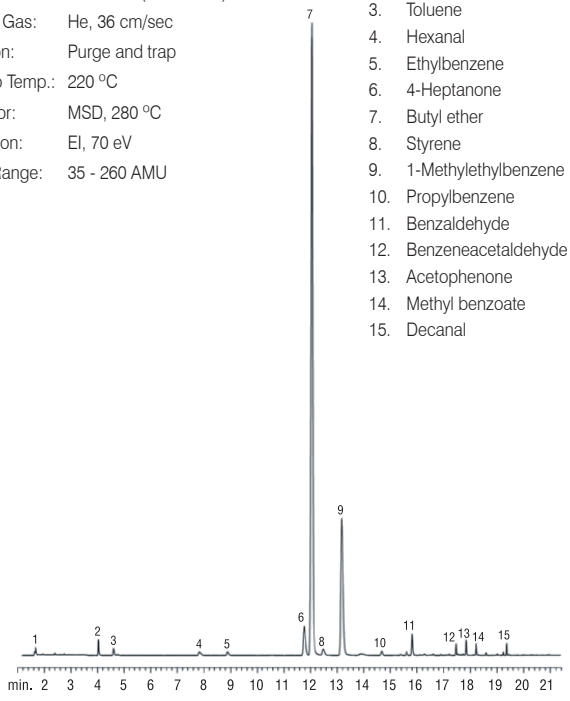
Column:	DM–17, 30 m x 0.53 mm x 1.00 µm
Cat. No.:	**7451**
Index:	CFR00630
Oven Temp.:	50 °C to 240 °C (hold 3 min) at 15 °C/min
Carrier Gas:	He, 60 cm/sec, 50 °C
Injection:	Direct, 280 °C
Sample:	50 ppm BHA / BHT each in MeOH, 1.0 µL
Detector:	FID, 280 °C



Food Packaging Volatiles

Column:	DM-5MS, 30 m x 0.25 mm x 0.50 µm
Cat. No.:	**8223**
Index:	CFR00459
Oven Temp.:	50 °C to 92 °C at 3 °C/min to 220 °C (hold 1 min) at 20 °C/min
Carrier Gas:	He, 36 cm/sec
Injection:	Purge and trap
Desorb Temp.:	220 °C
Detector:	MSD, 280 °C
Ionization:	EI, 70 eV
Scan Range:	35 - 260 AMU

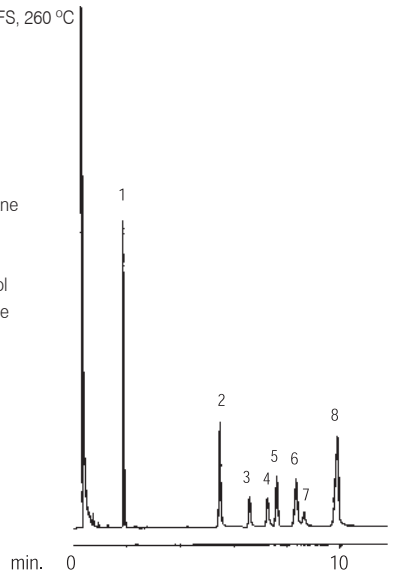
1. Tetrahydrofuran
2. 1-Butanol
3. Toluene
4. Hexanal
5. Ethylbenzene
6. 4-Heptanone
7. Butyl ether
8. Styrene
9. 1-Methylethylbenzene
10. Propylbenzene
11. Benzaldehyde
12. Benzeneacetaldehyde
13. Acetophenone
14. Methyl benzoate
15. Decanal



Neutral Sterols

Column:	DM-225, 30 m x 0.25 mm x 0.25 μm
Cat. No.:	**8421**
Index:	CFR00431
Oven Temp.:	260 °C constant
Carrier Gas:	He, 45 cm/sec, 240 °C
Injection:	Split, 30:1, 260 °C
Sample:	Neutral sterols and phytosterols, 1.5 μL, 200 ng on-column
Detector:	FID, 8 x 10^{-11} AFS, 260 °C

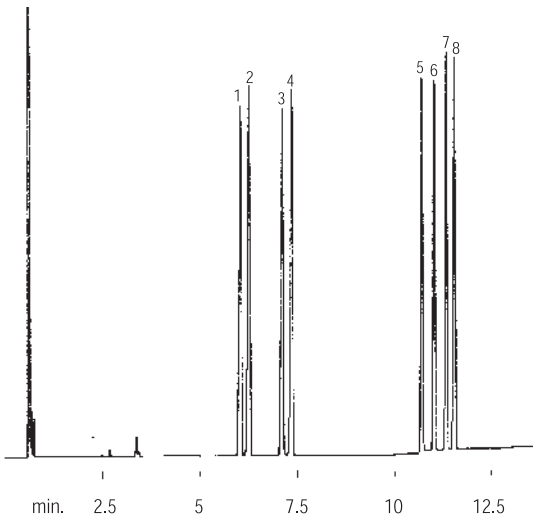
1. 5-α-Cholestane
2. Coprosterol
3. Cholesterol
4. Brassicasterol
5. Coprostanone
6. Campesterol
7. Stigmasterol
8. β-Sitosterol



Sugars (Alditol Acetates)

Column:	DM-225, 30 m x 0.25 mm x 0.25 μm
Cat. No.:	**8421**
Index:	CFR00128
Oven Temp.:	190 °C (hold 5 min) to 250 °C (hold 5 min) at 8 °C/min
Carrier Gas:	H_2, 42 cm/sec, 40 °C
Injection:	Split, 50:1, 260 °C
Sample:	Alditol acetates derivative, 0.5 μL
Detector:	FID, 16 x 10^{-11} AFS, 260 °C

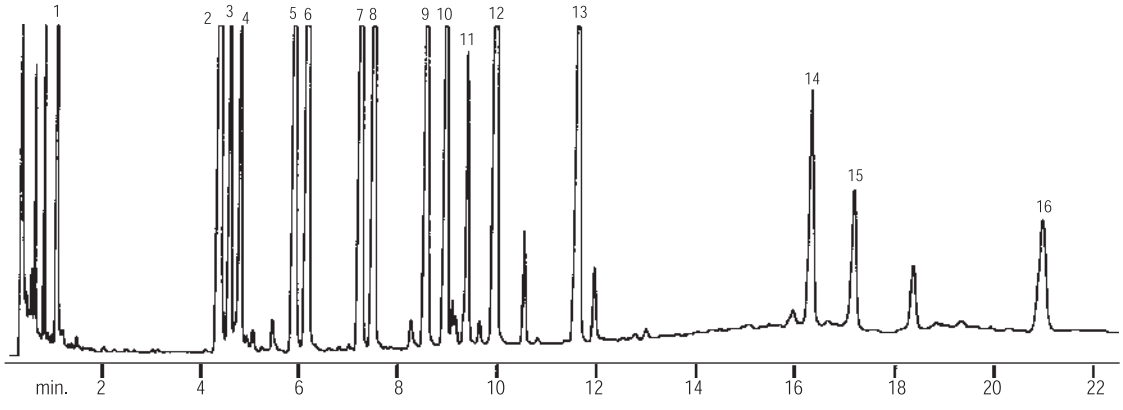
1. Rhamnitol
2. Fucitol
3. Ribitol
4. Arabinitol
5. Mannitol
6. Galactitol
7. Glucitol
8. Inositol



Sugars (Alditol Acetates)

Column:	DM-2330, 30 m x 0.32 mm x 0.20 μm
Cat. No.:	**8633**
Index:	CFR00127
Oven Temp.:	175 °C (hold 2 min) to 240 °C (hold 1 min) at 8 °C/min to 265 (hold 12 min) at 8 °C/min
Carrier Gas:	He, 80 cm/sec
Injection:	Split, 20:1, 275 °C
Sample:	Sugars, 0.6 μL
Detector:	FID, 2 x 10^{-11} AFS, 275 °C

1. Glyceraldehyde
2. Deoxyribitol
3. Rhamnitol
4. Fucitol
5. Ribitol
6. Arabinitol
7. Xylitol
8. Deoxyglucitol
9. Mannitol
10. Galactitol
11. Glucitol
12. Inositol
13. Glucoheptitol
14. *n*-Acetyl galactose amine
15. *n*-Acetyl glucose amine
16. 2-Keto-3-deoxyoctanate



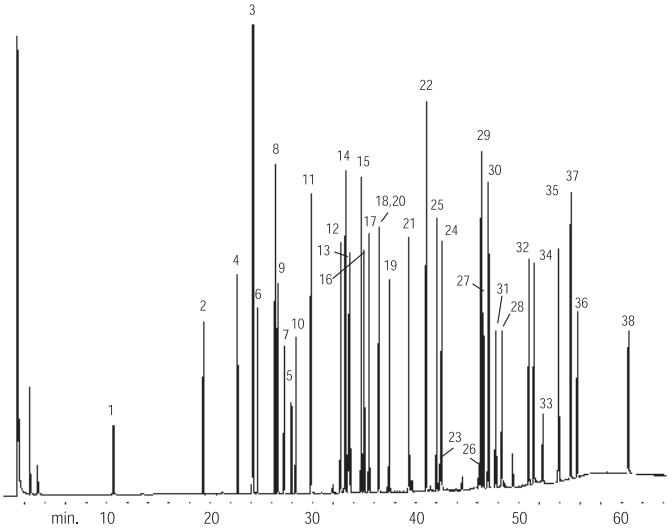
Basic Drugs (Underivatized)

Column:	30 m x 0.25 mm x 0.25 μm
Cat. No.:	DM-35, #7921
	DM-5, #7221
	DM-200, #8321
Oven Temp.:	100 °C to 325 °C (hold 10 min) at 4 °C/min
Carrier Gas:	He, 30 cm/sec, 100 °C
Injection:	Split, 50:1, 250 °C
Sample:	Basic drugs, 1.0 μL, 1000 ng/μL
Detector:	FID, 1.28 x 10^{-10} AFS, 320 °C

1. Nicotine
2. Benzocaine
3. Cotinine
4. Meperidine
5. Caffeine
6. Benzphetamine
7. Ketamine
8. Diphenhydramine
9. Lidocaine
10. Phenyltoloxamine
11. Tripelennamine
12. Phenothiazine
13. Dextromethorphan
14. Methadone
15. Amitriptyline
16. Trimipramine
17. Tetracaine
18. Pyrilamine
19. Medazepam
20. Bupivacaine
21. Scopolamine
22. Codeine
23. Morphine
24. Diazepam
25. Chlorpromazine
26. Temazepam
27. Flunitrazepam
28. Bromazepam
29. Prazepam
30. Acetopromazine
31. Flurazepam
32. Papaverine
33. Clonazepam
34. Haloperidol
35. Alprazolam
36. Triazolam
37. Thioridazine
38. Trazodone

