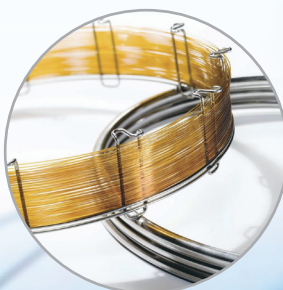
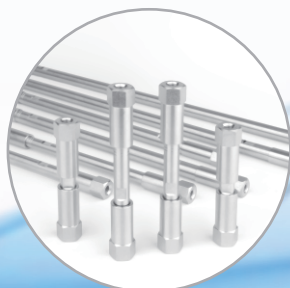


Dikma Technologies Inc.

CHROMATOGRAPHY

CATALOG 200



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A reliable partner for your lab

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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 notwithstanding 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

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Dikma HPLC Columns

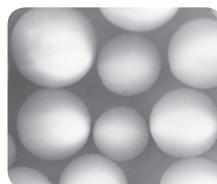
About Dikma HPLC Columns

Dikma has over 20 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

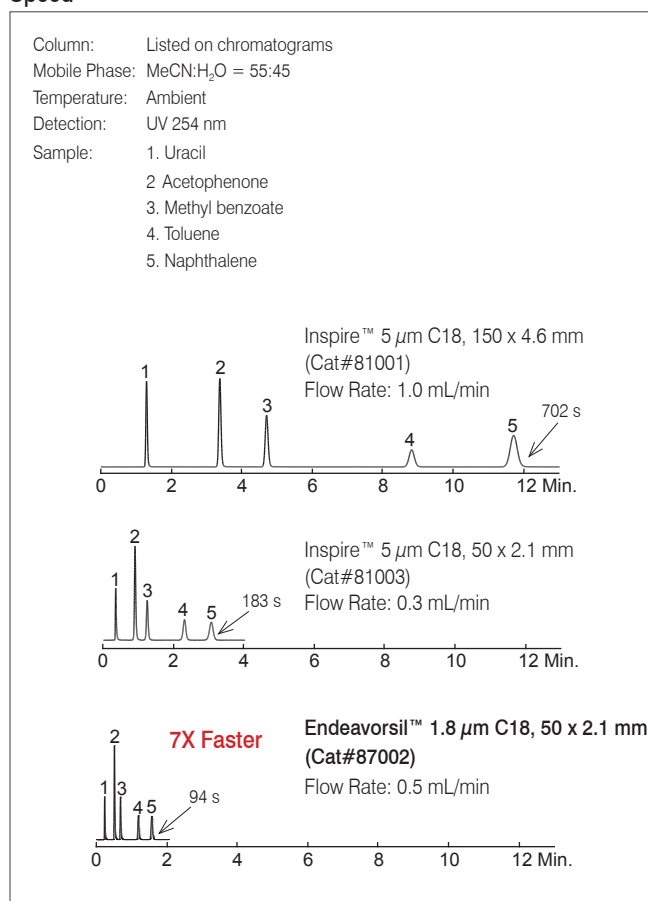
- Combined speed, resolution and sensitivity
- Reduced analysis time and solvent waste
- High efficiency combined with high selectivity generates more information and productivity
- Superior column performance at higher pressure
- Excellent separation characteristics over wide pH range



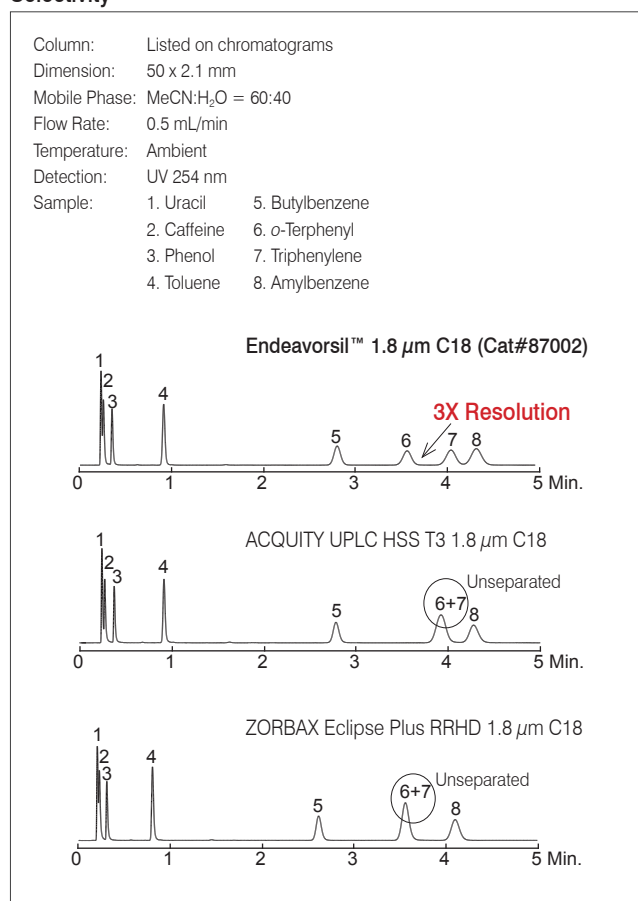
Endeavorsil™ Material Characteristics

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



Selectivity*



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

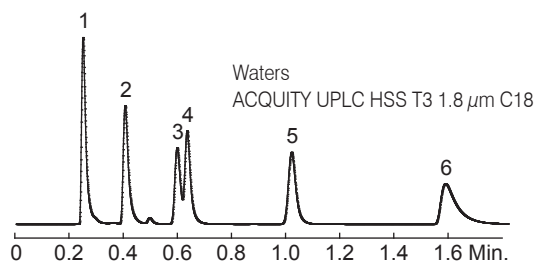
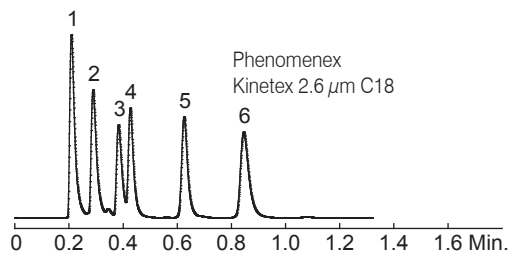
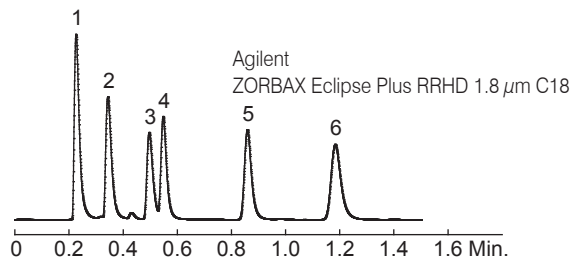
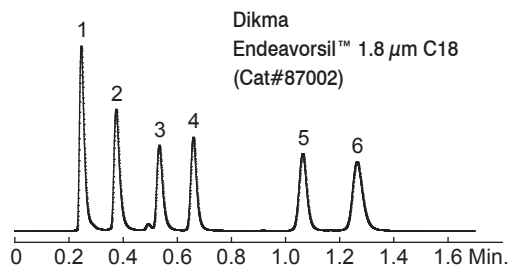
Endeavorsil™ Ordering Information

1.8 µm Microbore Columns (2.1 mm)

Phase	30 x 2.1	50 x 2.1	100 x 2.1	150 x 2.1
Endeavorsil™ C18	87001	87002	87003	87004

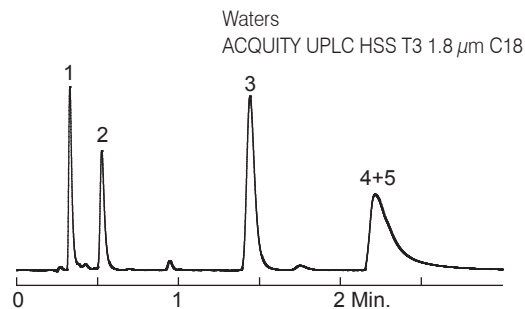
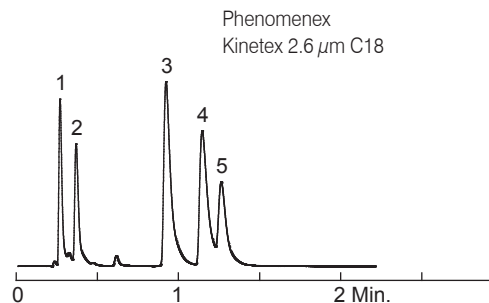
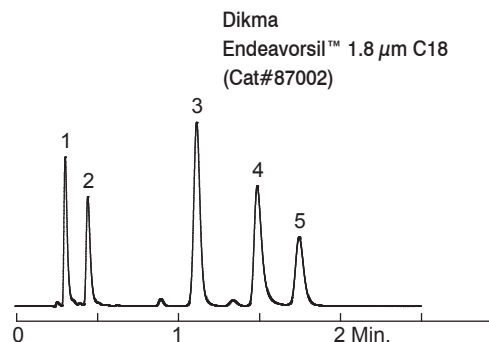
Separation of Hydrophobic, Polar and Basic Mixture*

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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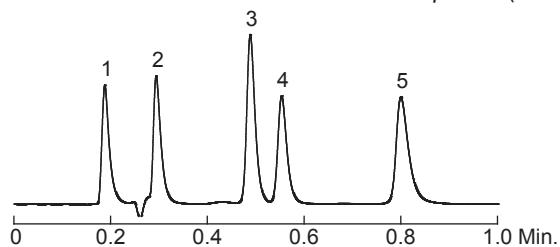
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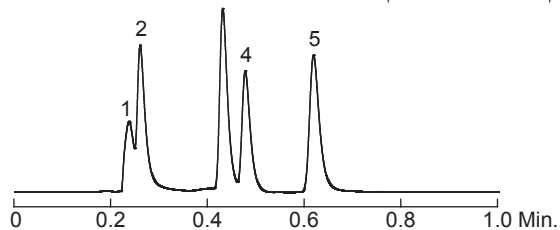
Cold Medicine*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 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

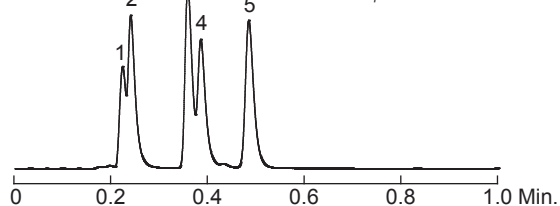
Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



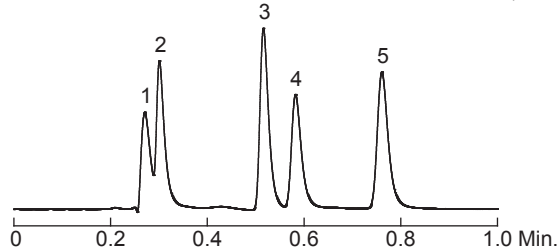
Agilent
ZORBAX Eclipse Plus RRHD 1.8 μm C18



Phenomenex
Kinetex 2.6 μm C18



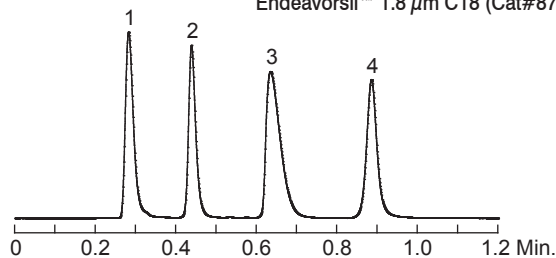
Waters
ACQUITY UPLC HSS T3 1.8 μm C18



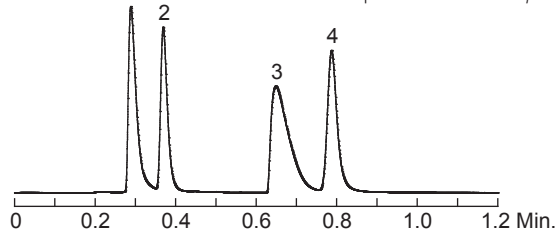
Water-Soluble Vitamins*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: 10 mM NH₄COOH, 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

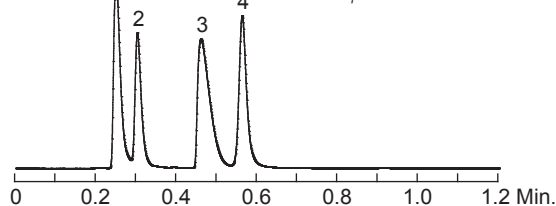
Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



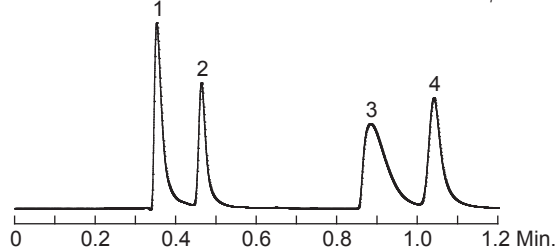
Agilent
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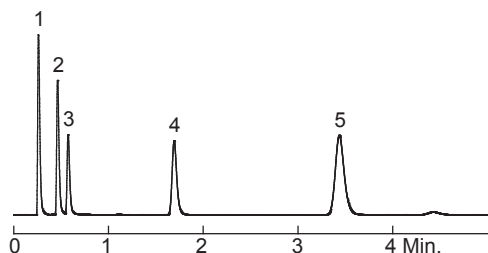
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Endeavorsil™

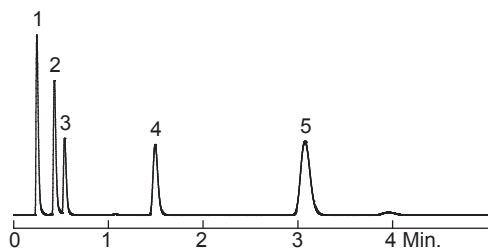
Galushko Test*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: MeOH:H₂O = 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

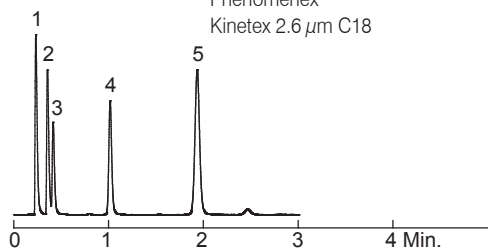
Dikma
 Endeavorsil™ 1.8 μm C18 (Cat#87002)



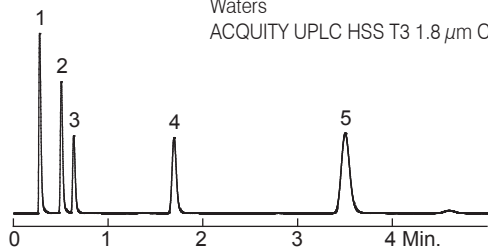
Agilent
 ZORBAX Eclipse Plus RRHD 1.8 μm C18



Phenomenex
 Kinetex 2.6 μm C18



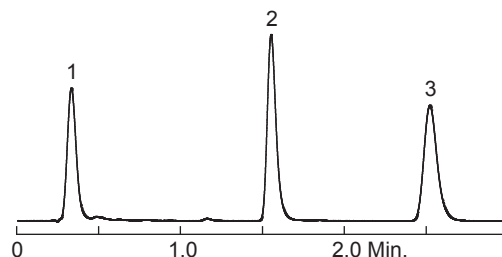
Waters
 ACQUITY UPLC HSS T3 1.8 μm C18



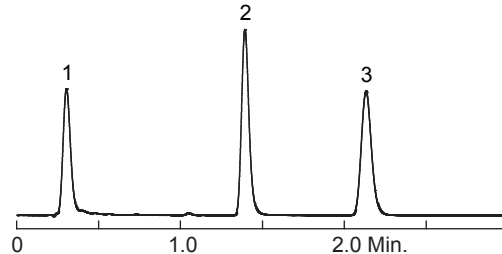
Verzele Test*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: MeOH:0.5% CH₃COONa (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

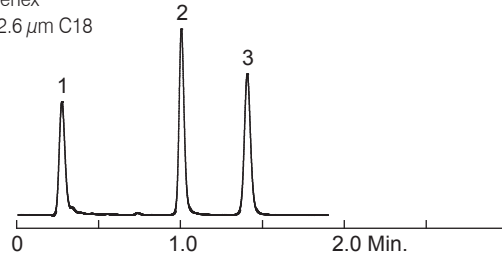
Dikma
 Endeavorsil™ 1.8 μm C18 (Cat#87002)



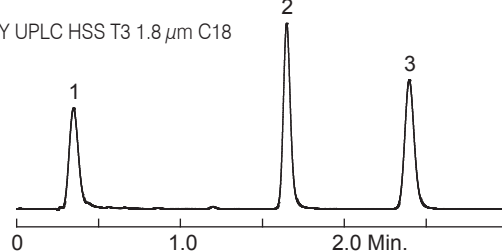
Agilent
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Phenomenex
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Waters
 ACQUITY UPLC HSS T3 1.8 μm C18



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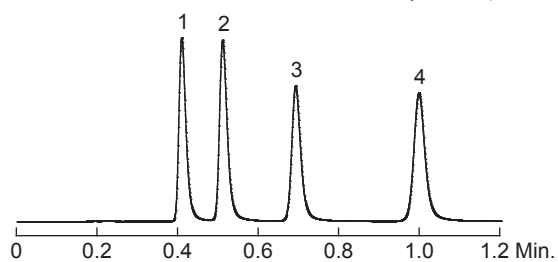
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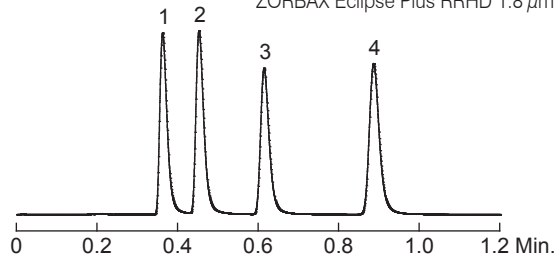
Parabens*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: MeCN:20 mM K₂HPO₄ (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

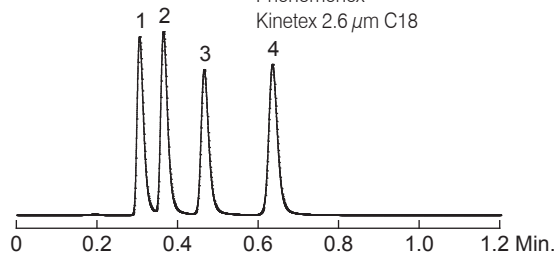
Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



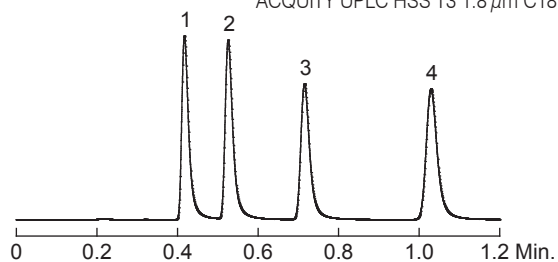
Agilent
ZORBAX Eclipse Plus RRHD 1.8 μm C18



Phenomenex
Kinetex 2.6 μm C18



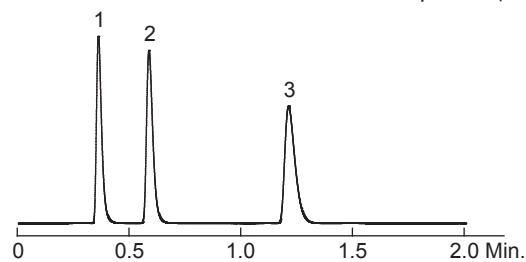
Waters
ACQUITY UPLC HSS T3 1.8 μm C18



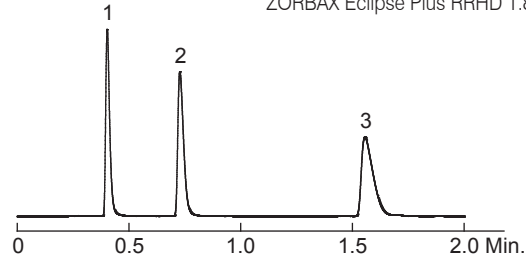
Catecholamines*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: 0.1% TFA in H₂O
 Flow Rate: 0.5 mL/min
 Temperature: Ambient
 Detection: UV 270 nm
 Sample: 1. Norepinephrine
 2. Epinephrine
 3. Dopamine

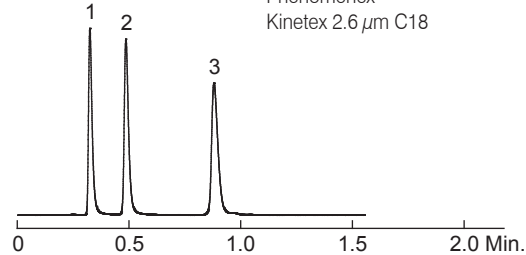
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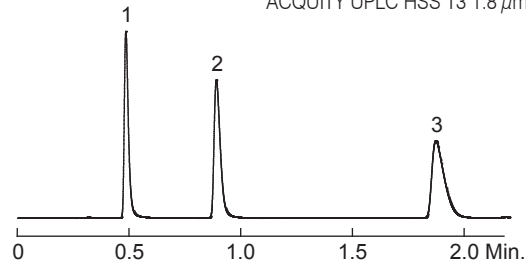
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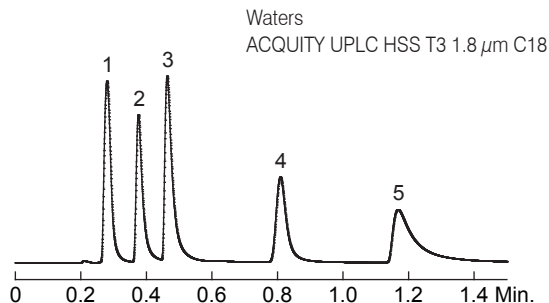
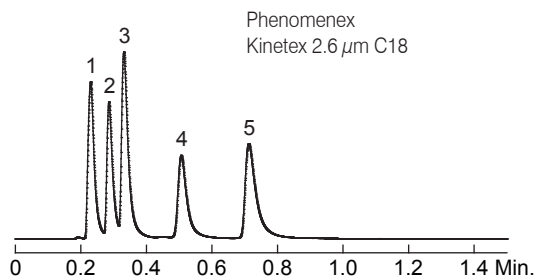
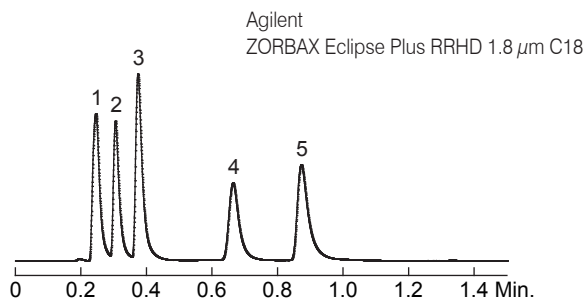
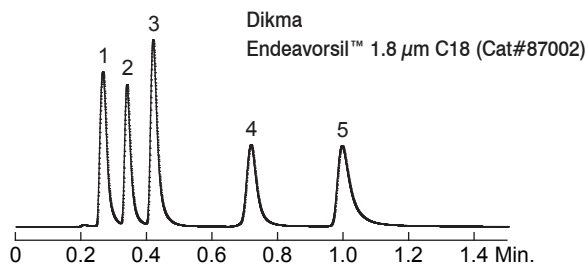
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Endeavorsil™

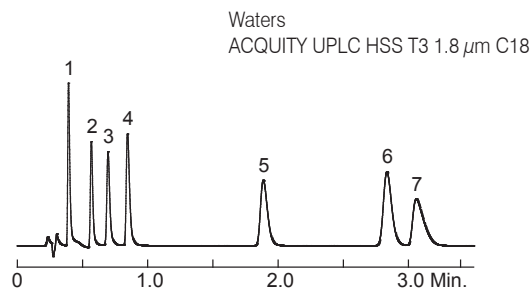
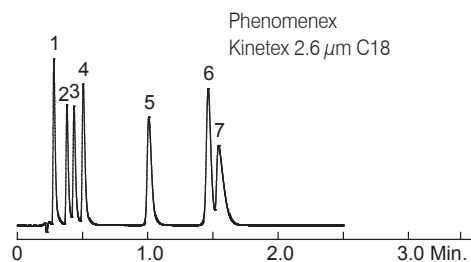
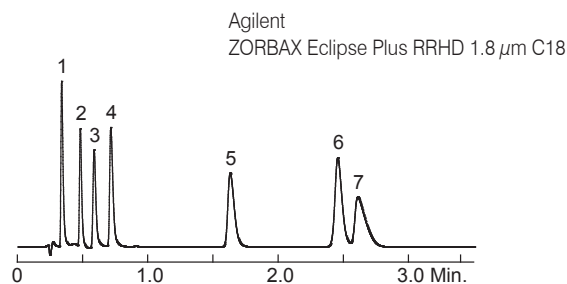
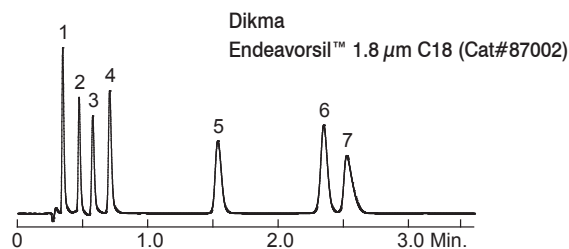
β-Blockers at Neutral pH*

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



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 H₂O = 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



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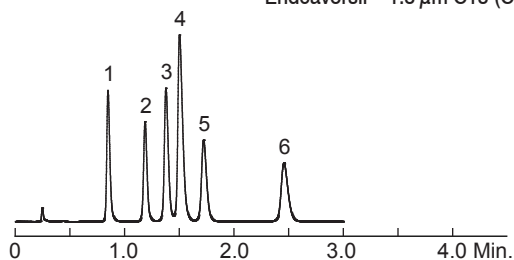
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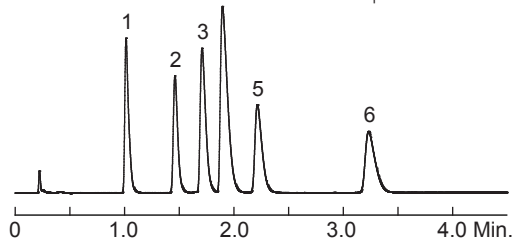
TCA's at Low pH*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H₂O = 35:65
 Flow Rate: 0.5 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Doxepin 4. Amitriptyline
 2. Desipramine 5. Trimipramine
 3. Nortriptyline 6. Clomipramine

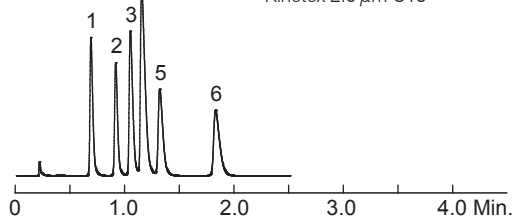
Dikma
 Endeavorsil™ 1.8 μm C18 (Cat#87002)



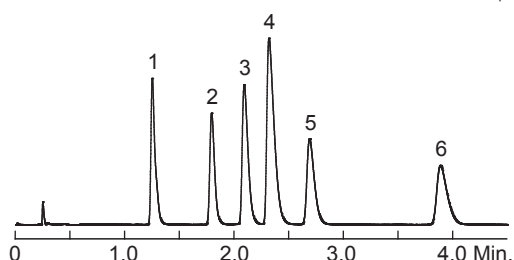
Agilent
 ZORBAX Eclipse Plus RRHD 1.8 μm C18



Phenomenex
 Kinetex 2.6 μm C18



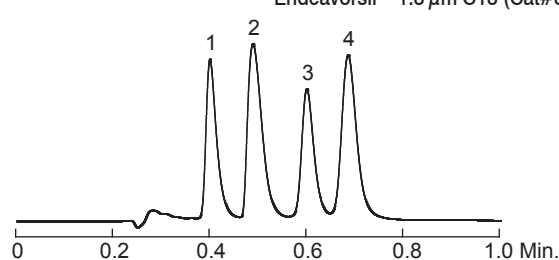
Waters
 ACQUITY UPLC HSS T3 1.8 μm C18



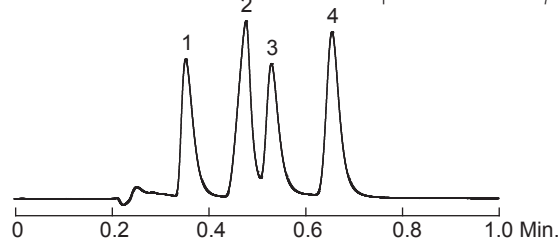
Anticlers*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: MeOH:10 mM CH₃COONH₄ (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

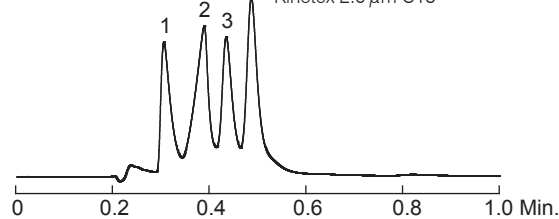
Dikma
 Endeavorsil™ 1.8 μm C18 (Cat#87002)



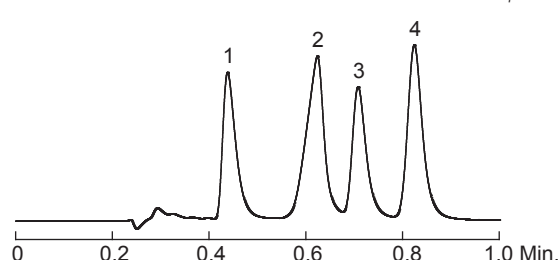
Agilent
 ZORBAX Eclipse Plus RRHD 1.8 μm C18



Phenomenex
 Kinetex 2.6 μm C18



Waters
 ACQUITY UPLC HSS T3 1.8 μm C18



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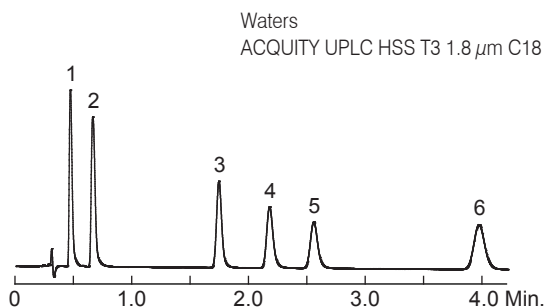
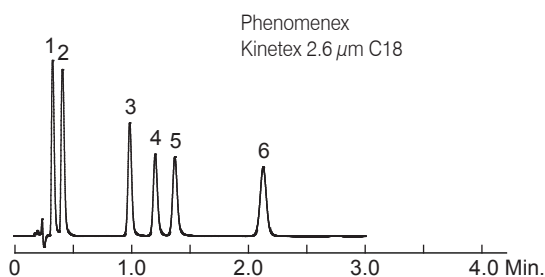
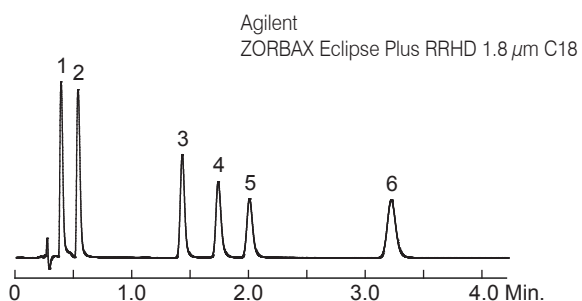
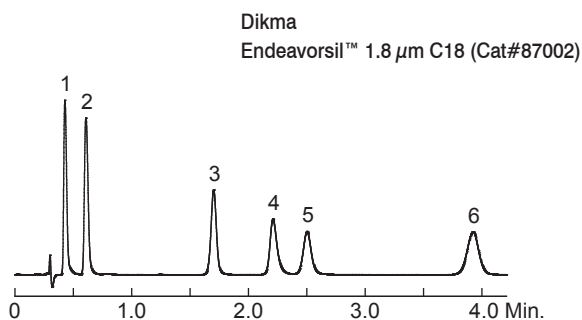
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Endeavorsil™

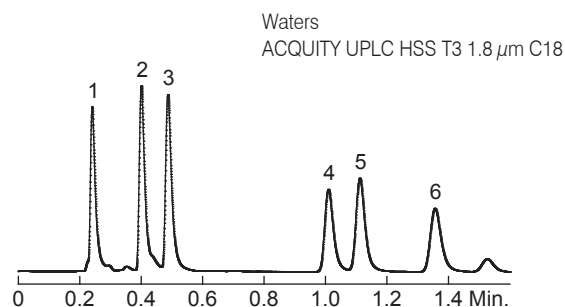
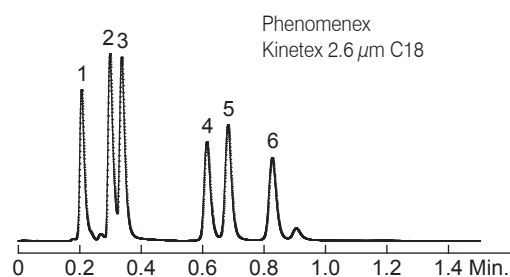
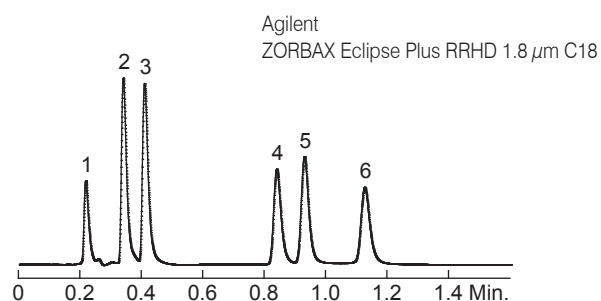
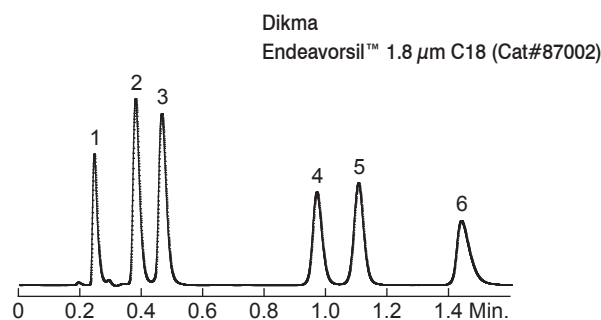
Polar Acids*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 20:80
 Flow Rate: 0.5 mL/min
 Temperature: 30 °C
 Detection: UV 254 nm
 Sample: 1. *p*-Aminobenzoic acid 4. Salicylic acid
 2. Homovanillic acid 5. *p*-Chlorobenzoic acid
 3. Sorbic acid 6. *p*-Nitrobenzoic acid



Acidic Compounds*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 25:75
 Flow Rate: 0.5 mL/min
 Temperature: 30 °C
 Detection: UV 254 nm
 Sample: 1. *L*-Ascorbic acid 4. Acetylsalicylic acid
 2. *p*-Aminobenzoic acid 5. Sorbic acid
 3. Homovanillic acid 6. Salicylic acid



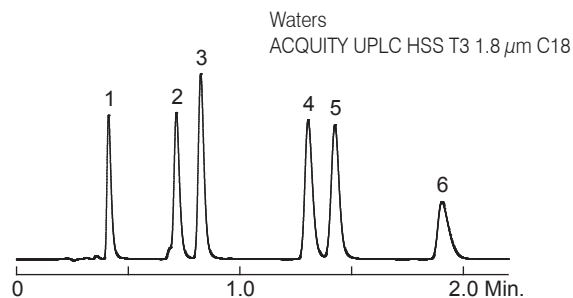
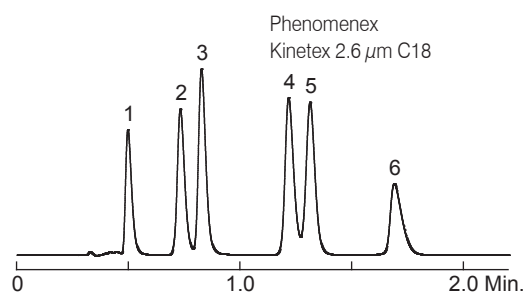
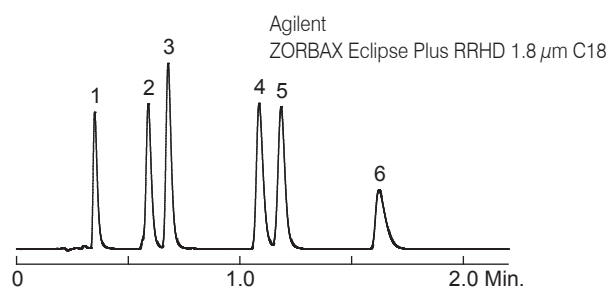
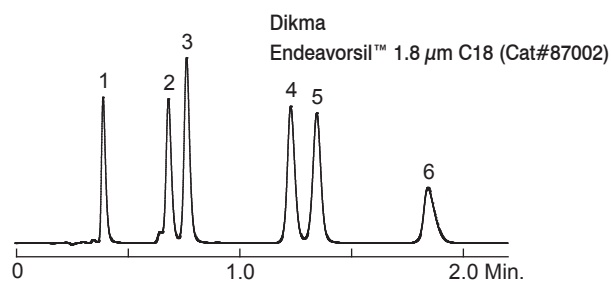
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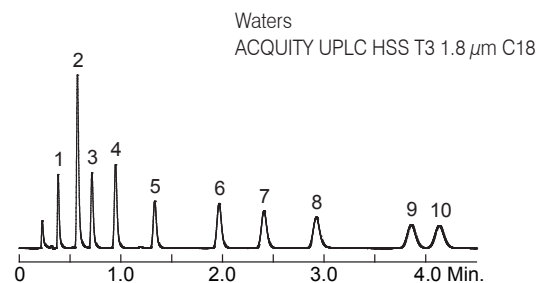
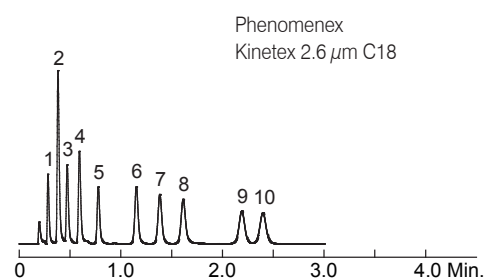
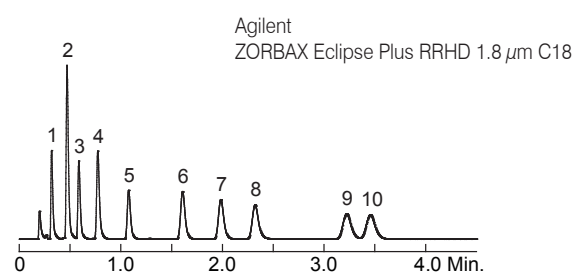
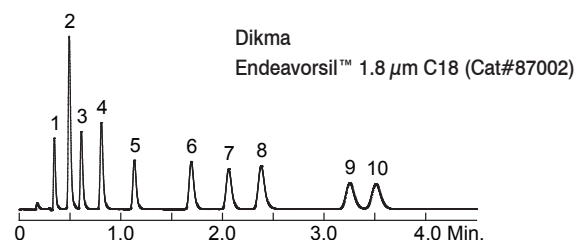
Anti-inflammatories*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 50:50
 Flow Rate: 0.5 mL/min
 Temperature: 30 °C
 Detection: UV 254 nm
 Sample: 1. Phenacetin 4. Fenoprofen
 2. Tolmetin 5. Flurbiprofen
 3. Ketoprofen 6. Ibuprofen



Antibacterials*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 20:80
 Flow Rate: 0.5 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Sulfanilamide 6. Sulfamethoxazole
 2. Carbadox 7. Sulfisoxazole
 3. Sulfamerazine 8. Oxolinic acid
 4. Sulfamethoxy-pyridazine 9. Sulfadimethoxine
 5. Furazolidone 10. Sulfaquinoxaline



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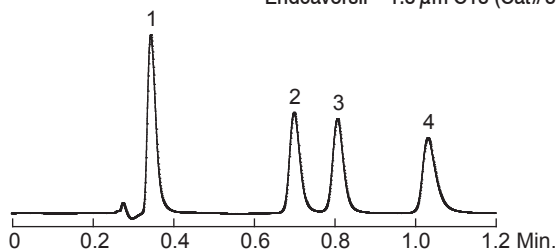
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Endeavorsil™

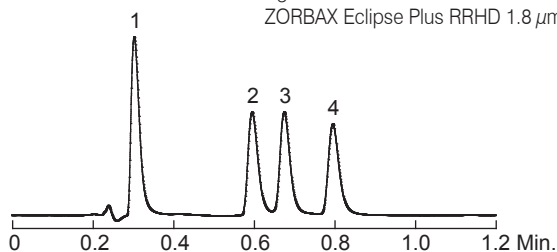
Antifungals*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 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

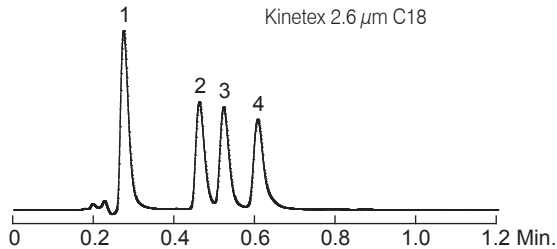
Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



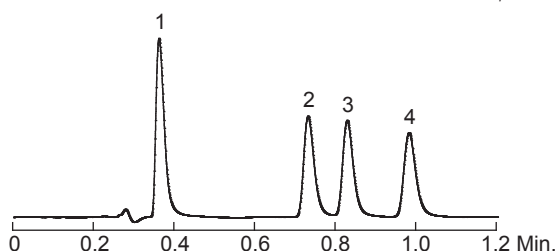
Agilent
ZORBAX Eclipse Plus RRHD 1.8 μm C18



Phenomenex
Kinetex 2.6 μm C18



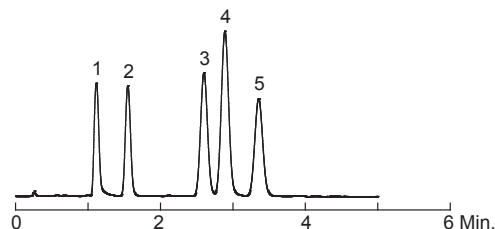
Waters
ACQUITY UPLC HSS T3 1.8 μm C18



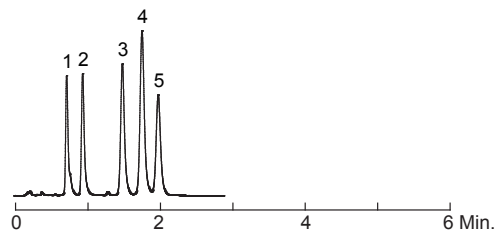
Steroids*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: MeOH:H₂O = 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

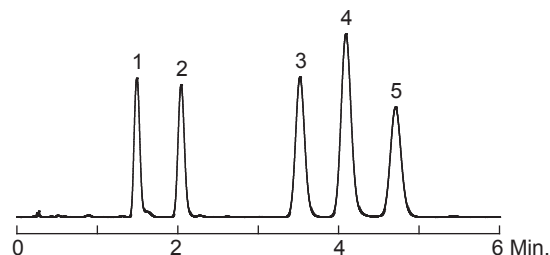
Dikma
Endeavorsil™ 1.8 μm C18 (Cat#87002)



Phenomenex
Kinetex 2.6 μm C18



Waters
ACQUITY UPLC HSS T3 1.8 μm C18



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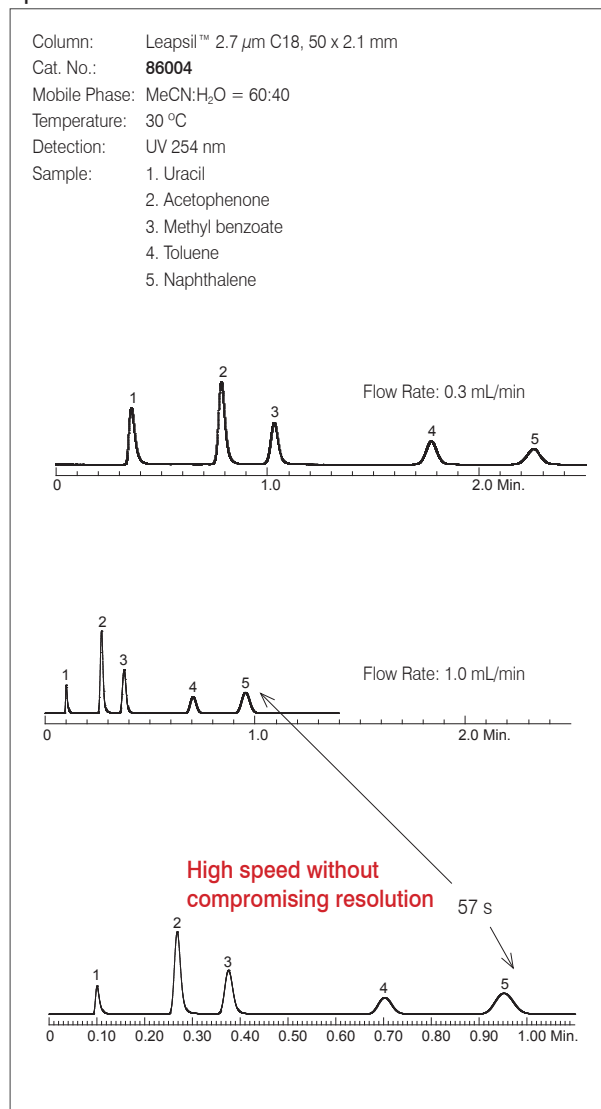
Features of Leapsil™ Columns

- 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

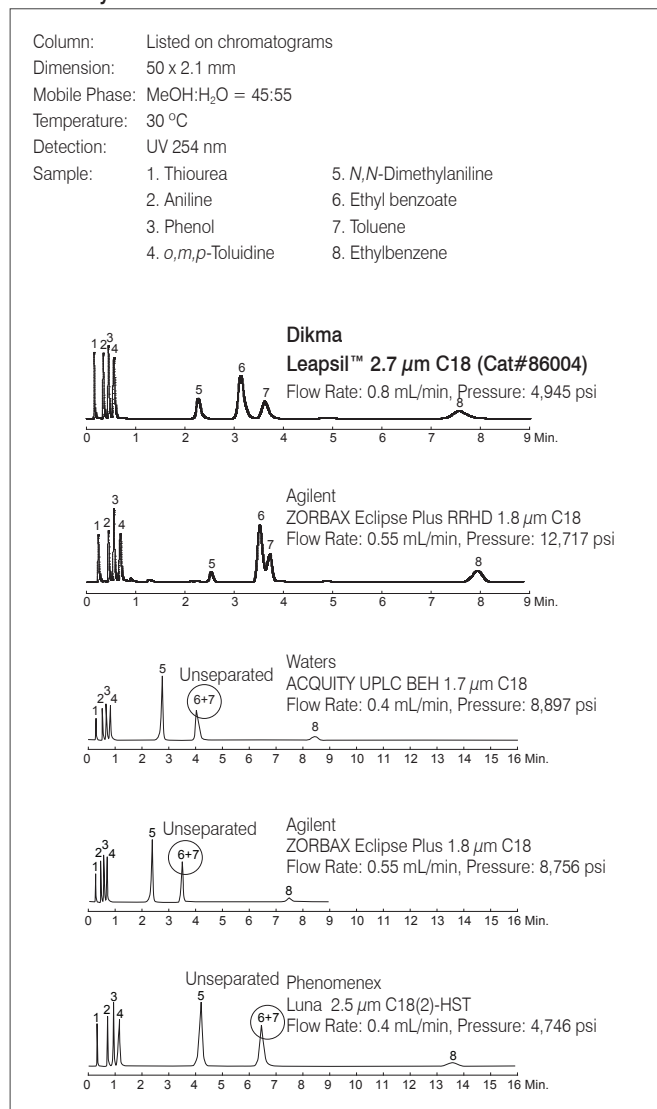
Leapsil™ Material Characteristics

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



Selectivity*



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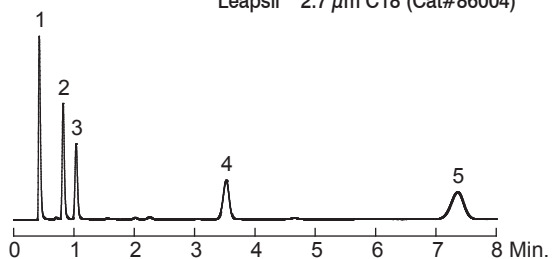
*ACQUITY UPLC is a registered trademark of Waters Corporation. Dikma Technologies Inc. is not affiliated with the above company.

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

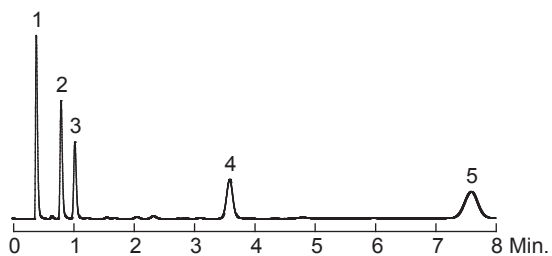
Galushko Test*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: MeOH:H₂O = 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

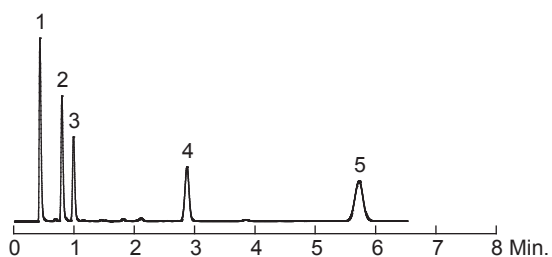
Dikma
 Leapsil™ 2.7 μm C18 (Cat#86004)



Agilent
 Pursuit XRs ULTRA 2.8 μm C18



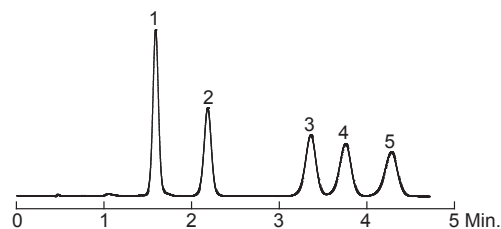
Phenomenex
 Luna 2.5 μm C18(2)-HST



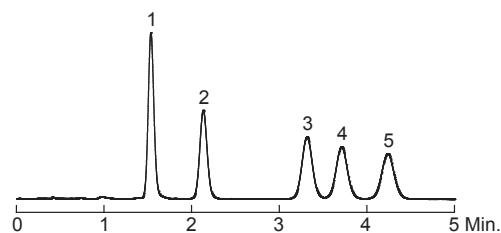
Steroids*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: MeOH:H₂O = 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

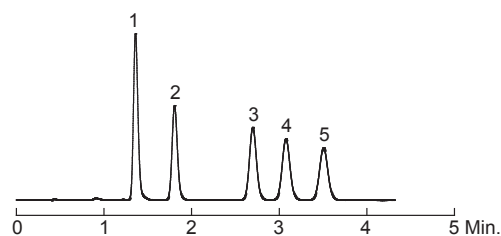
Dikma
 Leapsil™ 2.7 μm C18 (Cat#86004)



Agilent
 Pursuit XRs ULTRA 2.8 μm C18



Phenomenex
 Luna 2.5 μm C18(2)-HST

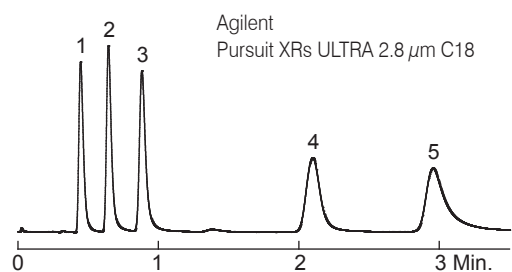
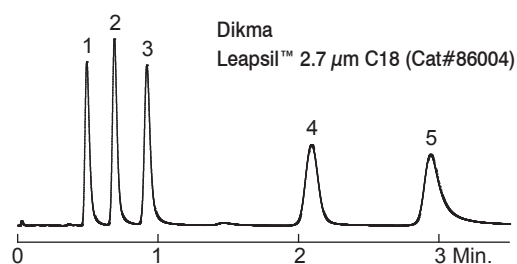


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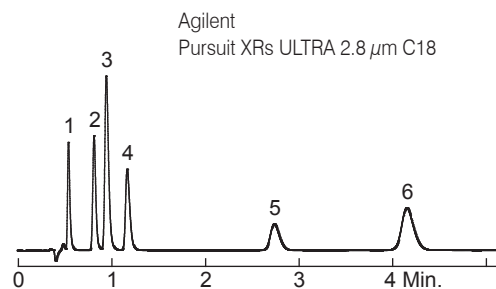
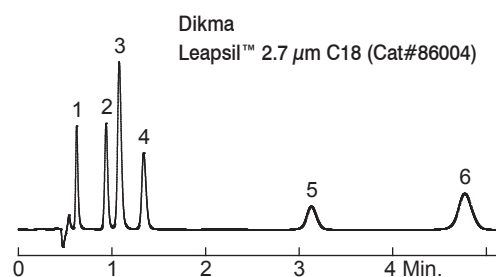
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β-Blockers at Neutral pH*

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 H₂O = 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

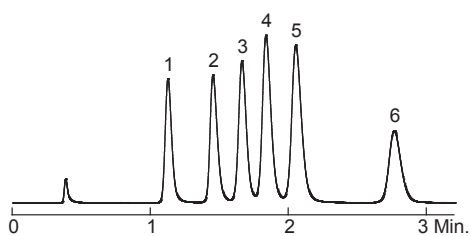


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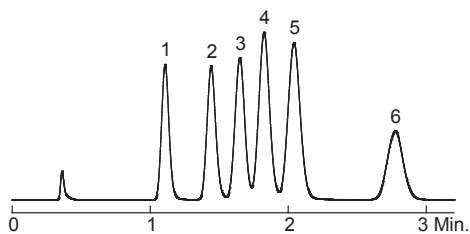
TCAs at Low pH*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H₂O = 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)



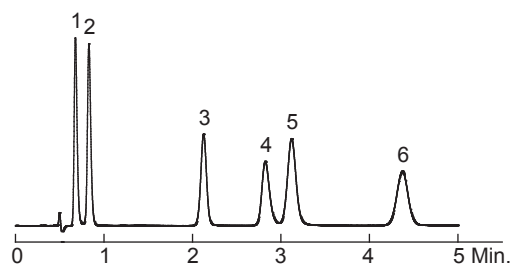
Agilent
Pursuit XRs ULTRA 2.8 μm C18



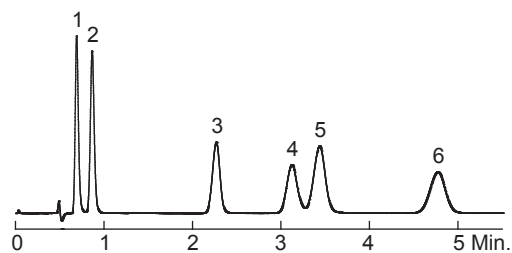
Polar Acids*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 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

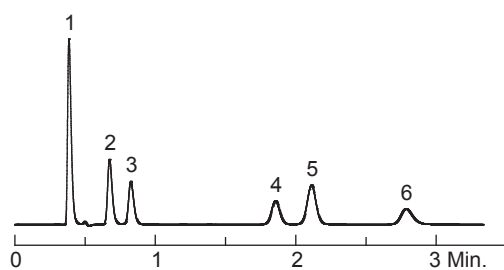


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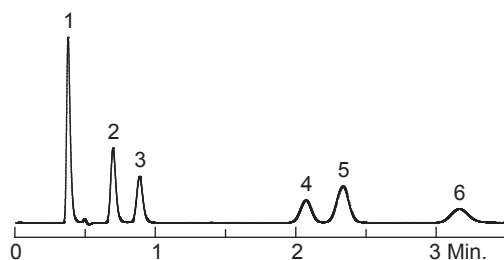
Acidic Compounds*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 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)



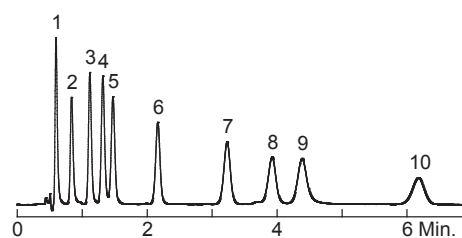
Agilent
 Pursuit XRs ULTRA 2.8 μm C18



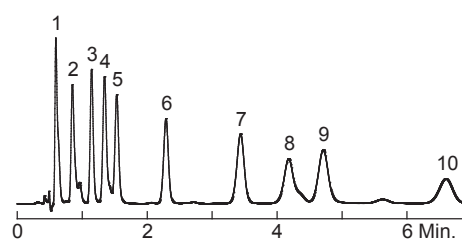
Antibacterials*

Column: Listed on chromatograms
 Dimension: 50 x 2.1 mm
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 20:80
 Flow Rate: 0.3 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Sulfanilamide
 2. Carbadox
 3. Sulfamerazine
 4. Sulfamethazine
 5. Sulfamethoxyipyridazine
 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	100 x 2.1	150 x 2.1
Leapsil™ C18	86004	86005	86006

2.7 μm Analytical Columns (3.0 mm)

Phase	50 x 3.0	100 x 3.0	150 x 3.0
Leapsil™ C18	86007	86008	86009

2.7 μm Analytical Columns (4.6 mm)

Phase	50 x 4.6	100 x 4.6	150 x 4.6
Leapsil™ C18	86001	86002	86003

Features of Inspire™ C18 & C8 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

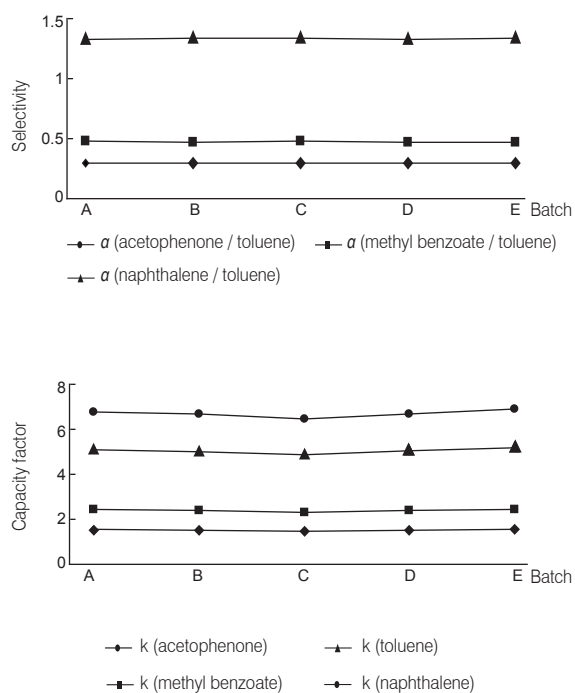
Bonded phase	Particle size (μm)	Pore size (Å)	Surface area (m ² /g)	Purity (%)	Phase density (μmol/m ²)	Carbon loading (%)	pH range	Endcapping
C18	3, 5, 10	100	440	> 99.999	3.9	27	1 - 11	Yes
C8	3, 5, 10	100	440	> 99.999	4.2	17	1 - 11	Yes

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.

Reproducibility Test

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

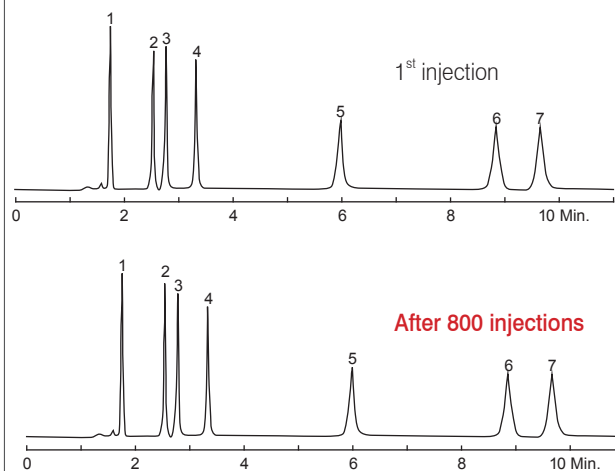


Long Lifetime

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.

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 H₂O = 30:70
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 220 nm
 Sample: 1. Nadolol 5. Labetolol
 2. Pindolol 6. Propranolol
 3. Acebutolol 7. Alprenolol
 4. Metoprolol



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.

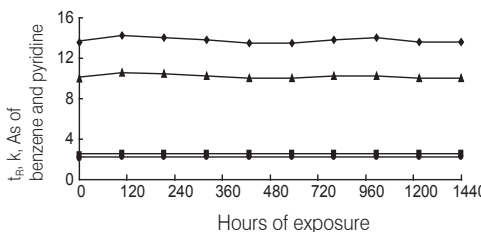
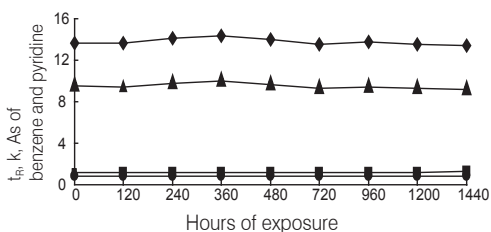
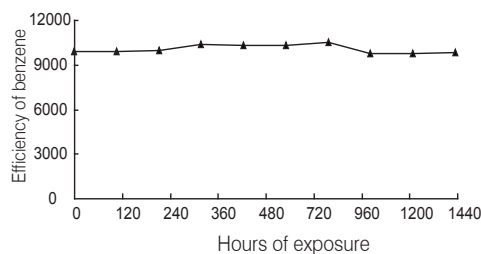
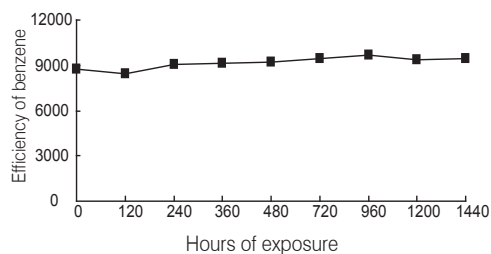
Dikma incorporates proprietary bonding and endcapping techniques, making Inspire™ packing much more stable across a broad pH range when compared to conventionally prepared material. Our packing platform also effectively resists the typical ligand hydrolysis and silica dissolution seen with conventional 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 μ m 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

pH 1

pH 11



■ As (pyridine)
 ◆ As (benzene)
 ▲ k (benzene)
 ● t_R (benzene)

Flush solution (pH 1)

Mobile Phase: 1% TFA in MeCN:1% TFA in H₂O = 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

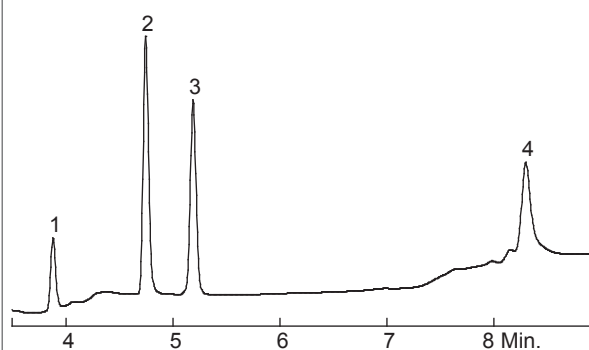
Inspire™ columns provide chromatographic laboratories with advanced performance and robust, rugged methods that can be achieved across the entire log *P* range of -2 to 8, simplifying the method validation and transfer process.

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.

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 H₂O
 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

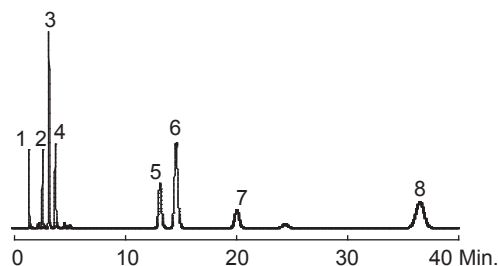


Engelhardt Test

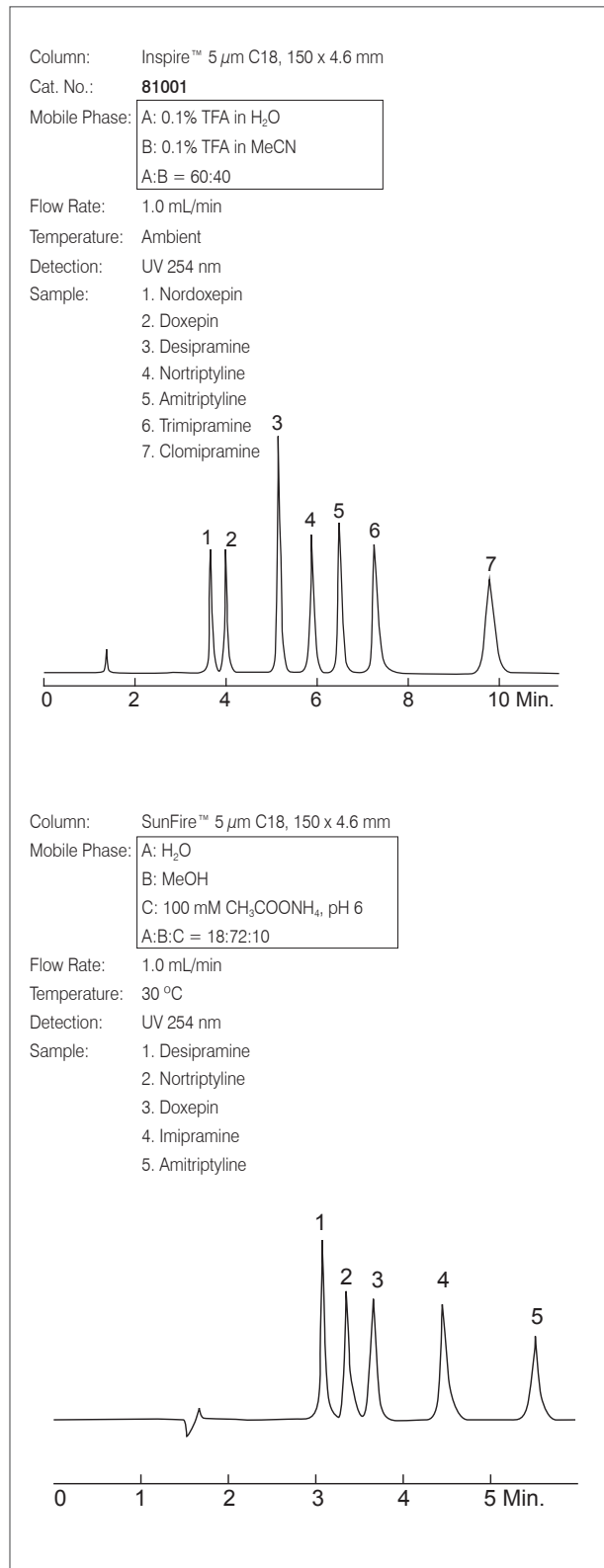
The Engelhardt test is a stringent test we use to verify the selectivity of Inspire™ columns. It is based solely on stationary phase chemistry. In this test, aniline elutes before phenol and the three toluidine isomers coelute, indicating that the acidic silanol groups of Inspire™ columns are deactivated.

Engelhardt Test

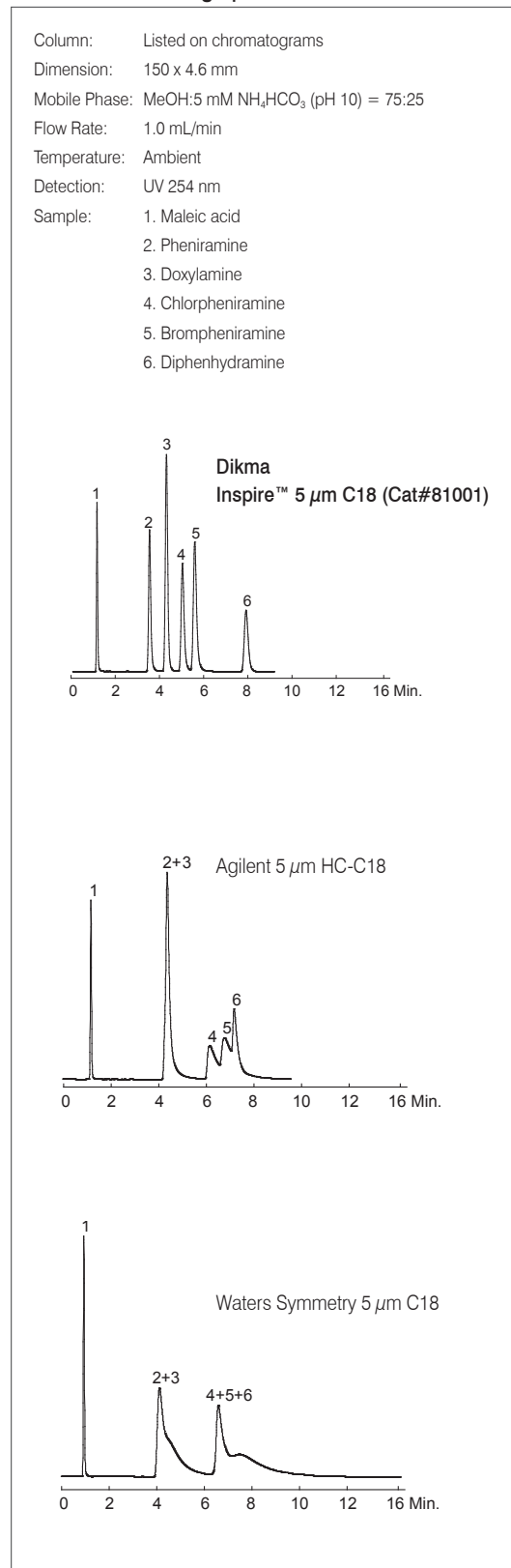
Column: Inspire™ 5 μm C18
 Dimension: 150 x 4.6 mm
 Cat. No.: 81001
 Mobile Phase: MeOH:H₂O = 55:45
 Flow Rate: 1.0 mL/min
 Temperature: 30 °C
 Detection: UV 254 nm
 Sample: 1. Thiourea
 2. Aniline
 3. Phenol
 4. *o,m,p*-Toluidine
 5. *N,N*-Dimethylaniline
 6. Ethyl benzoate
 7. Toluene
 8. Ethylbenzene



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



Antihistamines at High pH*



*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.

*HC-C18 is a registered trademark of Agilent Technologies. Dikma Technologies Inc. is not affiliated with the above company.

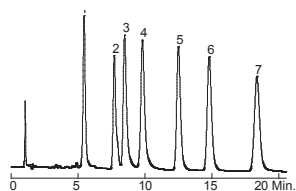
TCAs at High and Neutral pHs

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.

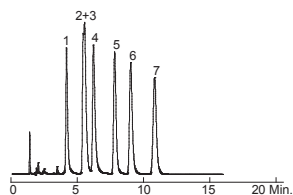
TCAs at High pH*

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: MeOH:5 mM NH₄HCO₃ (pH 10) = 80:20
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Nordoxepin 5. Imipramine
 2. Doxepin 6. Amitriptyline
 3. Desipramine 7. Trimipramine
 4. Nortriptyline

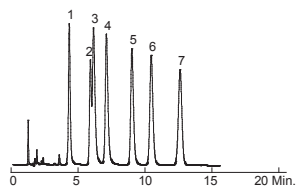
Dikma
 Inspire™ 5 μm C18 (Cat#81001)



Phenomenex Gemini 5 μm C18



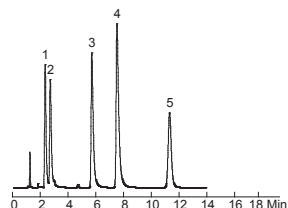
Kromasil 5 μm C18



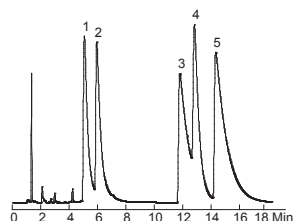
TCAs at Neutral pH*

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

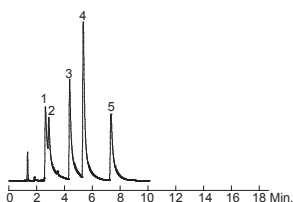
Dikma
 Inspire™ 5 μm C18 (Cat#81001)



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.

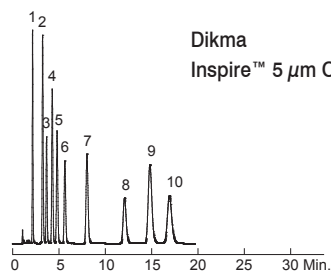
*HC-C18 is a registered trademark of Agilent Technologies. Dikma Technologies Inc. is not affiliated with the above company.

Ultimate Performance

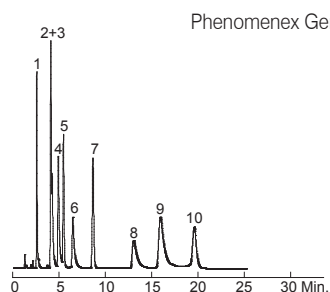
High phase density results in increased analyte-bonded phase interactions. These interactions impart greater selectivity and retention, leading to enhanced resolution.

Antibacterials*

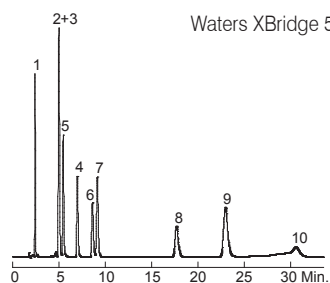
Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 20:80
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Sulfanilamide
 2. Carbadox
 3. Sulfapyridine
 4. Sulfamerazine
 5. Thiamphenicol
 6. Sulfamethoxyipyridazine
 7. Furazolidone
 8. Sulfamethoxazole
 9. Sulfisoxazole
 10. Oxolinic acid



Dikma
Inspire™ 5 μm C18 (Cat#81001)



Phenomenex Gemini 5 μm C18



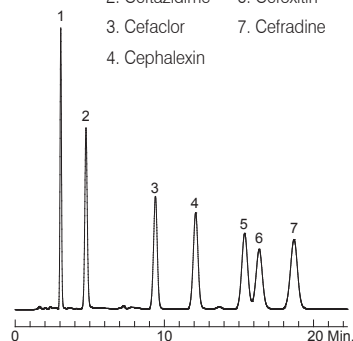
Waters XBridge 5 μm C18

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

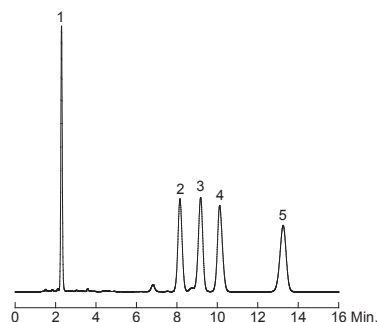
*Gemini is a registered trademark of Phenomenex. Dikma Technologies Inc. is not affiliated with the above company.

Separation of Cephalosporin Antibiotics at Different Mobile Phase Conditions

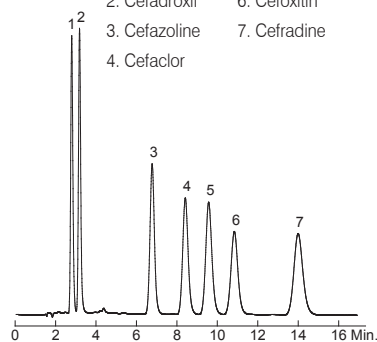
Column: Inspire™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: MeOH:25 mM phosphate buffer (pH 3) = 20:80
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 230 nm
 Sample: 1. Cefadroxil 5. Cefazoline
 2. Ceftazidime 6. Cefoxitin
 3. Cefaclor 7. Cefradine
 4. Cephalexin



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



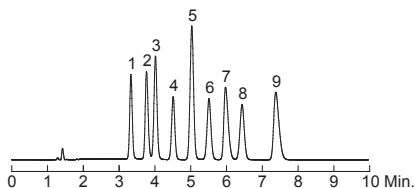
Mobile Phase: MeOH:0.1% TFA in H₂O = 30:70
 Flow Rate: 1.0 mL/min
 Detection: UV 230 nm
 Sample: 1. Ceftazidime 5. Cephalexin
 2. Cefadroxil 6. Cefoxitin
 3. Cefazoline 7. Cefradine
 4. Cefaclor



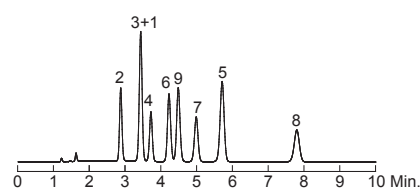
Separation of TCAs and Benzos*

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H₂O = 40:60
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Nitrozepam 6. Triazolam
 2. Nordoxepin 7. Nortriptyline
 3. Alprazolam 8. Clonazepam
 4. Diazepam 9. Trimipramine
 5. Oxazepam

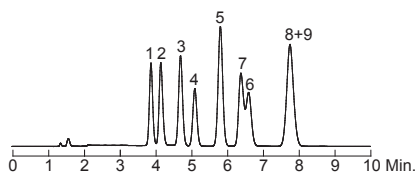
Dikma
 Inspire™ 5 μm C18 (Cat#81001)



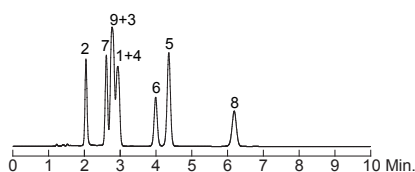
Dikma
 Spursil™ 5 μm C18-EP (Cat#82101)



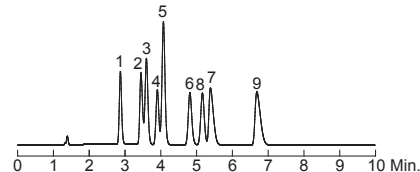
GL Science
 Inertsil 5 μm ODS-3



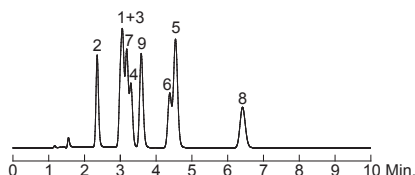
Agilent
 ZORBAX 5 μm Bonus-PP



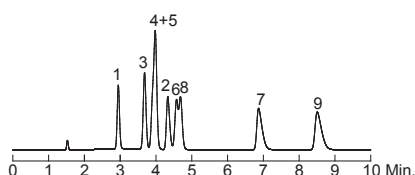
Agilent
 ZORBAX Eclipse 5 μm XDB-C18



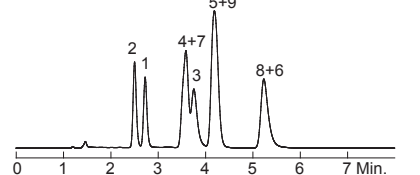
Waters
 SymmetryShield 5 μm RP18



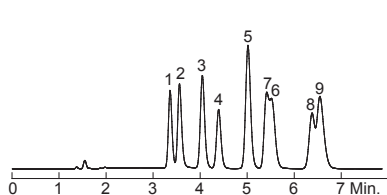
Waters
 XBridge 5 μm C18



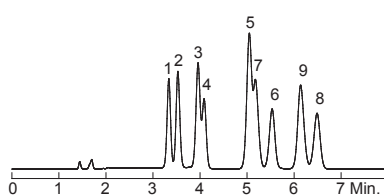
Waters
 Symmetry 5 μm C18



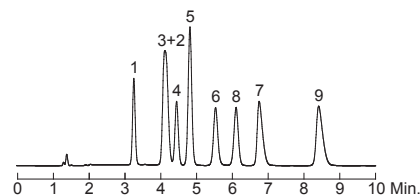
Phenomenex
 Luna 5 μm C18(2)



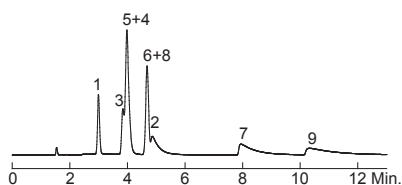
Phenomenex
 Gemini 5 μm C18



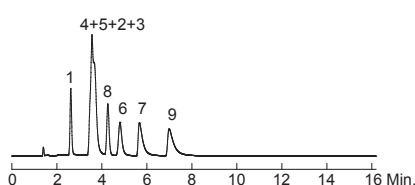
Eka Chemicals AB
 Kromasil 5 μm C18



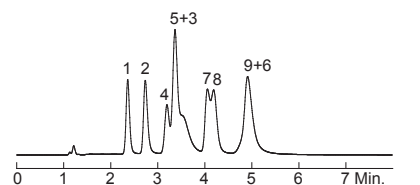
Thermo Scientific
 Hypersil 5 μm BDS C18



Beckman Coulter
 Ultrasphere 5 μm C18



Separation Methods Technologies
 OD-5-100 5 μm C18

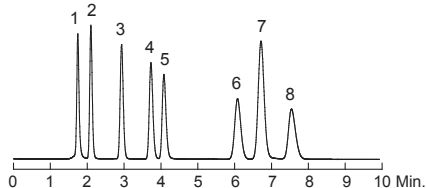


*The comparative data presented here may not be representative for all applications.

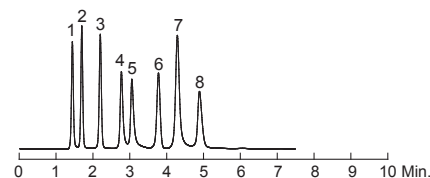
Organic Acids*

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: 25 mM KH₂PO₄, (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

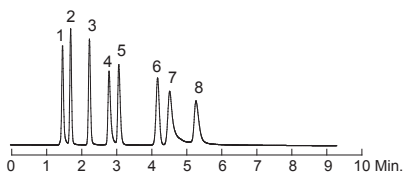
Dikma
Inspire™ 5 μm C18 (Cat#81001)



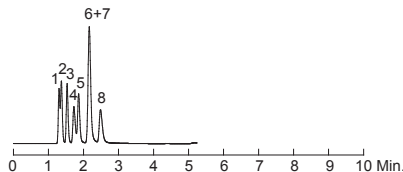
Dikma
Spursil™ 5 μm C18 (Cat#82001)



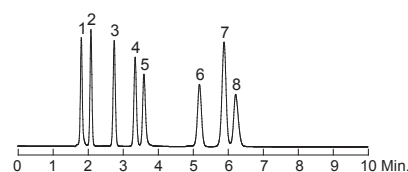
Agilent
ZORBAX 5 μm SB-C18



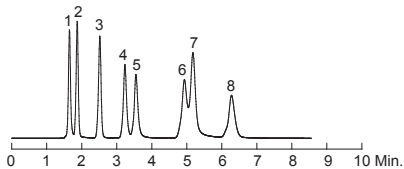
Agilent
ZORBAX Eclipse 5 μm XDB-C18



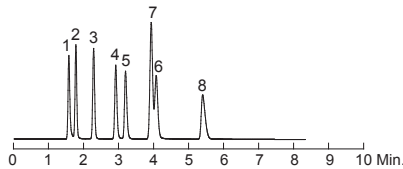
Phenomenex
Gemini 5 μm C18



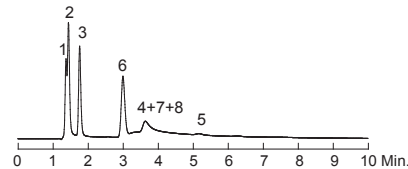
Phenomenex
Luna 5 μm C18(2)



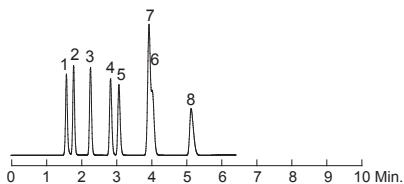
Waters
XBridge 5 μm C18



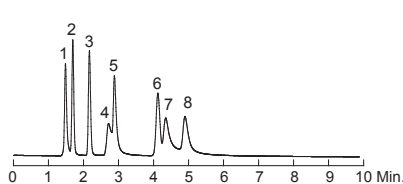
Waters
Symmetry 5 μm C18



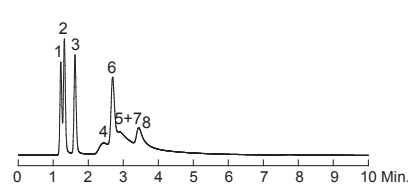
Thermo Scientific
Hypersil 5 μm BDS C18



Beckman Coulter
Ultrasphere 5 μm C18



Separation Methods Technologies
OD-5-100 5 μm C18

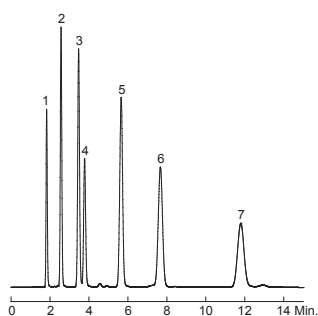


*The comparative data presented here may not be representative for all applications.

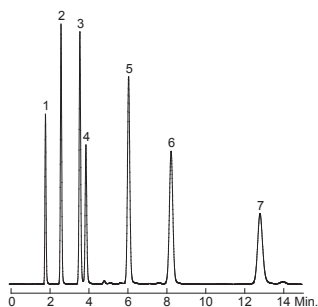
Flavonoids

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: MeCN:0.085% H₃PO₄ = 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)



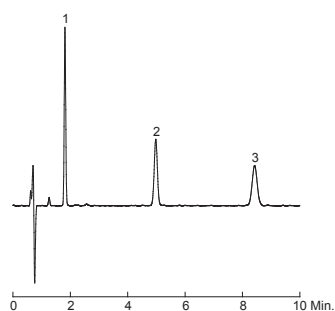
Dikma
 Spursil™ 5 μm C18 (Cat#82001)



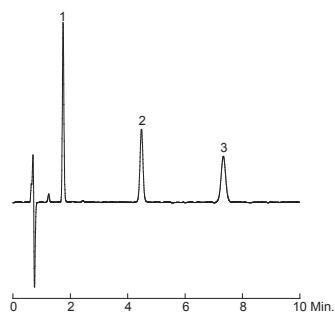
Herbicides

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H₂O = 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)



Features of Inspire™ Diol Columns New!

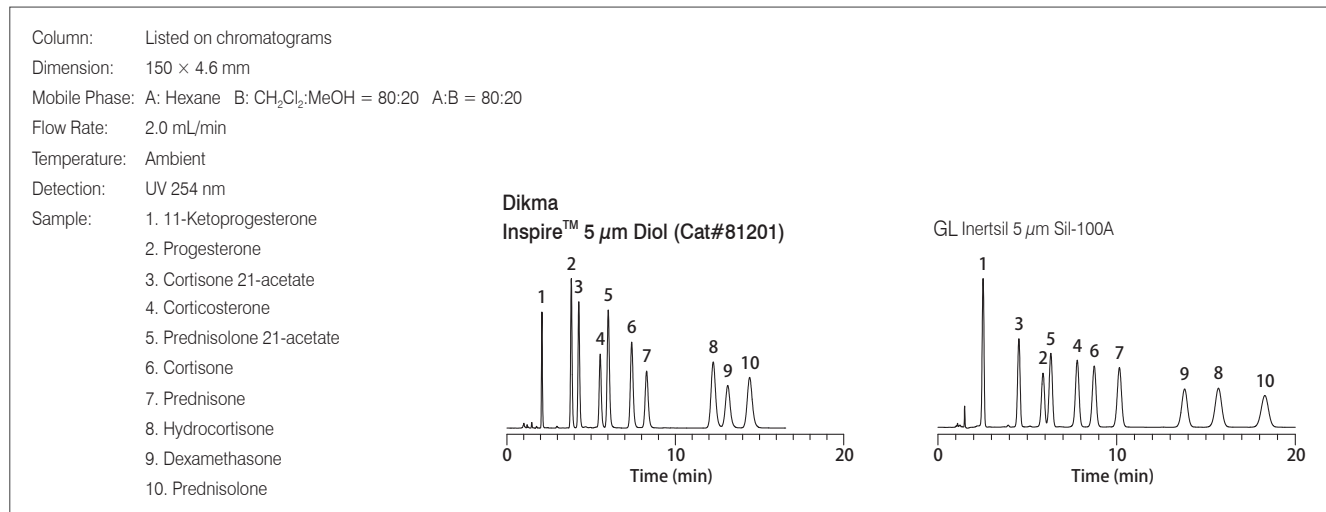
- Monomerically bonded dihydroxypropyl group
- Ultra pure silica and unique bonding chemistry promote long column lifetime, excellent column reproducibility and high inertness without endcapping
- Unique selectivity for polar / hydrophilic compounds in RP, NP, and HILIC modes
- Lower polarity than unmodified silica and very easily wettable with water
- Higher retentivity than silica in NP mode and useful tool as preparative column owing to easy dry-up

Inspire™ Diol columns are suitable for RP, NP, and HILIC modes. They are less polar than unmodified silica and very easily wettable with water. The water-enriched layer on the surface facilitates the retention of polar compounds. A well-known use of Diol columns, under normal phase conditions, is the separation of steroids and sterols.

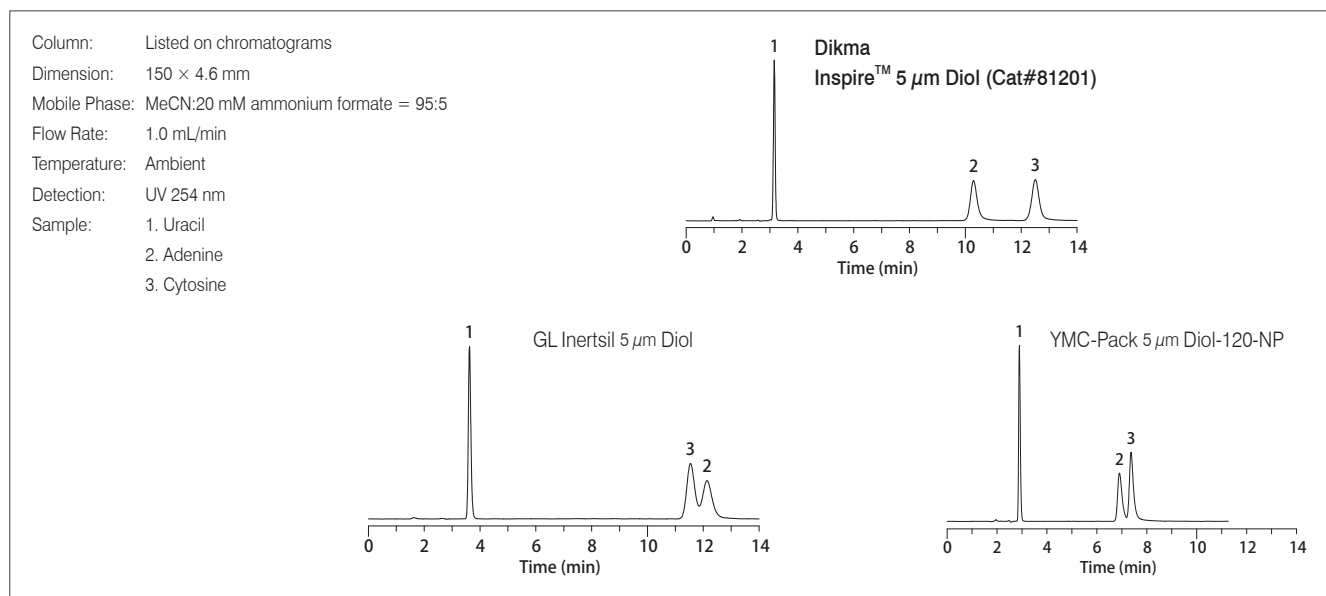
Inspire™ Diol Material Characteristics

Bonded phase	Particle size (µm)	Pore size (Å)	Surface area (m ² /g)	Purity (%)	Phase density (µmol/m ²)	Carbon loading (%)	pH range	Endcapping
Diol	3, 5, 10	100	440	> 99.999	2.1	7.5	2 - 7.5	No

Steroids*



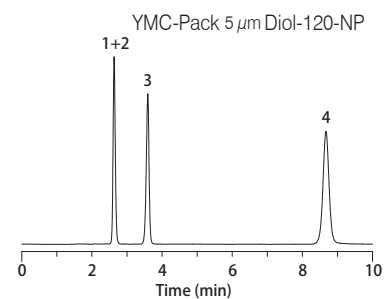
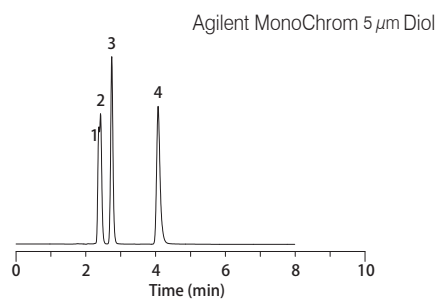
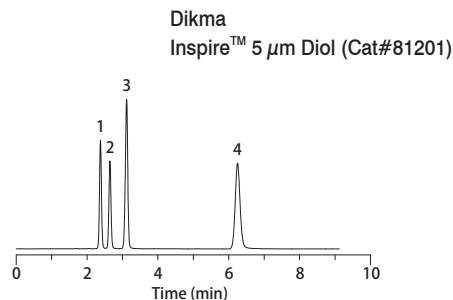
Nucleic Acid Bases*



*Inertsil is a trademark of GL Sciences, Inc., Dikma Technologies Inc. is not affiliated with the above company.
 *YMC-Pack is a trademark of YMC CO., LTD. Dikma Technologies Inc. is not affiliated with the above company.