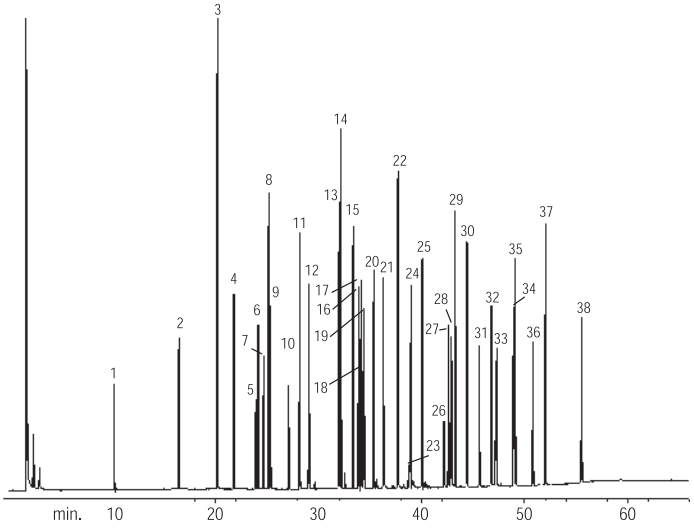
DM-35

Index: CPR00236



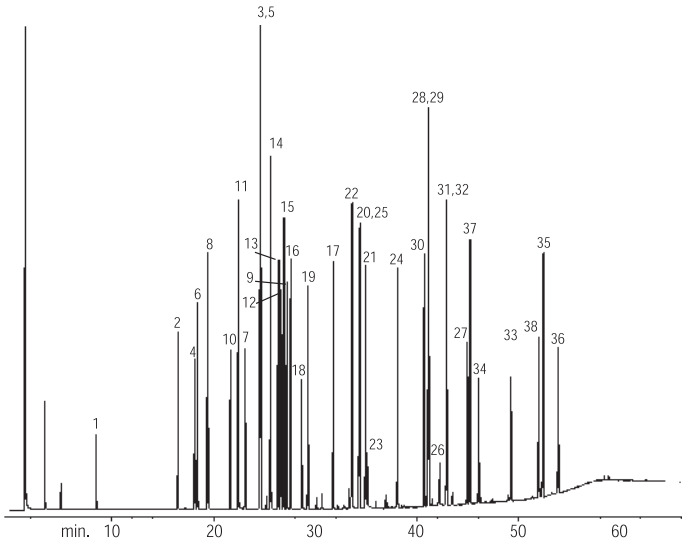
DM-5

Index: CPR00235



DM-200

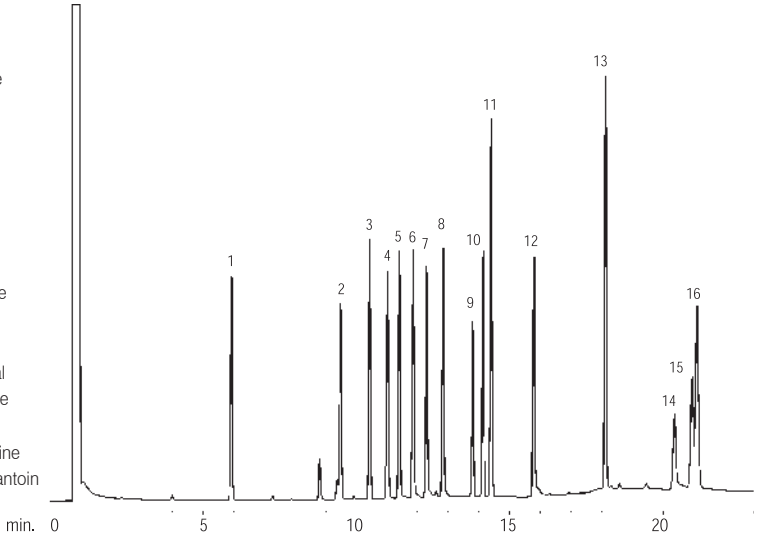
Index: CPR00237



Acidic / Neutral Drugs (Underivatized)

Column: DM-35, 30 m x 0.53 mm x 1.00 μm
Cat. No.: **7951**
Index: CPR00262
Oven Temp.: 100 °C to 280 °C (hold 5 min) at 10 °C/min
Carrier Gas: He, 40 cm/sec, 100 °C
Injection: Splitless, 0.5 min, 250 °C
Sample: Acidic / Neutral drugs, 1.0 μL, 50 μg/mL
Detector: FID, 5.12 x 10^{-10} AFS, 250 °C

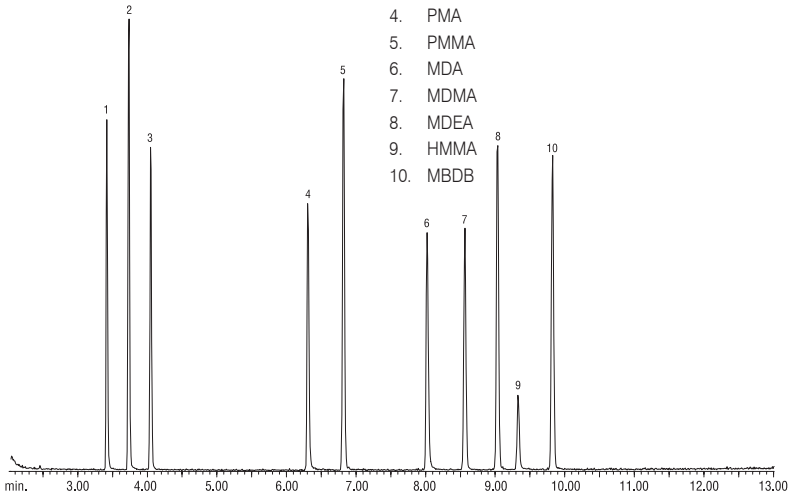
1. Ethosuximide
2. Barbital
3. Methyprylon
4. Aprobarbital
5. Butalbital
6. Amobarbital
7. Pentobarbital
8. Secobarbital
9. Meprobamate
10. Carisoprodal
11. Glutethimide
12. Phenobarbital
13. Methaqualone
14. Primidone
15. Carbamazepine
16. Diphenylhydantoin



Sympathomimetic Amines Drugs

Column: DM-35 Amine, 30 m x 0.25 mm x 0.50 μm
Cat. No.: **7821**
Index: CPR00574
Oven Temp.: 150 °C to 240 °C at 7 °C/min
Carrier Gas: He, 30 cm/sec
Injection: Split, 250 °C
Sample: Sympathomimetic amines drugs, 1.0 μL, 1,000 ng/μL
Detector: MS
Scan Range: 40 - 450 AMU
Ionization: EI, scan

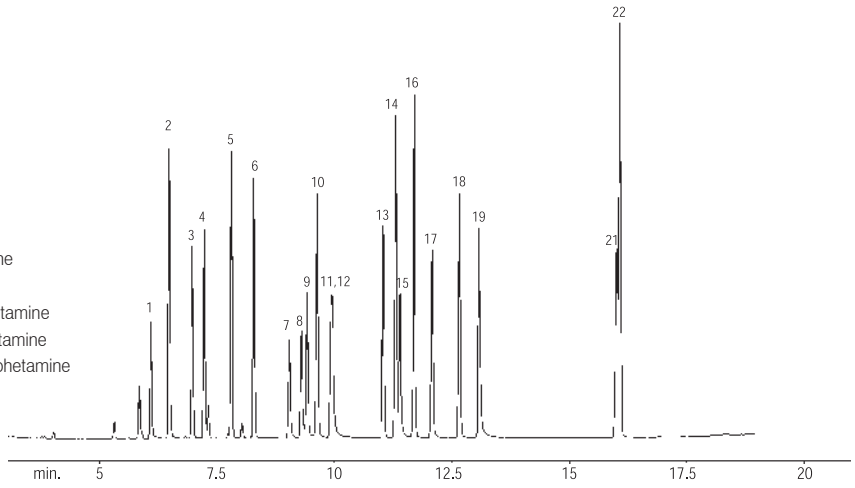
1. Amphetamine
2. Methamphetamine
3. *N*-Ethylamphetamine
4. PMA
5. PMMA
6. MDA
7. MDMA
8. MDEA
9. HMMA
10. MBDB



Sympathomimetic Amines Drugs

Column: DM-5 Amine, 30 m x 0.25 mm x 0.50 μm
Cat. No.: **7815**
Index: CPR00438
Oven Temp.: 100 °C to 310 °C at 10 °C/min
Injection: Split, 45 mL/min
Detector: MS

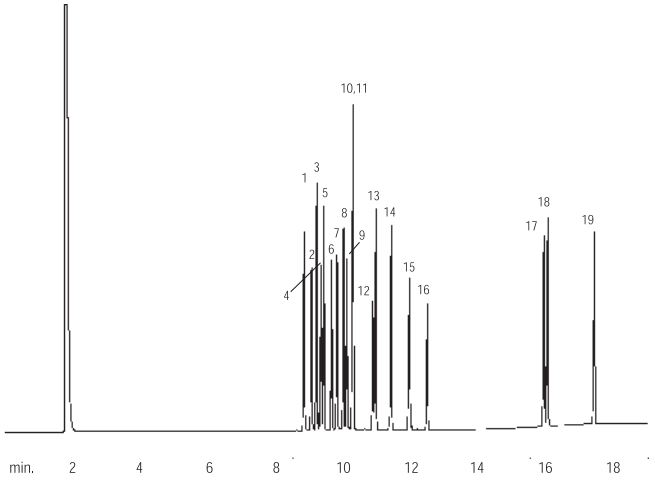
1. Phenylethylamine
2. Amphetamine
3. Phentermine
4. Methamphetamine
5. Fenfluramine
6. Mephentermine
7. Cathinone
8. Phenylpropanolamine
9. Methcathinone
10. Nicotine
11. Ephedrine
12. Pseudoephedrine
13. Phenmetrazine
14. Phendimetrazine
15. Methylenedioxyamphetamine
16. Diethylpropion
17. Methylenedioxymethamphetamine
18. Methylenedioxyethylamphetamine
19. 4-Methyl-2,5-dimethoxyamphetamine
20. Phenylephrine
21. Caffeine
22. Benzphetamine



Steroids, Anabolic

Column:	DM-5, 30 m x 0.25 mm x 0.10 μm
Cat. No.:	**7219**
Index:	CPR00255
Oven Temp.:	180 °C to 340 °C (hold 3 min) at 10 °C/min
Carrier Gas:	He, 35 cm/sec, 180 °C
Injection:	Split, 50:1, 280 °C
Sample:	Anabolic steroids, 0.5 μL, 1,000 ng/μL
Detector:	FID, 1.28 x 10^{-10} AFS, 340 °C

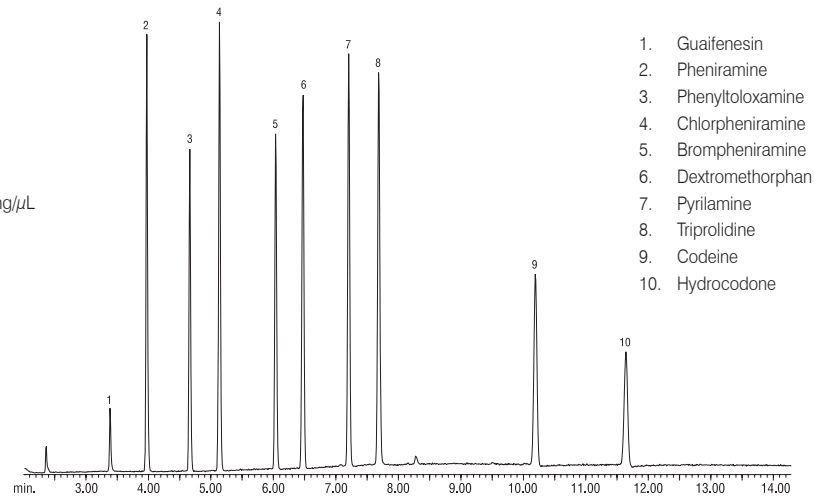
1. 5-Androstene-3β,17β-diol
2. 17α-Methyl-5-androstene-3β,17β-diol
3. 5α-Androstan-17β-ol-3-one
4. 19-Nortestosterone
5. 17α-Methylandrostan-17β-ol-3-one
6. Mesterolone
7. Testosterone
8. 17α-Methyltestosterone
9. 1-Dehydrotestosterone
10. 1-Dehydro-17α-methyltestosterone
11. Bolasterone
12. Oxymethalone
13. 19-Nortestosterone-17-propionate
14. Testosterone propionate
15. Fluoxymesterone
16. 4-Chlorotestosterone-17-acetate
17. Testosterone-17β-cypionate
18. 1-Dehydrotestosterone benzoate
19. 1-Dehydrotestosterone undecylenate