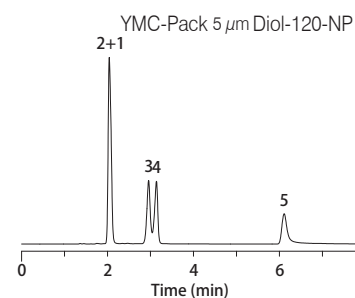
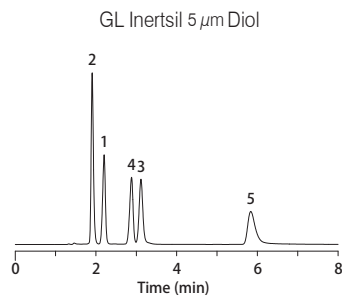
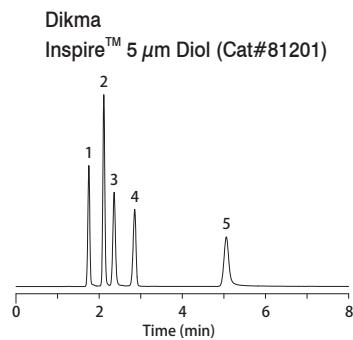
Water-Soluble Vitamins*

Column: Listed on chromatograms
 Dimension: 150 × 4.6 mm
 Mobile Phase: MeCN:25 mM KH₂PO₄ (pH 2.5) = 75:25
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. L-Ascorbic acid
 2. Nicotinamide
 3. Pyridoxine
 4. Thiamine



Salicylic Acids*

Column: Listed on chromatograms
 Dimension: 150 × 4.6 mm
 Mobile Phase: MeCN:20 mM CH₃COONH₄ (pH 6.8) = 90:10
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 228 nm
 Sample: 1. Salicylic acid
 2. Salicylamide
 3. 4-Aminosalicylic acid
 4. Acetylsalicylic acid
 5. 3,4-Dihydroxyphenylacetic acid



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

*YMC-Pack is a trademark of YMC CO., LTD. Dikma Technologies Inc. is not affiliated with the above company.

*Inertsil is a trademark of GL Sciences, Inc., Dikma Technologies Inc. is not affiliated with the above company.

Features of Inspire™ HILIC Columns New!

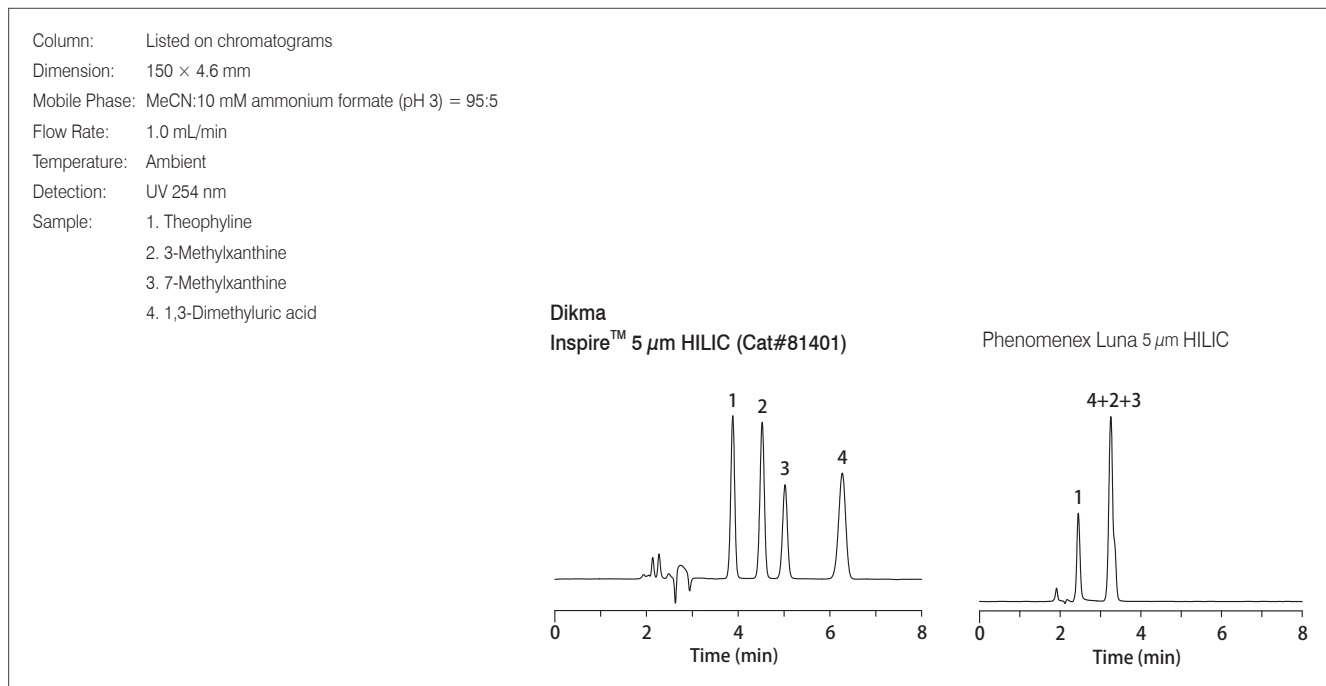
- Unique selectivity and increased retention for highly polar compounds
- Increased sensitivity and lower detection limits with microbore
- Enhanced retention for hydrophilic / polar compounds
- Increased laboratory throughput and productivity
- Superior batch-to-batch reproducibility
- Suitable for the separation of hydrophilic compounds such as polar acids and bases, polar compounds, nucleosides, oligonucleotides, amino acids, peptides, and water-soluble vitamins

HILIC is normal phase chromatography of polar and ionic compounds under RP conditions. It combines the characteristics of three methods in LC-RP, NP, and IC. Inspire™ HILIC columns retain a water-enriched layer on the surface of the silica. This water layer facilitates the transfer of polar compounds onto the stationary phase for increased retention. Separation is achieved through the partitioning of polar solutes from the high concentration, water-miscible, organic mobile phase into the hydrophilic surface environment. Polar solutes exhibit increased retention, and elute in the order of increasing hydrophilicity. HILIC is ideal for separating and retaining polar compounds that may not retain on traditional RP packings. Unlike reversed-phase columns, Inspire™ HILIC columns retain highly polar compounds with only small amounts of water in the mobile phase. These more volatile mobile phases increase sensitivity with microbore applications.

Inspire™ HILIC 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
HILIC	3, 5, 10	100	440	> 99.999	—	—	1.5 - 7.5	No

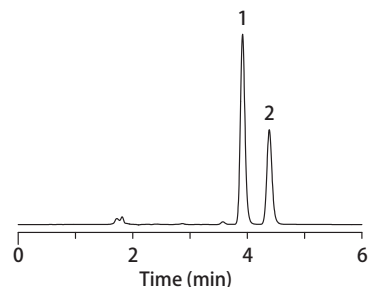
Caffeine Metabolites*



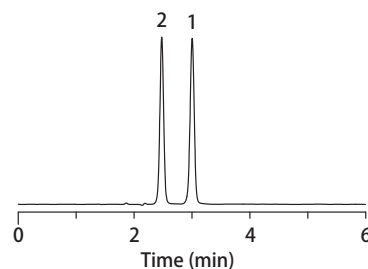
*Luna is a registered trademark of Phenomenex. Dikma Technologies Inc. is not affiliated with the above company.

Antivirals

Column: Inspire™ 5 µm HILIC, 150 × 4.6 mm
 Cat. No.: 81401
 Mobile Phase: MeCN:10 mM ammonium formate (pH 3) = 80:20
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Acyclovir
 2. Ganciclovir



Column: Inspire™ 5 µm C18, 150 × 4.6 mm
 Cat. No.: 81001
 Mobile Phase: MeCN:10 mM ammonium formate (pH 3) = 5:95
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Acyclovir
 2. Ganciclovir

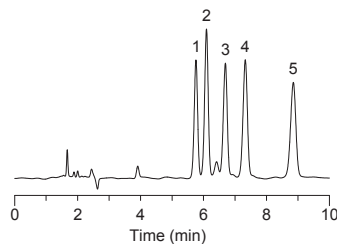


- Because HILIC uses a solvent system that is the reverse of what is common in RP, the peak elution order is reversed on Inspire™ HILIC
- Polar / hydrophilic compounds that are particularly difficult to retain on RP columns will enjoy maximum retention on HILIC

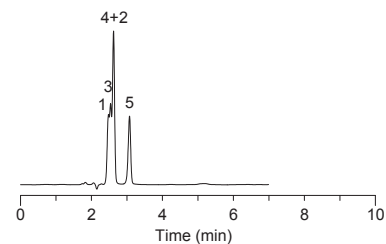
β-Blockers*

Column: Listed on chromatograms
 Dimension: 150 × 4.6 mm
 Mobile Phase: MeCN:10 mM ammonium formate (pH 3) = 85:15
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 220 nm
 Sample: 1. Propranolol
 2. Pindolol
 3. Metoprolol
 4. Acebutolol
 5. Nadolol

Dikma Inspire™ 5 µm HILIC (Cat#81401)



Phenomenex Luna 5 µm HILIC



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

Inspire™ Ordering Information

3 µm Microbore Columns (2.1 mm)

Guard Cartridge, 2/pk

Phases	30 x 2.1	50 x 2.1	100 x 2.1	150 x 2.1	250 x 2.1	10 x 2.1
Inspire™ C18	81030	81004	81012	81013	81015	6501
Inspire™ C8	81130	81104	81112	81113	81115	6502
Inspire™ Diol New!	81230	81204	81212	81213	81215	—
Inspire™ HILIC New!	81430	81404	81412	81413	81415	—

3 µm Analytical Columns (3.0 mm)

Phases	30 x 3.0	50 x 3.0	100 x 3.0	150 x 3.0	250 x 3.0	10 x 2.1
Inspire™ C18	81029	81021	81022	81023	81024	6501
Inspire™ C8	81129	81121	81122	81123	81124	6502
Inspire™ Diol New!	81229	81221	81222	81223	81224	—
Inspire™ HILIC New!	81429	81421	81422	81423	81424	—

3 µm Analytical Columns (4.6 mm)

Phases	30 x 4.6	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	10 x 4.0
Inspire™ C18	81031	81016	81017	81018	81020	6601
Inspire™ C8	81131	81116	81117	81118	81120	6602
Inspire™ Diol New!	81231	81216	81217	81218	81220	—
Inspire™ HILIC New!	81431	81416	81417	81418	81420	—

5 µm Analytical Columns (3.0 mm)

Phases	30 x 3.0	50 x 3.0	100 x 3.0	150 x 3.0	250 x 3.0	10 x 2.1
Inspire™ C18	81032	81025	81026	81027	81028	6503
Inspire™ C8	81132	81125	81126	81127	81128	6504
Inspire™ Diol New!	81232	81225	81226	81227	81228	—
Inspire™ HILIC New!	81432	81425	81426	81427	81428	—

5 µm Analytical Columns (4.6 mm)

Phases	30 x 4.6	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	10 x 4.0
Inspire™ C18	81034	81010	81011	81001	81006	6603
Inspire™ C8	81134	81110	81111	81101	81106	6604
Inspire™ Diol New!	81234	81210	81211	81201	81247	—
Inspire™ HILIC New!	81434	81410	81411	81401	81406	—

Special Column for Simvastatin **New!**

EasyGuard™ Guard Holder: Cat. #6220

Phases	Cat. No.
Inspire™ C18 3 µm 33 x 4.6 mm	81047

5 µm and 10 µm Semi-preparative Columns

Guard Cartridge, 2/pk

Phases	Particle Size (µm)	250 x 4.6 Cat. No.	250 x 10.0 Cat. No.	150 x 21.2 Cat. No.	250 x 21.2 Cat. No.	10 x 10.0 Cat. No.	10 x 21.2 Cat. No.
Inspire™ C18	5	81006	81038	81045	81039	6505	6506
Inspire™ C8	5	81106	81138	81145	81139	6507	6508
Inspire™ Diol New!	5	81247	81238	81245	81239	6509	6510
Inspire™ HILIC New!	5	81406	81438	81445	81439	—	—
Inspire™ C18	10	81035	81036	81046	81037	6511	6512
Inspire™ C8	10	81135	81136	81146	81137	6513	6514
Inspire™ Diol New!	10	81235	81236	81246	81237	6515	6516
Inspire™ HILIC New!	10	81435	81436	81446	81437	—	—

10 mm Guard Holder: Cat#6221, 21.2 mm Guard Holder: Cat#6222

10 µm Packing Materials

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

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

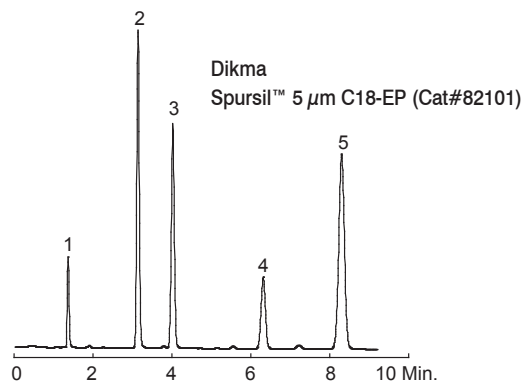
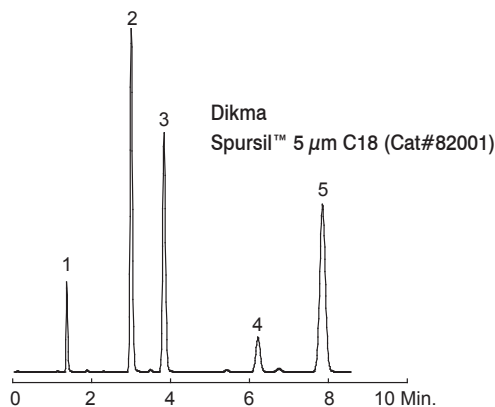
Bonded phase	Particle size (μm)	Pore size (Å)	Surface area (m ² /g)	Purity (%)	Phase density (μmol/m ²)	Carbon loading (%)	pH range	Endcapping
C18	3, 5, 10	100	440	> 99.999	3.5	25	1.5 - 10	Yes
C18-EP	3, 5, 10	100	440	> 99.999	3.4	24	1.5 - 10	Yes

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.

Performance Test

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: MeCN:H₂O = 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

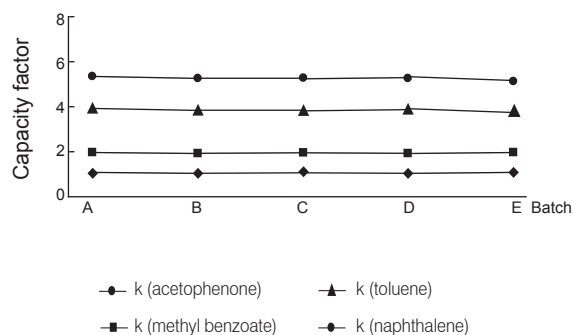
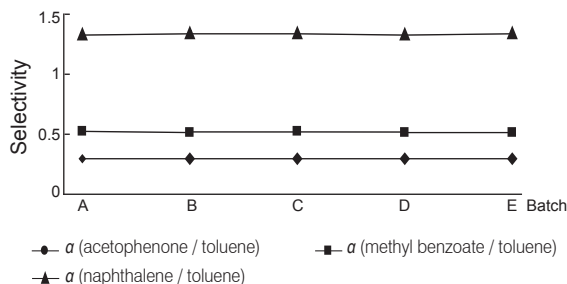


Batch-to-Batch Reproducibility of Spursil™ C18

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.

Reproducibility Test

Five randomly selected batches demonstrated excellent reproducibility in the example shown

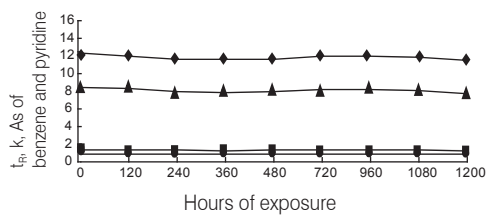
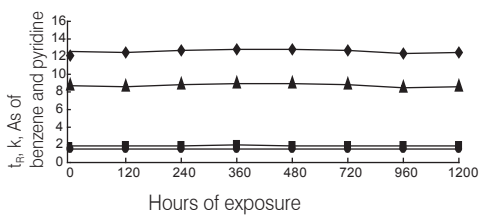
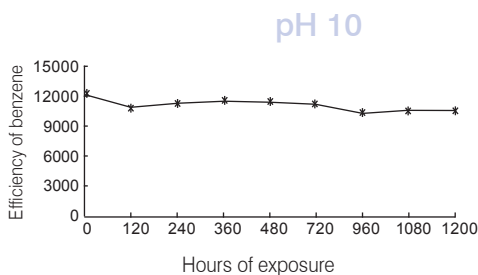
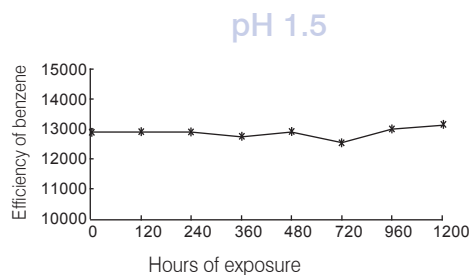


Wide pH Range

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 μ m 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



■ As (pyridine) ◆ As (benzene) ▲ k (benzene) ● t_R (benzene)

Flush solution (pH 1.5)

Mobile Phase: 1% TFA in MeCN:1% TFA in H₂O = 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

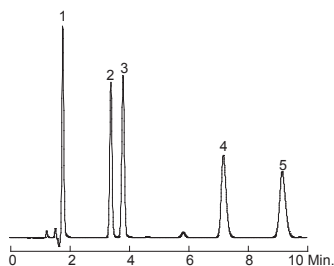
Unique Selectivity

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.

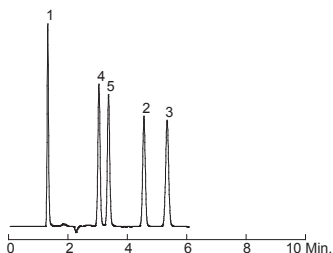
Cold Medicine

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: 0.1% TFA in MeCN:0.1% TFA
 in H₂O = 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)



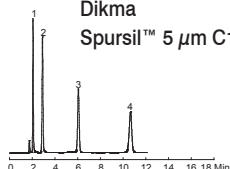
Dikma
Spursil™ 5 μm C18-EP (Cat#82101)



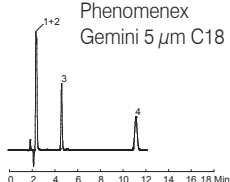
Polar Acids*

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: MeOH:0.1% TFA in H₂O = 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

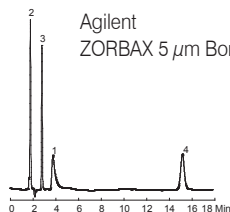
Dikma
Spursil™ 5 μm C18 (Cat#82001)



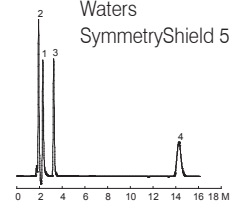
Phenomenex
Gemini 5 μm C18



Agilent
ZORBAX 5 μm Bonus-RP



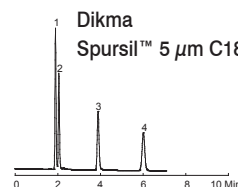
Waters
SymmetryShield 5 μm RP18



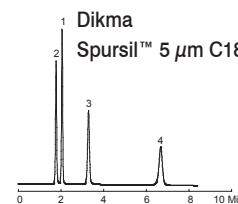
Polar Compounds*

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: 10 mM HCOONH₄, (pH 3)
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Thiourea
 2. Cytosine
 3. Adenine
 4. Uridine

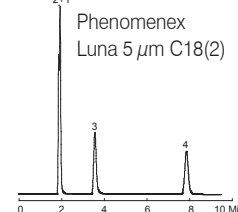
Dikma
Spursil™ 5 μm C18 (Cat#82001)



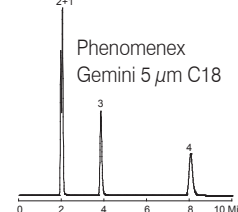
Dikma
Spursil™ 5 μm C18-EP (Cat#82101)



Phenomenex
Luna 5 μm C18(2)



Phenomenex
Gemini 5 μm C18



*Gemini and Luna are registered trademarks of Phenomenex. Dikma Technologies Inc. is not affiliated with the above company.

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

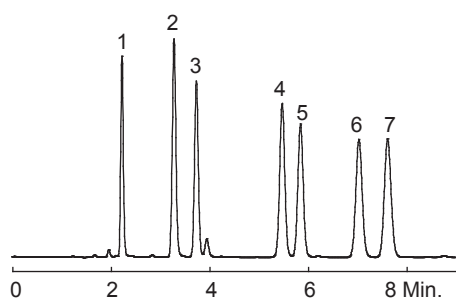
*SymmetryShield is a trademark of Waters Corporation. Dikma Technologies Inc. is not affiliated with the above company.

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.

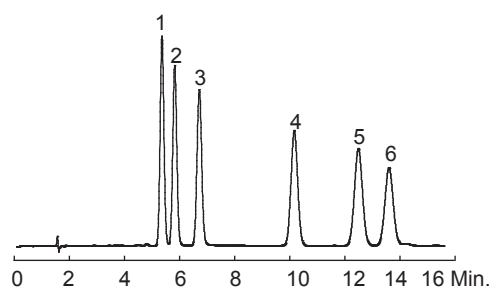
Anti-inflammatories

Column: Spursil™ 5 μ m C18, 150 x 4.6 mm
 Cat. No.: **82001**
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 55:45
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Phenacetin
 2. Tolmetin
 3. Ketoprofen
 4. Fenopropfen
 5. Flurbiprofen
 6. Diclofenac
 7. Ibuprofen



Steroids

Column: Spursil™ 5 μ m C18, 150 x 4.6 mm
 Cat. No.: **82001**
 Mobile Phase: MeOH:H₂O = 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

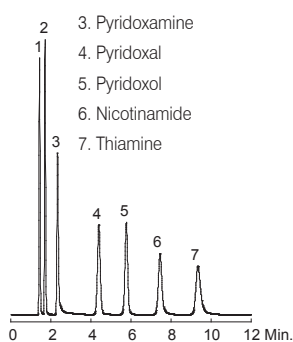


Our Solution for Working Under Highly Aqueous Conditions

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.

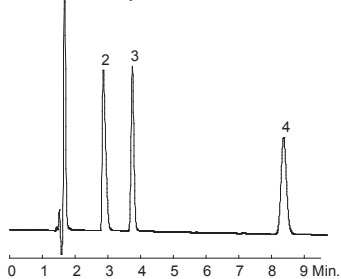
Water-Soluble Vitamins

Column: Spursil™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **82001**
 Mobile Phase: MeOH:10 mM K₂HPO₄ (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 KH₂PO₄ (pH 2.5 by H₃PO₄)
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 210 nm
 Sample: 1. Citrulline
 2. Valine
 3. Methionine
 4. Tyrosine

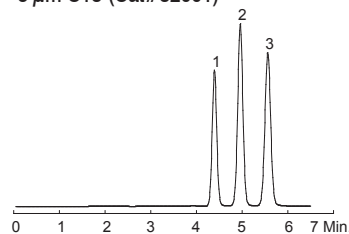


Although they are designed for use in highly aqueous mobile phase conditions, Spursil™ columns are completely compatible with highly organic mobile phases. The ability to cover the full range of mobile phase composition, from 100% aqueous to 100% organic, is useful for developing gradient methods for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

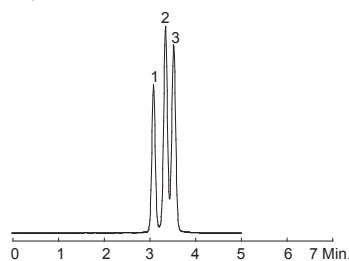
Tocopherols*

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

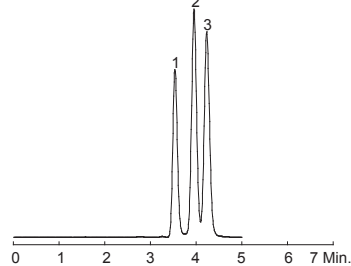
Dikma
 Spursil™ 5 μm C18 (Cat#82001)



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

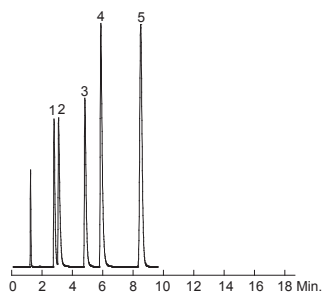
The most sensitive measurement of silanol interactions is achieved using highly basic probes with a pH 7 mobile phase. At this pH, many of the residual silanols are in their ionized form, and the basic probes are completely protonated. The protonated bases interact with the ionized silanols by an ion-exchange 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*

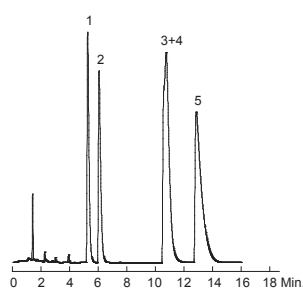
Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: MeCN:20 mM phosphate buffer (pH 7) = 2:1
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample:
 1. Desipramine
 2. Nortriptyline
 3. Imipramine
 4. Amitriptyline
 5. Trimipramine

Dikma

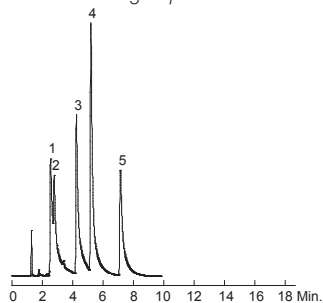
Spursil™ 5 μm C18 (Cat#82001)



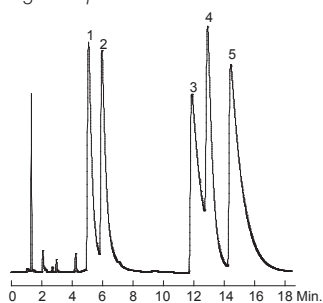
Agilent 5 μm TC-C18



Waters XBridge 5 μm C18



Agilent 5 μm HC-C18



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*TC-C18 is a registered trademark of Agilent Technologies. Dikma Technologies Inc. is not affiliated with the above company.

*HC-C18 is a registered trademark of Agilent Technologies. Dikma Technologies Inc. is not affiliated with the above company.

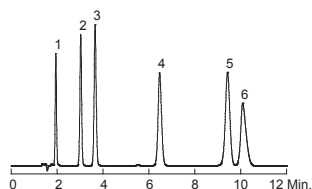
β-Blockers at Low and High pHs

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.

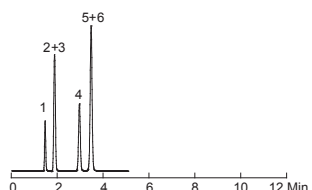
β-Blockers at Low pH*

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H₂O = 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

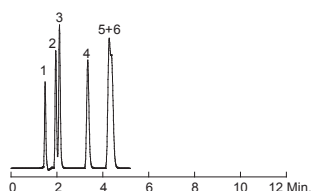
Dikma
 Spursil™ 5 μm C18 (Cat#82001)



Agilent
 ZORBAX 5 μm Bonus-RP



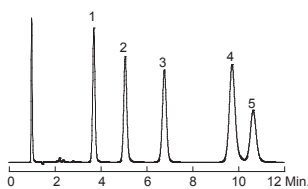
Waters
 SymmetryShield 5 μm RP18



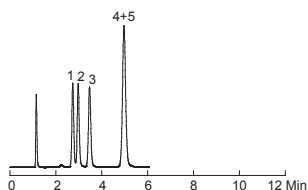
β-Blockers at High pH*

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: MeOH:5 mM NH₄HCO₃ (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

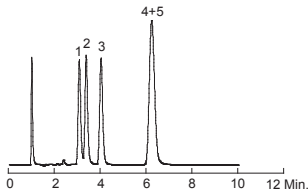
Dikma
 Spursil™ 5 μm C18 (Cat#82001)



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.

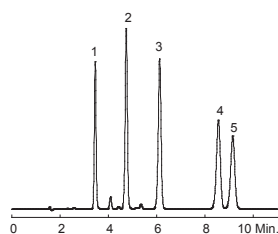
Steric Selectivity

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.

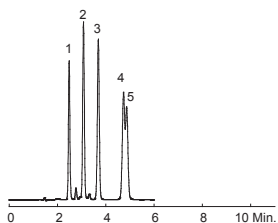
Steric Selectivity*

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: MeOH:H₂O = 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

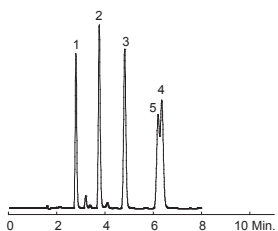
Dikma Spursil™ 5 μm C18-EP (Cat#82101)



Agilent ZORBAX 5 μm Bonus-RP



Waters XBridge 5 μm C18



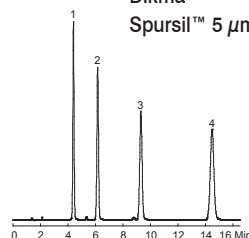
Enhanced Polar Retention

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.

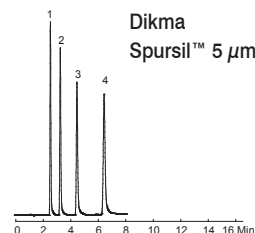
Parabens*

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: MeCN:20 mM K₂HPO₄ (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

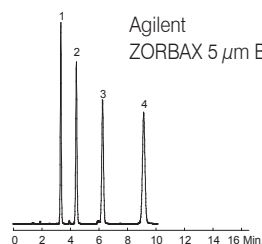
Dikma Spursil™ 5 μm C18-EP (Cat#82101)



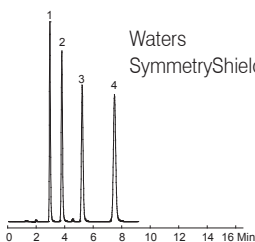
Dikma Spursil™ 5 μm C18 (Cat#82001)



Agilent ZORBAX 5 μm Bonus-RP



Waters SymmetryShield 5 μm RP18

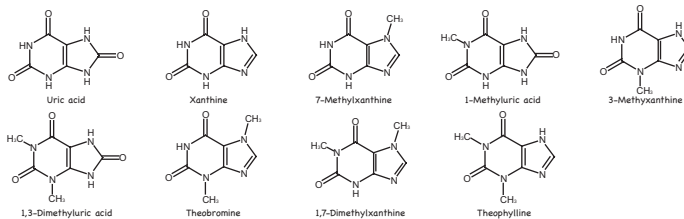


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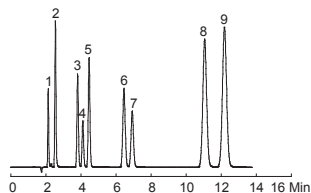
*SymmetryShield and XBridge are trademarks of Waters Corporation. Dikma Technologies Inc. is not affiliated with the above company.

Caffeine Metabolites*

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: MeOH:1% CH₃COOH in H₂O = 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

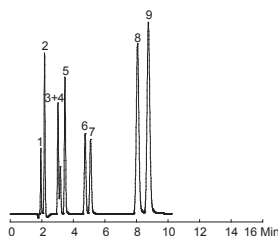


Dikma
Spursil™ 5 μm C18 (Cat#82001)

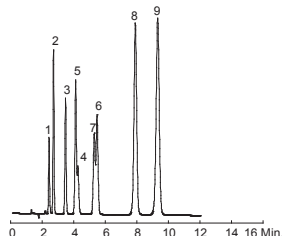


The separation of nine caffeine metabolites, each a geostereoisomer of similar structure, demonstrates the resolving power for positional isomers. The Spursil™ C18 column completes this separation in less than 13 minutes, with remarkable selectivity.

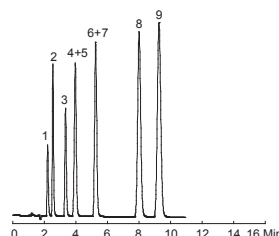
Thermo Scientific
 Hypersil 5 μm BDS C18



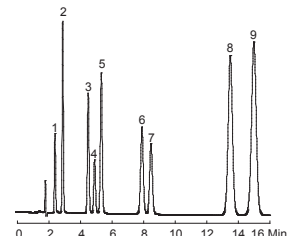
Agilent
 ZORBAX 5 μm Bonus-RP



Waters
 SymmetryShield 5 μm RP18



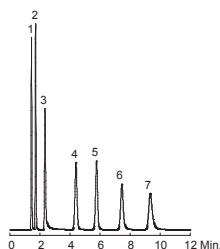
Phenomenex
 Gemini 5 μm C18



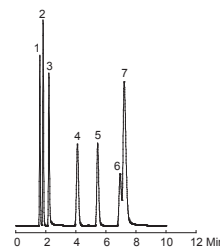
Water-Soluble Vitamins*

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: MeOH:10 mM K₂HPO₄ (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

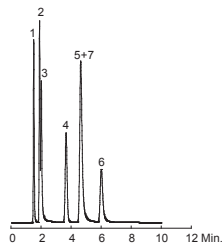
Dikma
Spursil™ 5 μm C18 (Cat#82001)



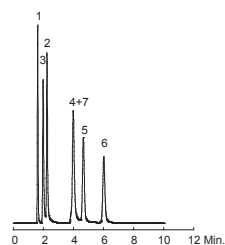
Waters
 XBridge 5 μm C18



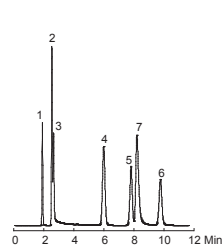
Waters
 SymmetryShield 5 μm RP18



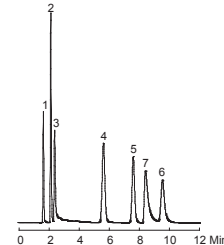
Agilent
 ZORBAX 5 μm Bonus-RP



Phenomenex
 Gemini 5 μm C18



Phenomenex
 Luna 5 μm C18(2)

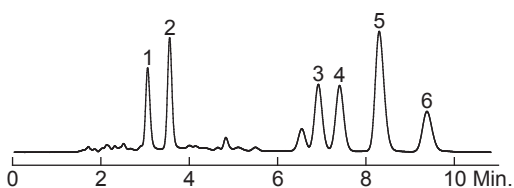


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 *SymmetryShield and XBridge are trademarks of Waters Corporation. Dikma Technologies Inc. is not affiliated with the above company.
 *Gemini and Luna are registered trademarks of Phenomenex. Dikma Technologies Inc. is not affiliated with the above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

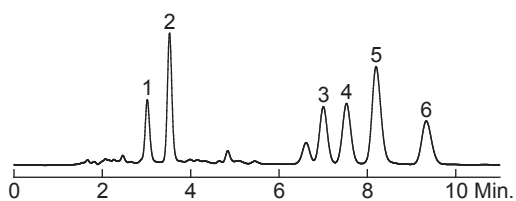
Multiple Injections of Antibiotics on Spursil™ C18 Column

Column: Spursil™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **82001**
 Mobile Phase: MeOH:0.1% TFA in H₂O = 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

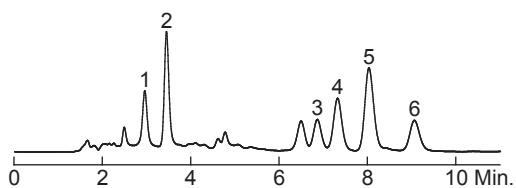
1st injection



After 500 injections



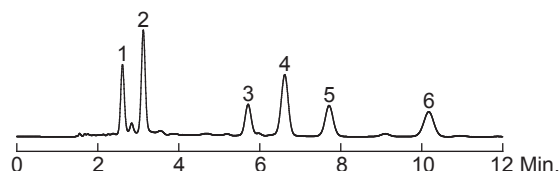
After 1,000 injections



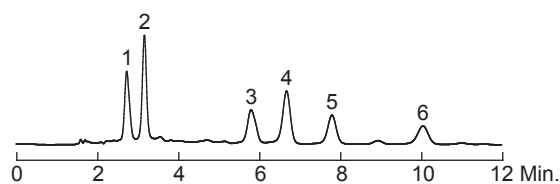
Multiple Injections of Antibiotics on Spursil™ C18-EP Column

Column: Spursil™ 5 μm C18-EP, 150 x 4.6 mm
 Cat. No.: **82101**
 Mobile Phase: MeOH:0.1% TFA in H₂O = 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

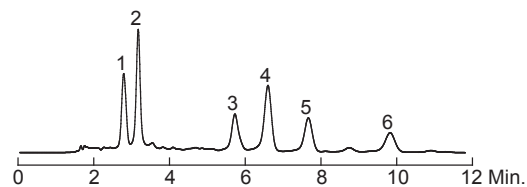
1st injection



After 500 injections



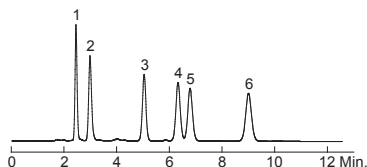
After 1,000 injections



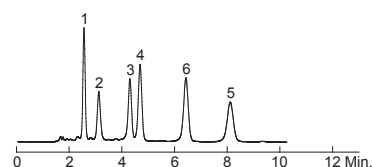
Separation of Cephalosporin Antibiotics at Phosphate Buffer Mobile Phase Conditions*

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 4. Cephalexin
 2. Ceftazidime 5. Cefazoline
 3. Cefaclor 6. Cefradine

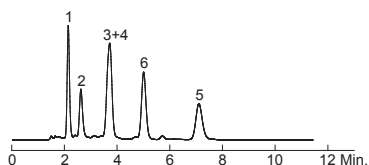
**Dikma
 Spursil™ 5 μm C18 (Cat#82001)**



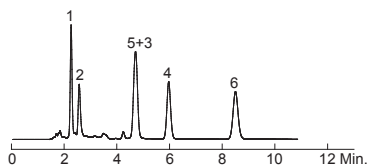
**Dikma
 Spursil™ 5 μm C18-EP (Cat#82101)**



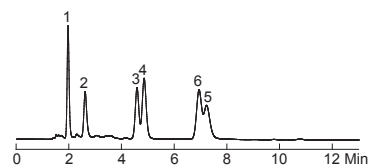
**Waters
 SymmetryShield 5 μm RP18**



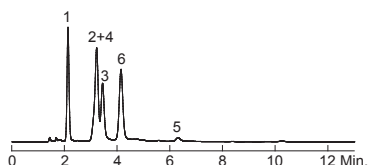
**Waters
 XBridge 5 μm C18**



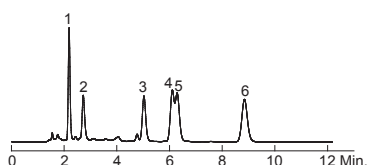
**Waters
 Symmetry 5 μm C18**



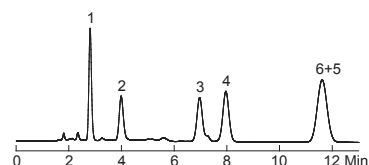
**Agilent
 ZORBAX 5 μm Bonus-RP**



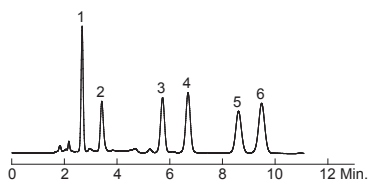
**Agilent
 ZORBAX Eclipse 5 μm XDB-C18**



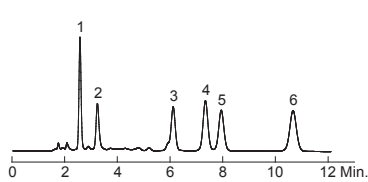
**GL Science
 Inertsil 5 μm ODS-3**



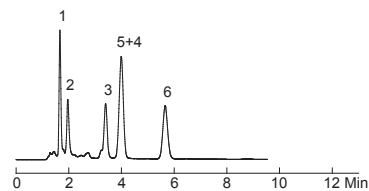
**Phenomenex
 Gemini 5 μm C18**



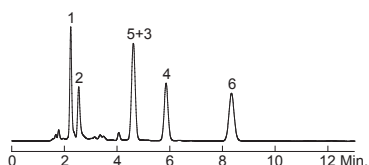
**Phenomenex
 Luna 5 μm C18(2)**



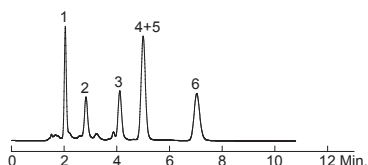
**Eka Chemicals AB
 Kromasil 5 μm C18**



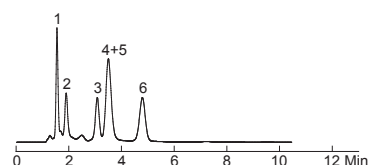
**Thermo Scientific
 Hypersil 5 μm BDS C18**



**Beckman Coulter
 Ultrasphere 5 μm C18**



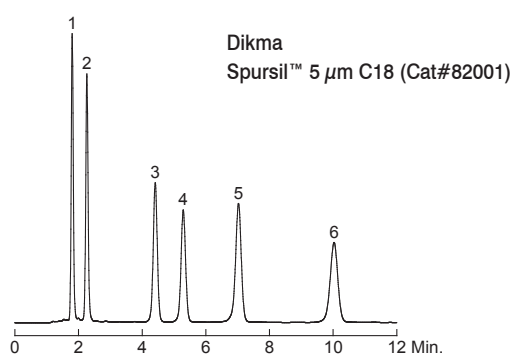
**Separation Methods Technologies
 OD-5-100 5 μm C18**



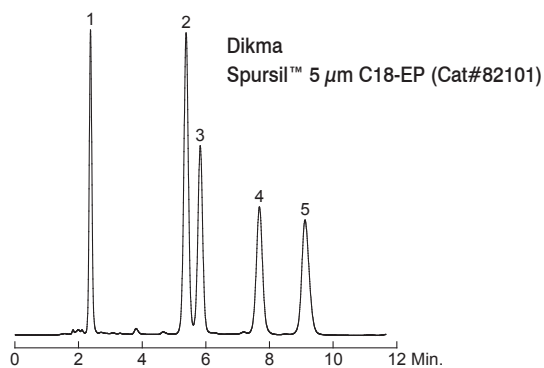
*The comparative data presented here may not be representative for all applications.

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 4. Cefoxitin
 2. Cefadroxil 5. Cefaclor
 3. Cefuroxime 6. Cefradine

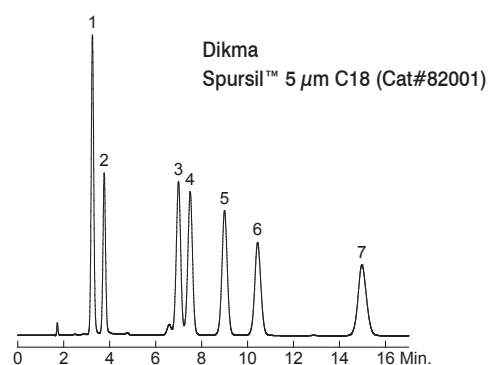


Mobile Phase: MeOH:100 mM acetate buffer = 20:80
 Flow Rate: 1.0 mL/min
 Detection: UV 254 nm
 Sample: 1. Ceftazidime 4. Cefradine
 2. Cephalexin 5. Cefoxitin
 3. Cefaclor

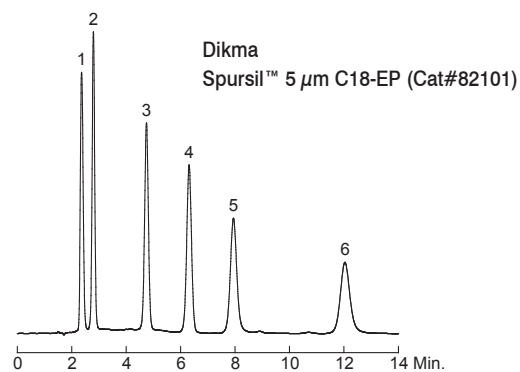


Separation of Cephalosporin Antibiotics at TFA Mobile Phase Conditions

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: MeOH:0.1% TFA in H₂O = 30:70
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 230 nm
 Sample: 1. Ceftazidime 5. Cefaclor
 2. Cefadroxil 6. Cephalexin
 3. Cefuroxime 7. Cefradine
 4. Cefazoline

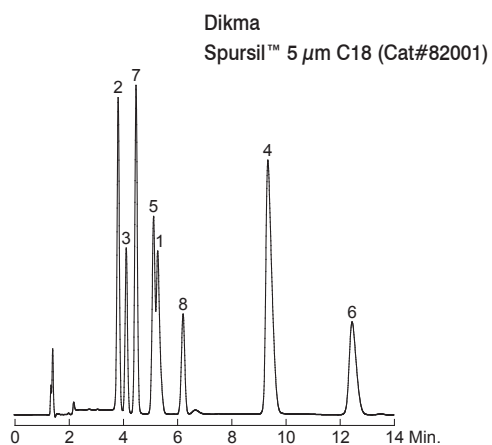
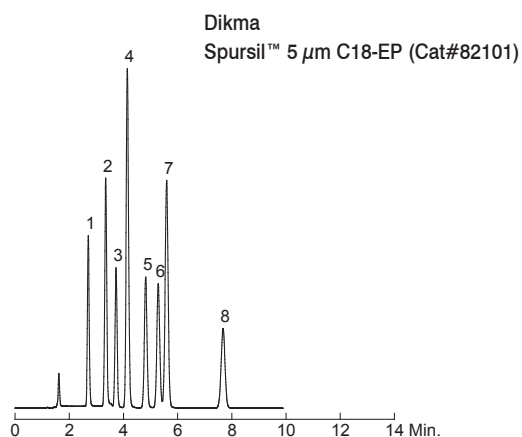


Mobile Phase: MeOH:0.1% TFA in H₂O = 30:70
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 230 nm
 Sample: 1. Ceftazidime 4. Cefradine
 2. Cefadroxil 5. Cefazoline
 3. Cephalexin 6. Cefoxitin



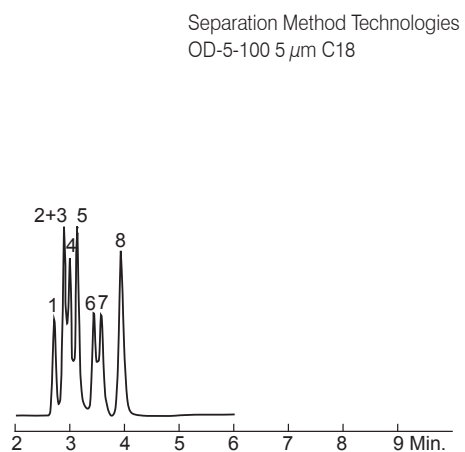
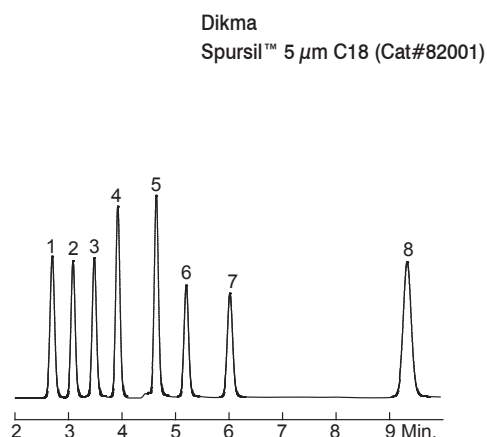
Separation of TCAs and Benzos

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H₂O = 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



Separation of Nucleotides in 100% Aqueous Conditions

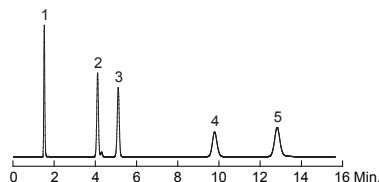
Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: 50 mM K₂HPO₄, (pH 6)
 Flow Rate: 0.7 mL/min
 Temperature: Ambient
 Detection: UV 260 nm
 Sample: 1. CTP
 2. CMP
 3. GTP
 4. GDP
 5. GMP
 6. ATP
 7. ADP
 8. AMP



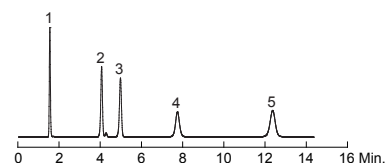
Sander Test*

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

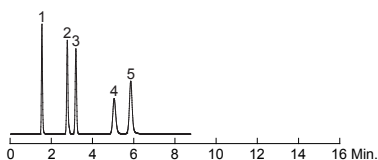
Dikma
 Spursil™ 5 µm C18 (Cat#82001)



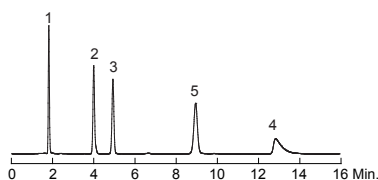
Dikma
 Spursil™ 5 µm C18-EP (Cat#82101)



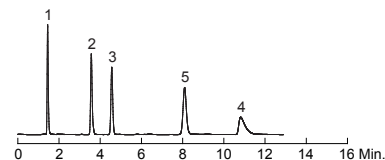
Agilent
 ZORBAX 5 µm Bonus-RP



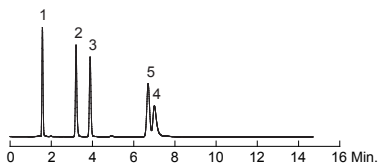
Agilent
 5 µm HC-C18



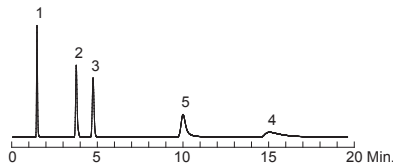
Agilent
 ZORBAX Eclipse 5 µm XDB-C18



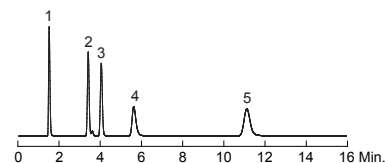
Waters
 XBridge 5 µm C18



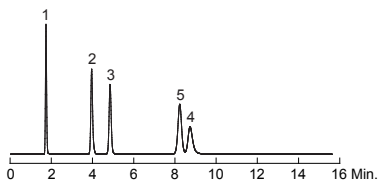
Waters
 Symmetry 5 µm C18



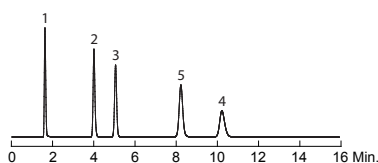
Waters
 SymmetryShield 5 µm RP18



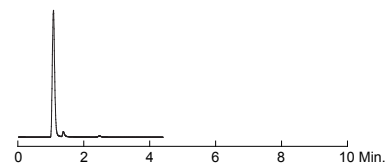
Phenomenex
 Gemini 5 µm C18



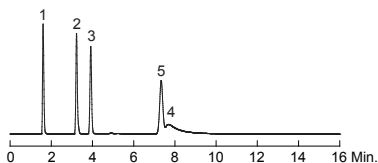
Phenomenex
 Luna 5 µm C18(2)



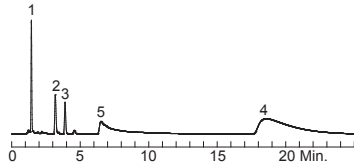
Eka Chemicals AB
 Kromasil 5 µm C18



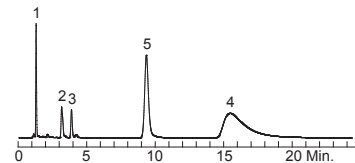
Thermo Scientific
 Hypersil 5 µm BDS C18



Beckman Coulter
 Ultrasphere 5 µm C18



Separation Methods Technologies
 OD-5-100 5 µm C18

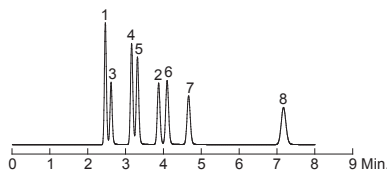


*The comparative data presented here may not be representative for all applications.

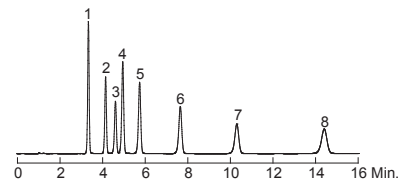
Phenols*

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 55:45
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 280 nm
 Sample: 1. Phenol 5. 4-Chlorophenol
 2. 2-Nitrophenol 6. 4-Chloro-3-methylphenol
 3. 4-Nitrophenol 7. 2,4-Dichlorophenol
 4. 2-Chlorophenol 8. 2,4,6-Trichlorophenol

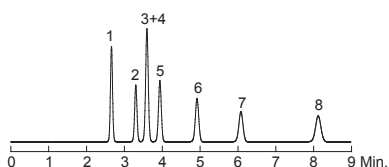
Dikma
Spursil™ 5 μm C18 (Cat#82001)



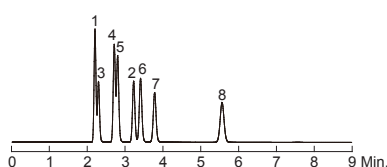
Dikma
Spursil™ 5 μm C18-EP (Cat#82101)



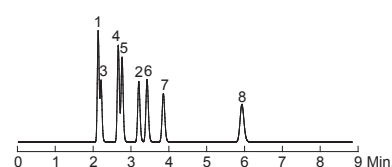
Agilent
ZORBAX 5 μm Bonus-RP



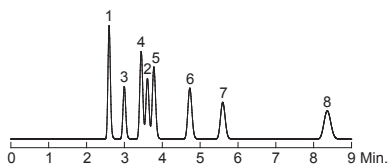
Agilent
ZORBAX 5 μm SB-C18



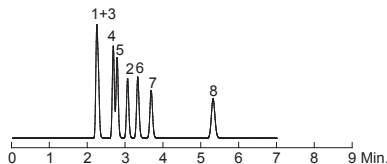
Agilent
ZORBAX Eclipse 5 μm XDB-C18



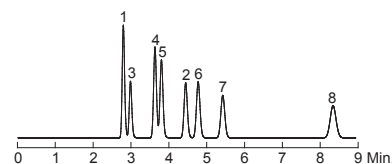
Waters
SymmetryShield 5 μm RP18



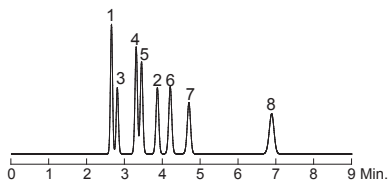
Waters
XBridge 5 μm C18



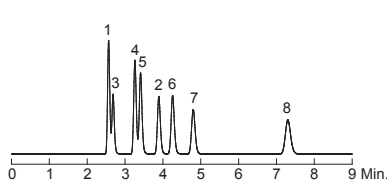
GL Science
Inertsil 5 μm ODS-3



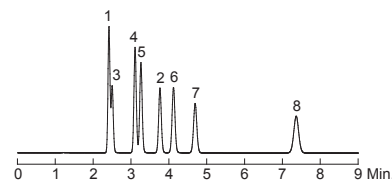
Phenomenex
Gemini 5 μm C18



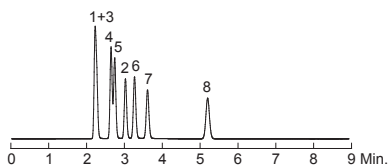
Phenomenex
Luna 5 μm C18(2)



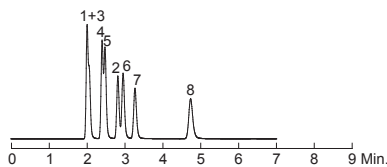
Eka Chemicals AB
Kromasil 5 μm C18



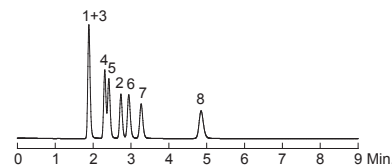
Thermo Scientific
Hypersil 5 μm BDS C18



Beckman Coulter
Ultrasphere 5 μm C18



Separation Methods Technologies
OD-5-100 5 μm C18

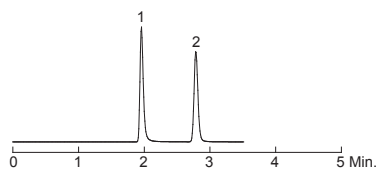


*The comparative data presented here may not be representative for all applications.

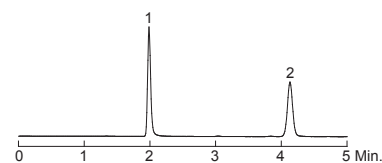
Pyridine / Phenol*

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: MeCN:H₂O = 50:50
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Pyridine
 2. Phenol

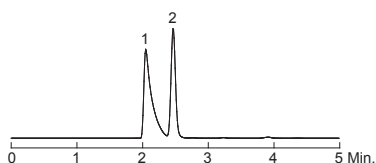
Dikma
 Spursil™ 5 μm C18 (Cat#82001)



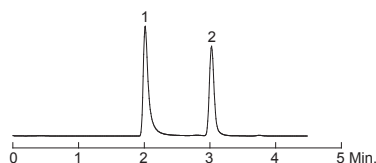
Dikma
 Spursil™ 5 μm C18-EP (Cat#82101)



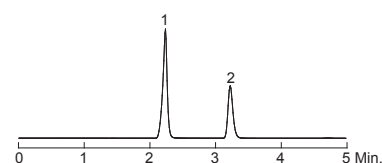
Waters
 XBridge 5 μm C18



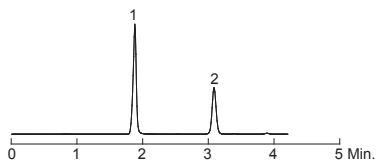
Waters
 SymmetryShield 5 μm C18



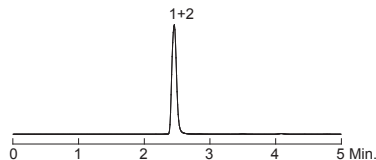
GL Science
 Inertsil 5 μm ODS-3



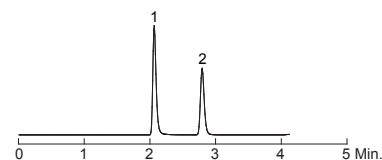
Agilent
 ZORBAX 5 μm Bonus-RP



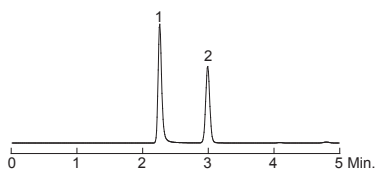
Agilent
 ZORBAX 5 μm SB-C18



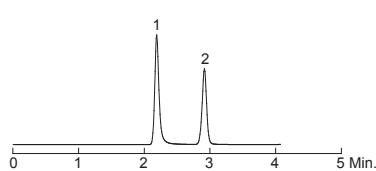
Agilent
 ZORBAX Eclipse 5 μm XDB-C18



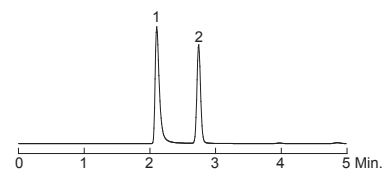
Phenomenex
 Gemini 5 μm C18



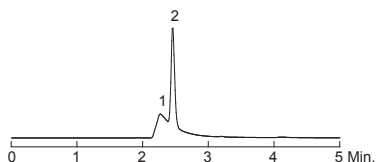
Phenomenex
 Luna 5 μm C18(2)



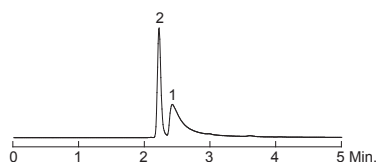
Eka Chemicals AB
 Kromasil 5 μm C18



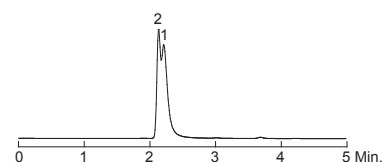
Thermo Scientific
 Hypersil 5 μm BDS C18



Beckman Coulter
 Ultrasphere 5 μm C18



Separation Methods Technologies
 OD-5-100 5 μm C18

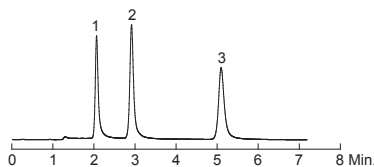


*The comparative data presented here may not be representative for all applications.

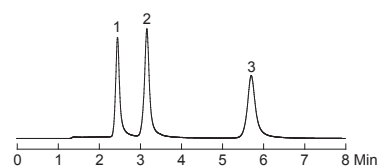
Catecholamines*

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: 20 mM KH₂PO₄, (pH 7)
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 270 nm
 Sample: 1. Norepinephrine
 2. Epinephrine
 3. Dopamine

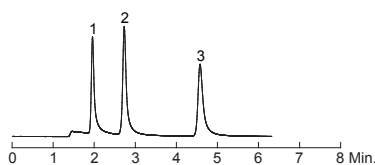
Dikma
Spursil™ 5 μm C18 (Cat#82001)



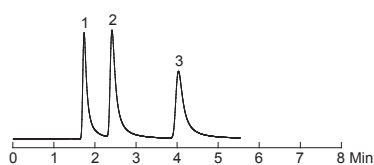
Dikma
Spursil™ 5 μm C18-EP (Cat#82101)



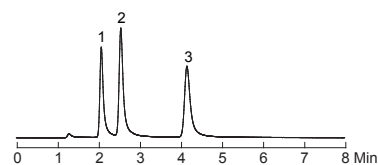
Waters
XBridge 5 μm C18



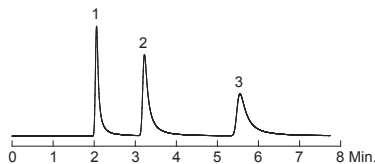
Waters
Symmetry 5 μm C18



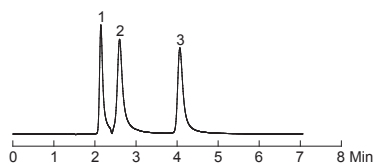
Waters
SymmetryShield 5 μm RP18



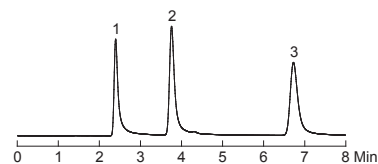
Agilent
ZORBAX 5 μm SB-C18



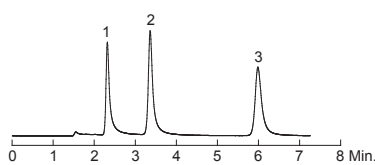
Agilent
ZORBAX 5 μm Bonus-RP



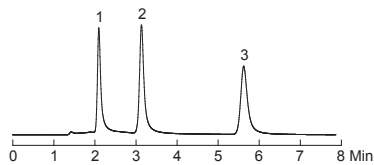
GL Science
Inertsil 5 μm ODS-3



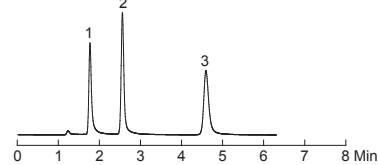
Phenomenex
Gemini 5 μm C18



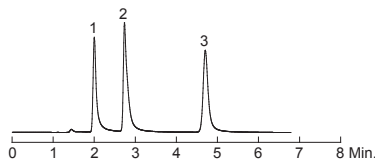
Phenomenex
Luna 5 μm C18(2)



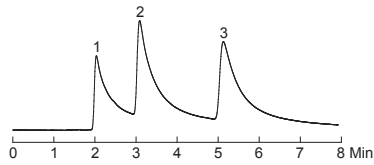
Eka Chemicals AB
Kromasil 5 μm C18



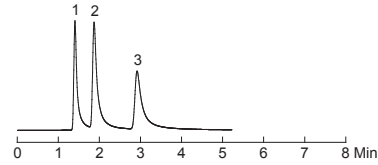
Thermo Scientific
Hypersil 5 μm BDS C18



Beckman Coulter
Ultrasphere 5 μm C18



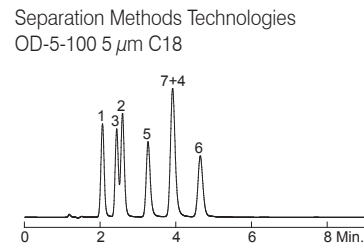
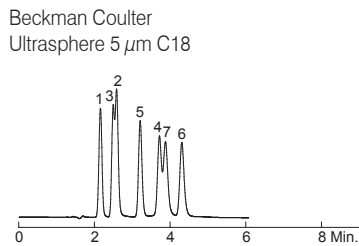
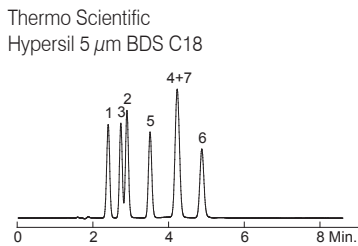
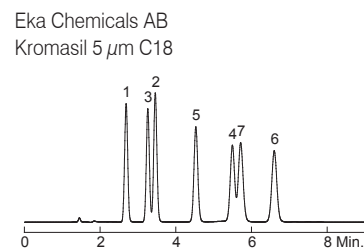
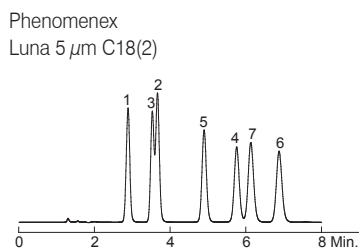
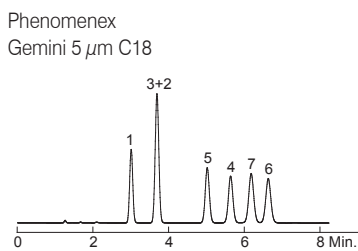
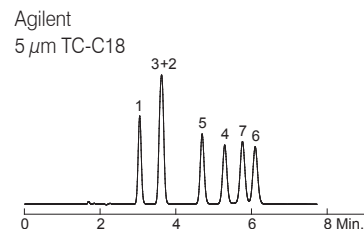
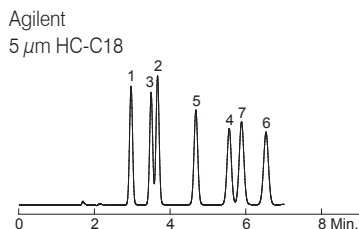
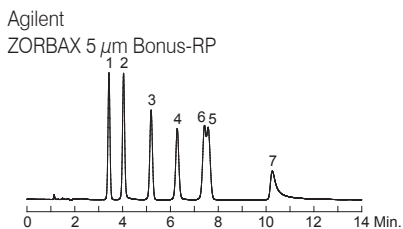
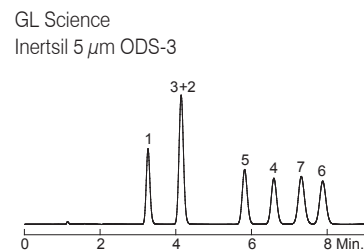
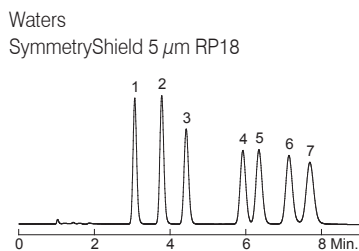
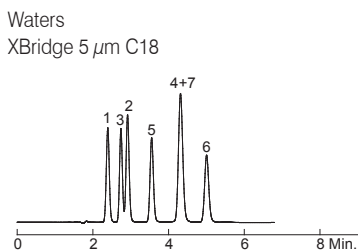
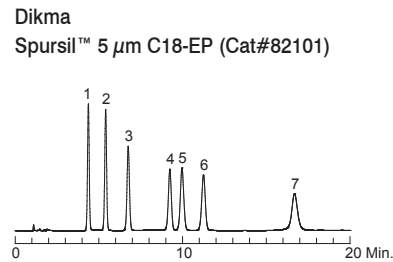
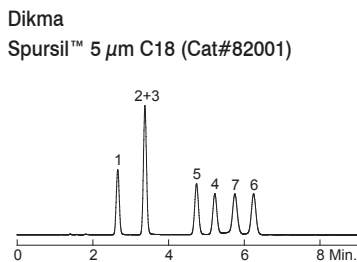
Separation Methods Technologies
OD-5-100 5 μm C18



*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 H₂O = 25:75
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 270 nm
 Sample: 1. Resorcinol 5. 2,5-Dimethylresorcinol
 2. Catechol 6. 3-Methylcatechol
 3. 2-Methylresorcinol 7. 4-Nitrocatechol
 4. 4-Methylcatechol

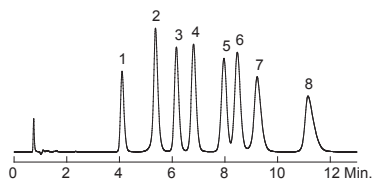


*The comparative data presented here may not be representative for all applications.

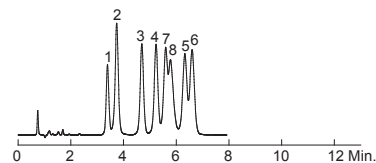
TCAs at High pH*

Column: Listed on chromatograms
 Dimension: 150 x 4.6 mm
 Mobile Phase: MeOH:5 mM NH₄HCO₃ (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

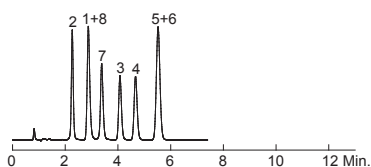
Dikma
Spursil™ 5 μm C18 (Cat#82001)



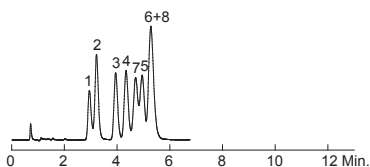
Dikma
Spursil™ 5 μm C18-EP (Cat#82101)



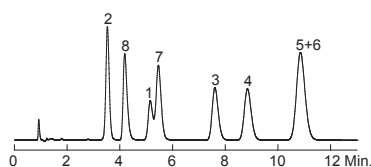
Waters
XBridge 5 μm C18



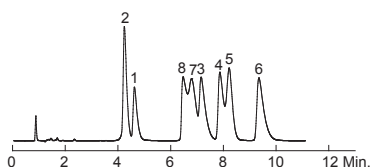
Waters
SymmetryShield 5 μm RP18



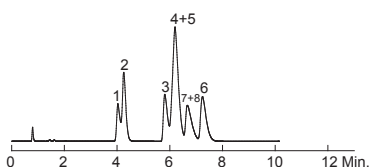
GL Science
Inertsil 5 μm ODS-3



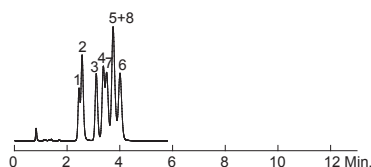
Agilent
5 μm HC-C18



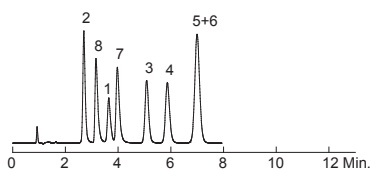
Agilent
5 μm TC-C18



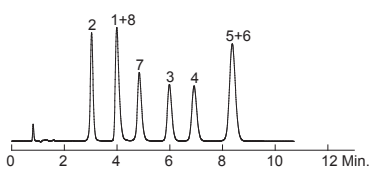
Agilent
ZORBAX 5 μm Bonus-RP



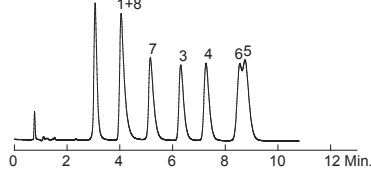
Phenomenex
Gemini 5 μm C18



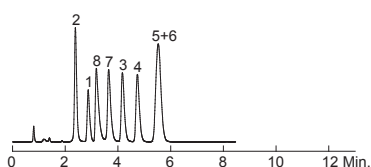
Phenomenex
Luna 5 μm C18(2)



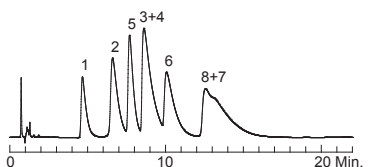
Eka Chemicals AB
Kromasil 5 μm C18



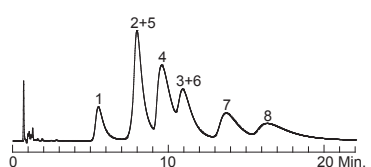
Thermo Scientific
Hypersil 5 μm BDS C18



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	50 x 2.1	100 x 2.1	150 x 2.1	250 x 2.1	10 x 2.1
Spursil™ C18	82030	82004	82012	82013	82015	6701
Spursil™ C18-EP	82130	82104	82112	82113	82115	6702

3 µm Analytical Columns (3.0 mm)

Phases	30 x 3.0	50 x 3.0	100 x 3.0	150 x 3.0	250 x 3.0	10 x 2.1
Spursil™ C18	82029	82021	82022	82023	82024	6701
Spursil™ C18-EP	82129	82121	82122	82123	82124	6702

3 µm Analytical Columns (4.6 mm)

Phases	30 x 4.6	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	10 x 4.0
Spursil™ C18	82031	82016	82017	82018	82020	6801
Spursil™ C18-EP	82131	82116	82117	82118	82120	6802

5 µm Analytical Columns (3.0 mm)

Phases	30 x 3.0	50 x 3.0	100 x 3.0	150 x 3.0	250 x 3.0	10 x 2.1
Spursil™ C18	82032	82025	82026	82027	82028	6703
Spursil™ C18-EP	82132	82125	82126	82127	82128	6704

5 µm Analytical Columns (4.6 mm)

Phases	30 x 4.6	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	10 x 4.0
Spursil™ C18	82034	82010	82011	82001	82006	6803
Spursil™ C18-EP	82134	82110	82111	82101	82106	6804

EasyGuard™ Guard Holder: Cat#6220

5 µm and 10 µm Semi-preparative Columns

Guard Cartridge, 2/pk

Phases	Particle Size (µm)	250 x 4.6 Cat. No.	250 x 10.0 Cat. No.	150 x 21.2 Cat. No.	250 x 21.2 Cat. No.	10 x 10.0 Cat. No.	10 x 21.2 Cat. No.
Spursil™ C18	5	82006	82038	82045	82039	6705	6706
Spursil™ C18-EP	5	82106	82138	82145	82139	6707	6708
Spursil™ C18	10	82035	82036	82046	82037	6709	6710
Spursil™ C18-EP	10	82135	82136	82146	82137	6711	6712

10 mm Guard Holder: Cat#6221, 21.2 mm Guard Holder: Cat#6222

10 µm Packing Materials

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

Features of Bio-Bond™ Columns

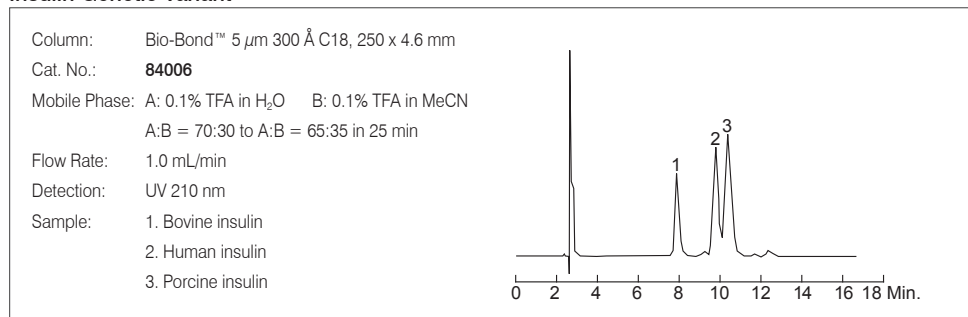
- Designed to analyze and purify proteins, peptides and biomolecules
- Available with C18, C8 and C4 bonded phases
- Direct scale-up to preparative material
- Outstanding reproducibility, efficiency and column lifetime

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.

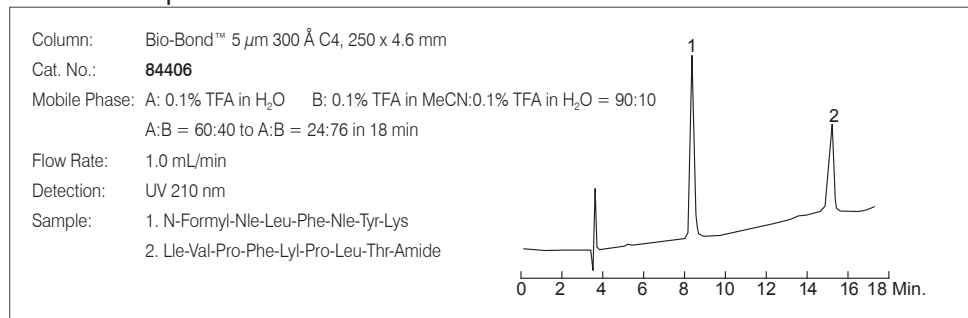
Bio-Bond™ Material Characteristics

Bonded phase	Particle size (µm)	Pore size (Å)	Surface area (m ² /g)	Purity (%)	Phase density (µmol/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

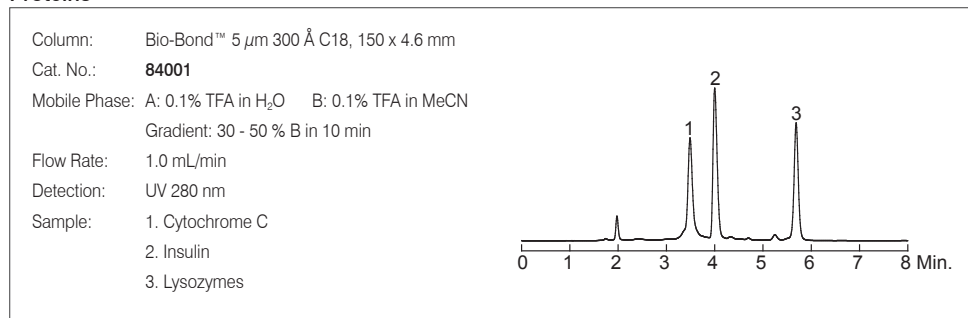
Insulin Genetic Variant



Chemotactic Peptide



Proteins



Bio-Bond™ Ordering Information

3 µm Analytical Columns

Guard Cartridges, 2/pk

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

5 µm Analytical Columns

Phases	50 x 4.6	150 x 4.6	250 x 4.6	10 x 4.0
Bio-Bond™ C18	84010	84001	84006	6953
Bio-Bond™ C8	84110	84101	84106	6954
Bio-Bond™ C4	84410	84401	84406	6956

EasyGuard™ Guard Holder: Cat#6220

5 µm and 10 µm Semi-preparative Columns

Guard Cartridges, 2/pk

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

10 mm EasyGuard™ Guard Holder: Cat#6221, 21.2 mm EasyGuard™ Guard Holder: Cat#6222

Platisil™

Features of Platisil™ C18 Columns

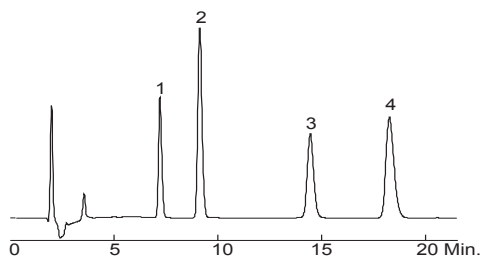
- Unique bonding technology prevents the phase collapse, and allows stable retention in highly aqueous mobile phases
- Unique selectivity, excellent peak shape
- Enhanced retention of polar compounds
- High loadability
- pH range 1 - 11
- Reduced silanol interactions and improved peak shape for basic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

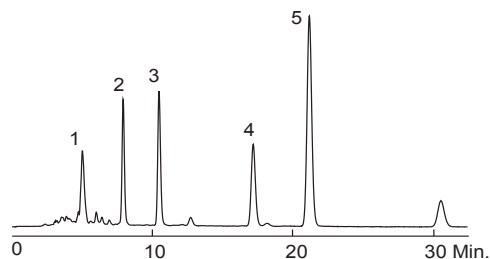
Cold Medicine

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™ C18 Ordering Information

5 µm Analytical Columns

Phase	150 x 4.6	250 x 4.6
Platisil™ C18	99501	99503

Features of Platisil™ NH₂ Columns **New!**

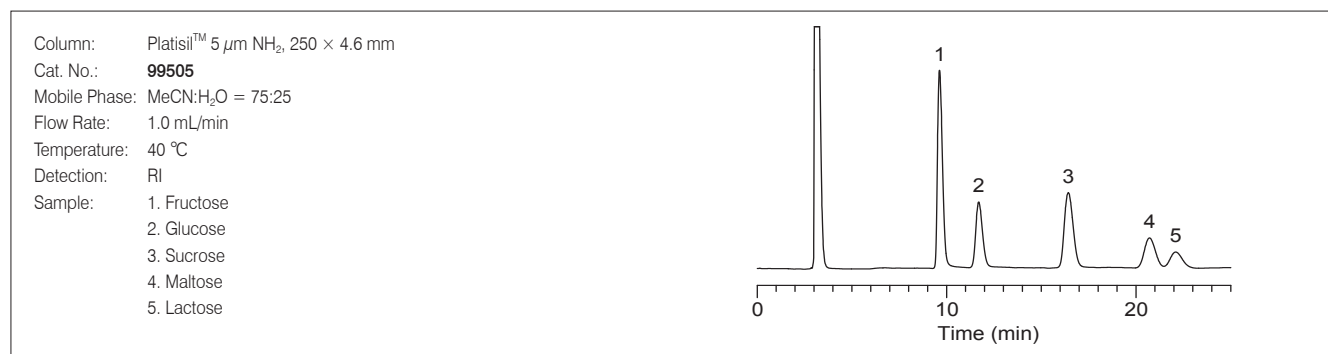
- Aminopropyl modified silica phase for multi-mode chromatography (RP, NP, & IC)
- Improved phase ruggedness and stability
- Excellent retention for polar compounds such as sugars, oligosaccharides, sugar alcohols, and other hydroxyl compounds, as well as DNA bases under RP conditions and vitamins A & D and hydrocarbons in the petroleum industry under NP conditions

Platisil™ NH₂ columns retain hydrogen-bonding compounds under three separation modes-RP, NP, and IC. Platisil™ NH₂ columns provide reproducible retention and selectivity with improved column lifetime.

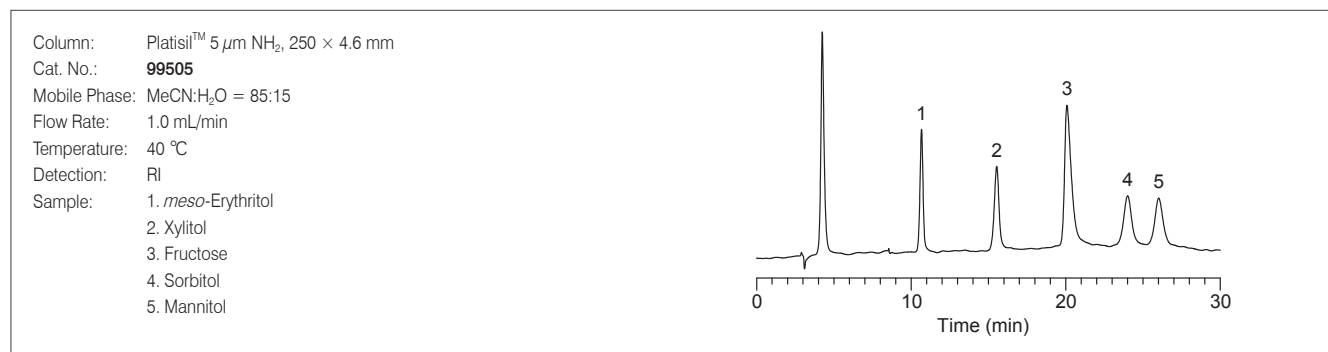
Platisil™ NH₂ Material Characteristics

Bonded phase	Particle size (μm)	Pore size (Å)	Surface area (m ² /g)	Purity (%)	Phase density (μmol/m ²)	Carbon loading (%)	pH range	Endcapping
NH ₂	3, 5, 10	100	440	> 99.999	3.2	7	2 - 7.5	No

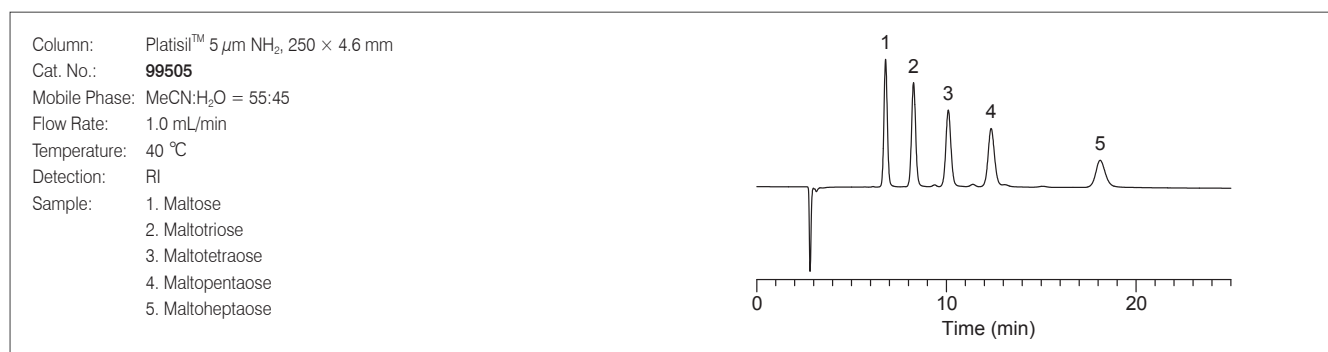
Sugars



Sugar Alcohols

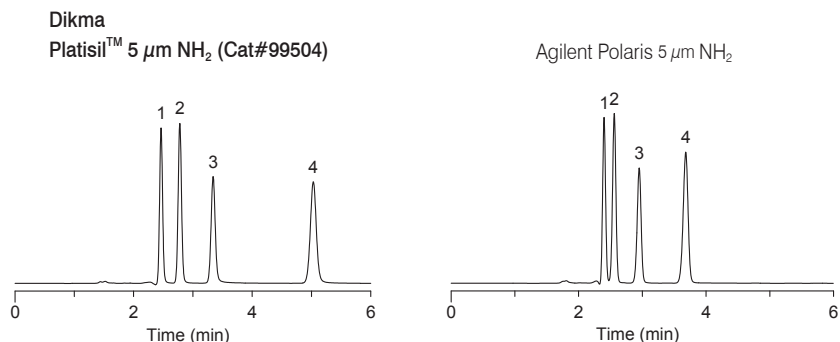


Malto Oligosugars



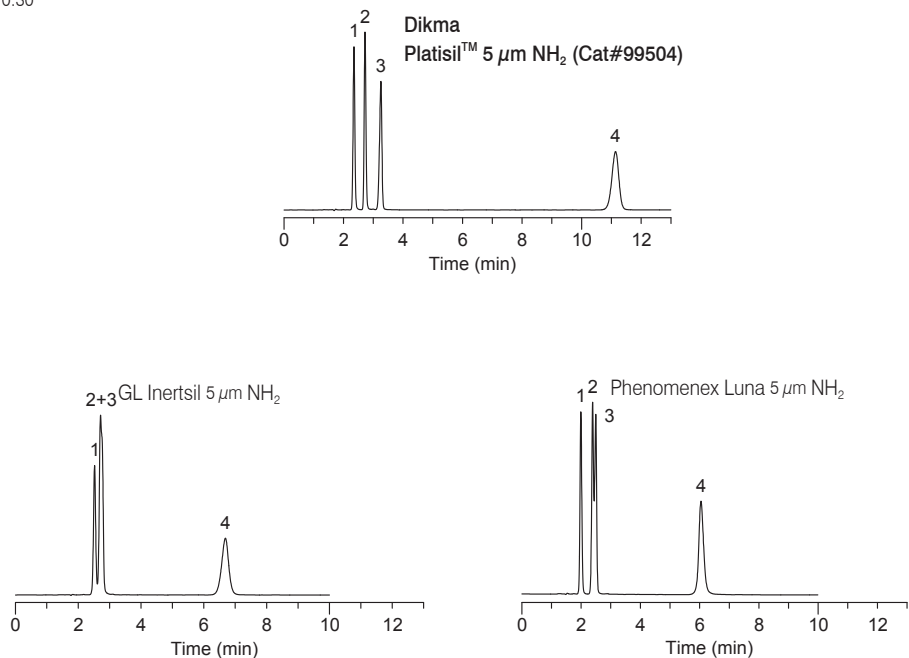
Nucleic Acid Bases*

Column: Listed on chromatograms
 Dimension: 150 × 4.6 mm
 Mobile Phase: MeCN:20 mM ammonium formate = 80:20
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Thymine
 2. Uracil
 3. Adenine
 4. Cytosine



Water-Soluble Vitamins*

Column: Listed on chromatograms
 Dimension: 150 × 4.6 mm
 Mobile Phase: MeCN:25 mM KH₂PO₄(pH 2.5) = 70:30
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Riboflavin
 2. Nicotinamide
 3. Pyridoxine
 4. Thiamine

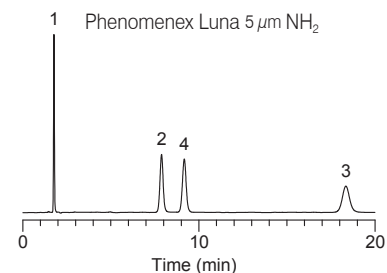
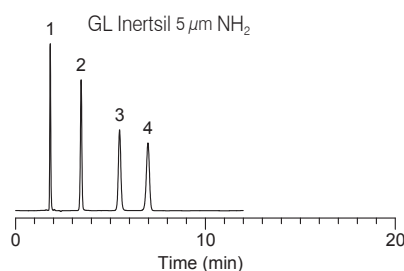
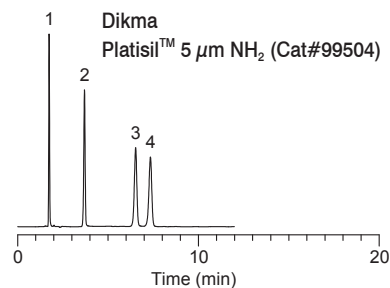


• Water-soluble vitamins provide an excellent platform to demonstrate the benefits of Platisil™ NH₂. The effect of increased polar compounds retention can be easily seen in this application.

*Polaris is a registered trademark of Agilent Technologies. Dikma Technologies Inc. is not affiliated with the above company.
 *Inertsil is a trademark of GL Sciences, Inc., 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.

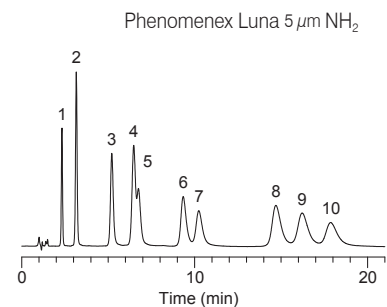
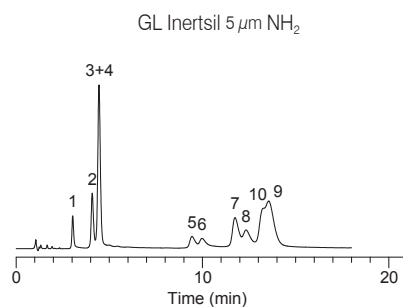
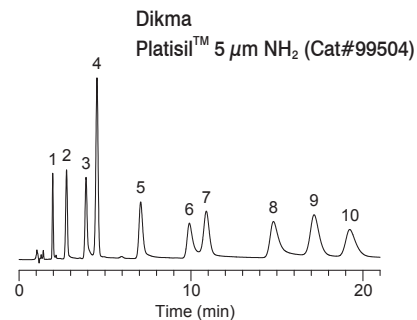
Salicylic Acids*

Column: Listed on chromatograms
 Dimension: 150 × 4.6 mm
 Mobile Phase: MeCN:20 mM CH₃COONH₄ (pH 6.8) = 80:20
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 228 nm
 Sample: 1. Salicylamide
 2. Salicylic acid
 3. 4-Aminosalicylic acid
 4. Acetylsalicylic acid



Steroids*

Column: Listed on chromatograms
 Dimension: 150 × 4.6 mm
 Mobile Phase: Hexane:Ethanol = 90:10
 Flow Rate: 2.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. 11-ketoprogesterone
 2. Progesterone
 3. Cortisone 21-acetate
 4. Prednisolone 21-acetate
 5. Corticosterone
 6. Cortisone
 7. Prednisone
 8. Hydrocortisone
 9. Prednisolone
 10. Dexamethasone



*Inertsil is a trademark of GL Sciences, Inc., 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.

Platisil™ NH₂ Ordering Information

5 μm Analytical Columns

Guard Cartridges, 5/pk

Phases	150 x 4.6	250 x 4.6	10 x 4.0
Platisil™ NH ₂	99504	99505	6215

EasyGuard™ Guard Holder: Cat#6220

Features of Platisil™ CN Columns New!