Cold Medicine

Column:	DM-35 Amine, 30 m x 0.25 mm x 0.50 μm
Cat. No.:	**7821**
Index:	CPR00575
Oven Temp.:	250 °C to 300 °C (hold 7 min) at 7 °C/min
Carrier Gas:	He, 30 cm/sec
Injection:	Split, 250 °C
Sample:	Underivatized cold medicine, 1.0 μL, 1,000 ng/μL
Detector:	MS
Scan Range	40 - 450 AMU
Ionization	EI, scan

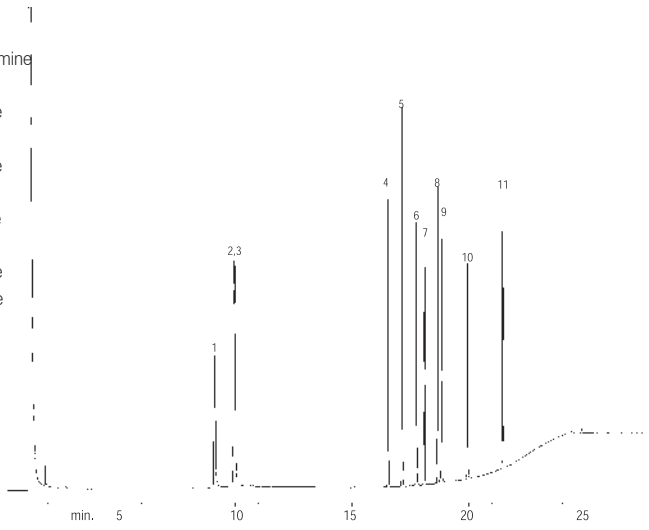
1. Guaifenesin
2. Pheniramine
3. Phenyltoloxamine
4. Chlorpheniramine
5. Brompheniramine
6. Dextromethorphan
7. Pyrilamine
8. Triprolidine
9. Codeine
10. Hydrocodone



Antihistamines

Column:	DM-5 Amine, 30 m x 0.32 mm x 1.00 μm
Cat. No.:	**7817**
Index:	CPR00247
Oven Temp.:	130 °C (hold 5 min) to 305 °C (hold 5 min) at 10 °C/min
Carrier Gas:	H_2, 43 cm/sec, 130 °C
Injection:	Split, 50:1, 305 °C
Sample:	Antihistamines, 1.0 μL, 1,000 ng/μL
Detector:	FID, 6.4 x 10^{-11} AFS, 305 °C

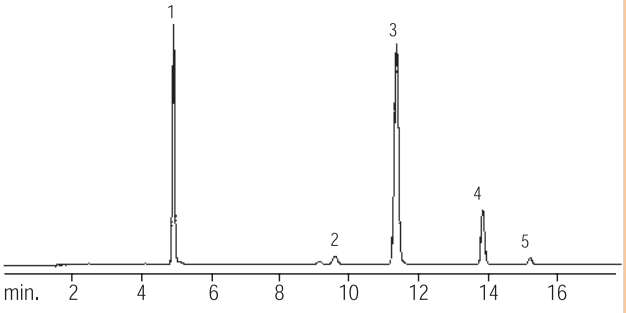
1. Phenylpropanolamine
2. Ephedrine
3. Pseudoephedrine
4. Pheniramine
5. Diphenhydramine
6. Doxylamine
7. Phenyltoloxamine
8. Methapyrilene
9. Chlorpheniramine
10. Brompheniramine
11. Triprolidine



Organic Volatile Impurities (USP 467)

Column:	DM-624, 30 m x 0.53 mm x 3.00 μm + 5 m Guard column
Cat. No.:	**7751**
Index:	CPR00259
Oven Temp.:	40 °C (hold 20 min) to 240 °C (hold 10 min) at 35 °C/min
Carrier Gas:	He, 35 cm/sec, 35 °C
Injection:	Split, 2:1, 180 °C
Detector:	FID, 1.25 x 10^{-10} AFS, 260 °C

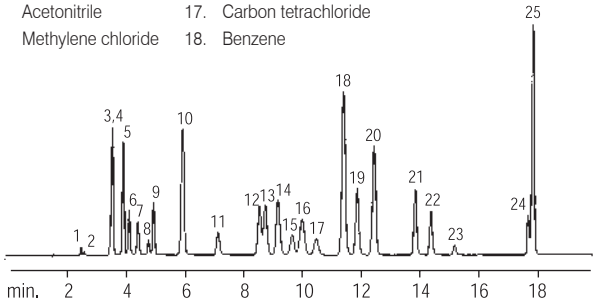
1. Methylene chloride
2. Chloroform
3. Benzene
4. Trichloroethylene
5. 1,4-Dioxane



Organic Volatile Impurities

Column:	DM-624, 30 m x 0.53 mm x 3.00 μm
Cat. No.:	**7751**
Index:	CPR00261
Oven Temp.:	35 °C (hold 10 min) to 100 °C at 5 °C/min to 240 °C (hold 5 min) at 25 °C/min
Carrier Gas:	He, 35 cm/sec, 35 °C
Injection:	Split, 2:1, 220 °C
Detector:	FID, 1.05 x 10^{-11} AFS, 240 °C

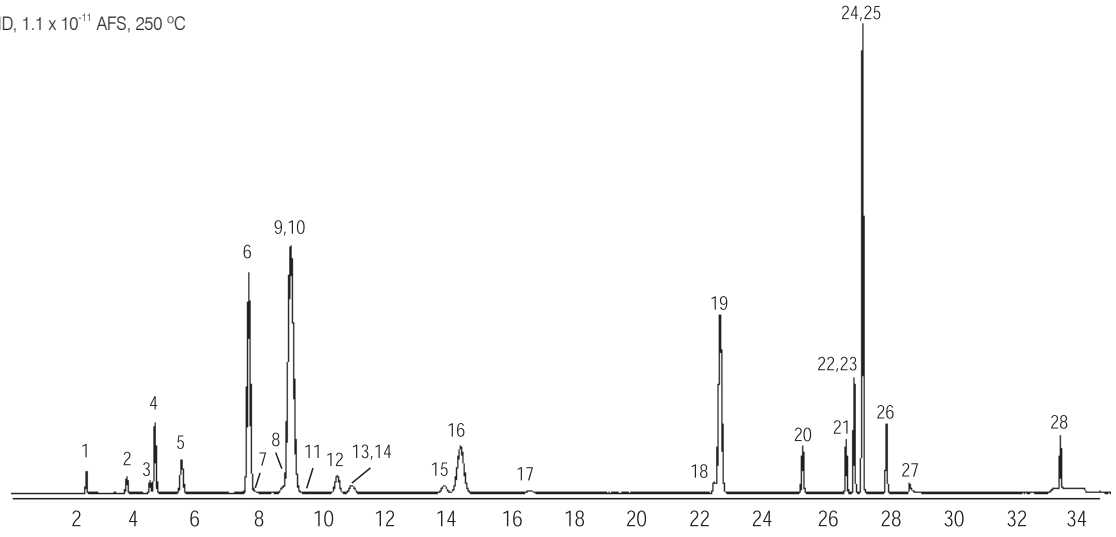
1. Ethylene oxide
2. Methanol
3. Ethanol
4. Diethyl ether
5. 1,1-Dichloroethene
6. Acetone
7. Isopropanol
8. Acetonitrile
9. Methylene chloride
10. -Hexane
11. *n*-Propanol
12. Methyl ethyl ketone
13. Ethyl acetate
14. Tetrahydrofuran
15. Chloroform
16. 1,1,1-Trichloroethane
17. Carbon tetrachloride
18. Benzene
19. 1,2-Dichloroethane
20. Heptane
21. Trichloroethylene
22. *n*-Butanol
23. 1,4-Dioxane
24. Pyridine
25. Toluene



EP Class 1 and Class 2 Solvents

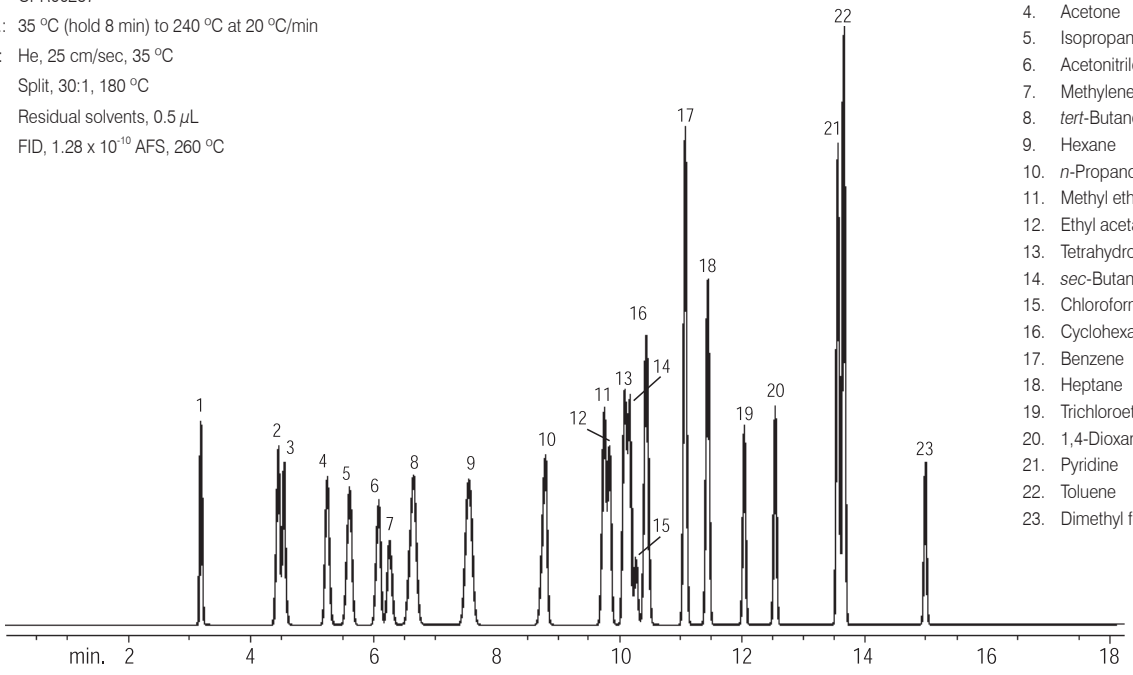
Column:	DM-624, 30 m x 0.53 mm x 3.00 μm
Cat. No.:	**7751**
Index:	CPR00553
Oven Temp.:	40 °C (hold 20 min) to 240 °C (hold 20 min) at 10 °C/min
Carrier Gas:	H_2, 35 cm/sec
Injection:	1 mL Headspace injection, using samples shaken and heated at 80 °C for 15 min, 200 °C
Split Ratio:	2:1
Detector:	FID, 1.1 x 10^{-11} AFS, 250 °C