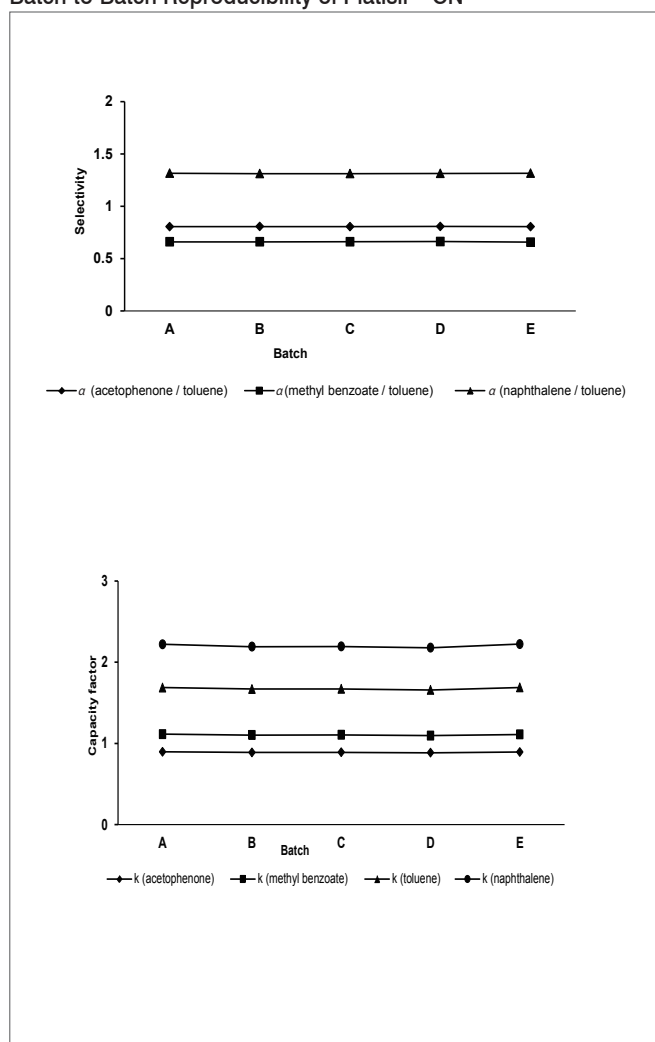
- Monomerically bonded cyanopropyl group
- Exceptionally high surface coverage and alternative selectivity
- Low hydrophobicity for rapid elution of hydrophobic analytes
- More reproducible separations than silica for NP applications
- Multi-mode column (RP, NP, & HILIC) widens scope of selectivity
- High retention capacity for polar and unsaturated compounds
- Excellent reproducibility and superior stability
- Quick equilibration and less sensitivity to small changes of the water content in the mobile phase
- Suitable for the separation of ionizable compounds such as basic drugs, organic acids, and steroids

Platisil™ CN columns offer a unique polar selectivity in RP and NP mode. They provide sharp peaks and great reproducibility run-to-run, column-to-column, and batch-to-batch. The smooth silica allows for a more uniform bonding with improved resistance to bonded phase hydrolysis to produce one of the most stable CN phases. The high coverage combined with a thorough endcapping makes Platisil™ CN columns suitable for the separation of ionizable compounds such as basic drugs, organic acids, and steroids as well as carboxyl, carbonyl, and amine containing compounds.

Platisil™ 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
CN	3, 5, 10	100	440	> 99.999	4.8	12	1.5 - 7.5	Yes

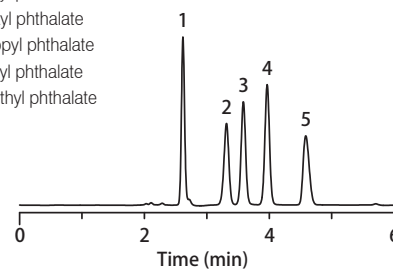
Batch-to-Batch Reproducibility of Platisil™ CN



Phthalate Esters

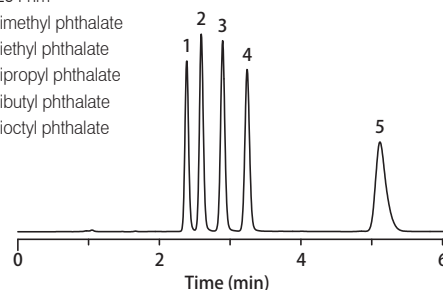
Normal Phase

Column: Platisil™ 5 μm CN, 150 × 4.6 mm
 Cat. No.: **99506**
 Mobile Phase: Hexane:Ethanol = 95:5
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Dioctyl phthalate
 2. Dibutyl phthalate
 3. Dipropyl phthalate
 4. Diethyl phthalate
 5. Dimethyl phthalate



Reversed Phase

Column: Platisil™ 5 μm CN, 150 × 4.6 mm
 Cat. No.: **99506**
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Dimethyl phthalate
 2. Diethyl phthalate
 3. Dipropyl phthalate
 4. Dibutyl phthalate
 5. Dioctyl phthalate



Selectivity and Retention Comparison

Column: Listed on chromatograms

Dimension: 150 × 4.6 mm

Mobile Phase: MeOH:H₂O = 65:35

Flow Rate: 1.0 mL/min

Temperature: Ambient

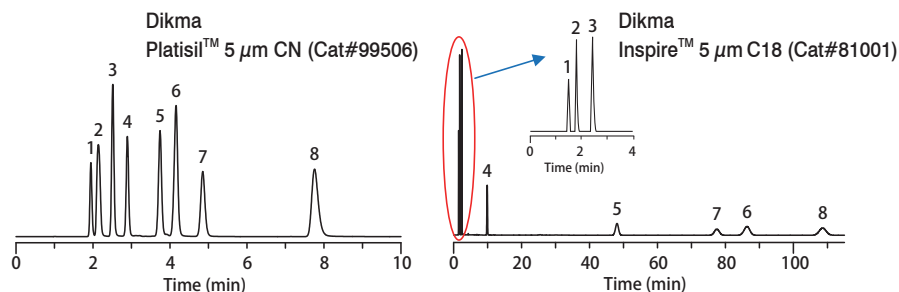
Detection: UV 254 nm

Sample: 1. Uracil 5. Butylbenzene

2. Caffeine 6. Amylbenzene

3. Phenol 7. *o*-Terphenyl

4. Toluene 8. Triphenylene



Anti-inflammatories*

Column: Listed on chromatograms

Dimension: 150 × 4.6 mm

Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 50:50

Flow Rate: 1.0 mL/min

Temperature: Ambient

Detection: UV 254 nm

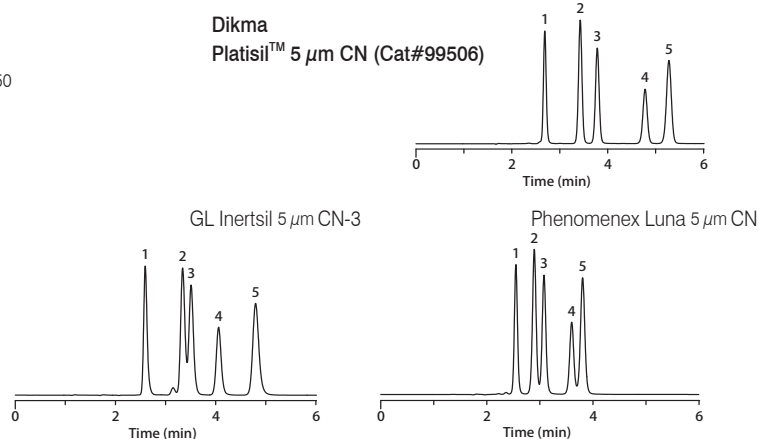
Sample: 1. Phenacetin

2. Tolmetin

3. Ketoprofen

4. Ibuprofen

5. Meclofenamic acid



Steroids*

Column: Listed on chromatograms

Dimension: 150 × 4.6 mm

Mobile Phase: Hexane:Ethanol = 90:10

Flow Rate: 2.0 mL/min

Temperature: Ambient

Detection: UV 254 nm

Sample: 1. 11-Ketoprogesterone

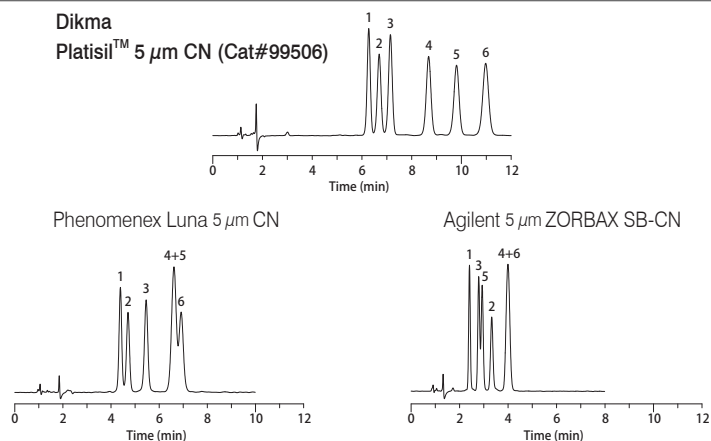
2. Prednisolone 21-acetate

3. Corticosterone

4. Prednisolone

5. Cortisone

6. Dexamethasone



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

*Inertsil is a trademark of GL Sciences, Inc., 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.

Platisil™ CN Ordering Information

5 μm Analytical Columns

Guard Cartridges, 5/pk

Phases	150 x 4.6	250 x 4.6	10 x 4.0
Platisil™ CN	99506	99507	6214

EasyGuard™ Guard Holder: Cat. #6220

Platisil™

Features of Platisil™ Silica Columns **New!**

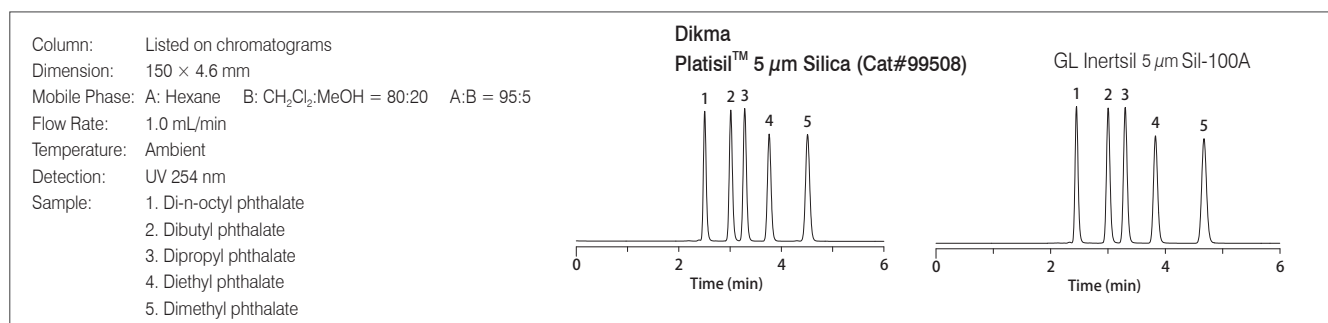
- High loading capacity and strong mechanical stability due to exceptionally stable silica packing
- Minimal peak distortion
- Useful for separating compounds differing in the number and type of the functional groups
- Suitable for the separation of stereoisomers as well as neutral and weakly acidic compounds
- Excellent batch-to-batch reproducibility

Platisil™ Silica is ideal for the rapid separation of low molecular weight compounds that are soluble in organic solvents. Separation on silica columns depend upon the difference in orientation, type, and number of functional groups associated with the compounds in the sample.

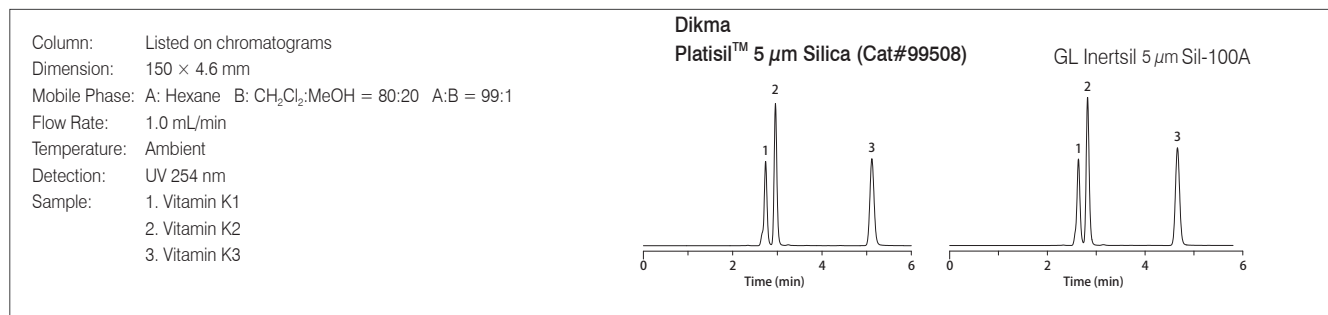
Platisil™ Silica Material Characteristics

Bonded phase	Particle size (μm)	Pore size (Å)	Surface area (m ² /g)	Purity (%)	Impurity (ppm)	Carbon loading (%)	pH range	Endcapping
Silica	3, 5, 10	100	440	>99.999	<5	—	1.5 - 7.5	No

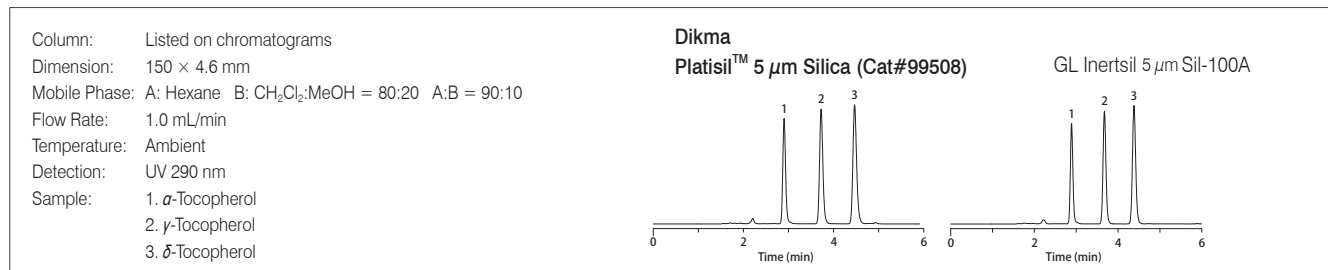
Phthalate Esters*



Vitamin K*



Tocopherols*



*Inertsil is a trademark of GL Sciences, Inc., Dikma Technologies Inc. is not affiliated with the above company.

Platisil™ Silica Ordering Information

5 μm Analytical Columns

Phases	150 x 4.6	250 x 4.6	10 x 4.0
Platisil™ Silica	99508	99509	6216

Guard Cartridges, 5/pk

EasyGuard™ Guard Holder: Cat. #6220

Features of Platisil™ PH Columns ^{New!}

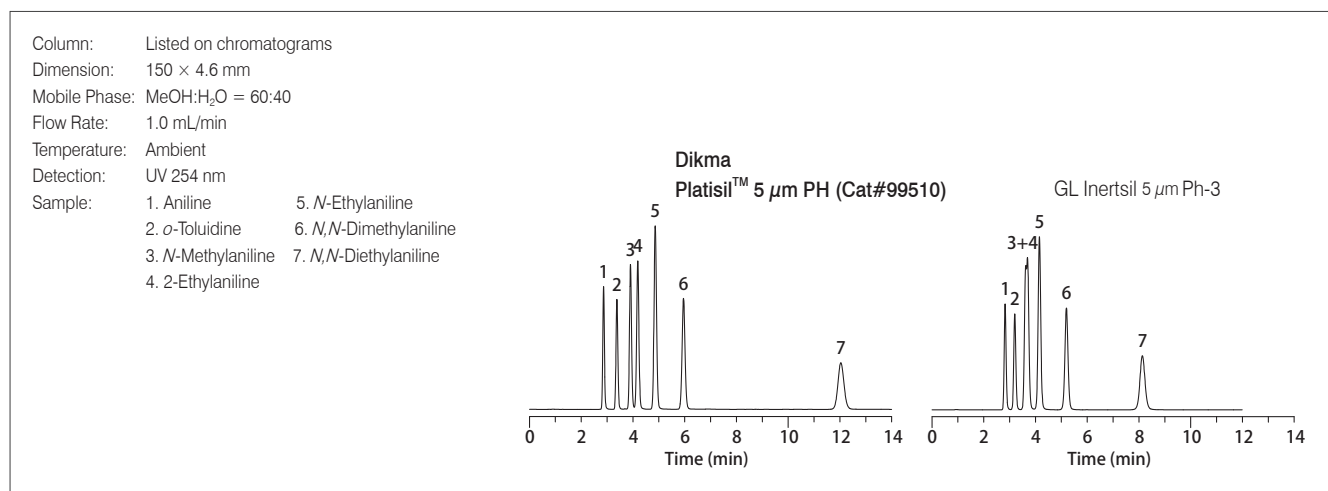
- Monomerically bonded phenyl group
- Alternative selectivity from π - π interactions
- Exceptionally high surface coverage and superior stability
- Lower hydrophobicity than C8 columns for rapid elution of hydrophobic analytes
- Excellent resolution and reproducibility
- Suitable for the separation of polar compounds, aromatic compounds, and isomers

Platisil™ PH columns are well-suited for the separation of aromatic and polar compounds in RP mode. The retention characteristics are similar to those of the C8 phase, but with lower hydrophobicity. The presence of the phenyl functional group provides π - π interactions and offers alternative selectivity compared to traditional alkyl bonded phases, thereby expanding the range of selectivity options available. These columns provide sharp peaks and great reproducibility run-to-run, column-to-column, and batch-to-batch. The high coverage combined with a thorough endcapping makes Platisil™ PH columns more stable and durable.

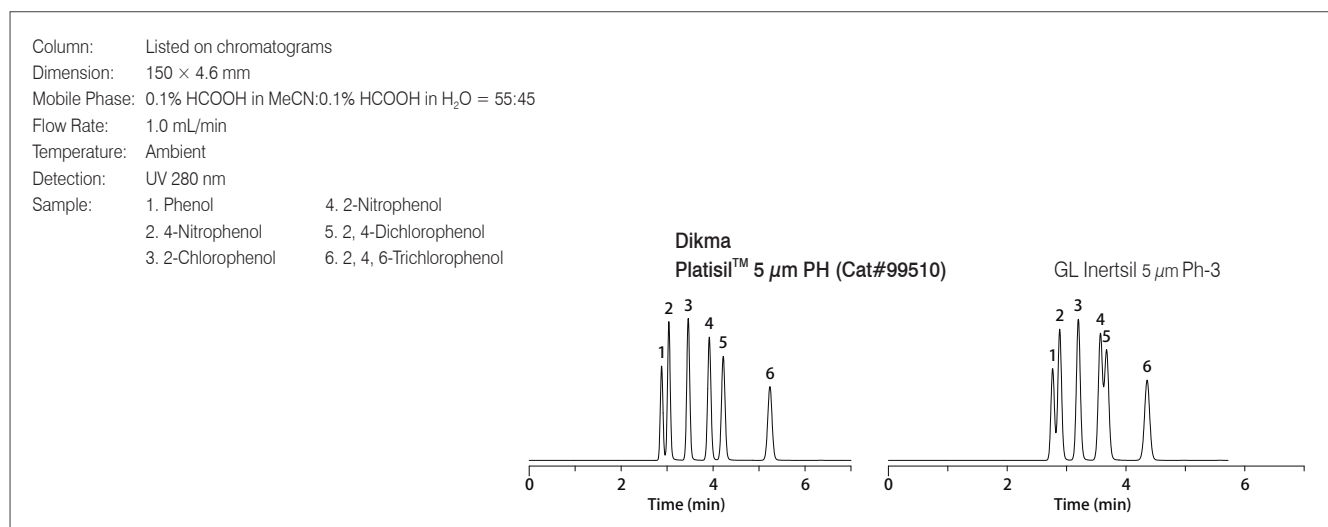
Platisil™ PH Material Characteristics

Bonded phase	Particle size (μm)	Pore size (\AA)	Surface area (m^2/g)	Purity (%)	Phase density ($\mu\text{mol}/\text{m}^2$)	Carbon loading (%)	pH range	Endcapping
Phenyl	3, 5, 10	100	440	>99.999	4.1	14	1.5 - 7.5	Yes

Aniline Homologs*



Phenol Homologs*

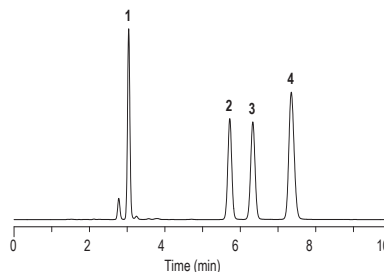


*Inertsil is a trademark of GL Sciences, Inc., Dikma Technologies Inc. is not affiliated with the above company.

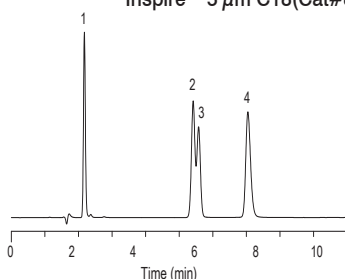
Polar Acids (Enhanced Selectivity)*

Column: Listed on chromatograms
 Dimension: 150 × 4.6 mm
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 30:70
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. *p*-Aminobenzoic acid
 2. Sorbic acid
 3. Benzoic acid
 4. Salicylic acid

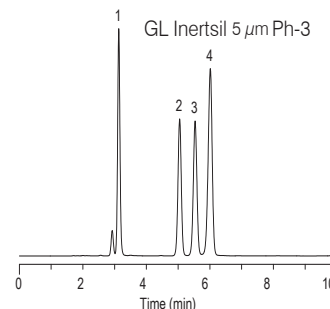
Dikma
Platisil™ 5 μm PH (Cat#99510)



Dikma
Inspire™ 5 μm C18(Cat#81001)



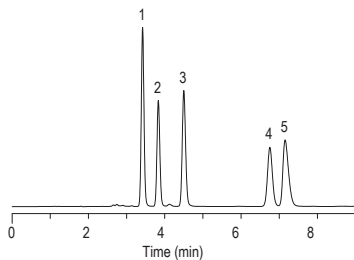
GL Inertsil 5 μm Ph-3



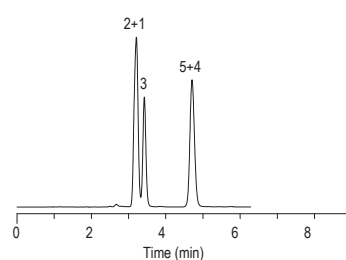
Steric Selectivity*

Column: Listed on chromatograms
 Dimension: 150 × 4.6 mm
 Mobile Phase: MeOH:H₂O = 75:25
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. *N,N*-Dimethylaniline
 2. Ethylbenzene
 3. Propylbenzene
 4. *trans*-Stilbene
 5. Bibenzyl

Dikma
Platisil™ 5 μm PH (Cat#99510)



GL Inertsil 5 μm Ph-3



*Inertsil is a trademark of GL Sciences, Inc., Dikma Technologies Inc. is not affiliated with the above company.

Platisil™ PH Ordering Information

5 μm Analytical Columns

Guard Cartridges, 5/pk

Phases	150 x 4.6	250 x 4.6	10 x 4.0
Platisil™ PH	99510	99511	6213

EasyGuard™ Guard Holder: Cat. #6220

Features of Diamonsil® HPLC Columns

- General-purpose, highly inert reversed-phase columns
- Simultaneous separation of acids, bases, and neutral compounds with excellent peak shape
- Outstanding selectivity for efficient method development
- Uses high-purity silica with impurities less than 10 ppm
- Superior batch-to-batch reproducibility

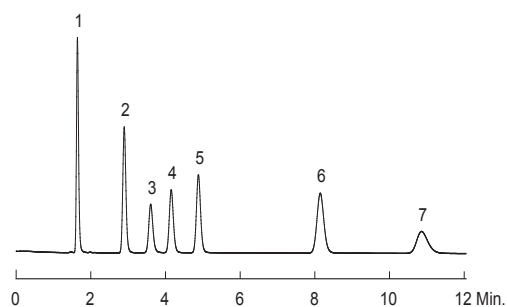


Diamonsil® Material Characteristics

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	17	2 - 7.5	Yes
C8	5	100	440	> 99.999	<10	10	2 - 7.5	Yes

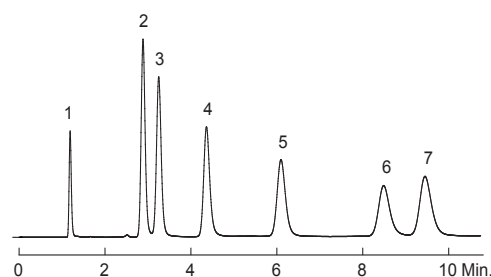
Separation of Hydrophobic, Polar and Basic Mixture

Column: Diamonsil® 5 µm C18, 150 x 4.6 mm
 Cat. No.: 99901
 Mobile Phase: MeOH:20 mM KH₂PO₄ + K₂HPO₄ (pH 7) = 80:20
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Uracil
 2. Butyl paraben
 3. Propranolol
 4. Dipropyl phthalate
 5. Naphthalene
 6. Acenaphthene
 7. Amitriptyline



Strong Basic Compounds at High pH

Column: Diamonsil® 5 µm C18, 150 x 4.6 mm
 Cat. No.: 99901
 Mobile Phase: MeOH:5 mM NH₄HCO₃ (pH 10) = 70:30
 Flow Rate: 1.0 mL/min
 Detection: UV 220 nm
 Sample: 1. Impurity
 2. Pindolol
 3. Acebutolol
 4. Metoprolol
 5. Bisoprolol
 6. Propranolol
 7. Alprenolol



Diamonsil® Ordering Information

5 µm Analytical Columns

Phases	150 x 4.6	200 x 4.6	250 x 4.6
Diamonsil® C18	99901	99902	99903
Diamonsil® C8	99801	-	99803

Diamonsil®

Features of Diamonsil® (2) HPLC Columns

- High efficiency and outstanding lifetime
- Excellent separation characteristics over wide pH range (1.5 - 9)
- Rapid separations with excellent resolution
- Faster method development
- Superior batch-to-batch reproducibility



The quality of packing material is the basis for all good chromatographic separation. 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.

Dikma incorporates a proprietary bonding technique to make Diamonsil® (2) packing much more efficient and stable across a broad pH range (1.5 - 9).

Dikma's proprietary endcapping technique covers unreacted silanols on the silica surface to eliminate unpredictable secondary interactions. Basic analytes tend to produce asymmetric tailed peaks on non endcapping columns, thereby leading to low column performance. Diamonsil® (2) columns are available in 3, 5, and 10 micron particle sizes. The bonded phases include C18 and C8. Column lengths range from 30 mm to 250 mm, and column dimensions range from 2 mm to 4.6 mm.

Diamonsil® (2) Material Characteristics

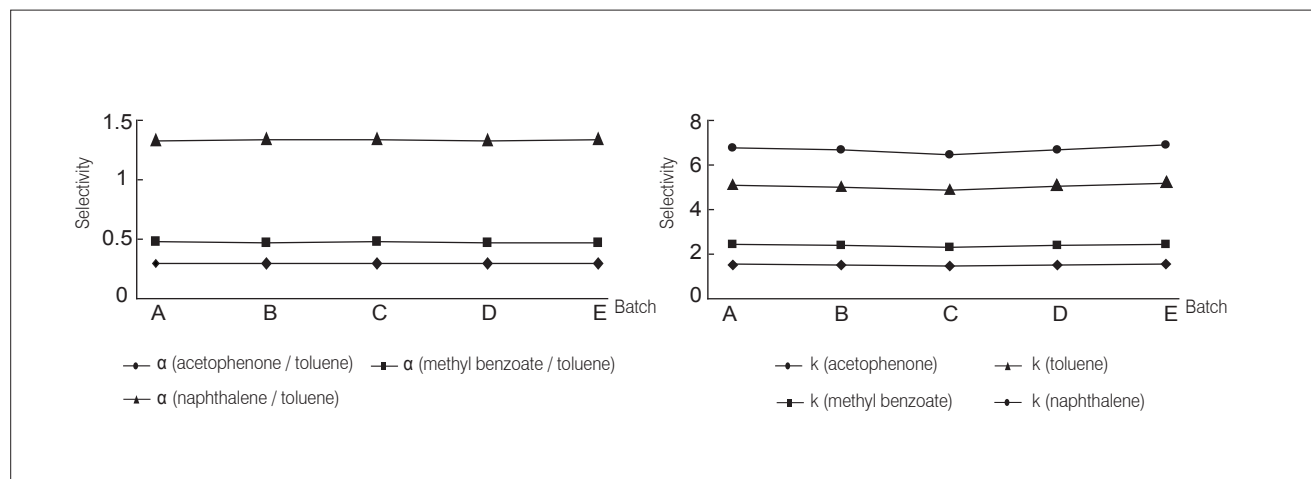
Bonded phase	Particle size (µm)	Pore size (Å)	Surface area (m ² /g)	Purity (%)	Impurities (mg/kg)	Carbon loading (%)	pH range	Endcapping
C18(2)	3, 5, 10	100	440	> 99.999	<10	27	1.5 - 9	Yes
C8(2)	3, 5, 10	100	440	> 99.999	<10	17	1.5 - 9	Yes

Superior Batch-to-Batch Reproducibility

Batch-to-batch reproducibility is essential for all analytical laboratories. Diamonsil® (2) columns are engineered with high purity raw silica, rigorously controlled manufacturing processes, and column packing procedures to ensure long-term reproducibility, letting you increase your laboratory's productivity and allowing for easier method transfer between labs around the world.

Reproducibility Test

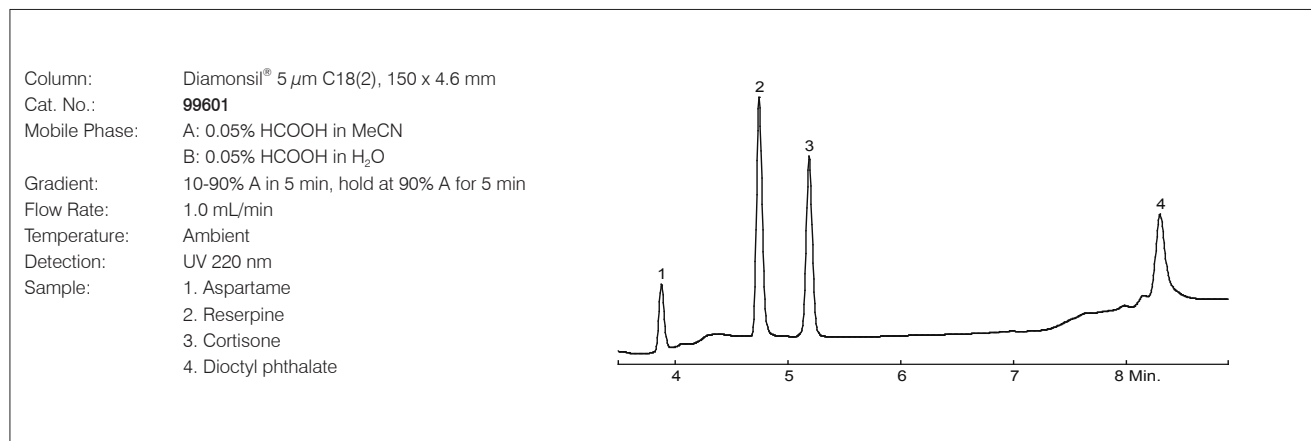
Five randomly selected batches demonstrated excellent reproducibility in the example shown:



Efficient Method Development

The Dolan test** was developed by Dr. John W. Dolan to accelerate the process of establishing a new RPLC/MS method. LC/MS performance test mix (LPTM) is composed of aspartame, cortisone, reserpine, and dioctyl phthalate to evaluate RPLC 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). LPTM contains a very hydrophilic compound (aspartame) and a very hydrophobic compound (dioctyl phthalate). It also contains two compounds (cortisone, reserpine) with very similar polarities to monitor the selectivity of the RPLC column. High quality separation of these components demonstrates the broad applicability of Diamonsil® C18(2) 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. LC/MS Performance Test Mix



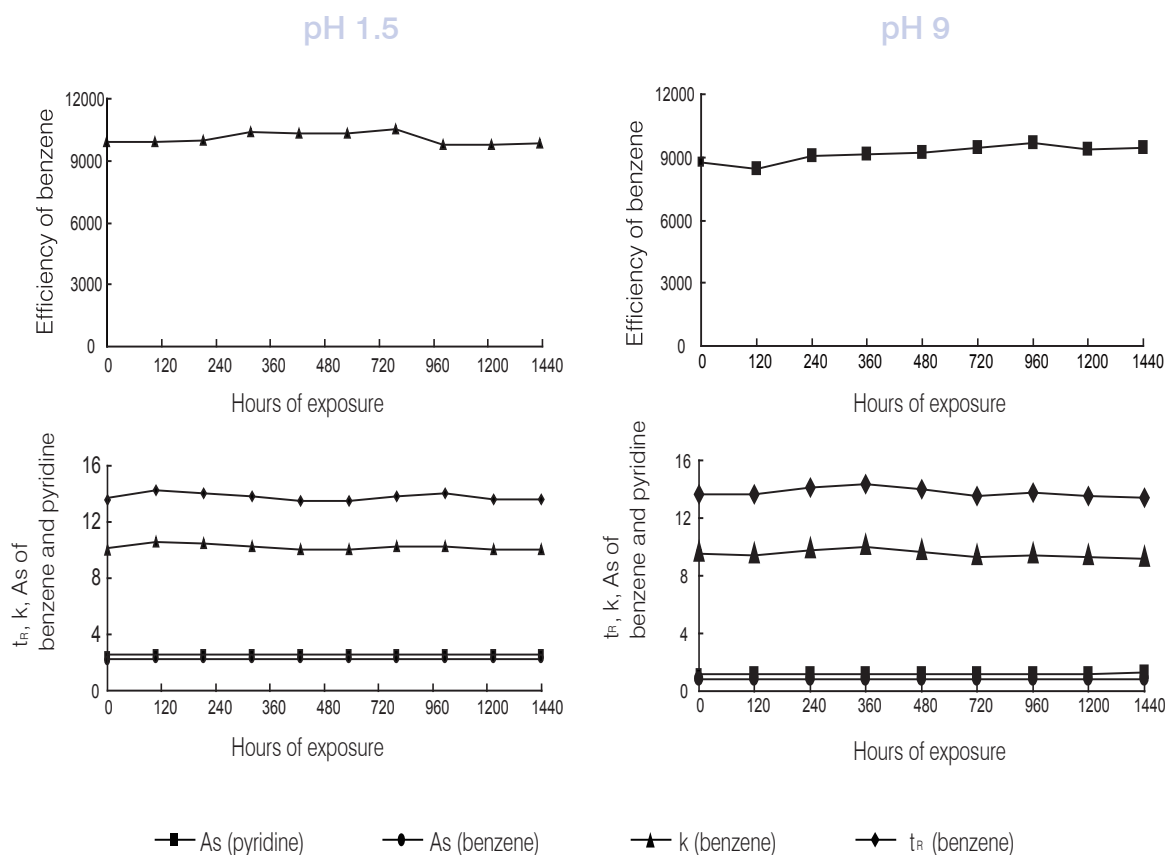
Stable from pH 1.5 to 9

Generally, silica-based column packings are unstable under extreme pH mobile phases and can exhibit hydrolysis of the bonded phase at low pH (<2.0) and dissolution of silica at high pH (>7.5), resulting in significantly shortened column lifetime.

Dikma incorporates proprietary bonding and endcapping techniques, making Diamonsil® (2) packing much more stable across a pH range (1.5 - 9). In both low pH 1.5 and high pH 9 tests, Diamonsil® (2) 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: Diamonsil® 5 μ m C18(2), 150 x 4.6 mm
 Cat. No.: 99601
 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 H₂O = 50:50
 Flow Rate: 1.0 mL/min
 Temperature: Ambient

Flush solution (pH 9)

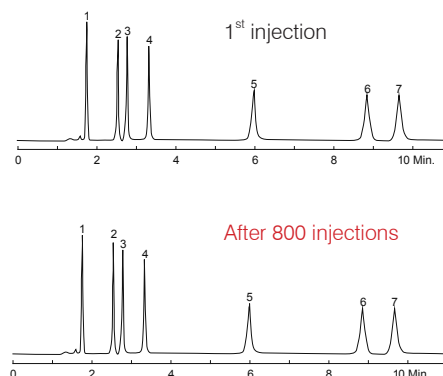
Mobile Phase: MeCN:20 mM phosphate buffer = 50:50
 Flow Rate: 1.0 mL/min
 Temperature: Ambient

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. With strict quality control of uniformity of particle structure and mechanical stability of the packed bed, Diamonsil® (2) columns deliver guaranteed, consistent performance across a long lifetime.

Lifetime Test

Column: Diamonsil® 5 µm C18(2), 150 x 4.6 mm
 Cat. No.: **99601**
 Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H₂O = 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



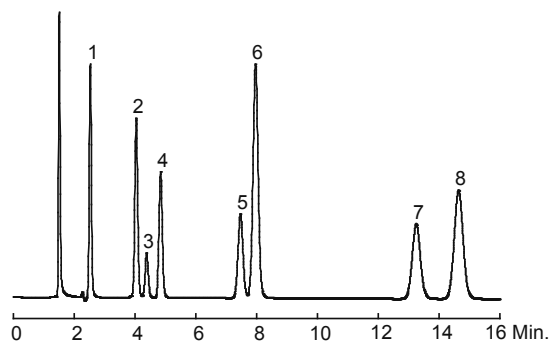
Diamonsil® (2) columns last over 800 injections with minimal loss in efficiency, symmetry, and retention time.

Outstanding Selectivity and Resolution

When separating a complex mixture containing acid, basic, polar, and non-polar compounds, various columns show different selectivity and retention. Generally, with higher carbon loading and phase density, the RPLC column has better selectivity and resolution. Due to high phase density, Diamonsil® (2) columns show ultimate performance for analyzing complex mixtures.

Caffeine Metabolites

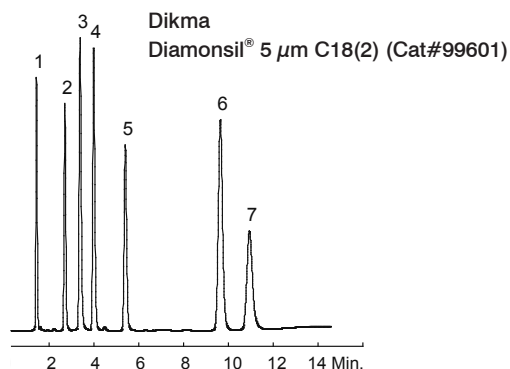
Column: Diamonsil® 5 µm C18(2), 150 x 4.6 mm
 Cat. No.: **99601**
 Mobile Phase: MeOH:0.1% HCOOH in H₂O = 10:90
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample:
 1. Xanthine
 2. 7-Methylxanthine
 3. 1-Methyluric acid
 4. 3-Methylxanthine
 5. 1,3-Dimethyluric acid
 6. Theobromine
 7. 1,7-Dimethylxanthine
 8. Theophylline



Separation of Hydrophobic, Polar, and Basic Mixture*

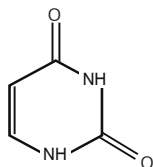
The Neue Test is a classic method for testing column selectivity. Uracil is used to determine the dead time of the column. Butyl paraben and dipropyl phthalate are polar neutral compounds; Naphthalene and acenaphthene are non-polar neutral compounds reflecting column hydrophobicity; Propranolol and amitriptyline are polar basic compounds. Partially endcapped reversed-phase columns will exhibit strong tailing during the separation of this mixture.

Column: Listed on chromatograms
 Dimension: 150 × 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. Butyl paraben
 3. Propranolol
 4. Dipropyl phthalate
 5. Naphthalene
 6. Acenaphthene
 7. Amitriptyline

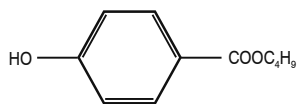


Structures of hydrophobic, polar, and basic compounds investigated

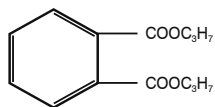
Uracil



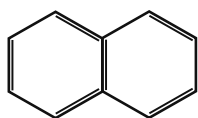
Butyl paraben



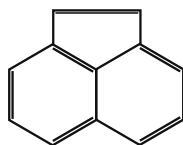
Dipropyl phthalate



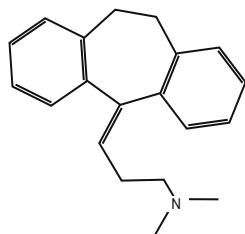
Naphthalene



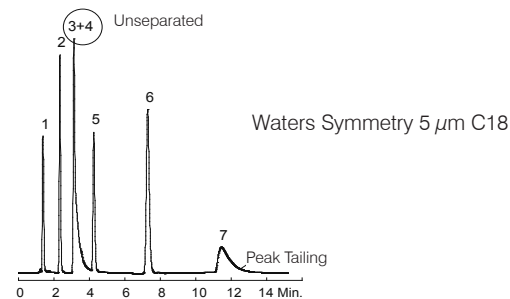
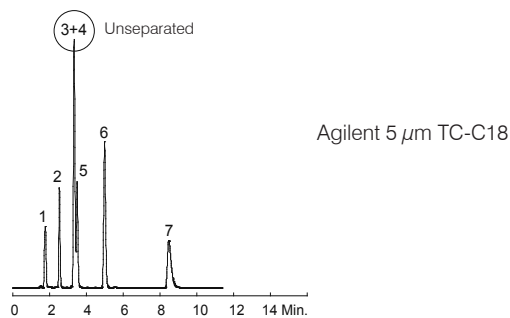
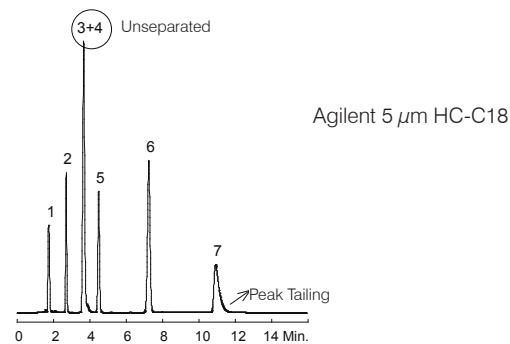
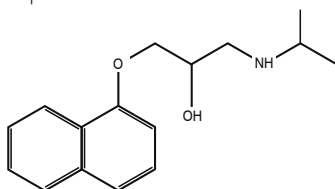
Acenaphthene



Amitriptyline



Propranolol



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

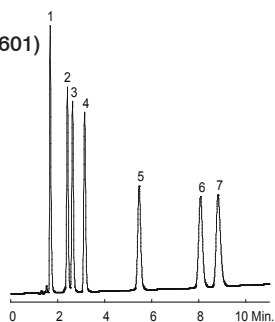
*TC-C18 is a registered trademark of Agilent Technologies. Dikma Technologies Inc. is not affiliated with the above company.

*HC-C18 is a registered trademark of Agilent Technologies. Dikma Technologies Inc. is not affiliated with the above company.

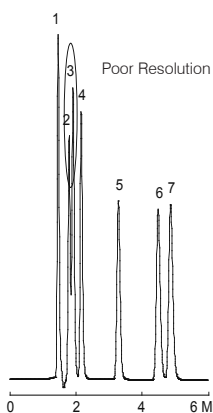
β-Blockers at Low pH*

Column: Listed on chromatograms
 Dimension: 150 × 4.6 mm
 Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H₂O = 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

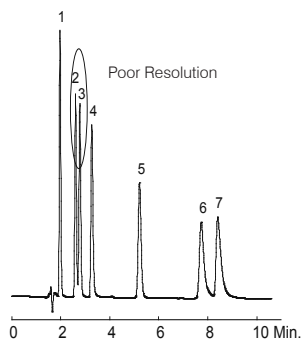
**Dikma
 Diamonsil® 5 μm C18(2) (Cat#99601)**



Waters Symmetry 5 μm C18



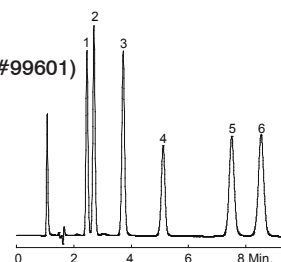
Agilent 5 μm HC-C18



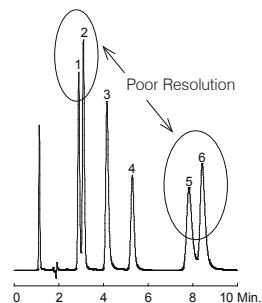
β-Blockers at High pH*

Column: Listed on chromatograms
 Dimension: 150 × 4.6 mm
 Mobile Phase: MeOH:5 mM NH₄HCO₃ (pH 10) = 70:30
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 220 nm
 Sample: 1. Pindolol
 2. Acebutolol
 3. Metoprolol
 4. Bisoprolol
 5. Propranolol
 6. Alprenolol

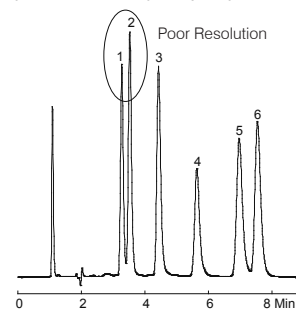
**Dikma
 Diamonsil® 5 μm C18(2) (Cat#99601)**



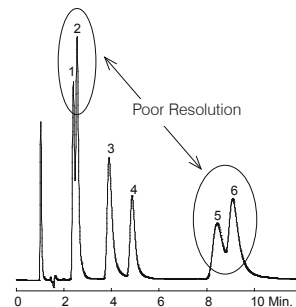
Agilent 5 μm TC-C18



Phenomenex Luna 5 μm C18



Waters Symmetry 5 μm C18

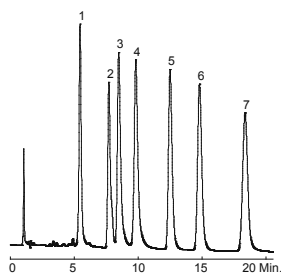


*Luna is a registered trademark of Phenomenex. Dikma Technologies Inc. is not affiliated with the above company.
 *Symmetry is a registered trademark of Waters Corporation. Dikma Technologies Inc. is not affiliated with the above company.
 *TC-C18 is a registered trademark of Agilent Technologies. Dikma Technologies Inc. is not affiliated with the above company.
 *HC-C18 is a registered trademark of Agilent Technologies. Dikma Technologies Inc. is not affiliated with the above company.

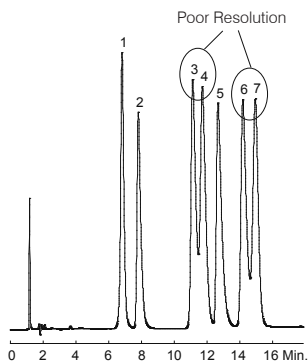
TCAs at High pH*

Column: Listed on chromatograms
 Dimension: 150 × 4.6 mm
 Mobile Phase: MeOH:5 mM NH₄HCO₃ (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

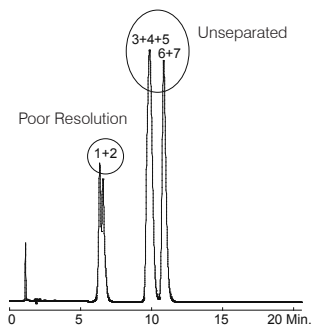
Dikma
 Diamonsil® 5 μm C18(2) (Cat#99601)



Agilent 5 μm HC-C18



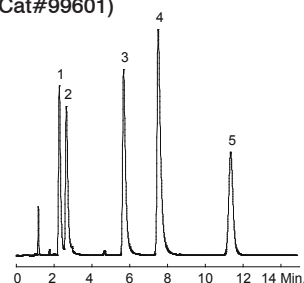
Agilent 5 μm TC-C18



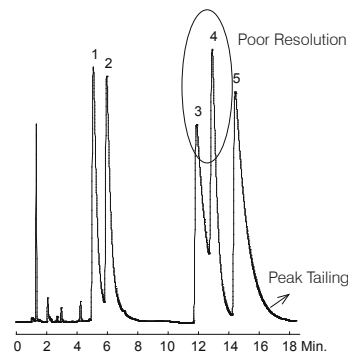
TCAs at Neutral pH*

Column: Listed on chromatograms
 Dimension: 150 × 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

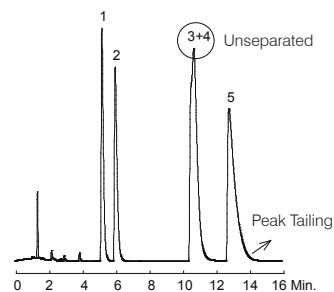
Dikma
 Diamonsil® 5 μm C18(2) (Cat#99601)



Agilent 5 μm HC-C18



Agilent 5 μm TC-C18

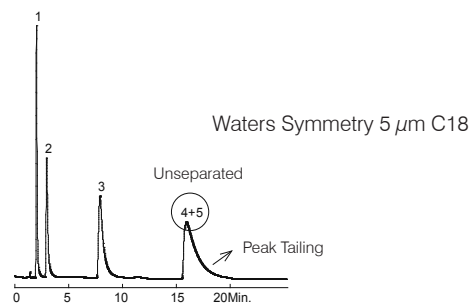
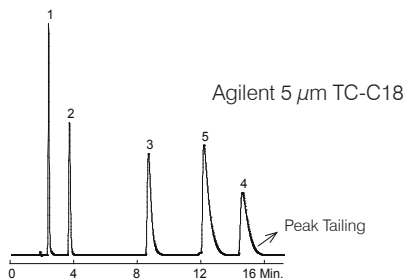
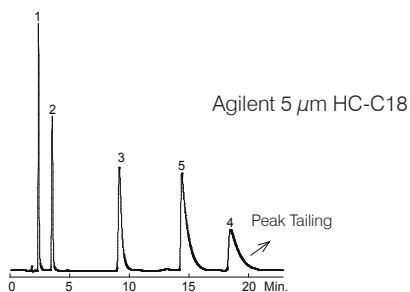
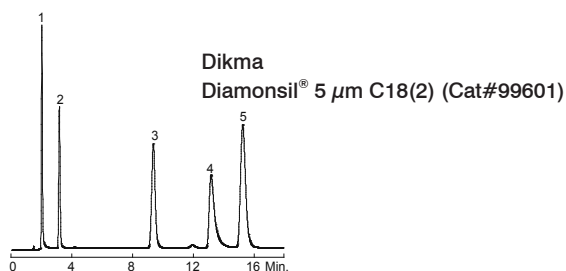


*TC-C18 is a registered trademark of Agilent Technologies. Dikma Technologies Inc. is not affiliated with the above company.

*HC-C18 is a registered trademark of Agilent Technologies. Dikma Technologies Inc. is not affiliated with the above company.

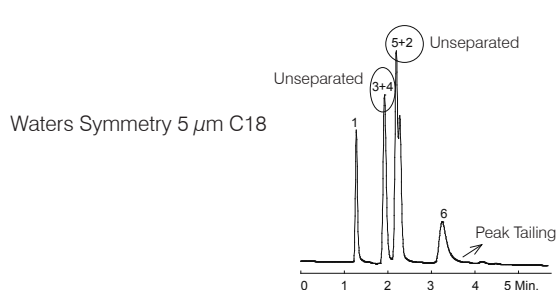
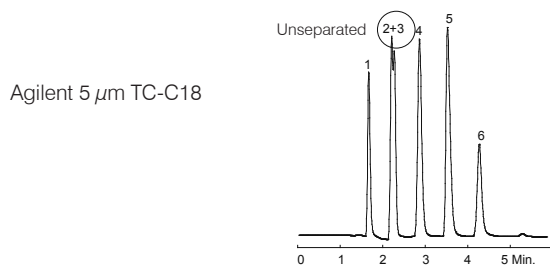
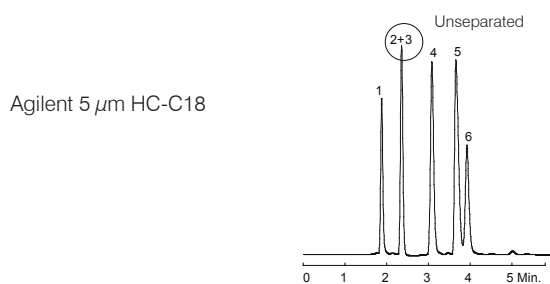
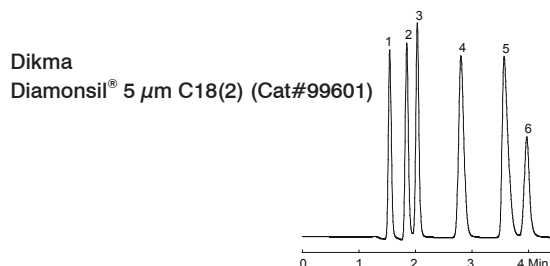
McCalley Test - Separation of Strong Basic Compounds at Neutral pH Conditions *

Column: Listed on chromatograms
 Dimension: 150 × 4.6 mm
 Mobile Phase: MeOH:20 mM phosphate buffer (pH 7) = 65:35
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Pyridine
 2. Codeine
 3. Quinine
 4. Nortriptyline
 5. Diphenhydramine



Water-Soluble Vitamins *

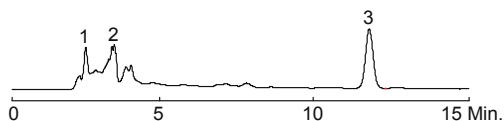
Column: Listed on chromatograms
 Dimension: 150 × 4.6 mm
 Mobile Phase: MeOH:10 mM HCOONH₄ (pH 3) = 5:95
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Pyridoxamine
 2. Orotic acid
 3. L-Ascorbic acid
 4. Pyridoxal
 5. Pyridoxol
 6. Nicotinamide



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 *TC-C18 is a registered trademark of Agilent Technologies. Dikma Technologies Inc. is not affiliated with the above company.
 *HC-C18 is a registered trademark of Agilent Technologies. Dikma Technologies Inc. is not affiliated with the above company.

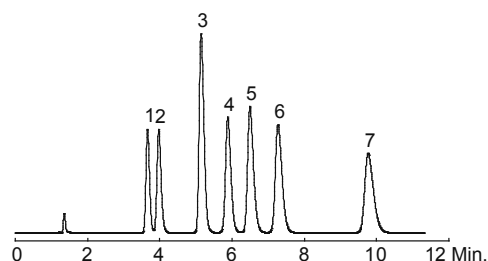
Polygonum Multiflorum

Column: Diamonsil® 5 µm C18(2), 150 x 4.6 mm
 Cat. No.: **99601**
 Mobile Phase: MeCN:H₂O=70:30
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 220 nm
 Sample:
 1. Impurity a
 2. Impurity b
 3. 2,3,5,4'-tetrahydroxy stilbene-2-O-β-glucosidase



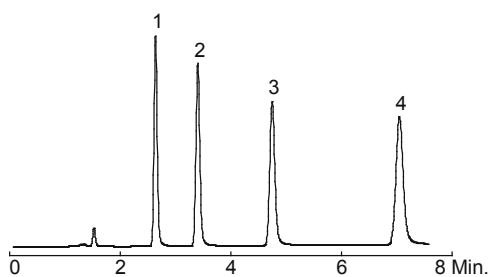
TCAs

Column: Diamonsil® 5 µm C18(2), 150 x 4.6 mm
 Cat. No.: **99601**
 Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H₂O = 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



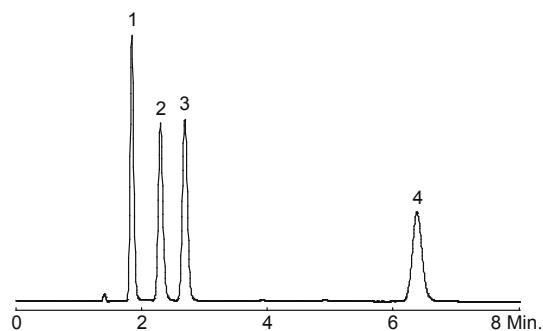
Parabens

Column: Diamonsil® 5 µm C18(2), 150 x 4.6 mm
 Cat. No.: **99601**
 Mobile Phase: MeCN:20 mM K₂HPO₄ (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



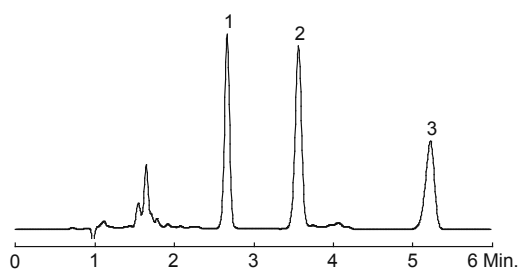
Alkaloids

Column: Diamonsil® 5 µm C18(2), 150 x 4.6 mm
 Cat. No.: **99601**
 Mobile Phase: MeOH:20 mM KH₂PO₄ (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



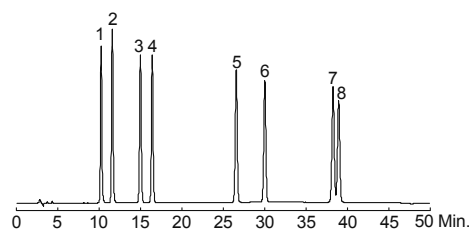
Unsaturated Fatty Acids

Column: Diamonsil® 5 µm C18(2), 150 x 4.6 mm
 Cat. No.: 99601
 Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H₂O = 95:5
 Flow Rate: 1.5 mL/min
 Temperature: Ambient
 Detection: UV 214 nm
 Sample: 1. Linolenic acid
 2. Linoleic acid
 3. Oleic acid



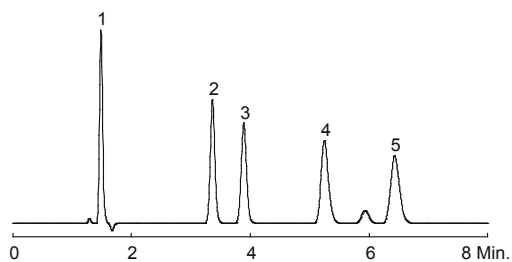
Sulfa Drugs

Column: Diamonsil® 5 µm C18(2), 250 x 4.6 mm
 Cat. No.: 99603
 Mobile Phase: A: MeCN
 B: 2% CH₃COOH
 Gradient: 12-25% A in 30 min; hold at 25% A for 10 min;
 25-12% A in 1 min; hold at 12% A for 9 min
 Flow Rate: 1.0 mL/min
 Temperature: 35 °C
 Detection: UV 270 nm
 Sample: 1. Sulfapyridine 5. Sulfamethoxazole
 2. Sulfamerazine 6. Sulfisoxazole
 3. Sulfamethazine 7. Sulfaquinoxaline
 4. Sulfamethoxypyridazine 8. Sulfadimethoxine



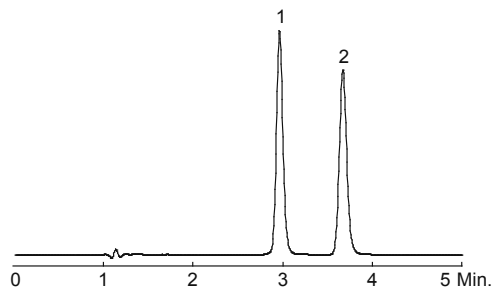
Cold Medicine

Column: Diamonsil® 5 µm C18(2), 150 x 4.6 mm
 Cat. No.: 99601
 Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H₂O = 35:65
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 220 nm
 Sample: 1. Doxylamine
 2. Acetanilide
 3. Aspirin
 4. Dextromethorphan
 5. Diphenhydramine



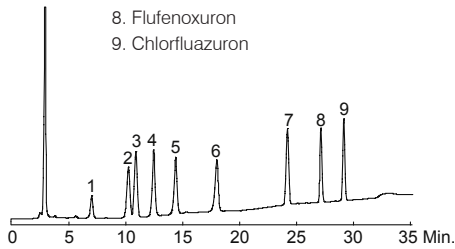
Natural Products

Column: Diamonsil® 5 µm C18(2), 150 x 4.6 mm
 Cat. No.: 99601
 Mobile Phase: MeCN:H₂O = 70:30
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 220 nm
 Sample: 1. Capsaicin
 2. Dihydrocapsaicin



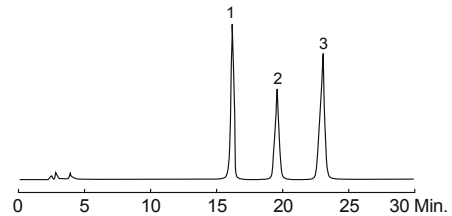
Benzoylurea and Bishydrazide

Column: Diamonsil® 5 µm C18(2), 250 x 4.6 mm
 Cat. No.: 99603
 Mobile Phase: A: MeOH
 B: H₂O
 Gradient: hold at 75% A for 5 min; 75-80% A in 10 min; 80-95% A in 15 min
 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



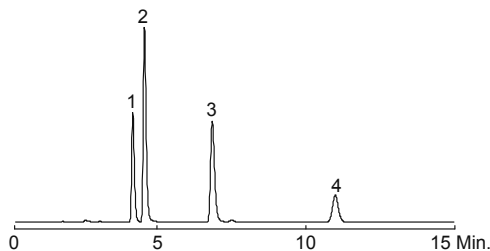
Vitamin E

Column: Diamonsil® 5 µm C18(2), 250 x 4.6 mm
 Cat. No.: 99603
 Mobile Phase: MeOH:H₂O = 98:2
 Flow Rate: 1.0 mL/min
 Temperature: 30 °C
 Detection: FI, Ex: 290 nm, Em: 340 nm
 Sample: 1. δ -Vitamin E
 2. (β + γ)-Vitamin E
 3. α -Vitamin E



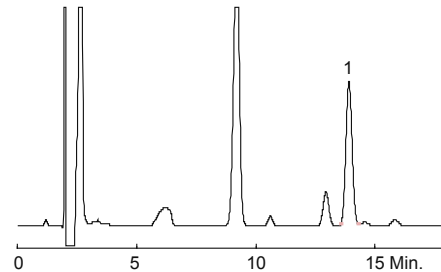
Phridine Compounds

Column: Diamonsil® 5 µm C18(2), 200 x 4.6 mm
 Cat. No.: 99602
 Mobile Phase: 5 mM Octanesulfonate (adjust to pH 2.5 with HClO₄):MeOH = 65:35
 Flow Rate: 1.0 mL/min
 Temperature: 35 °C
 Detection: UV 261 nm
 Sample: 1. Pyridine-2-Carboxamide
 2. 2-Cyanopyridine
 3. Pyridine
 4. 2-Methylpyridine



Melamine

Column: Diamonsil® 5 µm C18(2), 250 x 4.6 mm
 Cat. No.: 99603
 Mobile Phase: MeCN:buffer = 8:92
 Buffer: mixed 2.02 g sodium heptane sulfonate and 2.10 g citric acid with H₂O, setting volume to 1000 mL
 Flow Rate: 1.0 mL/min
 Temperature: 30 °C
 Detection: UV 240 nm
 Sample: 1. Melamine



Diamonsil (2) Ordering Information

3 µm Microbore Columns (2.1 mm)

Guard Cartridges, 2/pk

Phases	30 x 2.1	50 x 2.1	100 x 2.1	150 x 2.1	200 x 2.1	250 x 2.1	10 x 2.1
Diamonsil® C18(2)	99631	99611	99612	99613	—	99615	6311
Diamonsil® C8(2)	99681	99661	99662	99663	—	99665	6312

3 µm Analytical Columns (3.0 mm)

Phases	30 x 3.0	50 x 3.0	100 x 3.0	150 x 3.0	200 x 3.0	250 x 3.0	10 x 2.1
Diamonsil® C18(2)	99632	99621	99622	99623	—	99625	6311
Diamonsil® C8(2)	99682	99671	99672	99673	—	99675	6312

3 µm Analytical Columns (4.6 mm)

Phases	30 x 4.6	50 x 4.6	100 x 4.6	150 x 4.6	200 x 4.6	250 x 4.6	10 x 4.0
Diamonsil® C18(2)	99633	99616	99617	99618	99619	99620	6331
Diamonsil® C8(2)	99683	99666	99667	99668	99669	99670	6332

5 µm Analytical Columns (3.0 mm)

Phases	30 x 3.0	50 x 3.0	100 x 3.0	150 x 3.0	200 x 3.0	250 x 3.0	10 x 2.1
Diamonsil® C18(2)	99635	99626	99627	99628	—	99630	6313
Diamonsil® C8(2)	99685	99676	99677	99678	—	99680	6314

5 µm Analytical Columns (4.6 mm)

Phases	30 x 4.6	50 x 4.6	100 x 4.6	150 x 4.6	200 x 4.6	250 x 4.6	10 x 4.0
Diamonsil® C18(2)	99636	99609	99610	99601	99602	99603	6333
Diamonsil® C8(2)	99686	99659	99660	99650	99652	99651	6334

5 µm and 10 µm Semi-preparative Columns

Guard Cartridges, 2/pk

Phases	Particle Size (µm)	250 x 4.6 Cat.No.	250 x 10.0 Cat.No.	150 x 21.2 Cat.No.	250 x 21.2 Cat.No.	10 x 10.0 Cat.No.	10 x 21.2 Cat.No.
Diamonsil® C18(2)	5	99603	99644	99770	99645	6335	6336
Diamonsil® C8(2)	5	99651	99694	99771	99695	6339	6340
Diamonsil® C18(2)	10	99641	99642	99774	99643	6337	6338
Diamonsil® C8(2)	10	99691	99692	99775	99693	6341	6342

10 mm Guard Holder: Cat#6221, 21.2 mm Guard Holder: Cat#6222

Diamonsil® AAA Columns

Diamonsil® AAA columns show outstanding selectivity and high resolution. Eighteen kinds of natural amino acids, an internal standard, and ammonia can be detected simultaneously using PITC and DNFB reagents.

The analysis method is stable and highly reproducible, and can therefore be used for quantitative as well as qualitative analysis.

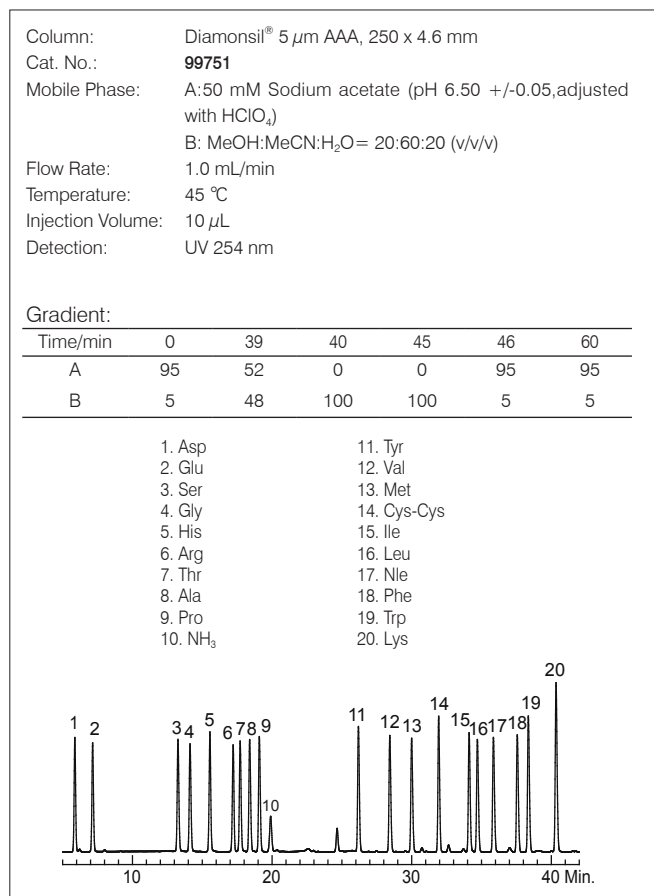
A variety of interfering factors such as reagents, byproducts, solvents, etc., can be removed by rapid extraction.

Every AAA column passes the test of separation of eighteen natural amino acids.

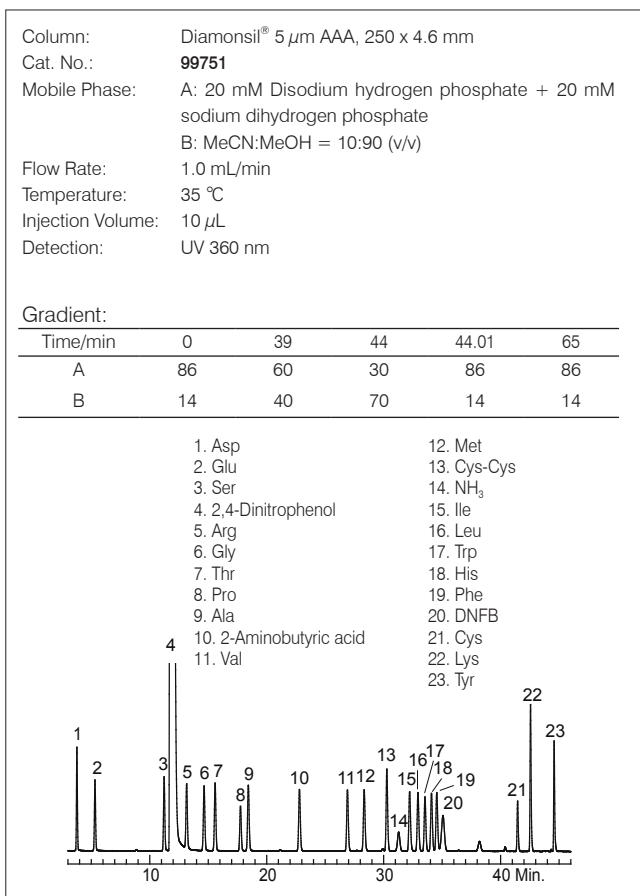
In proteomics and food quality tests, amino acid analysis (AAA) is often used as a tool to determine the exact composition of the amino acid (AA) sample, so the improvement of amino acid analysis (AAA) is highly emphasized.

Diamonsil® AAA column is a new product made by Dikma Technologies Inc. which can perform amino acid analysis using two different amino acid derivative methods upon changing the chromatograph condition.

Eighteen Natural Amino Acids, Norleucine, and NH₃-PITC Derivatives



Eighteen Natural Amino Acids, 2,4-Dinitrophenol, DNFB, Cysteine, 2-Aminobutyric Acid, and NH₃-DNFB Derivatives



Diamonsil® AAA Ordering Information

5 µm Analytical Columns

Phase	250 x 4.6
Diamonsil® AAA	99751

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 protect 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

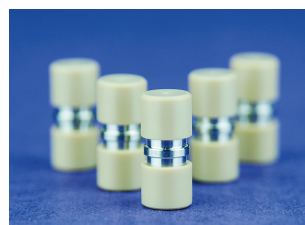
EasyGuard™ Kit (1 holder and 2 cartridges)

Description	10 x 2.1 mm	10 x 4.0 mm
C18	6231	6201
C8	6232	6202
Phenyl	6233	6203
CN	6234	6204
NH ₂	6235	6205
Silica	6236	6206



EasyGuard™ Replacement Cartridges (5/pk)

Description	10 x 2.1 mm	10 x 4.0 mm
C18	6241	6211
C8	6242	6212
Phenyl	6243	6213
CN	6244	6214
NH ₂	6245	6215
Silica	6246	6216



EasyGuard™ Guard Column Accessories

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

Easy-Lok™ Coupler

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.
Easy-Lok™ Coupler	1/pk	6132
Tip for Easy-Lok™ Coupler, PEEK	2/pk	6133



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.

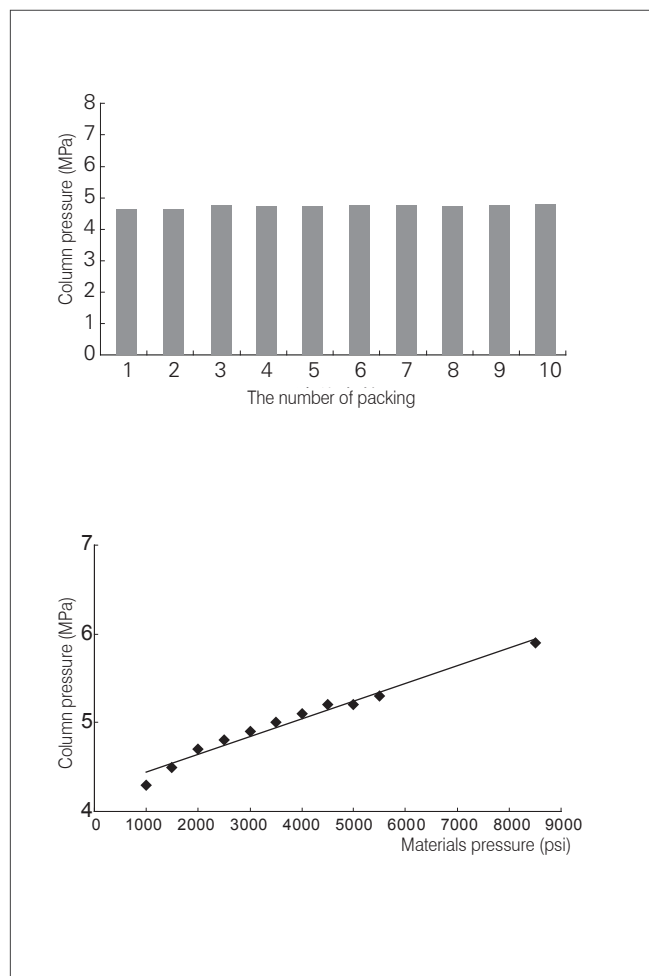
Features of Dikma Preparative Chromatography Packing Materials :

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 of 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 stability.



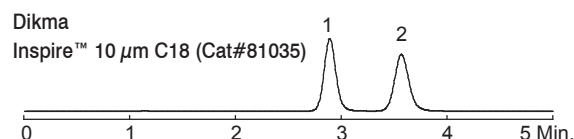
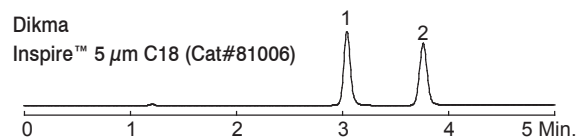
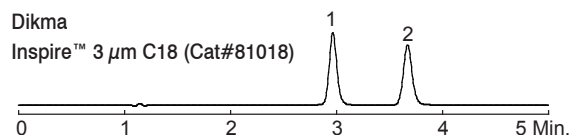
Quick and Easy Transition from Analytical to Prep

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.

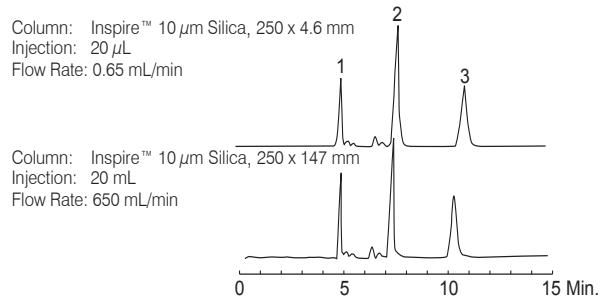
Linear Scale-up

Column: Inspire™ C18, 250 x 4.6 mm
 Mobile Phase: MeCN:H₂O = 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

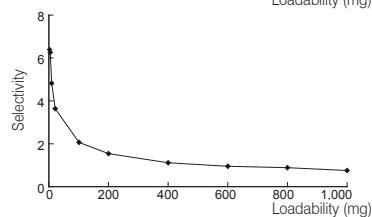
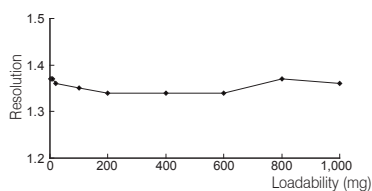
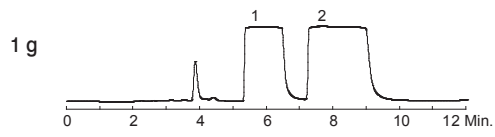
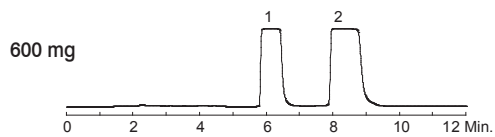
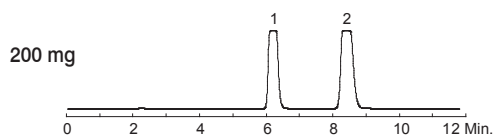
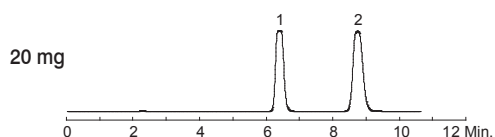
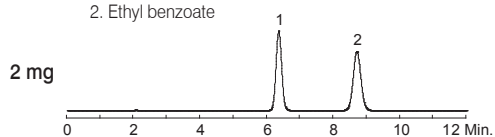


Maximum Loadability

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:H₂O = 70:30
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Methyl benzoate
 2. Ethyl benzoate

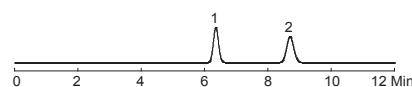


Increasing loadability did not reduce the resolution of compounds 1 and 2

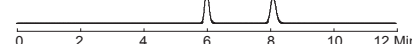
Column: Listed on chromatograms
 Dimension: 250 x 4.6 mm
 Mobile Phase: MeOH:H₂O = 70:30
 Flow Rate: 20 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Methyl benzoate
 2. Ethyl benzoate

0.1 mg

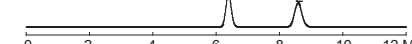
Dikma Inspire™ 10 μm C18 (Cat#81035)



Kromasil* 10 μm C18

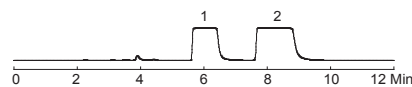


DAISOGEL* 10 μm C18-AP

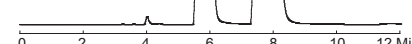


20 mg

Dikma Inspire™ 10 μm C18 (Cat#81035)



Kromasil 10 μm C18

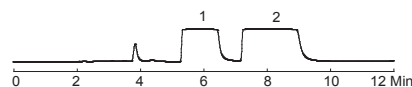


DAISOGEL 10 μm C18-AP

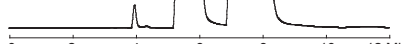


50 mg

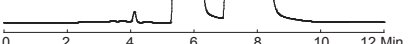
Dikma Inspire™ 10 μm C18 (Cat#81035)



Kromasil 10 μm C18



DAISOGEL 10 μm C18-AP



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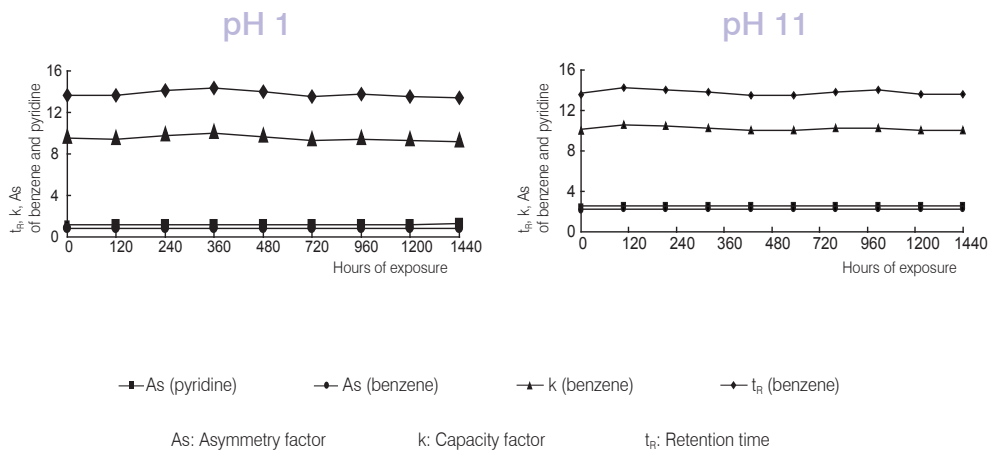
*DAISOGEL is a registered trademark of DAISO Co., LTD.. Dikma Technologies Inc. is not affiliated with the above company.

Preparative Chromatography

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 H₂O = 50:50
 Flow Rate: 1.0 mL/min
 Temperature: Ambient

Flush solution (pH 11)

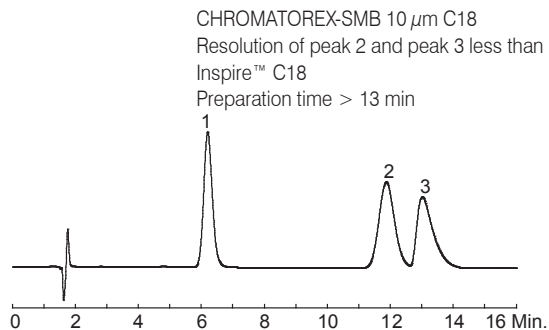
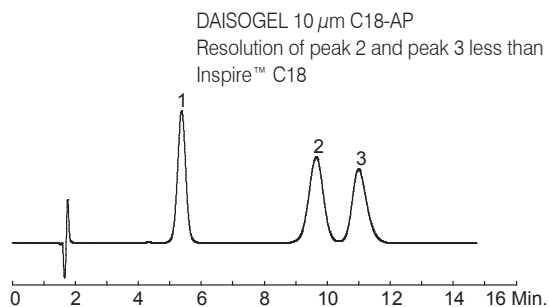
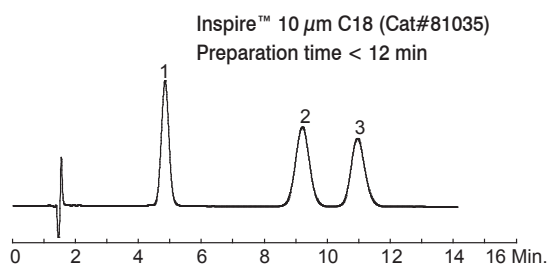
Mobile Phase: MeCN:20 mM phosphate buffer = 50:50
 Flow Rate: 1.0 mL/min
 Temperature: Ambient

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.

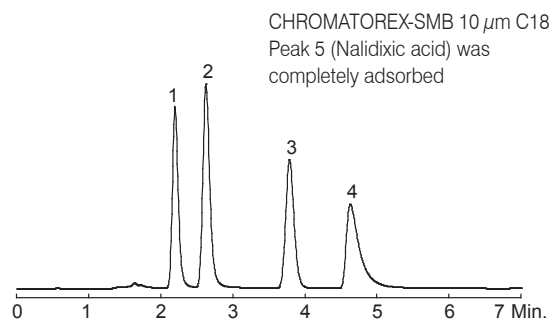
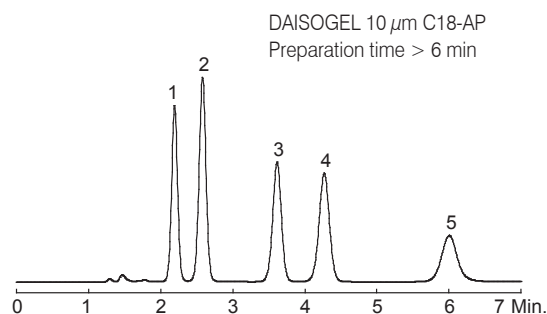
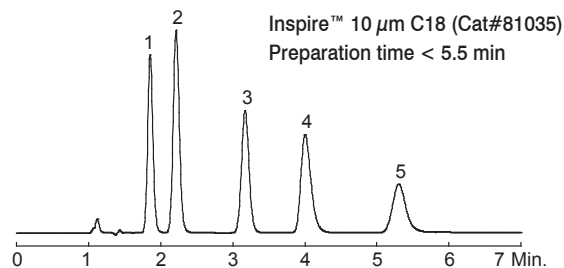
Separation of Basic Compounds*

Column: Listed on chromatograms
 Dimension: 250 x 4.6 mm
 Mobile Phase: MeOH:5 mM NaHCO₃ (pH 10) = 70:30
 Flow Rate: 1.0 mL/min
 Temperature: 30 °C
 Detection: UV 254 nm
 Sample: 1. Norclozapine
 2. Verapamil
 3. Diphenhydramine



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 H₂O = 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



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*CHROMATOREX is a registered trademark of Fuji Silysia Chemical Ltd.. Dikma Technologies Inc. is not affiliated with the above company.

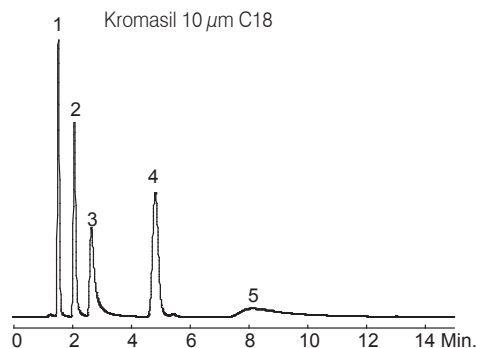
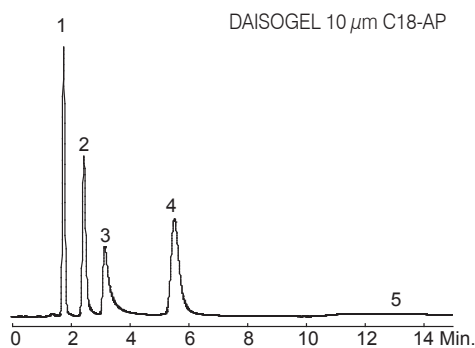
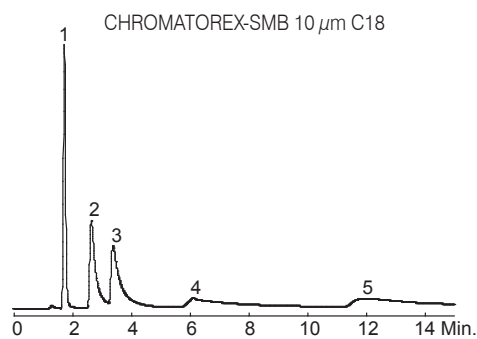
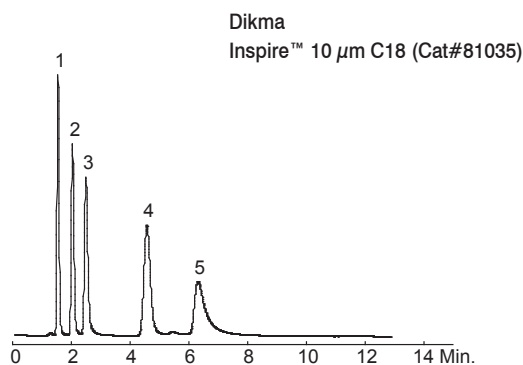
Preparative Chromatography

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



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*CHROMATOREX is a registered trademark of Fujii Silysia Chemical Ltd.. 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.

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

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

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

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

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

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

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

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

10 mm EasyGuard™ Guard Holder, Cat# 6221, 21.2 mm EasyGuard™ Guard Holder, Cat# 6222

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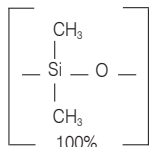


DikmaCap™ (DM)

Structures, Properties, Polarities and Uses for DM Columns

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

100% Dimethyl polysiloxane

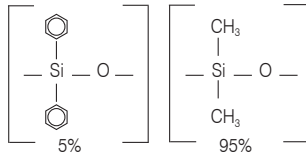


Polarity: Non-polar

Application: Solvents, natural gases, petroleum products, etc.

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

5% Diphenyl
95% Dimethyl polysiloxane

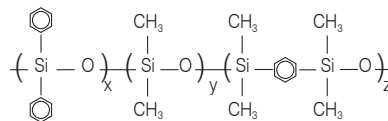


Polarity: Slightly polar

Application: Flavors, aromatic hydrocarbons, environmental compounds, etc.

DM-5MS / LB

5% Diphenyl
95% Phenyl arylene dimethyl polysiloxane

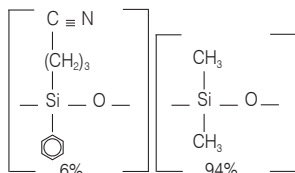


Polarity: Slightly polar

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

DM-624 / DM-624MS

6% Cyanopropylphenyl
94% Dimethyl polysiloxane

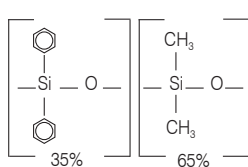


Polarity: Slightly polar

Application: Insecticides, alcohols, volatile organic compounds

DM-35 / DM-35MS

35% Diphenyl
65% Dimethyl polysiloxane

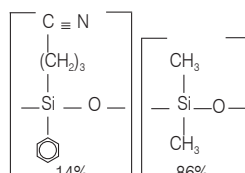


Polarity: Intermediately polar

Application: Pesticides, PCBs, herbicides

DM-1701

14% Cyanopropylphenyl
86% Dimethyl polysiloxane

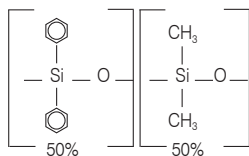


Polarity: Intermediately polar

Application: Alcohols, oxygenates, PCBs

DM-17 / DM-17MS

50% Diphenyl
50% Dimethyl polysiloxane

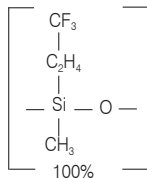


Polarity: Intermediately polar

Application: Triglycerides, steroids, PAEs

DM-200

100% Trifluoropropylmethyl polysiloxane

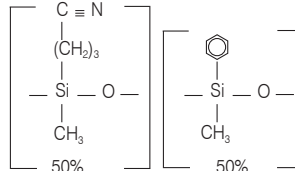


Polarity: Intermediately polar, special selectivity for compounds containing lone pair electron groups

Application: Solvents, alcohols, etc.