1. Methanol
2. 1,1-Dichloroethene
3. Acetonitrile
4. Dichloromethane
5. Hexane
6. *cis*-1,2-Dichloroethene
7. Nitromethane
8. Chloroform
9. Cyclohexane
10. 1,1,1-Trichloroethane
11. Carbon tetrachloride
12. Benzene
13. 1,2-Dimethoxyethane
14. 1,2-Dichloroethane
15. 1,1,2-Trichlorethene
16. Methyl cyclohexane
17. 1,4-Dioxane
18. Pyridine
19. Toluene
20. 2-Hexanone
21. Chlorobenzene
22. DMF
23. Ethylbenzene
24. *m*-Xylene
25. *p*-Xylene
26. *o*-Xylene
27. *N,N*-Dimethylacetamide
28. 1,2,3,4-Tetrahydronaphthalene



Residual Solvents

Column:	DM-624, 30 m x 0.53 mm x 3.00 µm
Cat. No.:	**7751**
Index:	CPR00257
Oven Temp.:	35 °C (hold 8 min) to 240 °C at 20 °C/min
Carrier Gas:	He, 25 cm/sec, 35 °C
Injection:	Split, 30:1, 180 °C
Sample:	Residual solvents, 0.5 µL
Detector:	FID, 1.28 x 10^{-10} AFS, 260 °C

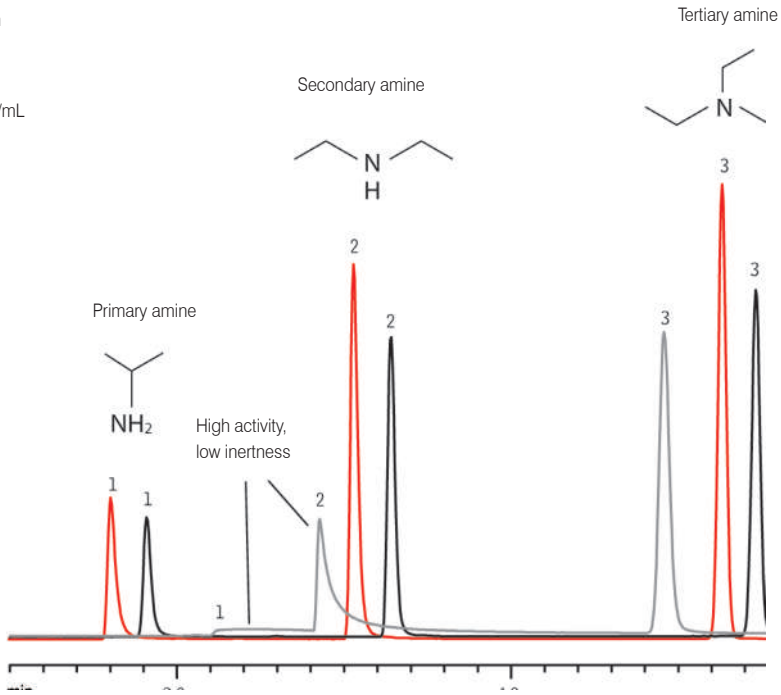


1. Methanol
2. Ethanol
3. Ether
4. Acetone
5. Isopropanol
6. Acetonitrile
7. Methylene chloride
8. *tert*-Butanol
9. Hexane
10. *n*-Propanol
11. Methyl ethyl ketone
12. Ethyl acetate
13. Tetrahydrofuran
14. *sec*-Butanol
15. Chloroform
16. Cyclohexane
17. Benzene
18. Heptane
19. Trichloroethylene
20. 1,4-Dioxane
21. Pyridine
22. Toluene
23. Dimethyl formamide

Primary, Second and Tertiary Amines

Column:	DM-624MS, 30 m x 0.32 mm x 1.80 µm
Cat. No.:	**8838**
Index:	CPR1162
Oven Temp.:	50 °C (hold 1 min) to 200 °C (hold 5 min) at 20 °C/min
Carrier Gas:	He, 37 cm/sec
Injection:	Split, 20:1, 1.0 µL, 250 °C
Sample:	Primary, second and tertiary amines in DMSO, 100 µg/mL
Detector:	FID, 250 °C

1. Isopropylamine 100 µg/mL
2. Diethylamine 100 µg/mL
3. Triethylamine 100 µg/mL



Industry Index

Product Index

ProElut™ BaP

ProElut™ PLS

ProElut™ PLS GLASS

ProElut™ PXC

Determination of Histamine Originating from Aquatic Products

1. Scope of application

For determination of histamine in aquatic products

2. Sample preparation / extraction

2.1. Weighing

Smoked fish and other dried samples: Weigh 2.5 g of sample (accurate to 0.01 g) in 50 mL centrifuge tube.
Tuna and other wet samples: Weigh 5.0 g of sample (accurate to 0.01 g) in 50 mL centrifuge tube.

2.2. Extraction of histamine

Add 20 mL histamine extract* to centrifuge tube, vortex 1 min, shock in thermostatic water bath for 30 min at 60 ^{o}C, centrifuge at 4,000 rpm for 10 min. Take 6 mL of supernatant and adjust the pH to be between 2 - 3 with 50% H_3PO_4 as the sample solution to be purified.

*Histamine extract: MeOH:50 mM KH_2PO_4 = 1:1

3. Sample purification

ProElut™ PXC 150 mg / 6 mL **(Cat#68204)**

Condition:	6 mL MeOH / 6 mL H_2O
Load:	6 mL supernatant
Wash 1:	6 mL 0.1 M HCl
Wash 2:	6 mL solution of NH_4OH:MeOH:H_2O = 5:5:90
Elute:	6 mL solution of NH_4OH:MeOH:H_2O = 5:60:35
Reconstitute:	Reconstitute to 6 mL with elution solvent

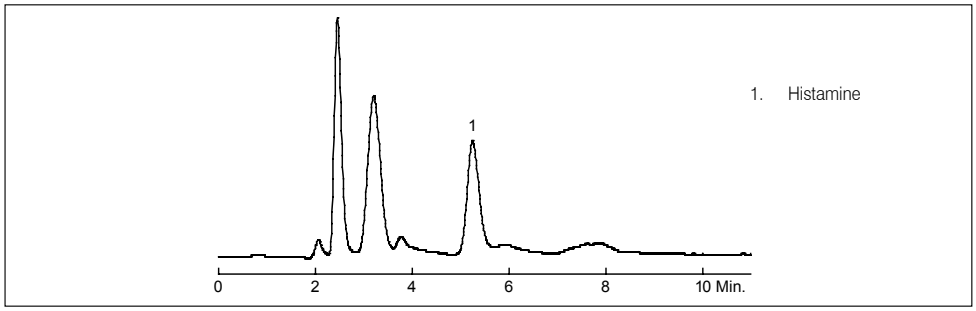
4. HPLC method

Column:	Inspire™ 5 μm C18, 150 x 4.6 mm **(Cat#81001)**
Mobile Phase:	A: MeOH, B: Phosphoric acid - triethylamine buffer*, A:B = 40:60
Flow Rate:	1.0 mL/min
Temperature:	30 ^{o}C
Detection:	FLD Ex: 345 nm, Em: 445 nm
Injection Volume:	10 μL
Injection Procedure:	7.5 μL *o*-Phthalaldehyde (OPA) + 10 μL sample + 7.5 μL OPA

*Phosphoric acid - triethylamine buffer: Add 12.5 mL triethylamine and 25.7 mL phosphoric acid to 1 L deionized water

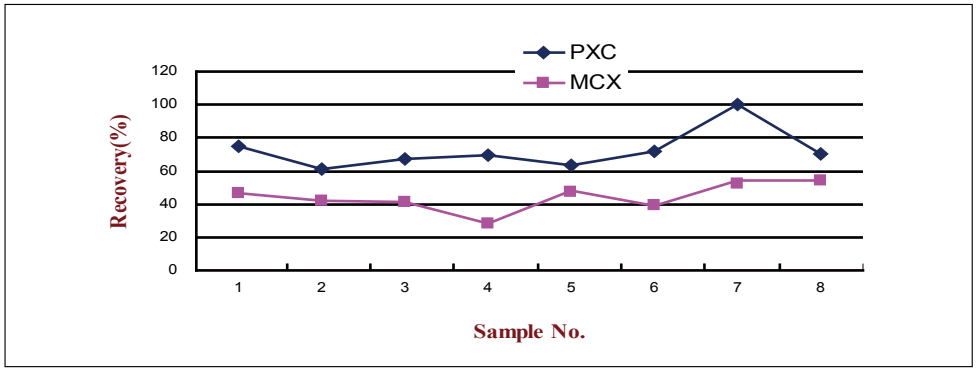
5.1. Recovery

Compounds	Spike Level (mg/kg)	Recovery
Histamine	10	89.96
	10	90.04
	20	73.04
	20	71.50
	40	59.98
	40	53.63



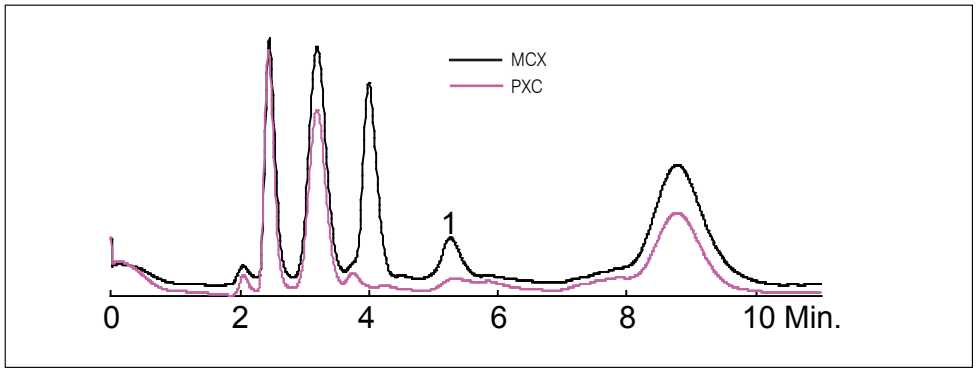
Chromatogram of aquatic products extracts - spiked histamine in aquatic products (10 mg/kg)

5.2. Recovery rate comparison



Samples No. 1 - 6 show the internal standard added in sample. Samples No. 7 and No. 8 show the internal standard added in sample extracting solution. Both methods exhibit stable recovery, the recovery of PXC treatment is better than that of MCX treatment.

5.3. Purification comparison



Determination of Melamine in Milk and Dairy Products

1. Scope of application

For determination of melamine in milk and dairy products

2. Sample preparation

2.1. Milk and milk powder

Dilute milk (2 mL) or milk powder (1 g) with 5 mL of trichloroacetic acid aqueous solution (10 g/L) in a 15 mL centrifuge tube, add 0.5 mL lead acetate aqueous solution (22 g/L) and 2 mL chloroform, vortex and centrifuge for 2 min at 3,000 rpm, collect supernatant, add 5 mL trichloroacetic acid aqueous solution (10 g/L) to residue, vortex and centrifuge for 2 min at 3,000 rpm, collect and combine supernatants.

2.2. Cream candy and cookies

Grind 1 g sample with sand into powder in a mortar, add powder to a 50 mL centrifuge tube, rinse the mortar with 15 mL of trichloroacetic acid aqueous solution (10 g/L), transfer solution to centrifuge tube then shake, add 1 mL lead acetate aqueous solution (22 g/L) and 5 mL chloroform, vortex and centrifuge for 2 min at 3,000 rpm, collect supernatant, add 15 mL trichloroacetic acid aqueous solution (10 g/L) to residue, vortex and centrifuge for 2 min at 3,000 rpm, collect and combine supernatants.