DM-225

50% Cyanopropylmethyl
50% Phenylmethyl polysiloxane

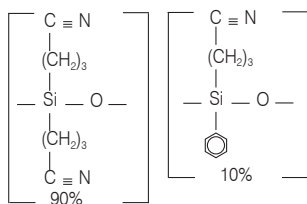


Polarity: Polar

Application: Adipic acid monomethyl ester, sugars, FAMES

DM-2330

90% Biscyanopropyl
10% Cyanopropylphenyl polysiloxane

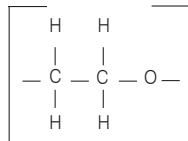


Polarity: Polar

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% Dimethyl polysiloxane	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 ₂ O ₃ PLOT	-	-	-
DM-PLOT Alumina / Na ₂ SO ₄	Aluminum oxide Na ₂ SO ₄ deactivation	GS-Alumina, HP-PLOT S, CP-Al ₂ O ₃ / Na ₂ SO ₄ PLOT	-	Rt-Alumina BOND / Na ₂ SO ₄	Alumina Sulfate PLOT
DM-PLOT Alumina / KCl	Aluminum oxide KCl deactivation	GS-Alumina / KCl, HP-PLOT Al ₂ O ₃ / KCl, CP-Al ₂ O 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-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

ID (mm)	OD (mm)	MAOT (°C)	5 m Cat. No.	5 m (6/pk) Cat. No.	10 m Cat. No.	30 m Cat. No.
0.05	0.363 ± 0.012	325	7001			
0.10	0.363 ± 0.012	325	7002			
0.15	0.363 ± 0.012	325	7003			
0.18	0.37 ± 0.04	325	7004			
0.25	0.37 ± 0.04	325	7005	7061	7015	7064
0.28	0.37 ± 0.04	325	7006			
0.32	0.45 ± 0.04	325	7007	7062	7017	7065
0.45	0.69 ± 0.04	325	7008			
0.53	0.69 ± 0.05	325	7009	7063	7019	7066

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

ID (mm)	OD (mm)	MAOT (°C)	5 m Cat. No.	10 m Cat. No.	30 m Cat. No.
0.25	0.37 ± 0.04	280	7011	7014	7010
0.32	0.45 ± 0.04	280	7012	7016	7020
0.53	0.69 ± 0.05	280	7013	7018	7030

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

ID (mm)	OD (mm)	MAOT (°C)	5 m Cat. No.	5 m (6/pk) Cat. No.	10 m Cat. No.	30 m Cat. No.
0.05	0.363 ± 0.012	325	7021			
0.10	0.363 ± 0.012	325	7022			
0.15	0.363 ± 0.012	325	7023			
0.18	0.37 ± 0.04	325	7024			
0.25	0.37 ± 0.04	325	7025	7031	7034	7037
0.32	0.45 ± 0.04	325	7027	7032	7035	7038
0.53	0.69 ± 0.05	325	7029	7033	7036	7039

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

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

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

Sample / Compound	Page
Air Sample TO-14	183
Citronella Java Oil	233
Fatty Acids (Free)	228
Flavor Volatiles	231
Fragrance	234
Gasoline Aromatics	208
Hydrocarbons, C7 - C42	207
Oxygenates MTBE	203
Petroleum Oxygenates	202, 203
Sulfide	204
Sulfur in Gasoline	204
Solvents	220, 221, 223, 225
Sulfur in Naphtha	204
USP Solvents	220

DM-1 Ordering Information

ID (mm)	df (µm)	MAOT (°C)	15 m	30 m	50 m	60 m
			Cat. No.	Cat. No.	Cat. No.	Cat. No.
0.25	0.10	-60 to 330 / 350		7119		
	0.25	-60 to 330 / 350		7121	7172	7122
	0.50	-60 to 330 / 350		7123	7174	7124
	1.00	-60 to 330 / 340		7125	7176	7126
0.32	0.25	-60 to 330 / 350		7131	7182	7132
	0.50	-60 to 330 / 350		7133	7184	7134
	1.00	-60 to 320 / 340		7135	7186	7136
	1.50	-60 to 310 / 330		7137		7138
	3.00	-60 to 280 / 300		7141		7142
	4.00	-60 to 280 / 300		7143		
0.53	0.50	-60 to 310 / 330		7147		7148
	1.00	-60 to 310 / 330	7109	7149		7150
	1.50	-60 to 310 / 330	7110	7151		7152
	3.00	-60 to 270 / 290	7112	7155		7156
	5.00	-60 to 270 / 290	7113	7157	7198	7158
	7.00	-60 to 270 / 290		7159		7160

DM-1MS Ordering Information

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

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

Sample / Compound	Page
Alcohols	215
Basic Drugs (Underivatized)	236
Benzidines / Phenols (EPA 604 / 605)	190
Butyl Tins	194
Chlorinated Hydrocarbons (EPA 612)	189
Food Packaging Volatiles	234
Glycols / Alcohols	215
Nitrogen-Containing Herbicides	192
Organochlorine Pesticides	191, 193
PAEs	195
PAHs (EPA 610)	186
Solvents	227
Steroids, Anabolic	238

DM-5 Ordering Information

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

DM-5MS Ordering Information

ID (mm)	df (µm)	MAOT (°C)*	30 m	50 m	60 m
			Cat. No.	Cat. No.	Cat. No.
0.25	0.10	-60 to 330 / 350	8219		8220
	0.25	-60 to 330 / 350	8221	8272	8222
	0.50	-60 to 330 / 350	8223		
0.32	0.10	-60 to 330 / 350	8229		8230
	0.25	-60 to 330 / 350	8231	8282	8232
	0.50	-60 to 330 / 350	8233		

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

DM-5MS / LB

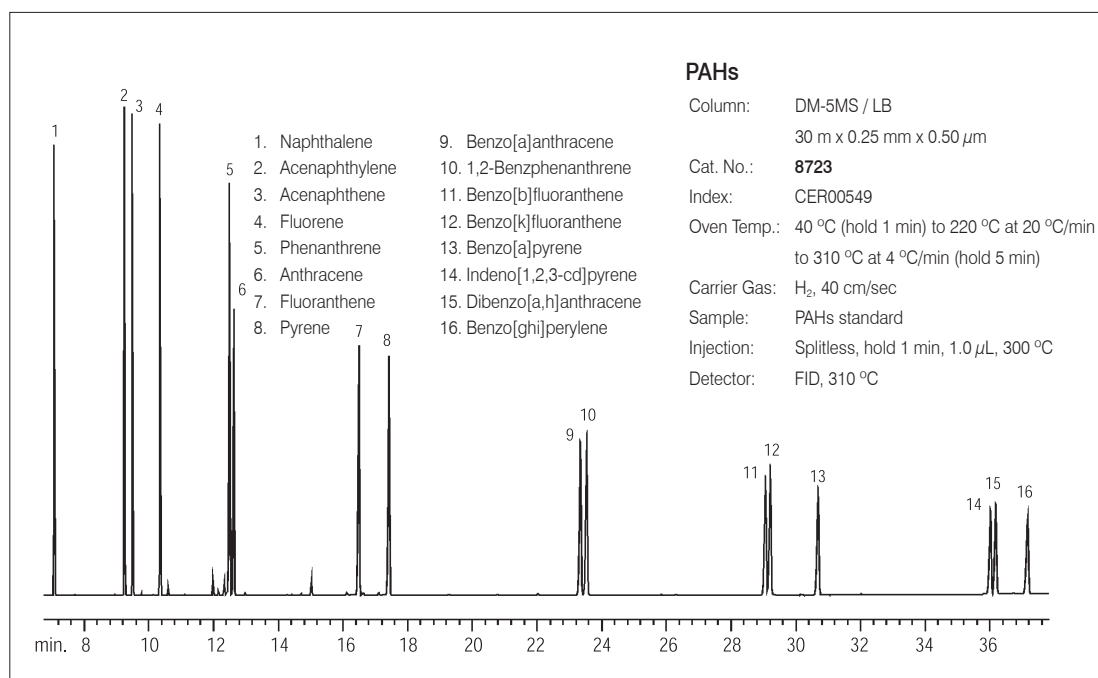
- Cross-linked 5% diphenyl / 95% phenyl arylene dimethyl polysiloxane
- Very low bleed
- Improves the resolution between Benzo[b]fluoranthene and Benzo[k]fluoranthene
- Similar to DB-5MS

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 stability. 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

Sample / Compound	Page
Phenols (EPA 528)	187
PAHs (EPA 610)	185
Semi-volatile Organic Compounds	188
Volatile Organic Compounds (EPA 526)	187



DM-5MS / LB Ordering Information

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

DM-1HT / DM-5HT

DM-1HT

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

DM-1HT Ordering Information

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

*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

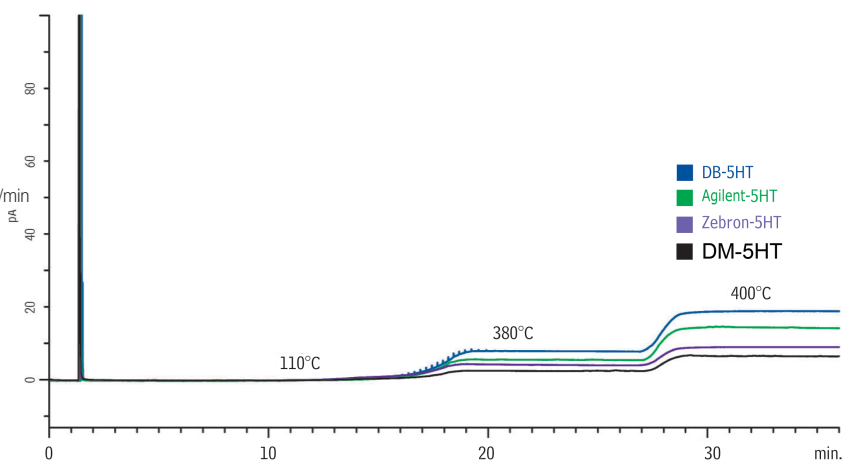
DM-5HT Ordering Information

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

*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

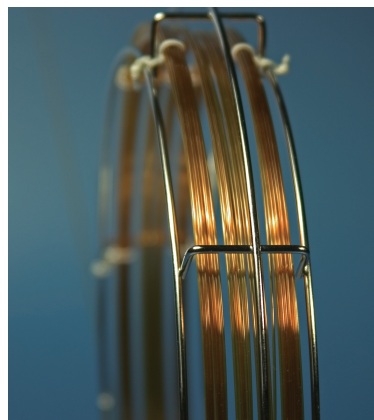


DM-35

- 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**

Sample / Compound	Page
Acidic / Neutral Drugs (Underivatized)	237
Basic Drugs (Underivatized)	236
Chlorinated Hydrocarbons (EPA 612)	189
Chlorophenoxyacid Herbicides (EPA 615)	194
Endocrine Disruptors Butyl Tins (Hexyl Derivatives)	195
Nitrogen-Containing Herbicides	192
Organochlorine Pesticides (EPA 8081)	193
Organophosphorus Pesticides (EPA 8140 / 8141 / 8141A)	191

DM-35 Ordering Information

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

DM-35MS Ordering Information

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

*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

Sample / Compound	Page
Acrylic Esters	219
Formaldehyde	217
Fragrance	234
Organochlorine Pesticides (EPA 8081)	193
Styrene Impurities	219

DM-1701 Ordering Information

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

*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

Sample / Compound	Page
BHA / BHT	234
Chlorophenoxyacid Herbicides (EPA 515.1)	194
Organochlorine Pesticides (EPA 8081)	193
PAEs (EPA 8060)	189
Phenols (EPA 604)	190
Triazine Herbicides (EPA 619)	194

DM-17 Ordering Information

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

DM-17MS Ordering Information

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

*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, organochlorine 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

Sample / Compound	Page
Aromatics (Benzene / Toluene / Xylene)	209
Basic Drugs	236
Chlorinated Hydrocarbons (EPA 612)	189
Explosives	195
Glycols	215
Nitrosamines	190
PAHs (EPA 610)	186
Silanes	219
Solvents	220, 222, 224, 226
USP Solvents	220

DM-200 Ordering Information

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

DM-200 MS Ordering Information

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

*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

Sample / Compound	Page
Neutral Sterols	235
Sugars (Alditol Acetates)	235

DM-225 Ordering Information

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

*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	<ul style="list-style-type: none"> • Wide chemical compatibility (acidic, basic and neutral samples) • Low bleed at elevated temperatures • High inertness • High stability and ruggedness 	<ul style="list-style-type: none"> • General purpose column • Best choice for MS use
DM-InertWax	<ul style="list-style-type: none"> • Wide operating temperature range • Lowest operating temperature limit • Best inertness 	<ul style="list-style-type: none"> • Analyze low boiling point analytes

Application Chromatogram

Sample / Compound	Page
Aldehydes	217
Alcohols	214
Alcohols / Aldehydes	216
Amines / Alcohols / Chlorides	213
Aromatics	209, 210
Concentrated Liquors	232
Esters	218
Flavor Volatiles	231
Glycols	215
Ketones	217
Solvents	222, 224, 226
Styrene Impurities	219
Peppermint Oil	233
Petroleum Oxygenates	202
PUFA (Animal Source)	229

DM-Wax Ordering Information

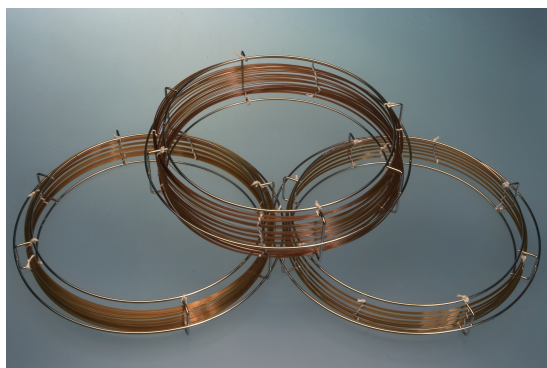
ID (mm)	df (µm)	MAOT (°C)	15 m	30 m	50 m	60 m
			Cat. No.	Cat. No.	Cat. No.	Cat. No.
0.25	0.25	40 to 250 / 260		7521	7572	7522
	0.50	40 to 250 / 260		7523	7574	7524
	1.00	40 to 250 / 260		7535		7536
0.32	0.25	40 to 250 / 260		7531	7582	7532
	0.50	40 to 250 / 260		7533	7584	7534
	1.00	40 to 250 / 260		7535		7536
0.53	0.50	40 to 250 / 260		7547		7548
	1.00	40 to 250 / 260	7510	7551	7592	7552
	2.00	40 to 220 / 230	7511	7553		

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

Sample / Compound	Page
Aldehydes	216
FAMEs	229



DM-InertWax Ordering Information

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

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

DM-FFAP

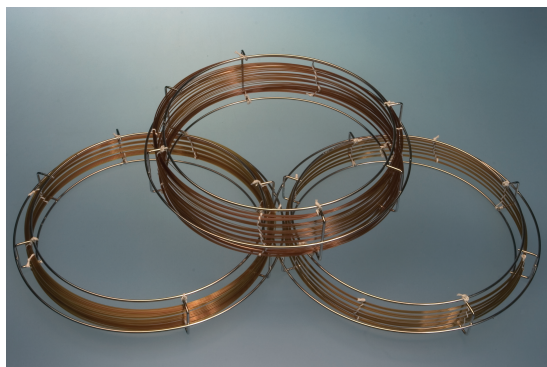
DM-FFAP

- 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

Sample / Compound	Page
Alcoholic Standard: Acids and Esters	232
Fatty Acids (Free)	228



DM-FFAP Ordering Information

ID (mm)	df (μm)	MAOT (°C)	15 m Cat. No.	30 m Cat. No.	50 m Cat. No.	60 m Cat. No.
0.25	0.25	40 to 250		7621	7672	7622
	0.50	40 to 250		7623	7673	7624
0.32	0.25	40 to 250		7631	7682	7632
	0.50	40 to 250		7633	7684	7634
	1.00	40 to 250		7635		7636
0.53	0.50	40 to 240 / 250		7647		7648
	1.00	40 to 240 / 250	7610	7651	7692	7652
	1.50	40 to 220 / 230	7611	7653		

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

Sample / Compound	Page
Dioxins	184
PUFA (Animal Source)	229
Suars (Alditol Acetate)	235

DM-2330 Ordering Information

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

*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

Sample / Compound	Page
FAMES (<i>cis</i> / <i>trans</i> Isomers)	228

cis / *trans* FAMES

Column: DM-2560

100 m x 0.25 mm x 0.20 μ m

Cat. No.: 8858

Index: CFR00652

Oven Temp.: 100 °C (hold 4 min) to 240 °C (hold 10 min), 3 °C/min

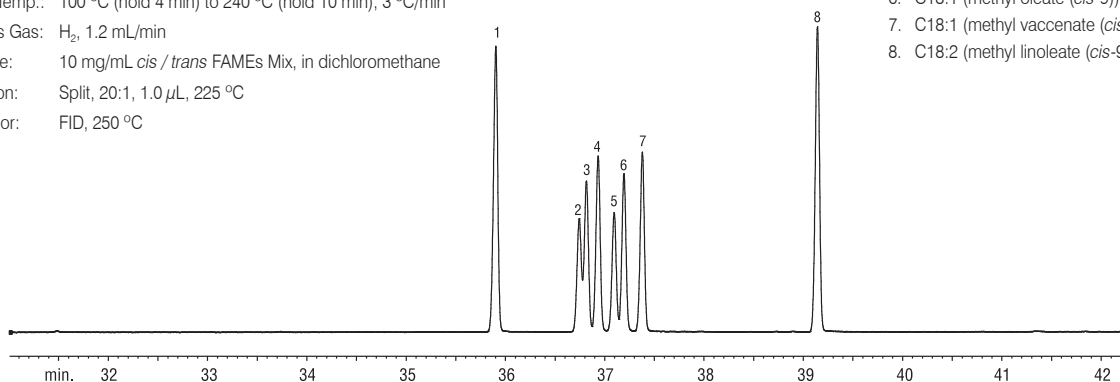
Carrier Gas: H₂, 1.2 mL/min

Sample: 10 mg/mL *cis* / *trans* FAMES Mix, in dichloromethane

Injection: Split, 20:1, 1.0 μ L, 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 (μ m)	MAOT (°C)	100 m Cat. No.
0.25	0.20	20 to 250	8858

Column Phase Cross Reference

DikmaCap™	Phase	Agilent	Restek	Supelco
DM-PLOT Alumina	Aluminum oxide	GS-Alumina, HP-PLOT S, CP-Al ₂ O ₃ PLOT		-
DM-PLOT Alumina / Na ₂ SO ₄	Aluminum oxide Na ₂ SO ₄ deactivation	GS-Alumina, HP-PLOT S, CP-Al ₂ O ₃ / Na ₂ SO ₄ PLOT	Rt-Alumina BOND / Na ₂ SO ₄ Alumina Sulfate PLOT	
DM-PLOT Alumina / KCl	Aluminum oxide KCl deactivation	GS-Alumina / KCl, HP-PLOT Al ₂ O ₃ / KCl, CP-Al ₂ O 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 (Al₂O₃)

- 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.

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



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.

Application Chromatogram

Sample / Compound	Page
1,3-Butadiene Purity	200
Hydrocarbons	201
Propylene Purity	199
Refinery Gas	200

DM-PLOT Alumina / Na₂SO₄

DM-PLOT Alumina / Na₂SO₄

- 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-Al₂O₃ / Na₂SO₄ PLOT

Application Chromatogram

Sample / Compound	Page
Refinery Gas	198

Refinery Gas

Column: DM-PLOT Alumina / Na₂SO₄
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

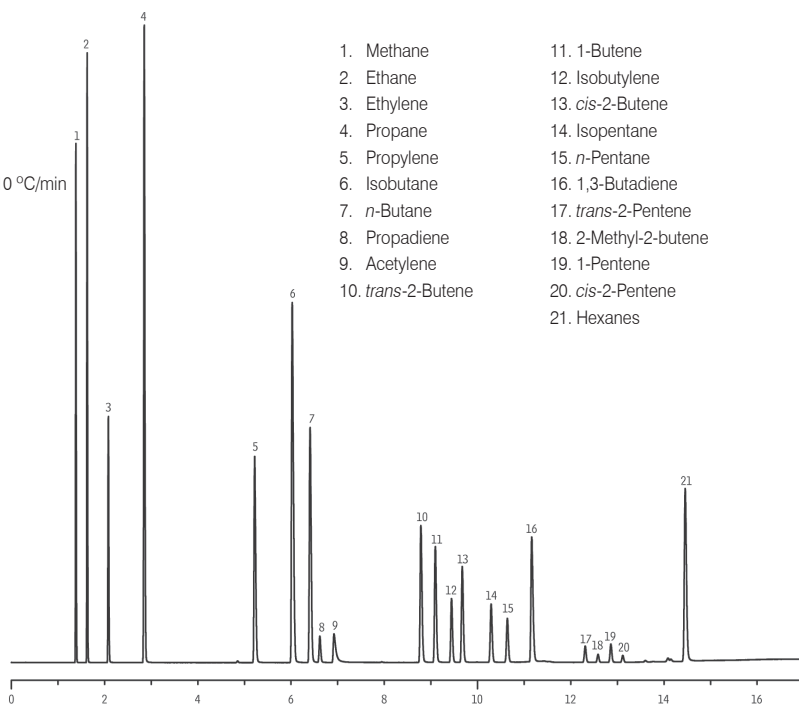
Injection: Split, 10 μL, 200 °C

Split Vent Flow Rate: 40 mL/min

Detector: FID, 200 °C

Makeup Gas: N₂

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



DM-PLOT Alumina / Na₂SO₄ Ordering Information

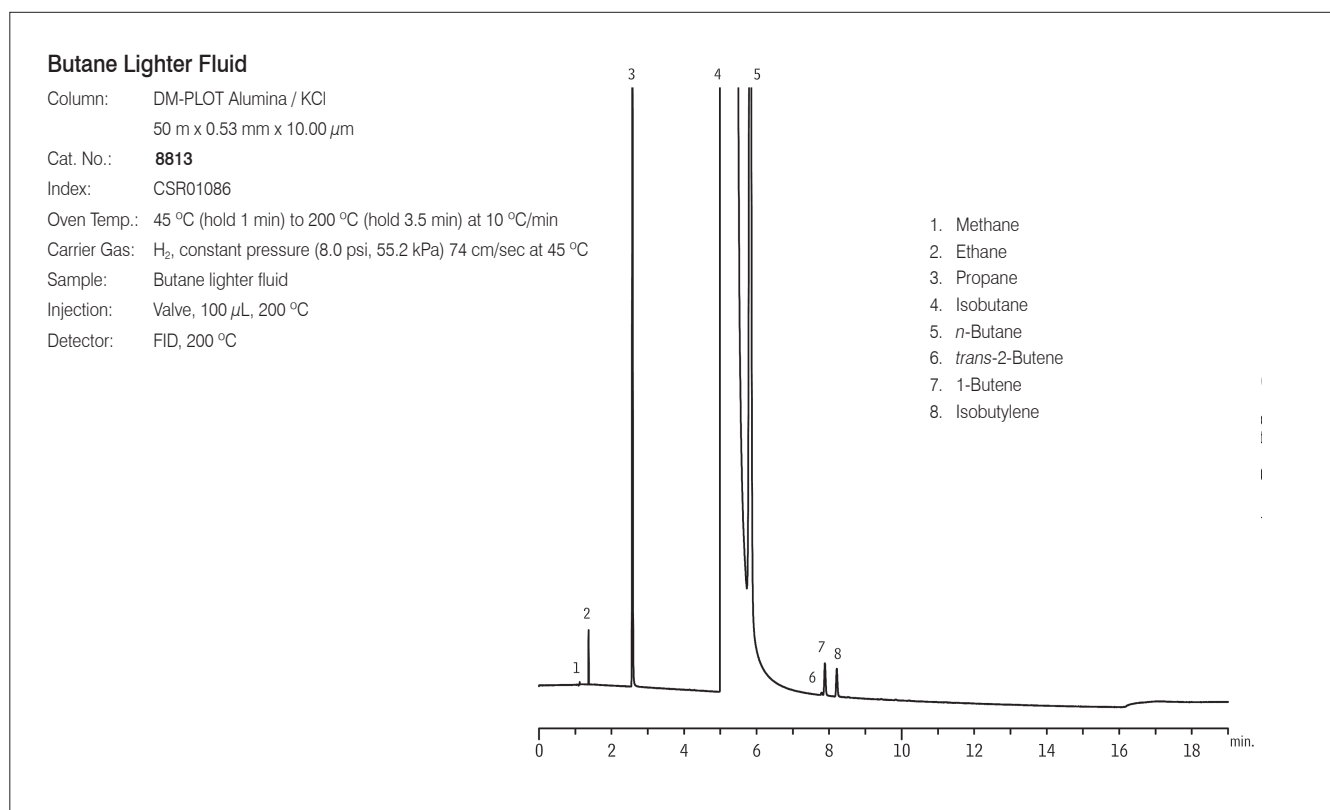
ID (mm)	df (μm)	MAOT (°C)	30 m	50 m
			Cat. No.	Cat. No.
0.25	4.00	to 200	8860	
0.32	5.00	to 200	8804	8805
0.53	10.00	to 200	8806	8807

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-Alumina / KCl and CP-Al₂O₃ / KCl PLOT

Application Chromatogram

Sample / Compound	Page
Butane Lighter Fluid	198



DM-PLOT Alumina / KCl Ordering Information

ID (mm)	df (μm)	MAOT (°C)	30 m	50 m
			Cat. No.	Cat. No.
0.25	4.00	to 200	8861	
0.32	5.00	to 200	8808	8809
0.53	10.00	to 200	8811	8813

DM-PLOT MS 5A

DM-PLOT MS 5A

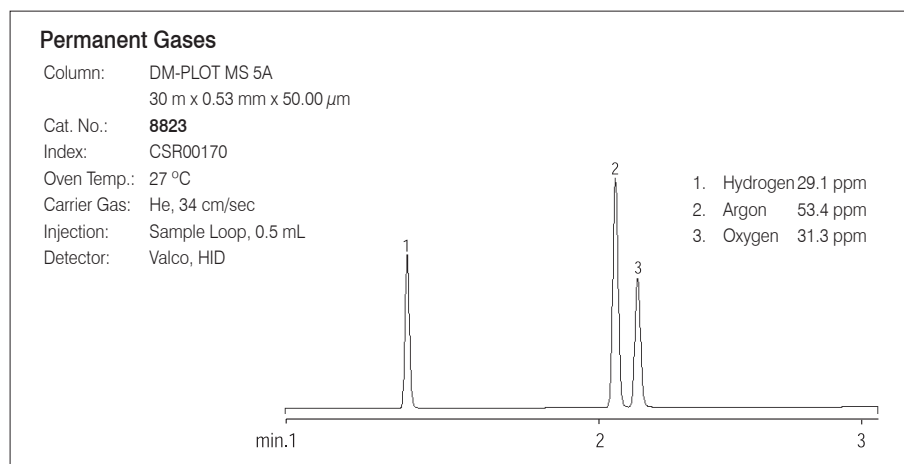
- Separation for permanent gases
- 100% Stationary phase bonded without particles loss

DM-PLOT MS 5A column is used for separation of Ar / O₂ 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 special immobilization process ensures that the stationary phase particles adheres to the tubing.

The advanced molecular sieve DM-PLOT MS 5A column can separate Ar / O₂ and H₂ / 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	197



DM-PLOT MS 5A Ordering Information

ID (mm)	df (μ m)	MAOT (°C)	30 m Cat. No.
0.32	30.00	to 300	8822
0.53	50.00	to 300	8823

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 CO₂, hydrocarbons and polar and non-polar solvents can be easily separated on PLOT columns.

Application Chromatogram

Sample / Compound	Page
Alcohols	214
Hydrocarbon Gases	199, 200, 201
Natural Gas #2	198
Polar Solvents	227
Permanent Gases	196, 197

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

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

DM-PLOT CFC

DM-PLOT CFC

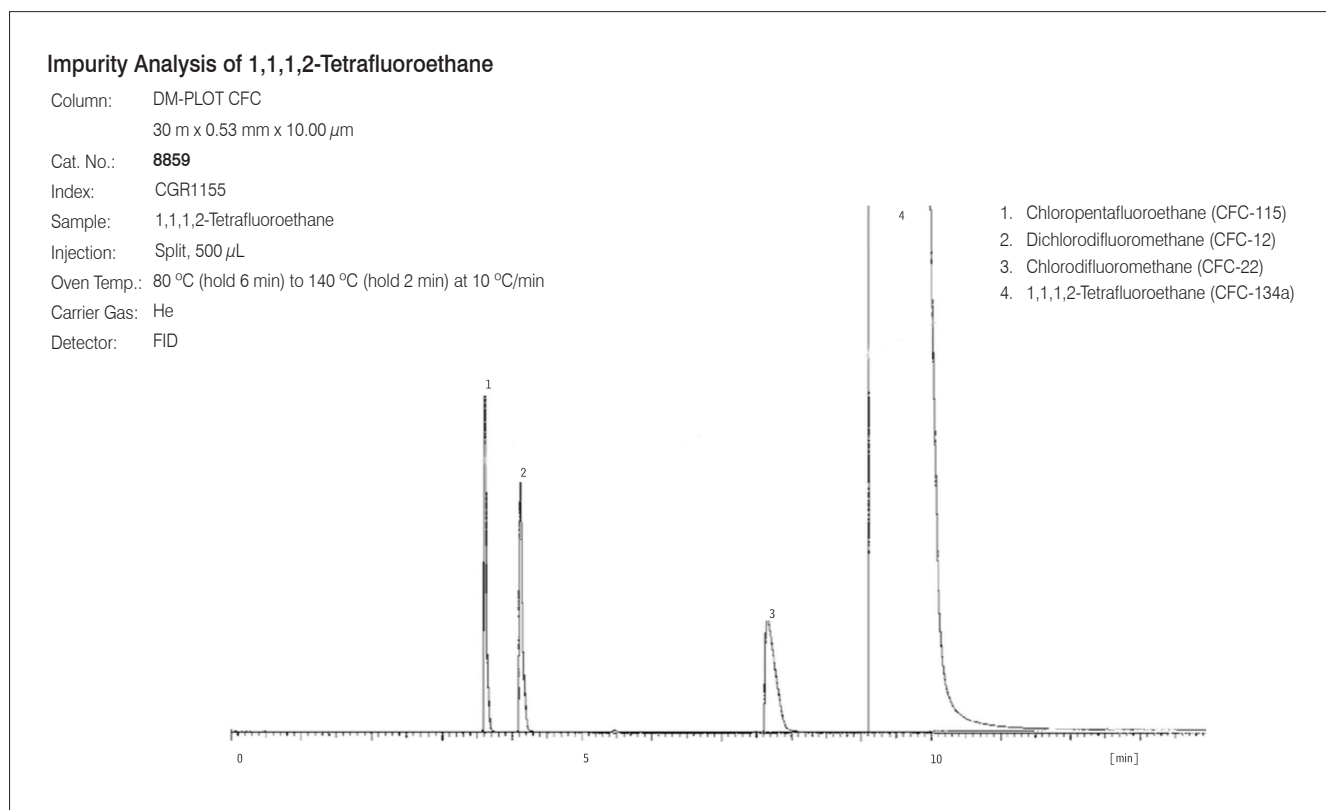
- Improved inertness for halogenated compounds
- Highly selective alumina-based column
- High retention and capacity for CFCs
- Specially designed for CFCs separation

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

Sample / Compound	Page
Impurity Analysis of 1,1,1,2-Tetrafluoroethane	198



DM-PLOT CFC Ordering Information

ID (mm)	df (μ m)	MAOT ($^{\circ}$ C)	30 m Cat. No.
0.53	10.00	to 200	8859

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

Sample / Compound	Page
Detailed Hydrocarbons Analysis	207

Detailed Hydrocarbons Analysis

Column: DM-PONA

100 m x 0.25 mm x 0.50 μ m

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

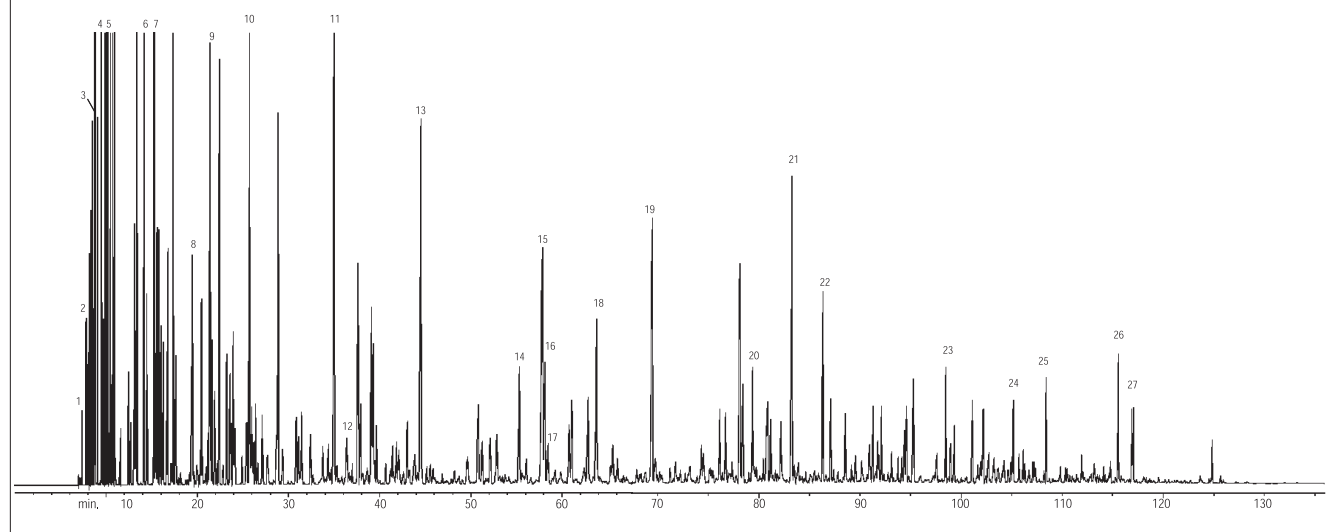
Carrier Gas: He, 24 cm/sec, 35 °C

Sample: Unleaded gasolines, 0.5 μ L

Injection: Split, 100:1, 250 °C

Detector: FID, 4 x 10⁻¹² AFS, 250 °C

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



DM-PONA Ordering Information

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

DM-TCEP

DM-TCEP

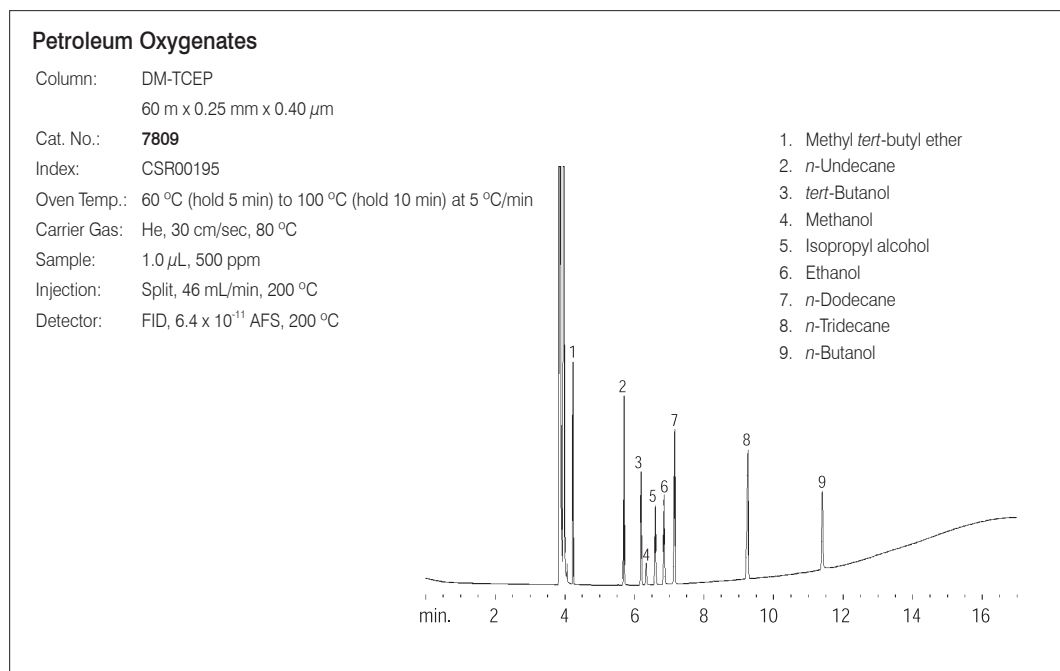
- 1,2,3-*Tris*[2-cyanoethoxy]propane
- Highly polar phase
- General purpose column, ideal for aromatics and oxygenates in gasoline
- Temperature range: 0 °C to 135 °C
- Similar to CP-TCEP

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

Sample / Compound	Page
Aromatics	209
Petroleum Oxygenates	202



DM-TCEP Ordering Information

ID (mm)	df (μ m)	MAOT (°C)	60 m Cat. No.
0.25	0.40	0 to 135	7809

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

Sample / Compound	Page
Bleed Profile	205
Hydrocarbons, C10 - C44	206
Hydrocarbons, C30 - C110	206
Hydrocarbons, C44 - C100	205

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

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

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

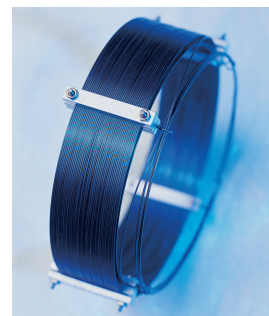
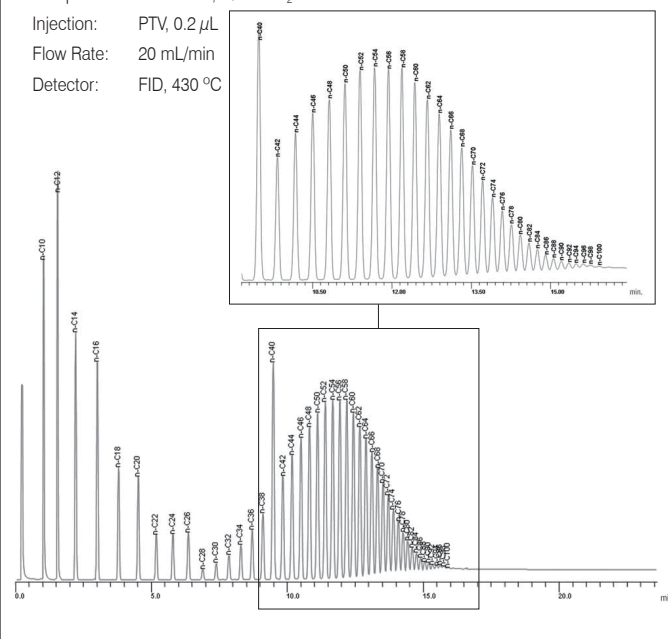
Carrier Gas: He

Sample: C10-C100, 1% in CS₂

Injection: PTV, 0.2 µL

Flow Rate: 20 mL/min

Detector: FID, 430 °C



DM-2887 / DM-2887 Metal

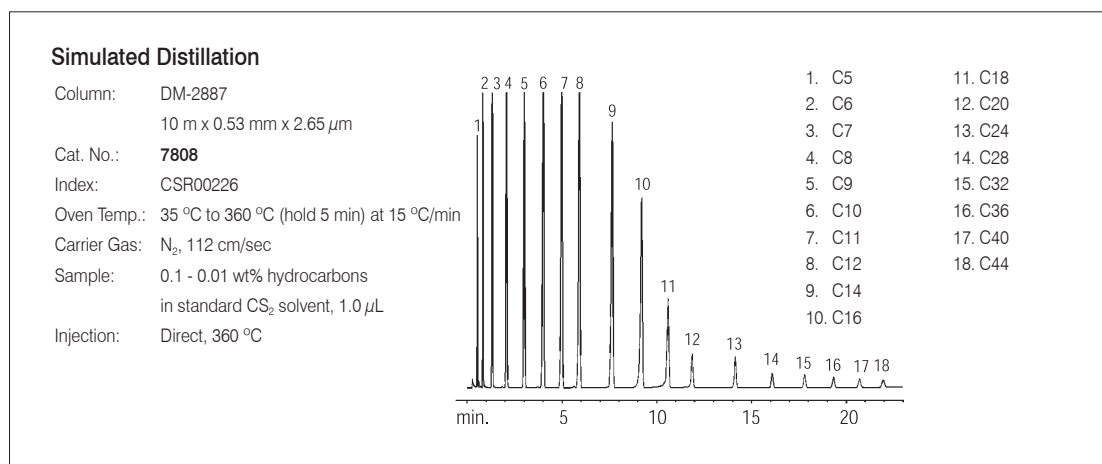
DM-2887 / 2887 Metal

- 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

Sample / Compound	Page
Simulated Distillation	206



DM-2887 (Fused Silica) Ordering Information

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

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

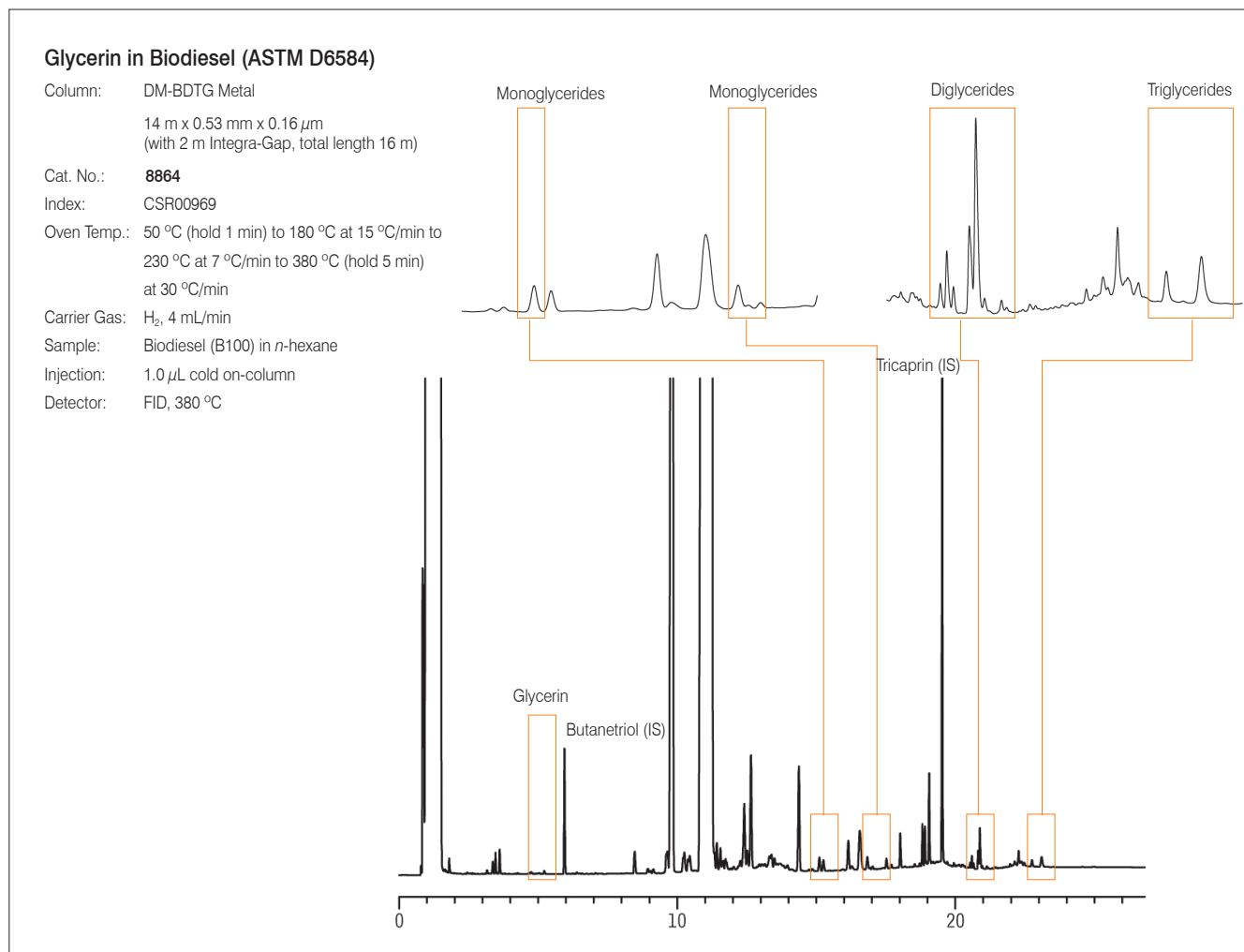
ID (mm)	df (μ m)	MAOT (°C)	10 m Cat. No.
0.53	2.65	-60 to 400	7810

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

Sample / Compound	Page
Glycerin in Biodiesel (ASTM D6584)	205



DM-BDTG Metal Ordering Information

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

DM-Volatile Amine

DM-Volatile Amine

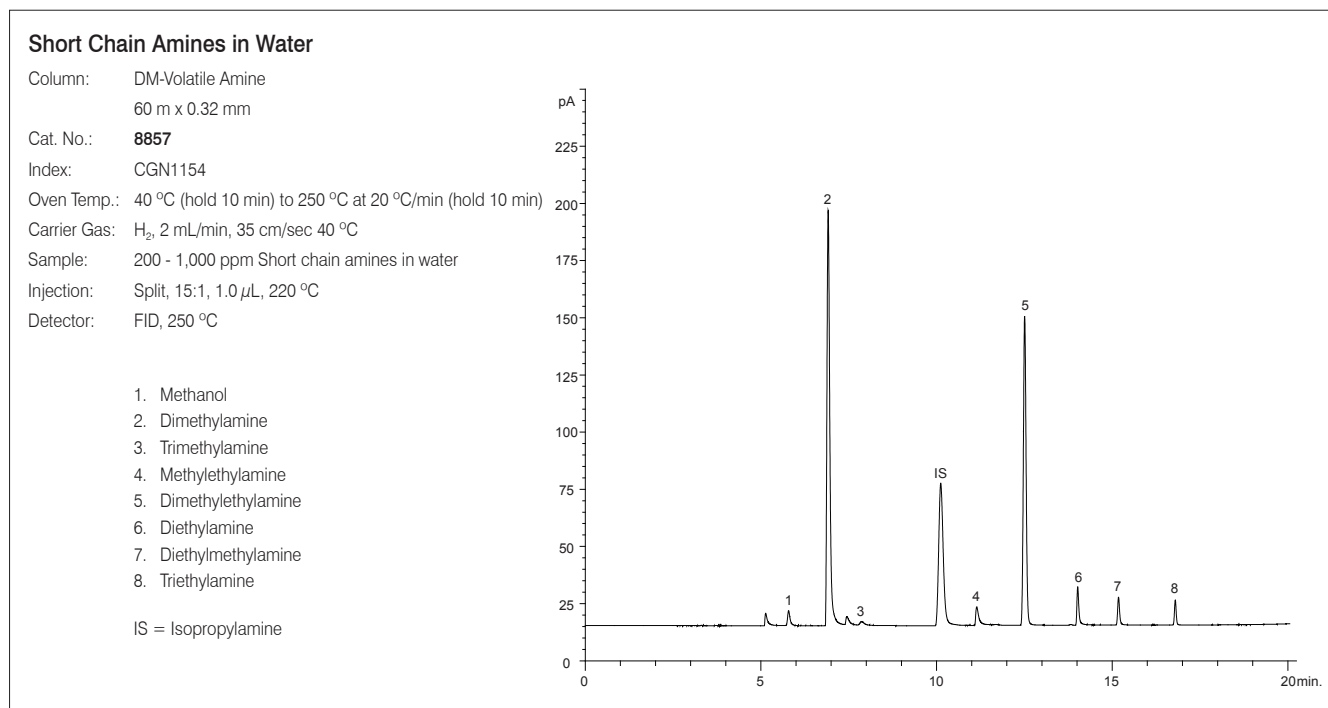
- Special selectivity for baseline resolution of all volatile amines
- Excellent inertness assures sensitivity and accuracy for volatile amines such as free ammonia
- Highly robust phase allows repeated water injections, increases longer column lifetime
- Direct replacement for CP-Volatile, thick-film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

The DM-Volatile Amine column was optimized for the separation of volatile amines even when the sample contains high percentages 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

Sample / Compound	Page
Short Chain Amines in Water	211



DM-Volatile Amine Ordering Information

ID (mm)	MAOT (°C)	30 m Cat. No.	60 m Cat. No.
0.32	-60 to 290	8856	8857

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.

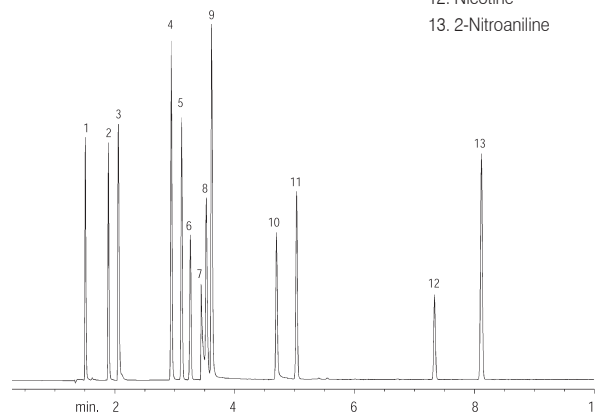
Every DM-5 Amine column is tested to ensure that it meets the requirements for analyzing amines with low ppm levels, and to ensure low bleed at maximum operating temperature.

Application Chromatogram

Sample / Compound	Page
Amines / Phenols	213
Antihistamines	238
Ethylenediamines	212
Sympathomimetic Amines Drugs	237

Amines / Phenols

Column:	DM-5 Amine	
	30 m x 0.32 mm x 1.00 μ m	
Cat. No.:	7817	1. Diethylamine
Index:	CCR00301	2. Pyridine
Oven Temp.:	120 °C to 220 °C at 10 °C/min	3. Morpholine
Carrier Gas:	H ₂ , 38 cm/sec, 120 °C	4. Phenol
Sample:	Amines / phenols in water, 1.0 μ L, 22 ng	5. Aniline
Injection:	Split, 25:1, 305 °C	6. 2-Chlorophenol
Detector:	FID, 6.4 x 10 ⁻¹¹ AFS, 305 °C	7. Diethylenetriamine
		8. Octylamine
		9. 1-Methyl-2-pyrrolidinone
		10. 2-Nitrophenol
		11. 2,6-Dimethylaniline
		12. Nicotine
		13. 2-Nitroaniline



DM-5 Amine Ordering Information

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

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.