3. Sample purification

ProElut™ PXC 60 mg / 3mL **(Cat#68203)**

Condition:	3 mL MeOH / 3 mL H_2O
Load*:	supernatant
Wash 1:	3 mL deionized water
Wash 2:	3 mL MeOH
Elute:	3 mL 5 % NH_4OH in MeOH
Reconstitute:	Evaporate at 50 ^oC by N_2, reconstitute to 1 mL with MeOH:H_2O (20:80, V / V) solution

*12 mL reservoir **(Cat#4810)** and adaptor **(Cat#4803)** is available for large volume sample

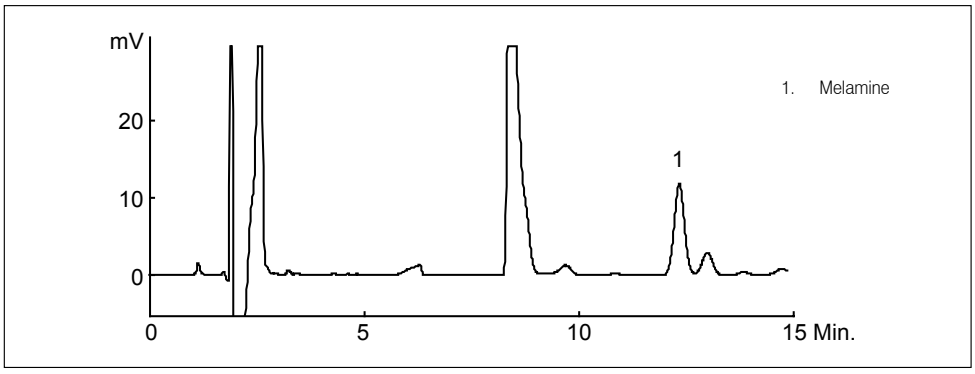
4. HPLC method

Column:	Inspire™ 5 μm C18, 150 x 4.6 mm **(Cat#81001)**
Mobile Phase :	Buffer:MeCN = 92:8
Flow Rate:	1.0 mL/min
Temperature:	30 ^oC
Detection:	UV 240 nm
Injection Volume:	20 μL

Buffer: dilute 2.02 g sodium 1-heptanesulfonate and 2.10 g citric acid with water to total volume 1,000 mL

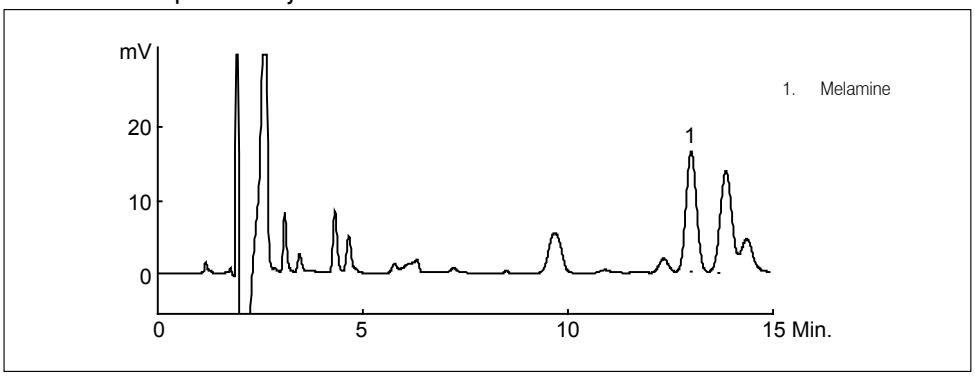
5. Recovery

5.1. Milk powder sample recovery



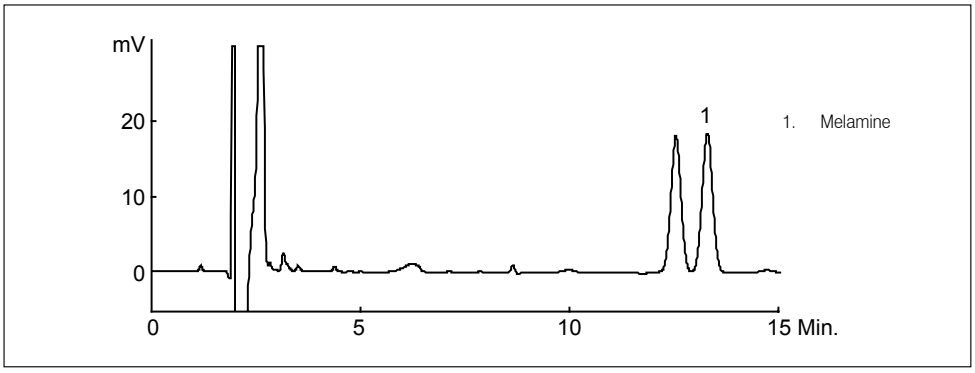
Chromatogram of milk powder extracts - spiked melamine in milk powder, 0.5 mg/kg

5.2. Cookies sample recovery



Chromatogram of cookies extracts - spiked melamine in cookies, 0.5 mg/kg, recovery: 85.9%

5.3. Cream candy sample recovery



Chromatogram of cream candy extracts - spiked melamine in cream candy, 0.5 mg/kg, recovery: 95.9%

Determination of Sulfonamides in Animal Tissue

1. Scope of application

Used for determination of sulfonamides in poultry, meat and aquatic product

2. Sample preparation

Weigh 5 g sample, add 5 g anhydrous sodium sulfate and 25 mL ethyl acetate, homogenize at 10,000 rpm for 2 min, centrifuge at 4,000 rpm for 2 min, collect ethyl acetate layer. Repeat 25 mL ethyl acetate extraction, combined ethyl acetate extracts, and vacuum distillation at 30 ^{o}C to near dry. Add 1 mL methanol, 2 mL 1% acetic acid and 3 mL *n*-hexane to the distillation flask, vortex for 1 min, then transfer to 15 mL centrifuge tube. Repeat the dissolution process, add mixture to the centrifuge tube, vortex for 1 min, centrifuge for 1 min at 4,000 rpm, discard the hexane. Add 6 mL *n*-hexane and repeat the operation. Finally, add 6 mL deionized water to the lower layer.

3. Sample purification

ProElut™ PLS 60 mg / 3mL **(Cat#68003)**

Condition:	3 mL MeOH / 3 mL H_2O
Load:	Add sample
Wash 1:	3 mL H_2O
Wash 2:	3 mL MeOH:H_2O = 5:95
Elute:	5 mL MeOH
Reconstitute:	Evaporate at 30 ^{o}C by N_2, reconstitute to 1 mL with mobile phase

4. HPLC method

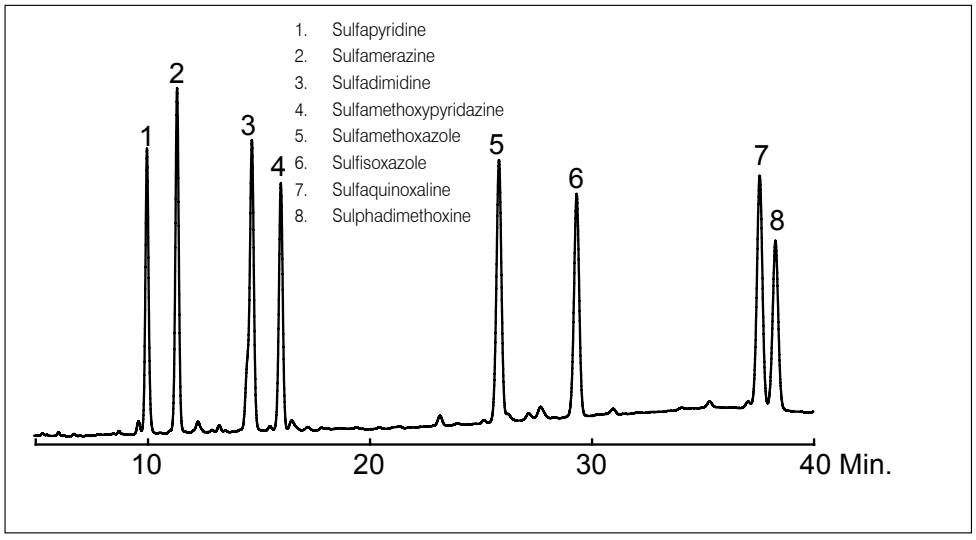
Column:	Inspire™ 5 μm C18, 250 x 4.6 mm **(Cat#81006)**
Mobile Phase:	A: MeCN, B: 2 % CH_3COOH in H_2O
Flow Rate:	1.0 mL/min
Temperature:	35 ^{o}C
Detection:	UV 270 nm
Injection Volume:	20 μL

Gradient:

Time / Min.	0	30	40	41	50
A	12	25	25	12	12
B	88	75	75	88	88

5. Recovery

Compounds	Spike Level (mg/kg)	Recovery (%)	RSD (%) (n = 4)
Sulfapyridine	0.1	79.8	5.5
	1.0	81.3	2.8
Sulfamerazine	0.1	89.5	6.4
	1.0	91.3	4.7
Sulfadimidine	0.1	94.3	5.2
	1.0	92.7	2.9
Sulfamethoxypyridazine	0.1	88.5	5.1
	1.0	86.2	3.9
Sulfamethoxazole	0.1	84.6	5.3
	1.0	82.9	3.2
Sulfisoxazole	0.1	94.1	4.7
	1.0	92.7	3.9
Sulfaquinoxaline	0.1	88.9	3.1
	1.0	91.3	4.5
Sulphadimethoxine	0.1	82.7	4.9
	1.0	94.2	2.6



Chromatogram of sulfonamides - spiked 8 sulfonamides in animal tissue (0.1 mg/kg)

Determination of Sulfonamides in Milk and Milk Powder

1. Scope of application

Used for determination of sulfonamides in milk and milk powder

2. Sample preparation

To 15 mL milk (or 3 g milk powder in 15 mL H_2O), add 15 mL acetonitrile, vortex for 2 min, centrifuge at 6,000 rpm for 5 min, transfer 20 mL supernatant to another centrifuge tube, and add 15 mL *n*-hexane, vortex for 2 min, centrifuge at 6,000 rpm for 2 min, then discard the *n*-hexane. Repeat 15 mL *n*-hexane extraction. Add 15 mL ethyl acetate to the lower layer, vortex for 2 min, centrifuge at 6,000 rpm for 2 min, and collect supernatant. Repeat 15 mL ethyl acetate extraction, and combine supernatants. Vacuum evaporate the ethyl acetate layer to near dry at 30 °C, reconstitute with 10 mL 2% phosphoric acid.

3. Sample purification

ProElut™ PXC 200 mg / 6 mL **(Cat#68212)**

Condition:	6 mL MeOH / 6 mL H_2O
Load:	Add sample
Wash 1:	6 mL H_2O
Wash 2:	6 mL MeOH
Elute:	6 mL MeOH (5 % NH_4OH)
Reconstitute:	Vacuum evaporation at 30 °C, reconstitute to 1 mL with mobile phase

4. HPLC method

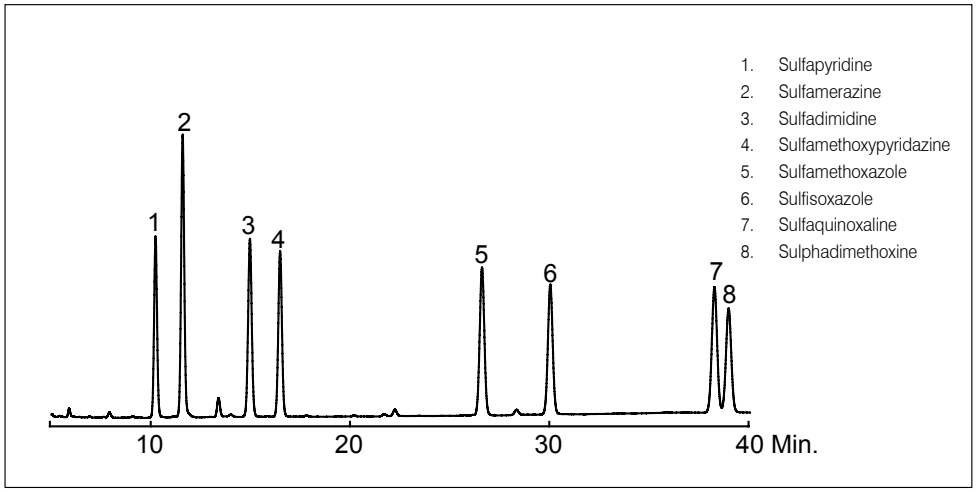
Column:	Inspire™ 5 μm C18, 250 x 4.6 mm **(Cat#81006)**
Mobile Phase:	A: MeCN, B: 2 % CH_3COOH in H_2O
Flow Rate:	1.0 mL/min
Temperature:	35 °C
Detection:	UV 270 nm
Injection Volume:	20 μL

Gradient:

Time / Min.	0	30	38	39	45
A	12	25	25	12	12
B	88	75	75	88	88

5. Recovery

Compounds	Spike Level (mg/kg)	Recovery (%)	RSD (%) (n = 4)
Sulfapyridine	0.1	78.4	4.1
	0.5	97.0	2.9
Sulfamerazine	0.1	82.3	4.6
	0.5	96.0	2.3
Sulfadimidine	0.1	83.5	4.8
	0.5	96.0	2.5
Sulfamethoxypyridazine	0.1	82.0	3.2
	0.5	98.0	2.3
Sulfamethoxazole	0.1	84.3	3.9
	0.5	101.5	2.5
Sulfisoxazole	0.1	75.4	3.4
	0.5	91.8	3.8
Sulfaquinoxaline	0.1	77.8	4.2
	0.5	96.2	3.1
Sulphadimethoxine	0.1	77.5	5.2
	0.5	97.0	2.6



Chromatogram of milk extracts - spiked 8 sulfonamides in milk (0.1 mg/kg)

Determination of β- Agonist Drugs in Animal Tissue

1. Scope of application

Used for determination of clenbuterol hydrochloride, salbutamol, cimaterol, and ractopamine hydrochloride in animal muscle and liver

2. Sample preparation

Weigh 5 g sample, add 15 mL ethyl acetate and 3 mL 10% sodium carbonate, homogenize at 10,000 rpm for 2 min, centrifuge at 6,000 rpm for 2 min, transfer the supernatant to the centrifuge tube, extract residues using 15 mL ethyl acetate, combine ethyl acetate layers. Add 5 mL 0.1 M hydrochloric acid to the ethyl acetate extract, vortex for 1 min, centrifuge for 1 min at 6,000 rpm, collect the lower aqueous phase. Repeat the extraction and combine lower aqueous phase, adjust to pH 5.2 with 2.5 mol/L sodium hydroxide.

3. Sample purification

ProElut™ PXC 60 mg / 3 mL **(Cat#68203)**

Condition:	3 mL MeOH / 3 mL H_2O / 3 mL 30 mM HCl
Load:	Add sample
Wash 1:	3 mL deionized water
Wash 2:	3 mL MeOH
Elute:	5 mL MeOH (4% NH_4OH), evaporate to near dry at 50 ^oC by N_2

4. Derivatization

Add 100 μL toluene and 100 μL *bis*-trimethylsilyl trifluoroacetamide (BSTFA), vortex for 20 sec, seal, heat for 1 h at 80 ^oC, add 300 μL of toluene after cooling as the sample solution.

5. GC-MS method

GC conditions

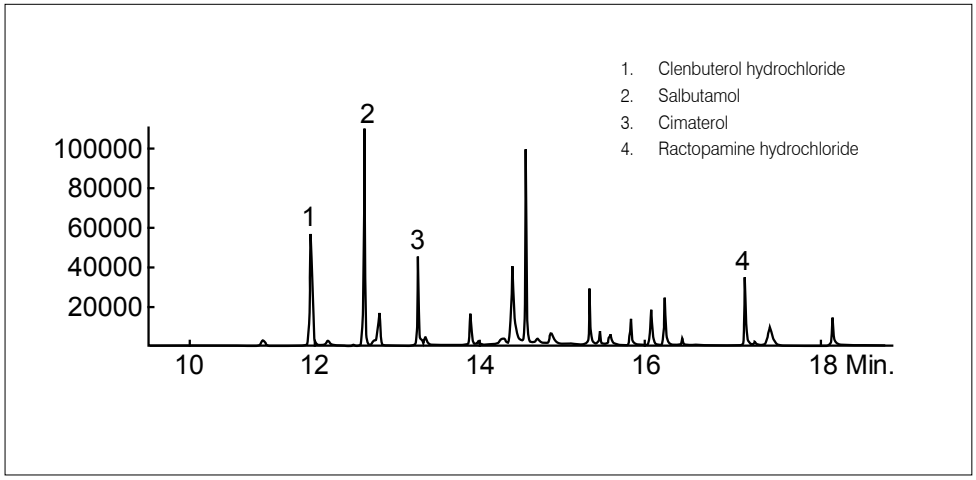
Column:	DM-5MS 30 m x 0.25 mm x 0.25 μm **(Cat#8221)**
Inlet Temperature:	220 ^oC
Injection Mode:	Splitless
Injection Volume:	1 μL
Temperature Program:	Heating to 70 ^oC in 0.6 min, then heating to 200 ^oC with 25 ^oC/min in 6 min, finally heating to 280 ^oC with 25 ^oC/min in 5 min
Carrier Gas:	He > 99.999%, flow rate: 0.9 mL/min

MS conditions

Interface Temperature:	280 ^oC
Solvent Delay:	8 min
EI Temperature:	230 ^oC
Quadrupole Temperature:	160 ^oC
Ion Monitoring:	Qualitative ion 86, 243, 262, 277, quantitative ion 86

5. Recovery

	Spike Level (μg/kg)					
	1.0		10.0		100	
Compounds	Recovery (%)	RSD (%) (n = 3)	Recovery (%)	RSD (%) (n = 3)	Recovery (%)	RSD (%) (n = 3)
Clenbuterol	75.37	5.93	83.21	5.39	90.05	2.86
Salbutamol	72.40	6.12	84.45	5.72	88.27	4.16
Cimaterol	76.73	4.90	85.95	4.68	91.15	3.86
Ractopamine	70.09	7.85	87.46	3.59	89.53	5.93



The total ion chromatogram (TIC) of pig liver extracts - spiked 4 β-agonist drugs in pig liver (0.1 mg/kg)

Determination of Benzopyrene Originating from Vegetable Oil

1. Scope of application

Used for determination of benzopyrene originating from vegetable oil

2. Sample preparation

Weigh 0.4 g sample, accurate to 0.001 g, dilute with 5 mL *n*-hexane.

3. Sample purification

ProElut™ BaP 22 g / 60 mL (Grade IV activity) **(Cat#65351)**

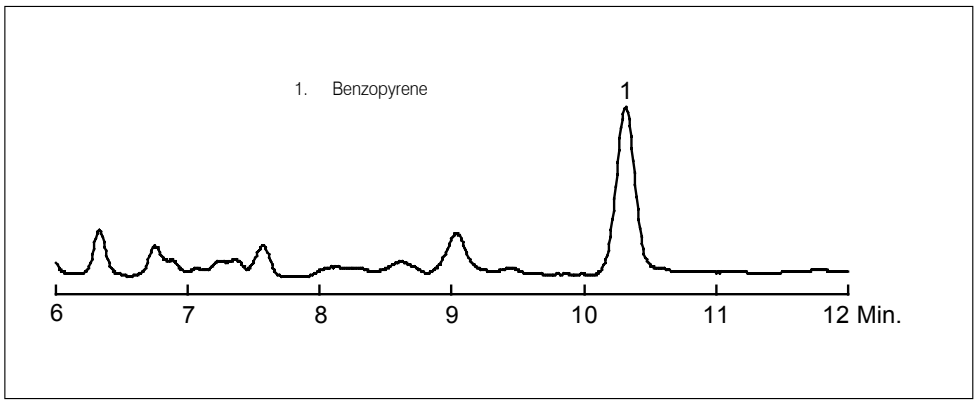
Condition:	30 mL *n*-hexane
Load:	Add sample
Elute:	50 mL *n*-hexane
Reconstitute:	Vacuum evaporation at 30 °C, reconstitute to 1 mL with MeCN:THF (9:1, V / V) solution

4. HPLC method

Column:	Inspire™ 5 μm C18, 250 x 4.6 mm **(Cat#81006)**
Mobile Phase:	MeCN:H_2O = 97:3
Flow Rate:	1.0 mL/min
Temperature:	30 °C
Detection:	FLD Ex: 384 nm, Em: 406 nm
Injection Volume:	5 μL

5. Recovery

Compounds	Spike Level (mg/kg)	Recovery (%)	RSD (%) (n = 4)
Benzopyrene	0.1	96.8	2.30
Benzopyrene	0.01	98.5	4.50



Chromatogram of vegetable oil extracts - spiked benzopyrene in vegetable oil (0.01 mg/kg)

Determination of Tetracyclines in Animal Tissue

1. Scope of application

Used for determination of oxytetracycline, tetracycline, chlortetracycline and doxycycline in animal tissue

2. Sample preparation

To 5.0 g of homogenized sample, add 20 mL of McIlvaine buffer*, vortex 2 min, centrifuge at 4000 rpm for 5 min, collect supernatant. Wash lower residue with 20 mL, and then 10 mL McIlvaine buffer. Repeat wash and combine extracts, and set the volume to 50 mL. Filter extract with fast filter paper, collect filtrate and take 10 mL as the sample solution.

*McIlvaine buffer: Disodium hydrogen phosphate ($Na_2HPO_4 \cdot 12H_2O$) 27.6 g, citric acid ($C_6H_8O_7 \cdot H_2O$) 12.9 g, EDTA disodium salt 37.2 g, dissolved in water and diluted to 1,000 mL.

3. Sample purification

ProElut™ PLS 60 mg / 3 mL **(Cat#68003)**

Condition:	3 mL MeOH / 3 mL H_2O
Load*:	10 mL sample
Wash 1:	3 mL H_2O
Wash 2:	3 mL 5 % MeOH in H_2O
Elute:	3 mL MeOH
Reconstitute:	Evaporate to near dry, reconstitute to 1 mL with mobile phase

*20 mL reservoir (Cat#4811) and adaptor (Cat#4803) is avilable for large volume sample

4. HPLC method

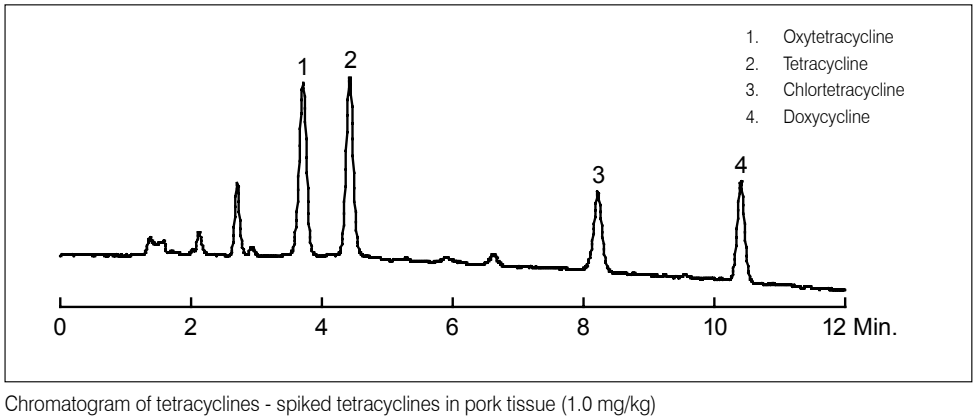
Column:	Spursil™ 5 μm C18, 150 x 4.6 mm **(Cat#82001)**
Mobile Phase:	A: 0.01 M Oxalic acid in H_2O, B: MeOH:MeCN = 1:1
Flow Rate:	1.0 mL/min
Temperature:	30 °C
Detection:	UV 365 nm
Injection Volume:	20 μL

Gradient:

Time / Min.	0	10	10.5	20
A	70	50	70	70
B	30	50	30	30

5. Recovery

Compounds	Spike Level (mg/kg)	Recovery (%)	RSD (%) (n = 3)
Oxytetracycline	0.2	95.31	2.80
	1.0	90.30	2.00
Tetracycline	0.2	83.17	0.54
	1.0	81.84	2.38
Chlortetracycline	0.2	102.70	2.75
	1.0	90.83	3.21
Doxycycline	0.2	83.16	3.12
	1.0	81.30	1.43



Chromatogram of tetracyclines - spiked tetracyclines in pork tissue (1.0 mg/kg)

Determination of Fungicides in Fruit Juice

1. Scope of application

Used for determination of carbendazim and thiabendazole in fruit juice

2. Sample preparation

2.1 Juice drinks and pure fruit juice

Start with 10 mL sample, adjust to pH 10 - 11 with 0.1 M NaOH, add 15 mL ethyl acetate, shake 1 min, centrifuge 1 min at 4,000 rpm, collect ethyl acetate layer. Repeat 15 mL ethyl acetate extraction, and combine organic phases, vacuum distillation at 30 °C to near dry. Dissolve residue with 0.1 M HCl (6 mL) twice.

2.2 Fruit juice concentrate

Start with 2 mL sample mixed with 8 mL H_2O, adjust to pH 10 - 11 with 0.1 M NaOH, and then follow the above steps.

3. Sample purification

ProElut™ PXC 60 mg / 3 mL **(Cat#68203)**

Condition:	3 mL MeOH / 3 mL H_2O
Load:	Adding sample
Wash:	3 mL H_2O / 3 mL MeOH
Elute:	3 mL MeOH (5 % NH_4OH)
Reconstitute:	Evaporate to near dry at 30 °C, reconstitute to 1 mL with mobile phase

4. HPLC method

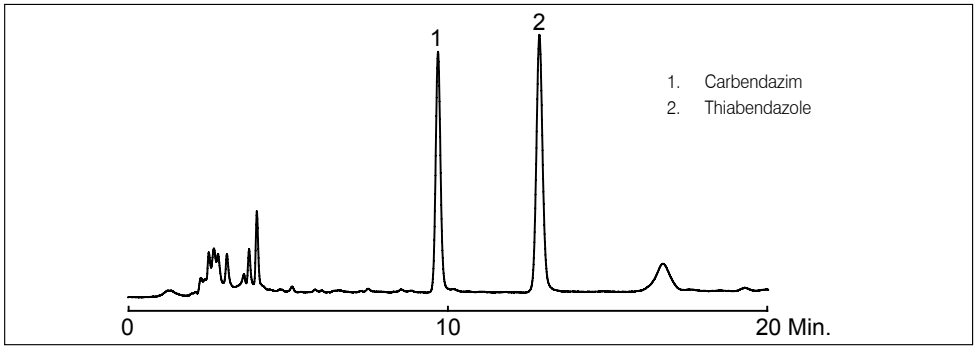
Column:	Inspire™ 5 μm C18, 250 x 4.6 mm **(Cat#81006)**
Mobile Phase:	Phosphate buffer:MeCN = 75:25
Flow Rate:	1.0 mL/min
Temperature:	30 °C
Detection:	UV 288 nm
Injection Volume:	20 μL

Phosphate buffer: 1.38 g sodium dihydrogen phosphate, 1.41 g disodium hydrogen phosphate, dissolve in 1,000 mL water

5. Recovery

5.1. Grape juice

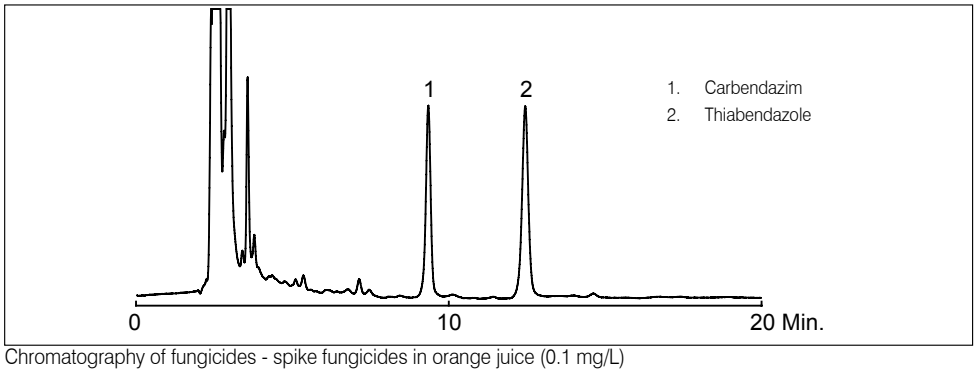
Compounds	Spike Level (mg/L)	Recovery (%)	RSD (%) (n = 3)
Carbendazim	0.1	87.0	8.0
	0.5	99.7	3.5
Thiabendazole	0.1	83.1	7.8
	0.5	102.6	3.8



Chromatography of fungicides - spiked fungicides in grape juice (0.1 mg/L)

5.2. Orange juice

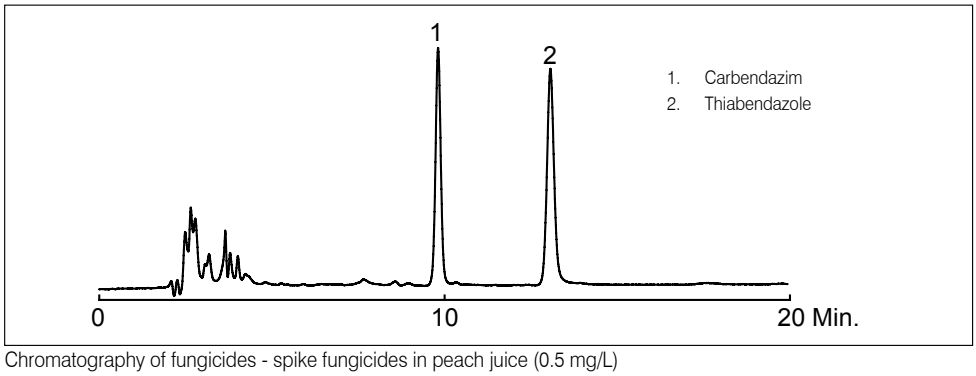
Compounds	Spike Level (mg/L)	Recovery (%)	RSD (%) (n = 3)
Carbendazim	0.1	100.4	2.6
	0.5	94.4	4.5
Thiabendazole	0.1	98.1	3.1
	0.5	98.3	1.9



Chromatography of fungicides - spike fungicides in orange juice (0.1 mg/L)

5.3. Peach juice

Compounds	Spike Level (mg/L)	Recovery (%)	RSD (%) (n = 3)
Carbendazim	0.1	89.9	2.4
	0.5	92.3	5.5
Thiabendazole	0.1	90.0	1.6
	0.5	92.6	2.9



Chromatography of fungicides - spike fungicides in peach juice (0.5 mg/L)

Determination of Tetracyclines in Milk and Dairy Products

1. Scope of application

Used for determination of oxytetracycline, tetracycline, chlortetracycline and doxycycline in milk and dairy products

2. Sample preparation

Dilute milk sample (20 mL) or 2 g solid dairy product with 20 mL H_2O, add 20 mL McIlvaine buffer*, vortex for 2 min, centrifuge at 4,000 rpm for 10 min, take 20 mL supernatant as the sample solution.

*McIlvaine buffer: Disodium hydrogen phosphate ($Na_2HPO_4 \cdot 12H_2O$) 27g, citric acid ($C_6H_8O_7 \cdot H_2O$) 12 g, EDTA disodium salt 37 g, dissolved in water and diluted to 1,000 mL.

3. Sample purification

ProElut™ PLS 150 mg / 6 mL **(Cat#68004)**

Condition:	6 mL MeOH / 6 mL H_2O
Load*:	20 mL sample
Wash 1:	6 mL H_2O
Wash 2:	6 mL 10 % MeOH in H_2O
Elute:	6 mL MeOH
Reconstitute:	Evaporate to near dry at 40 °C, reconstitute to 1 mL with mobile phase

*20 mL reservoir (Cat#4811) and adaptor (Cat#4803) is avilable for large volume sample

4. HPLC method

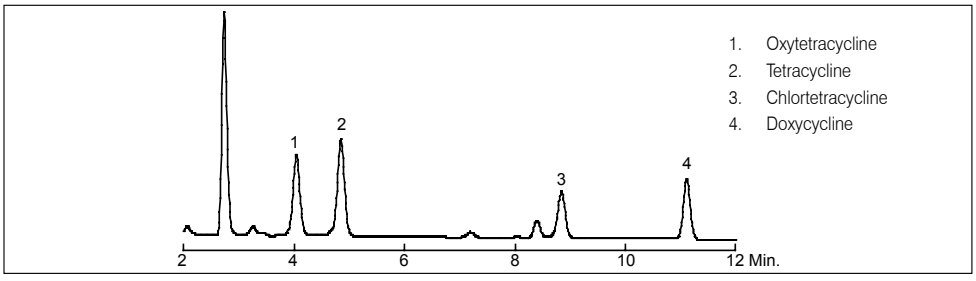
Column:	Spursil™ 5 μm C18, 150 x 4.6 mm **(Cat#82001)**
Mobile Phase:	A: 0.01 M Oxalic acid in H_2O, B: MeOH:MeCN = 1:1
Flow Rate:	1.0 mL/min
Temperature:	30 °C
Detection:	UV 365 nm
Injection Volume:	20 μL

Gradient:

Time / Min.	0	10	10.5	20
A	70	50	70	70
B	30	50	30	30

5. Recovery

Compounds	Spike Level (mg/kg)	Recovery (%)	RSD (%) (n = 3)
Oxytetracycline	0.1	88.17	4.01
	0.5	83.95	2.35
Tetracycline	0.1	89.46	0.69
	0.5	90.06	3.68
Chlortetracycline	0.1	96.54	2.92
	0.5	100.86	0.69
Doxycycline	0.1	90.48	0.99
	0.5	88.26	0.81



Chromatogram of tetracyclines - spiked tetracyclines in milk (0.1 mg/kg)

Determination of Phenols in Water

1. Scope of application

Used for determination of phenols in natural water, drinking water

2. Sample preparation

100 mL sample, adjust to pH 2 with H_3PO_4

3. Sample purification

ProElut™ PLS 60 mg / 3 mL **(Cat#68003)**

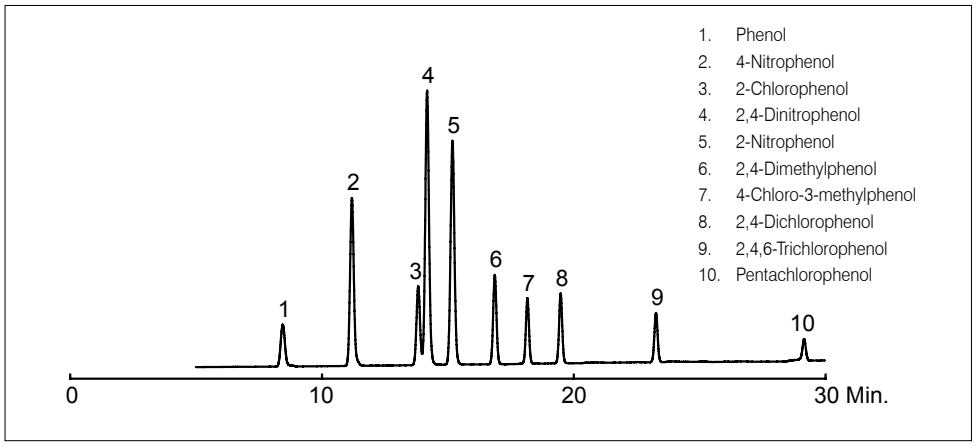
Condition:	3 mL MeOH:MTBE = 10:90 / 3 mL MeOH / 3 mL H_2O
Load:	100 mL sample, flow rate ≤ 5 mL/min
Wash:	3 mL H_2O
Elute:	3 mL MeOH:MTBE = 10:90
Reconstitute:	Evaporate at 40 °C by N_2, reconstitute to 1 mL with MeCN:H_2O (50:50, V / V) solution

4. HPLC method

Column:	Inspire™ 5 μm C18, 150 x 4.6 mm **(Cat#81001)**
Mobile Phase:	A: 1% CH_3COOH in H_2O, B: 1% CH_3COOH in MeCN
Flow Rate:	1.0 mL/min
Temperature:	Ambient
Detection:	UV 280 nm
Injection Volume:	20 μL

Gradient:

Time / Min.	0	25	30	35	37
A	80	30	0	0	80
B	20	70	100	100	20



Determination of Phthalate Esters (PAEs) in Water

1. Scope of application

Used for determination of dimethyl phthalate (DMP), diethyl phthalate (DEP), dipropyl phthalate (DPrP), butyl benzyl phthalate (BBP), dibutyl phthalate (DBP), diamyl phthalate (DPP), dicyclohexyl phthalate (DCHP), di-*n*-hexyl phthalate (DHP), and di-(2-ethylhexyl)phthalate (DEHP) in natural water and drinking water.

2. Sample purification

ProElut™ PLS GLASS 200 mg / 6 mL **(Cat#68012G)**

Condition:	6 mL methyl *tert*-butyl ether / 6 mL MeOH / 6 mL H_2O
Load:	Up to 500 mL sample, flow rate ≤15 mL/min
Wash:	3 mL 5 % MeOH / H_2O
Elute:	3 mL MeOH / 6 mL methyl *tert*-butyl ether
Reconstitute:	Evaporate to near dry at 30 °C, reconstitute to 1 mL with acetonitrile

3. HPLC method

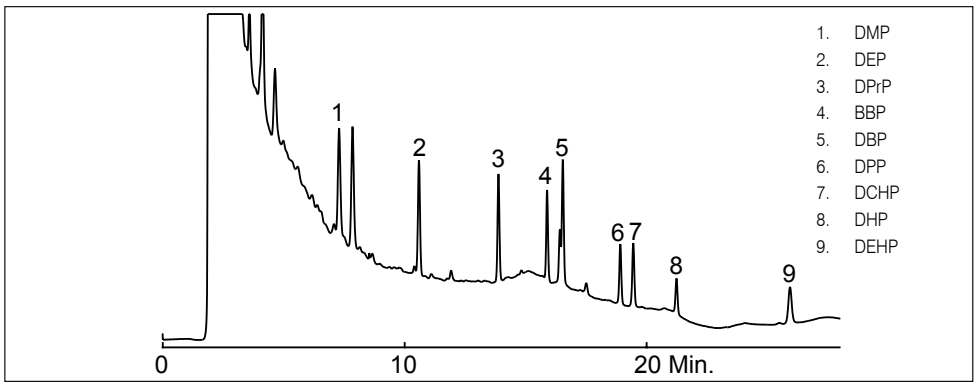
Column:	Inspire™ 5 μm C18, 250 x 4.6 mm **(Cat#81006)**
Mobile Phase:	A: H_2O, B: MeCN
Flow Rate:	1.0 mL/min
Temperature:	30 °C
Detection:	UV 230 nm
Injection Volume:	20 μL

Gradient:

Time / Min.	0	10	15	23	24	33
A	50	10	0	0	50	50
B	50	90	100	100	50	50

4. Recovery

Compounds	Spike Level (μg/L)	Recovery (%)	RSD (%) (n = 3)
DMP	2	110.3	5.6
	10	90.9	3.8
DEP	2	99.4	2.9
	10	88.9	1.3
DPrP	2	98.7	1.5
	10	89.1	1.0
BBP	2	82.6	1.5
	10	76.3	3.0
DBP	2	98.4	1.6
	10	97.1	2.2
DPP	2	74.7	6.4
	10	68.3	5.6
DCHP	2	82.8	1.7
	10	76.2	5.8
DHP	2	70.4	3.0
	10	69.3	3.8
DEHP	2	74.3	1.9
	10	71.9	2.5



Chromatography of PAEs - spiked PAEs in water (2 μg/L)

Determination of Tetracyclines in Serum

1. Scope of application

Used for determination oxytetracycline, tetracycline and chlortetracycline in human and animal serum

2. Sample preparation

2 mL serum, add 40 μL H_3PO_4

3. Sample purification

ProElut™ PLS 60 mg / 3 mL **(Cat#68003)**

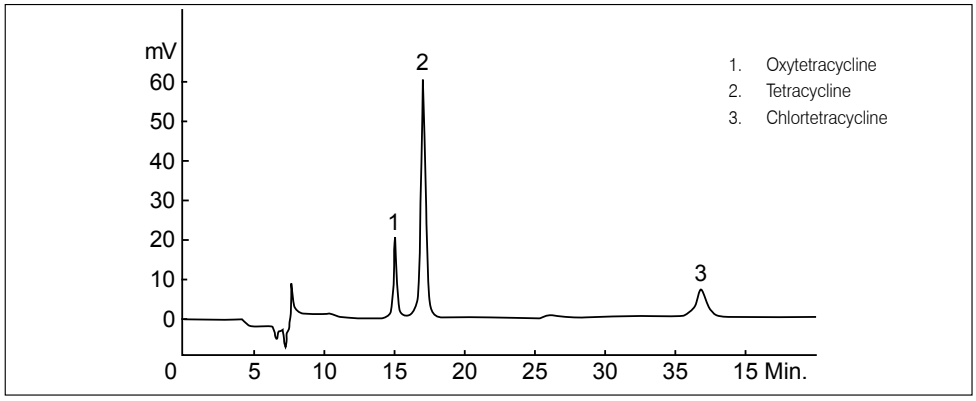
Condition:	3 mL MeOH / 3 mL H_2O
Load:	2 mL sample
Wash:	3 mL 5 % MeOH in H_2O
Elute:	3 mL MeOH
Reconstitute:	Evaporate to near dry at 30 °C, reconstitute to 1 mL with mobile phase

4. HPLC method

Column:	Inspire™ 5 μm C18, 250 x 4.6 mm **(Cat#81006)**
Mobile Phase:	MeOH:MeCN:10 mM oxalic acid in H_2O = 15:15:70
Flow Rate:	1.0 mL/min
Temperature:	30 °C
Detection:	UV 365 nm
Injection Volume:	20 μL

5. Recovery

Compounds	Spike Level (mg/L)	Recovery (%)	RSD (%) (n = 3)
Oxytetracycline	0.5	92.6	2.1
	2.0	95.8	0.5
Tetracycline	0.5	97.3	2.4
	2.0	95.8	0.8
Chlortetracycline	0.5	102.70	3.1
	2.0	97.3	1.4



Chromatogram of tetracyclines - spiked tetracyclines in serum (0.5 mg/L)

Determination of Migration of Bisphenol A (BPA) from Plastic Baby Bottles

1. Scope of application

Used for determination of migration of bisphenol A (BPA) from plastic baby bottles

2. Sample purification

Wash bottles, dry completely. Add distilled water so that each 8 m^2 of plastic contact area corresponds to 10 mL of simulant immersion. Sealed with aluminum foil, place in oven at 100 °C for 1 h. Cool to room temperature, then transfer to glass bottles, and seal until detection.

3. Sample purification

ProElut™ PLS GLASS 200 mg / 6 mL **(Cat#68012G)**

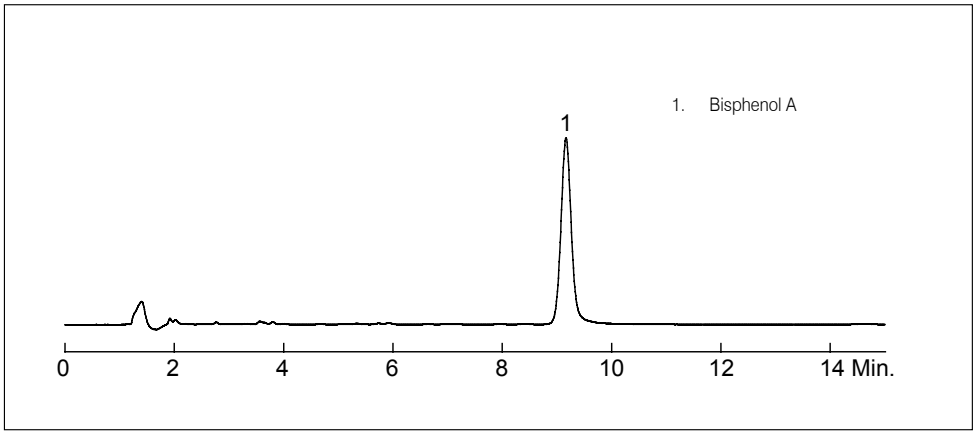
Condition:	6 mL MeOH / 6 mL H_2O
Load:	Adding sample
Wash:	6 mL 5 % MeOH in H_2O
Elute:	6 mL MeOH
Reconstitute:	Evaporate to near dry at 40 °C, reconstitute to 1 mL with mobile phase

4. HPLC method

Column:	Inspire™ 5 μm C18, 250 x 4.6 mm **(Cat#81006)**
Mobile Phase:	MeCN:2% CH_3COOH in H_2O = 40:60
Flow Rate:	1.0 mL/min
Temperature:	30 °C
Detection:	FLD Ex: 227 nm, Em: 313 nm
Injection Volume:	20 μL

5. Recovery

Compounds	Spike Level (μg/L)	Recovery (%)	RSD (%) (n = 3)
Bisphenol A	0.4	94.54	5.1
	1.6	97.30	3.7



Chromatography of bisphenol A - immersion concentration (0.4 μg/L)

HPLC

Compound Index for HPLC / GC

GC

Compound Index for GC

Compound Index for GC

SPE

Product Index

About Dikma

Dikma Technologies Inc., established in 1993, is a global technology leader committed to developing novel separation and purification solutions for life sciences and related industries. Our core technology portfolio includes products for liquid chromatography, gas chromatography, sample preparation, and bulk purification chromatographic media. We also provide related chromatography accessories.

Quality

Dikma Technologies Inc. is an ISO 9001:2000 Standard Quality Assessed Company to ensure the quality and reliability of our products and services. We are dedicated to the highest standards of production, quality assurance and quality control.

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