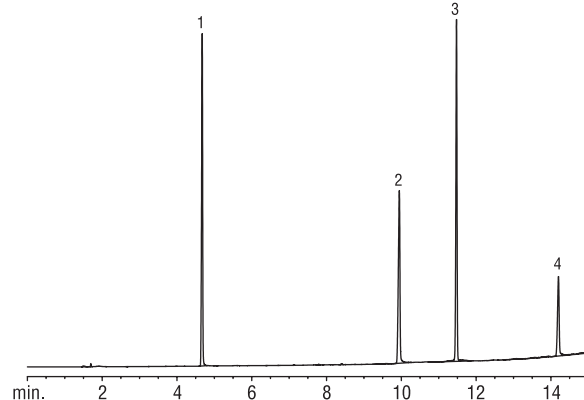
Application Chromatogram

Sample / Compound	Page
Cold Medicine	238
Ethanolamines	212
Primary Amines	211
Sympathomimetic Amines Drugs	237

Ethanolamines

Column: DM-35 Amine
30 m x 0.32 mm x 1.00 μ m
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 μ g/mL Ethanolamine standard in water, 1.0 μ L
Injection: Split, 10:1, 300 °C
Detector: FID, 300 °C

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



DM-35 Amine Ordering Information

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

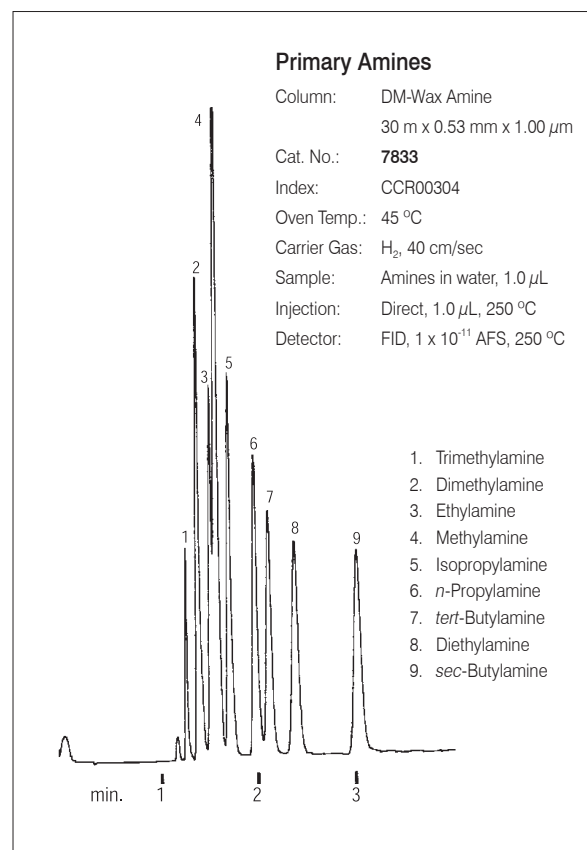
DM-Wax Amine

- 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

Sample / Compound	Page
Amines (Low MW)	211
Hexamethylenediamine	212
Nitrosamines	213
Primary Amines (Low MW)	211



DM-Wax Amine Ordering Information

ID (mm)	df (μ m)	MAOT (°C)	30 m	60 m
			Cat. No.	Cat. No.
0.25	0.25	40 to 210 / 220	7827	
	0.50	40 to 210 / 220	7828	
0.32	0.25	40 to 210 / 220	7829	
	0.50	40 to 210 / 220	7830	
	1.00	40 to 210 / 220	7832	7835
0.53	0.50	40 to 210 / 220	7837	
	1.00	40 to 210 / 220	7833	7836
	1.50	40 to 210 / 220	7834	

DM-624 / DM-624MS

DM-624

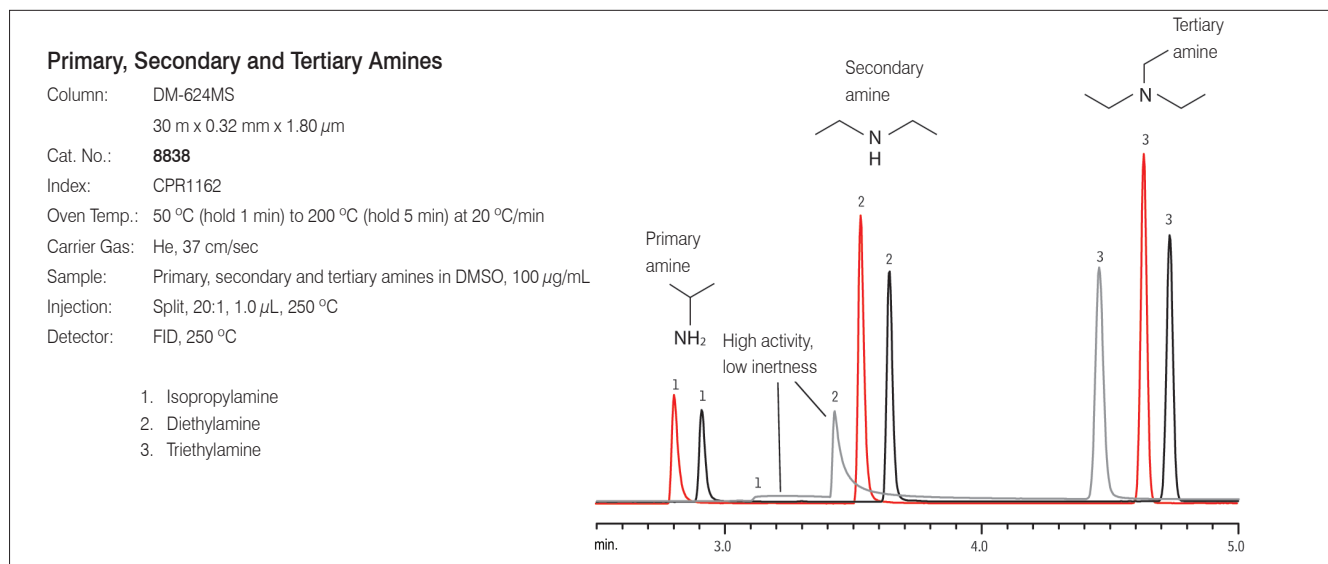
- 6% Cyanopropylphenyl / 94% dimethyl polysiloxane
- Recommended in US EPA methods for volatile organic pollutants
- Ideal for analyzing residual solvents in drugs
- Stable up to 240 °C
- Solvent rinsable
- Similar to HP-1301, HP-624, DB-1301, DB-624, etc.
- Equivalent to USP G43 phase

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

Sample / Compound	Page
EP Class 1 and Class 2 Solvents	239
Organic Volatile Impurities	239
Primary, Secondary and Tertiary Amines	240
Residual Solvents	240
Volatile Organic Compounds (EPA 524.2)	184



DM-624 Ordering Information

ID (mm)	df (μm)	MAOT (°C)	30 m	60 m	75 m	105 m
			Cat. No.	Cat. No.	Cat. No.	Cat. No.
0.25	1.40	-20 to 240	7721	7722		
0.32	1.80	-20 to 240	7731	7732		
0.53	3.00	-20 to 240	7751		7752	7753

DM-624MS Ordering Information

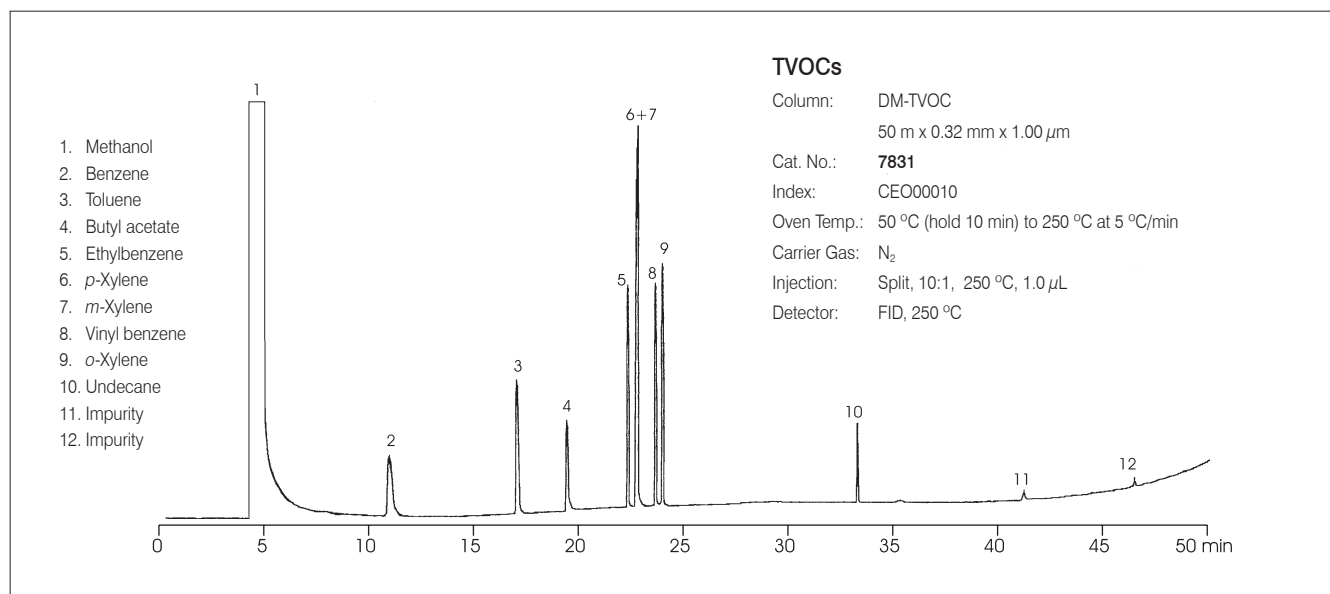
ID (mm)	df (μm)	MAOT (°C)	20 m	30 m	60 m
			Cat. No.	Cat. No.	Cat. No.
0.18	1.00	-20 to 300 / 320	8836		
0.25	1.40	-20 to 300 / 320		8837	
0.32	1.80	-20 to 300 / 320		8838	8839
0.53	3.00	-20 to 300 / 320		8840	

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	183



DM-TVOC Ordering Information

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

DM-PAH

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

Sample / Compound	Page
PAHs	185

PAH-Mix 27

Column: DM-PAH
30 m x 0.25 mm x 0.25 μ m

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

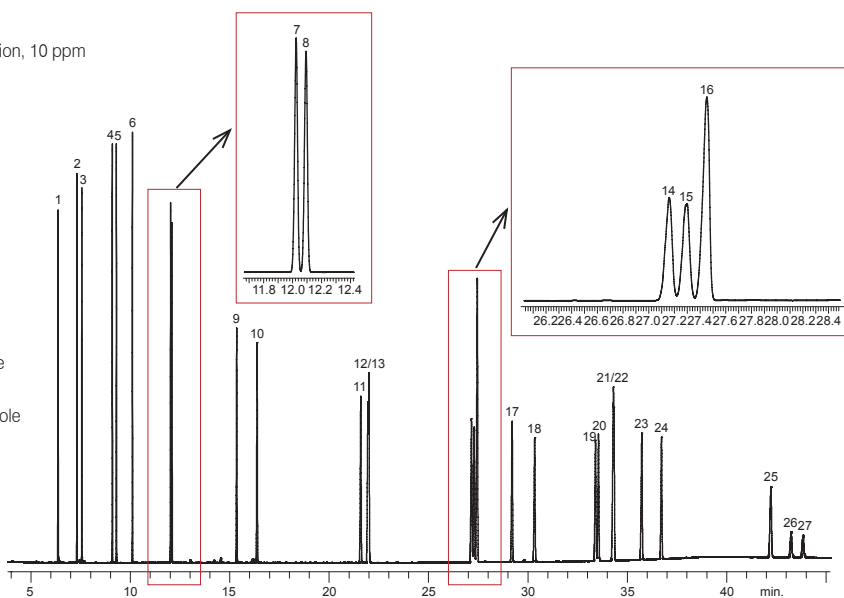
Sample: EPA 8310 PAHs in dichloromethane solution, 10 ppm

Injection: Splitless (hold 1.75 min), 0.5 μ L, 320 °C

Detector: FID, 320 °C

Makeup Gas: 75 mL/min

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



DM-PAH Ordering Information

ID (mm)	df (μ m)	MAOT (°C)*	30 m	60 m
			Cat. No.	Cat. No.
0.25	0.25	40 to 340 / 360	8862	8863

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

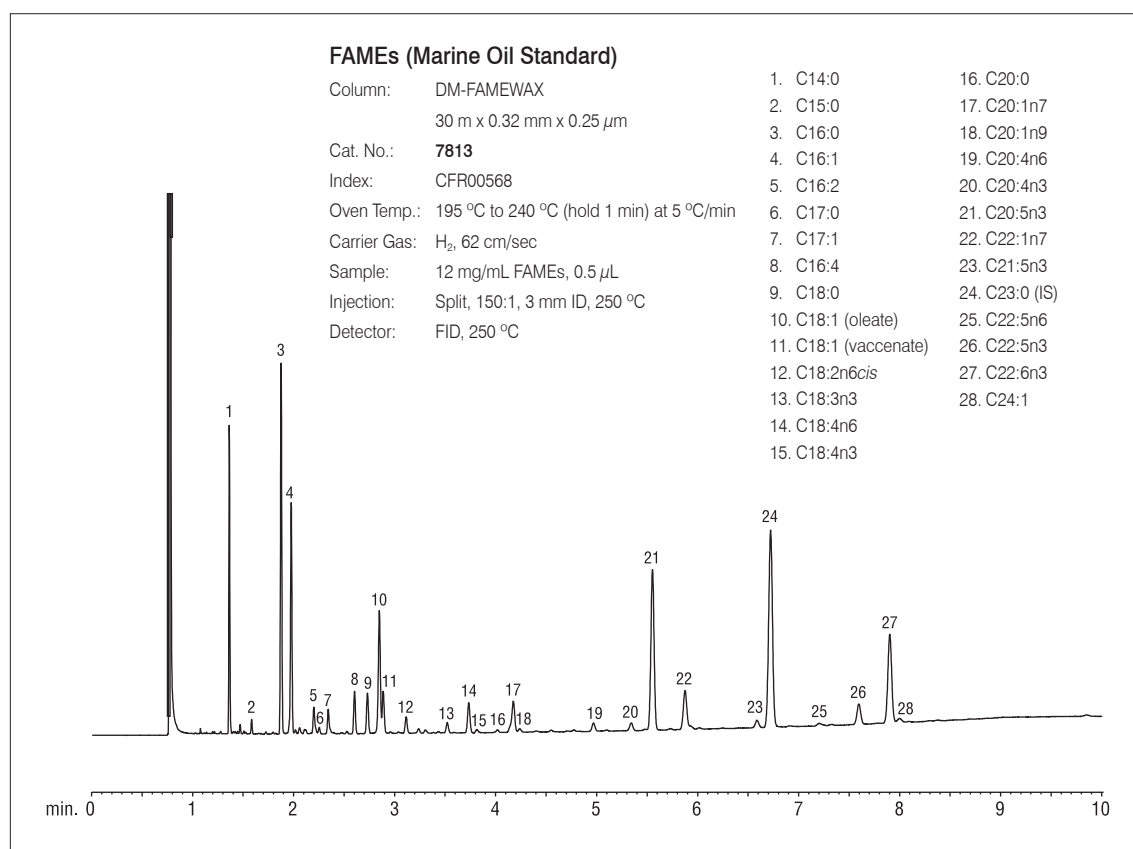
DM-FAMEWAX

- 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

Sample / Compound	Page
FAMES (Black Currant Seed Oil)	230
FAMES (Flax Seed Oil)	230
FAMES (Marine Oil Standard)	230



DM-FAMEWAX Ordering Information

ID (mm)	df (μ m)	MAOT (°C)	30 m Cat. No.
0.25	0.25	20 to 250	7811
0.32	0.25	20 to 250	7813
0.53	0.50	20 to 250	7814

Sample Preparation

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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

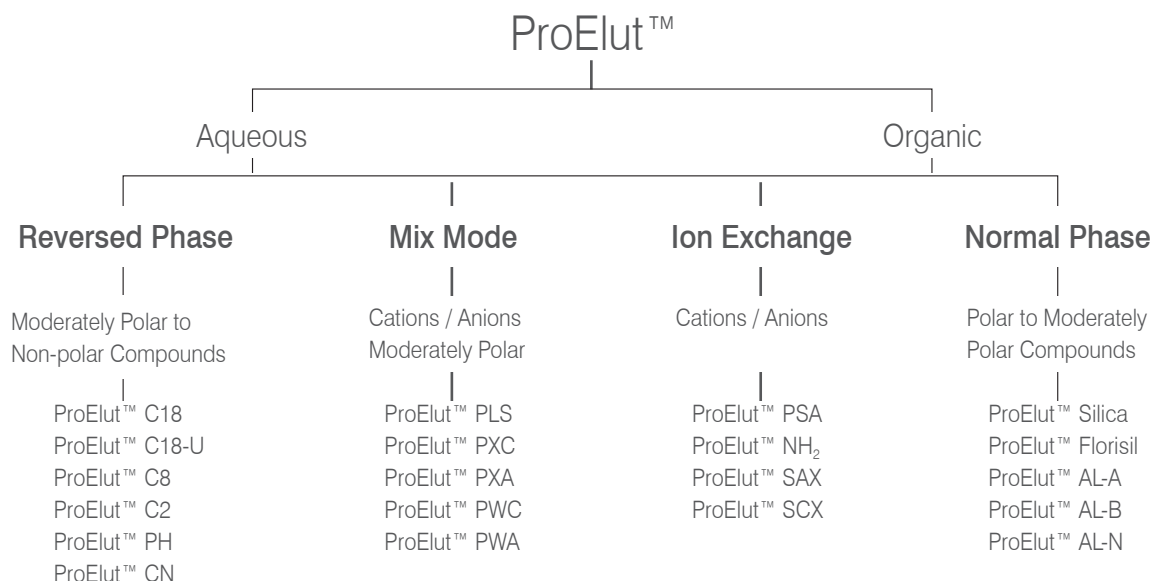
Use SPE for Samples That

- 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



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).

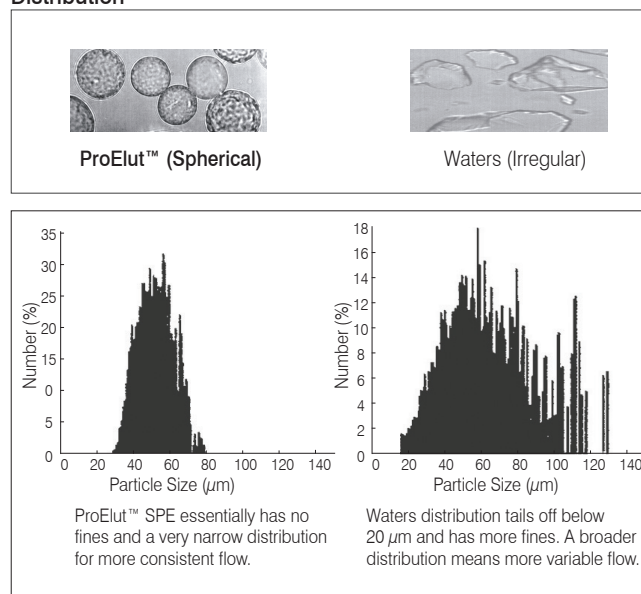
Features of ProElut™ SPE

- 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



ProElut™ SPE

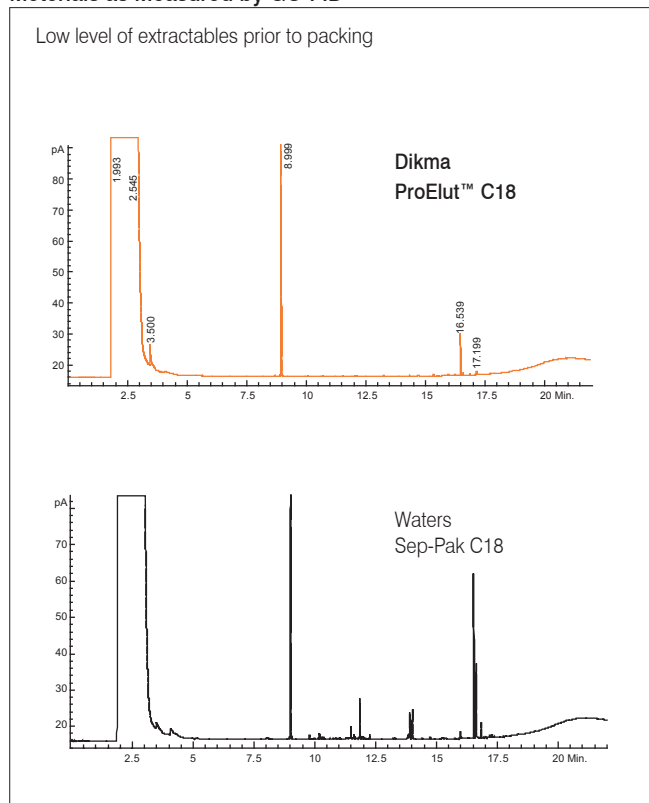
High Purity Silica Improves Recovery and Reproducibility

- 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)

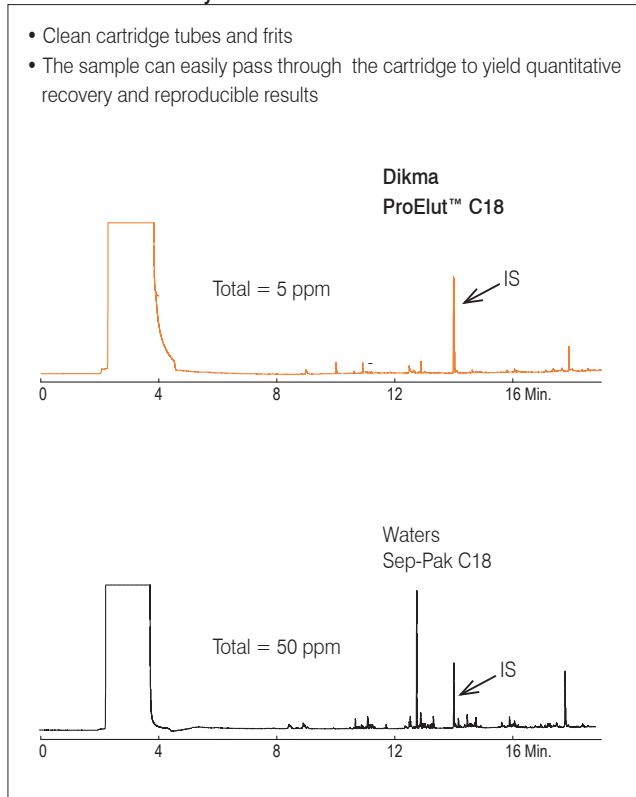
Metal	Dikma ProElut™ High-purity Silica	Brand A Silica	Brand B Silica
Na	<12	917	17
Al	<12	276	57
Ca	<12	<12	<12
Fe	<12	64	23
Ti	<12	<12	130
Zr	<12	48	38

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



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

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



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- <i>N</i> -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 ₂ O ₃ (Acid) Al ₂ O ₃ (Neutral) Al ₂ O ₃ (Basic) Florisil (Magnesium silicate) CARB (Graphitized carbon black) Na ₂ SO ₄		CARB / NH ₂ CARB / PSA SAX / PSA CARB / C18	C18 / CN Silica / PSA Na ₂ SO ₄ / AL-A CARB / SAX / PSA

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

Brand Cross Reference

Dikma	Waters	Agilent	Supelco	Phenomenex
ProElut™ PLS	Oasis HLB	Plexa	—	Strata-X
ProElut™ PXC	Oasis MCX	Plexa PCX	—	Strata-X-C
ProElut™ PXA	Oasis MAX	—	—	Strata-X-A
ProElut™ PWC	Oasis WCX	—	—	Strata-X-CW
ProElut™ PWA	Oasis WAX	—	—	Strata-X-AW
ProElut™ C18	Sep-pak C18	BondElut C18	ENVI-18, LC-18	Strata C18
ProElut™ C18-U	—	BondElut C18-OH	—	Strata C18-U
ProElut™ C8	Sep-pak C8	BondElut C8	—	Strata C8
ProElut™ C2	—	BondElut C2	—	—
ProElut™ PH	—	BondElut PH	LC-PH	Strata Phenyl(PH)
ProElut™ CN	Sep-pak CN	BondElut CN	LC-CN	Strata CN
ProElut™ NH ₂	Sep-pak NH ₂	BondElut NH ₂	LC-NH ₂	Strata NH ₂
ProElut™ PSA	—	BondElut PSA	—	—
ProElut™ Silica	Sep-pak Silica	BondElut Silica	LC-Silica	Strata Si-1 (Silica)
ProElut™ SCX	—	BondElut SCX	LC-SCX	Strata SCX
ProElut™ SAX	—	BondElut SAX	LC-SAX	Strata 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 ₂ O	Ready for use
Load sample solution 3 mL	The compounds of interest will be adsorbed by the sorbent
Wash 3 mL H ₂ O (5% MeOH)	To remove aqueous soluble materials and disruptors
Elute 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 ₂ O	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 adsorbed on the sorbent by reversed 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
Elute 3 mL MeOH	To get compounds of interest that previously adsorbed on the sorbent by non-polar interaction
Elute 3 mL MeOH (5% NH ₄ OH)	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 ₂ O	Ready for use
Load sample solution 3 mL	Protonated basic compounds (under low pH) will approach sulfonic group by Coulomb force. The neutral and acidic compounds will be adsorbed on the sorbent by reversed interaction
Wash 1 3 mL 0.1 M HCl	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
Elute 3 mL MeOH	To get compounds of interest that previously adsorbed on the sorbent by non-polar interaction
Elute 3 mL MeOH (5% NH ₄ OH)	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™ PWC (60 mg / 3 mL)

Suggested Method	Purpose
Condition / equilibrate 3 mL MeOH / 3 mL 5% NH ₄ OH	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 reversed interaction
Wash 1 3 mL 0.1 M NH ₄ OH	To remove aqueous soluble materials and disruptors, including salts and proteins The interaction between acidic 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
Elute 3 mL MeOH (2% HCOOH)	To get compounds of interest that previously adsorbed on the sorbent by non-polar interaction
Elute 3 mL MeOH (5% NH ₄ OH)	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 2% HCOOH solution	Ready for use Add formic acid to make the 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- acidic 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 acidic 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
Elute 3 mL MeOH (5% NH ₄ OH)	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

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	$\begin{array}{c} \text{CH}_3 \\ \\ \text{---Si---C}_{18}\text{H}_{37} \\ \\ \text{CH}_3 \end{array}$
Endcapping	Yes
Carbon load (C%)	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.
ProElut™ C18 SPE Tubes			
50 mg	1 mL	100	63101
60 mg	3 mL	50	63161
100 mg	1 mL	100	63102
100 mg	3 mL	50	63163
100 mg	6 mL	30	63164
200 mg	3 mL	50	63103
250 mg	3 mL	50	63162
500 mg	3 mL	50	63104
500 mg	6 mL	30	63105
1 g	6 mL	30	63106
2 g	12 mL	20	63107
5 g	20 mL	20	63108
10 g	60 mL	10	63109
ProElut™ C18 Bulk Sorbents			
10 g		1	63181
100 g		1	63182
1 kg		1	63183

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	$\begin{array}{c} \text{CH}_3 \\ \\ \text{---Si---C}_{18}\text{H}_{37} \\ \\ \text{CH}_3 \\ \\ \text{---Si---OH} \\ \end{array}$
Endcapping	No
Carbon load (C%)	17%
Retention mechanism	Reversed phase
Application	Similar to ProElut™ C18, but with enhanced retention for polar compounds

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ C18-U SPE Tubes			
50 mg	1 mL	100	63501
60 mg	3 mL	50	63561
100 mg	1 mL	100	63502
200 mg	3 mL	50	63503
500 mg	3 mL	50	63504
500 mg	6 mL	30	63505
500 mg	20 mL	20	63562
1 g	6 mL	30	63506
2 g	12 mL	20	63507
5 g	20 mL	20	63508
10 g	60 mL	10	63509
ProElut™ C18-U Bulk Sorbents			
10 g		1	63581
100 g		1	63582
1 kg		1	63583

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 \AA Specific Surface Area: 500 m^2/g
Functional group	$\begin{array}{c} \text{CH}_3 \\ \\ \text{---Si---C}_8\text{H}_{17} \\ \\ \text{CH}_3 \end{array}$
Endcapping	Yes
Carbon load (C%)	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.
ProElut™ C8 SPE Tubes			
100 mg	1 mL	100	63702
200 mg	3 mL	50	63703
500 mg	3 mL	50	63704
500 mg	6 mL	30	63705
1 g	6 mL	30	63706
2 g	12 mL	20	63707
5 g	20 mL	20	63708
10 g	60 mL	10	63709
ProElut™ C8 Bulk Sorbents			
10 g		1	63781
100 g		1	63782
1 kg		1	63783

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 \AA Specific Surface Area: 500 m^2/g
Functional group	$\begin{array}{c} \text{CH}_3 \\ \\ \text{---Si---C}_2\text{H}_5 \\ \\ \text{CH}_3 \end{array}$
Endcapping	Yes
Carbon load (C%)	5.6%
Retention mechanism	Reversed phase
Application	Plasma, urine, aqueous samples

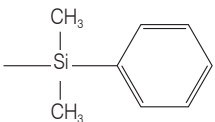
Ordering Information

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

ProElut™ SPE

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.

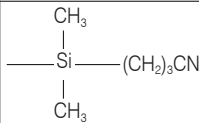
Base material	Spherical silica, Particle Size: 50 μm, Pore Size: 60 Å Specific Surface Area: 500 m ² /g
Functional group	
Endcapping	Yes
Carbon load (C%)	10%
Retention mechanism	Reversed phase
Application	Volatiles in water: PAHs, PAEs, PCBs, pesticides, herbicides, phenols Biological fluids: blood,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

Ordering Information

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

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 load (C%)	8%
Retention mechanism	Reversed phase or normal phase
Application	Pesticides in water, metabolites

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ CN SPE Tubes			
100 mg	1 mL	100	63802
200 mg	3 mL	50	63803
500 mg	3 mL	50	63804
1 g	6 mL	30	63806
2 g	12 mL	20	63807
5 g	20 mL	20	63808
10 g	60 mL	10	63809
ProElut™ CN Bulk Sorbents			
10 g		1	63881
100 g		1	63882
1 kg		1	63883
1 kg		1	63883

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	$\begin{array}{c} \\ \text{---Si---OH} \\ \end{array}$
Endcapping	No
Carbon load (C%)	-
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.
ProElut™ Silica SPE Tubes			
100 mg	1 mL	100	63002
200 mg	3 mL	50	63003
500 mg	3 mL	50	63004
500 mg	6 mL	30	63005
1 g	6 mL	30	63006
2 g	6 mL	30	63061
2 g	12 mL	20	63007
5 g	20 mL	20	63008
10 g	60 mL	10	63009
ProElut™ Silica Bulk Sorbents			
10 g		1	63081
100 g		1	63082
1 kg		1	63083

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™ NH₂. The PSA sorbent is an excellent choice for extracting polar compounds from non-polar solvents. The compounds that are retained too strongly on a NH₂ 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	$\begin{array}{c} \text{CH}_3 \\ \\ \text{---Si---}(\text{CH}_2)_3\text{NH}(\text{CH}_2)_2\text{NH}_2 \\ \\ \text{CH}_3 \end{array}$
Endcapping	No
Carbon load (C%)	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.
ProElut™ PSA SPE Tubes			
100 mg	1 mL	100	63202
200 mg	3 mL	50	63203
500 mg	3 mL	50	63204
500 mg	6 mL	30	63205
1 g	6 mL	30	63206
2 g	12 mL	20	63207
5 g	20 mL	20	63208
10 g	60 mL	10	63209
ProElut™ PSA Bulk Sorbents			
10 g		1	63281
100 g		1	63282
1 kg		1	63283

ProElut™ SPE

ProElut™ NH₂

ProElut™ NH₂ has both polar and weak anion exchange interactions. It can effectively absorb compounds with a polar functional group (-OH, -NH₂, -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	$\begin{array}{c} \text{CH}_3 \\ \\ \text{---Si---}(\text{CH}_2)_3\text{NH}_2 \\ \\ \text{CH}_3 \end{array}$
Endcapping	No
Carbon load (C%)	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.
ProElut™ NH₂ SPE Tubes			
100 mg	1 mL	100	63302
200 mg	3 mL	50	63303
500 mg	3 mL	50	63304
500 mg	6 mL	30	63305
1 g	6 mL	30	63306
2 g	12 mL	20	63307
5 g	20 mL	20	63308
6 g	60 mL	10	63309
10 g	60 mL	10	63361
ProElut™ NH₂ Bulk Sorbents			
10 g		1	63381
100 g		1	63382
1 kg		1	63383



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 \AA Specific Surface Area: 500 m^2/g
Functional group	$\begin{array}{c} \text{CH}_3 \\ \\ \text{---Si---}(\text{CH}_2)_3\text{C}_6\text{H}_4\text{SO}_3^- \text{H}^+ \\ \\ \text{CH}_3 \end{array}$
Endcapping	No
Carbon load (C%)	10.9%
Retention mechanism	Strong cation exchange
Application	Basic compounds in aqueous solution

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ SCX SPE Tubes			
60 mg	3 mL	50	63661
100 mg	1 mL	100	63602
100 mg	12 mL	20	63611
500 mg	3 mL	50	63604
500 mg	6 mL	30	63606
1 g	6 mL	30	63610
2 g	12 mL	20	63607
5 g	20 mL	20	63608
10 g	60 mL	10	63609
ProElut™ SCX Bulk Sorbents			
10 g		1	63681
100 g		1	63382
1 kg		1	63383

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 \AA Specific Surface Area: 500 m^2/g
Functional group	$\begin{array}{c} \text{CH}_3 \\ \\ \text{---Si---}(\text{CH}_2)_3\text{N}^+\text{Cl}^-(\text{CH}_3)_3 \\ \\ \text{CH}_3 \end{array}$
Endcapping	No
Carbon load (C%)	8%
Retention mechanism	Strong anion exchange
Application	Carboxylic acids in aqueous solution

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ SAX SPE Tubes			
100 mg	1 mL	100	63402
500 mg	3 mL	50	63404
500 mg	6 mL	30	63406
500 mg	12 mL	20	63410
2 g	12 mL	20	63407
5 g	20 mL	20	63408
10 g	60 mL	10	63409
ProElut™ SAX Bulk Sorbents			
10 g		1	63481
100 g		1	63482
1 kg		1	63483

ProElut™ SPE

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.

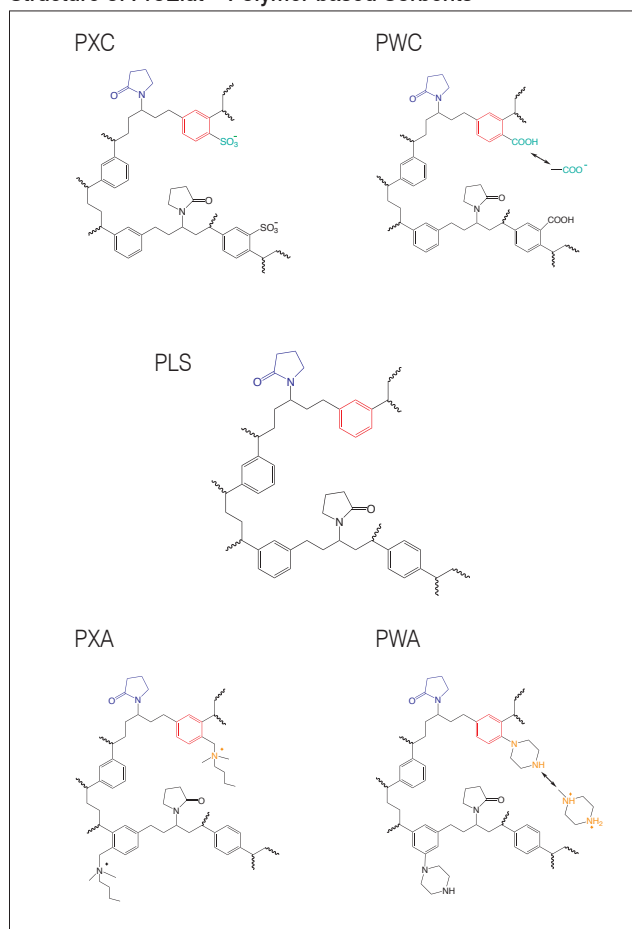
(4) Higher Capacity

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

(5) No Secondary Interaction

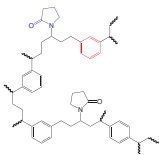
The residue silanols of silica-based sorbents can adsorb basic analytes resulting in low recovery. PLS is a polymer sorbent and there is no silanol activity leading to high recovery.

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 m²/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 "wetable". It is ideal in screening applications where a broad range of analytes can be extracted.

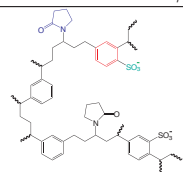
Base material	Porous, highly cross-linked, spherical PS-DVB, Particle Size: 50 μm, Pore Size: 80 Å, Specific Surface Area: 800 m ² /g
Functional group (Pyrrolidinone)	
Retention mechanism	Non-polar and polar interactions
Application	Pharmaceutical residues in animal tissue, such as tetracyclines, chloromycetin, 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.
ProElut™ PLS SPE Tubes			
30 mg	1 mL	100	68002
60 mg	1 mL	100	68011
60 mg	3 mL	50	68003
100 mg	6 mL	30	68015
150 mg	6 mL	30	68004
200 mg	6 mL	30	68012
500 mg	3 mL	50	68016
500 mg	6 mL	30	68005
500 mg	12 mL	20	68007
1 g	6 mL	30	68014
1 g	20 mL	20	68008
6 g	60 mL	10	68009

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

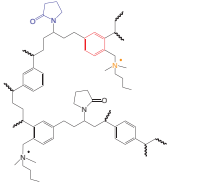
Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ PXC SPE Tubes			
20 mg	3 mL	50	68261
30 mg	1 mL	100	68202
60 mg	3 mL	50	68203
90 mg	6 mL	25	68223
150 mg	6 mL	30	68204
200 mg	6 mL	30	68212
500 mg	6 mL	30	68205
500 mg	12 mL	20	68207
1 g	20 mL	20	68208
6 g	60 mL	10	68209

ProElut™ SPE

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.

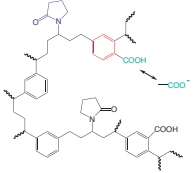
Base material	Porous, highly cross-linked, spherical PS-DVB, Particle Size: 50 μm , Pore Size: 80 \AA , Specific Surface Area: 800 m^2/g
Functional group (Quaternary amino)	
Retention mechanism	Non-polar interaction and anion exchange
Application	Compounds with groups as carboxyl and phenolic hydroxyl

Ordering Information

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

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.

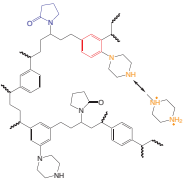
Base material	Porous, highly cross-linked, spherical PS-DVB, Particle Size: 50 μm , Pore Size: 80 \AA , Specific Surface Area: 800 m^2/g
Functional group (Carboxyl)	
Retention mechanism	Non-polar interaction and weak cation exchange
Application	Strong basic compounds, quaternary ammonium salts

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ PWC SPE Tubes			
30 mg	1 mL	100	65711
60 mg	3 mL	50	65712
150 mg	6 mL	30	65713
500 mg	3 mL	50	65714
500 mg	6 mL	30	65705

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 \AA , 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.
ProElut™ PWA SPE Tubes			
30 mg	1 mL	100	65811
60 mg	3 mL	50	65812
150 mg	6 mL	30	65813
500 mg	6 mL	30	65814

ProElut™ PWA-2

ProElut™ PWA-2 is a highly cross-linked PS-DVB copolymer with ethylenediamine 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 \AA , Specific Surface Area: 800 m^2/g
Functional group	Ethylenediamine, Phenyl, Vinyl, Pyrrolidonyl
Retention mechanism	Non-polar interaction and weak anion exchange
Application	For purification of strong acidic compounds

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ PWA-2 SPE Tubes			
150 mg	6 mL	30	65815

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.
ProElut™ Florisil SPE Tubes			
100 mg	1 mL	100	65002
200 mg	3 mL	50	65061
500 mg	3 mL	50	65004
500 mg	6 mL	30	65005
1 g	6 mL	30	65006
2 g	6 mL	30	65062
2 g	12 mL	20	65007
5 g	20 mL	20	65008
10 g	60 mL	10	65009
ProElut™ Florisil Bulk Sorbents			
10 g		1	65081
100 g		1	65082
1 kg		1	65083

ProElut™ AL-A

Base material	Al ₂ O ₃ (acid wash), 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.
ProElut™ AL-A SPE Tubes			
100 mg	1 mL	100	65102
500 mg	3 mL	50	65104
500 mg	6 mL	30	65105
1 g	6 mL	30	65106
2 g	12 mL	20	65107
5 g	20 mL	20	65108
10 g	60 mL	10	65109
ProElut™ AL-A Bulk Sorbents			
10 g		1	65181
100 g		1	65182
1 kg		1	65183

ProElut™ AL-N

Base material	Al ₂ O 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.
ProElut™ AL-N SPE Tubes			
100 mg	1 mL	100	65302
125 mg	3 mL	50	65362
200 mg	3 mL	50	65303
250 mg	3 mL	50	65311
500 mg	3 mL	50	65304
500 mg	6 mL	30	65305
1 g	3 mL	50	65310
1 g	6 mL	30	65306
2 g	12 mL	20	65307
5 g	20 mL	20	65308
5 g	20 mL	30	65361
10 g	60 mL	10	65309
ProElut™ AL-N Bulk Sorbents			
10 g		1	65381
100 g		1	65382
1 kg		1	65383

ProElut™ AL-B

Base material	Al ₂ O ₃ (base wash), Particle Size: 125 μm
pH	10
Retention mechanism	Lewis acid, polar, and ion exchange interactions
Application	Polar and anionic compounds, amines

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ AL-B SPE Tubes			
100 mg	1 mL	100	65202
500 mg	3 mL	50	65204
1 g	3 mL	50	65211
1 g	6 mL	30	65206
2 g	12 mL	20	65207
5 g	20 mL	20	65208
10 g	60 mL	10	65209
ProElut™ AL-B Bulk Sorbents			
10 g		1	65281
100 g		1	65282
1 kg		1	65283

ProElut™ SPE

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.
ProElut™ CARB SPE Tubes			
100 mg	1 mL	100	65402
100 mg	3 mL	50	65461
125 mg	3 mL	50	65463
200 mg	6 mL	30	65462
250 mg	3 mL	50	65403
500 mg	3 mL	50	65404
500 mg	6 mL	30	65405
1 g	6 mL	30	65406
2 g	12 mL	20	65407
5 g	20 mL	20	65408
10 g	60 mL	10	65409
ProElut™ CARB Bulk Sorbent			
10 g		1	65481

ProElut™ AC (Activated Carbon) New!

Base material	Packing of activated carbon
Application	Widely used in analysis of acrylamide in water

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ AC SPE Tubes			
250 mg	3 mL	50	65907
500 mg	6 mL	30	65908
2 g	12 mL	20	65356

ProElut™ CARB / NH₂ New!

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.
ProElut™ CARB / NH₂ SPE Tubes			
250 mg / 250 mg	6 mL	30	64106
500 mg / 500 mg	6 mL	30	64105
500 mg / 500 mg	20 mL	20	64108

ProElut™ C18 / CN New!

- Packing of equivalent volume of C18 and CN

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ C18 / CN SPE Tubes			
200 mg / 200 mg	3 mL	50	64364

ProElut™ CARB / PSA New!

- Packing of equivalent volume of CARB and PSA
- Widely used in analysis of pesticide residues (many different varieties) in foods

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ CARB / PSA SPE Tubes			
250 mg / 250 mg	6 mL	30	64206
500 mg / 500 mg	6 mL	30	64205
500 mg / 500 mg	20 mL	20	64208

ProElut™ CARB / C18 New!

- Packing of equivalent volume of CARB and C18

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ CARB / C18 SPE Tubes			
250 mg / 250 mg	6 mL	30	64362

ProElut™ SAX / PSA New!

Base material	Packing of equivalent volume of SAX and PSA
Application	Widely used in analysis of pesticide residues (many different varieties) in foods

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ SAX / PSA SPE Tubes			
250 mg / 250 mg	6 mL	30	64306
500 mg / 500 mg	6 mL	30	64305

ProElut™ Silica / PSA New!

- Packing of equivalent volume of Silica and PSA

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ Silica / PSA SPE Tubes			
500 mg / 500 mg	6 mL	30	64405

ProElut™ Na₂SO₄ / AL-A New!

- Packing of Na₂SO₄ and AL-A

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ Na₂SO₄ and AL-A SPE Tubes			
2 g / 2.5 g	6 mL	30	65567

ProElut™ CARB / SAX / PSA New!

- Packing of equivalent volume of CARB / SAX / PSA

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ CARB / SAX / PSA SPE Tubes			
500 mg / 500 mg / 500 mg	12 mL	20	64361

ProElut™ BaP ^{New!}

- Specially designed for analysis of benzopyrene

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ BaP SPE Tubes			
22 g	60 mL	10	65351
Matching accessories			
SS Rack 6-Ports for BaP		1	4802
SS Needle for Bap		50	1095

ProElut™ TPC ^{New!}

- Specially designed for analysis of pesticide residues in tea

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ TPC SPE Tubes			
1200 mg	6 mL	30	65360
2400 mg	12 mL	20	65354

ProElut™ Melamine ^{New!}

- Specially designed for analysis of melamine

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ Melamine SPE Tubes			
60 mg	3 mL	50	65355

ProElut™ DPC ^{New!}

- Specially designed for analysis of residues of pesticide, veterinary drugs

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ DPC SPE Tubes			
3 g	12 mL	20	65353

ProElut™ AFT ^{New!}

- Specially designed for analysis of aflatoxin

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ AFT SPE Tubes			
1500 mg	12 mL	20	65904

ProElut™ AFT-2 ^{New!}

- Specially designed for analysis of aflatoxin in fats

Ordering Information

Volume	Qty	Cat. No.
ProElut™ AFT-2 SPE Tubes		
12 mL	20	65906

ProElut™ AFT-3 ^{New!}

- Specially designed for analysis of aflatoxin in fats

Ordering Information

Volume	Qty	Cat. No.
ProElut™ AFT-3 SPE Tubes		
12 mL	20	65915

ProElut™ VDC ^{New!}

- Specially designed for analysis of vitamin D2, D3

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ VDC SPE Tubes			
2 g	12 mL	20	65358

ProElut™ GPR ^{New!}

- Specially designed for analysis of pesticide residues in Chinese medicine

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ GPR SPE Tubes			
1.5 g	12 mL	20	65352

ProElut™ PSC ^{New!}

- Specially designed for analysis of pesticide residues in cereals

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ PSC SPE Tubes			
1.5 g	12 mL	20	65357

ProElut™ DCD ^{New!}

- Specially designed for analysis of dicyandiamide

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ DCD SPE Tubes			
1 g	12 mL	20	65359

ProElut™ MCS ^{New!}

- Specially designed for analysis of plant growth regulator

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ MCS Tubes			
500 mg	6 mL	30	65912

ProElut™ SDH ^{New!}

- Specially designed for analysis of Sudan

Ordering Information

Volume	Qty	Cat. No.
ProElut™ SDH Tubes		
6 mL	30	65909

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.
ProElut™ PLS GLASS SPE Tubes			
200 mg	6 mL	30	68012G
500 mg	6 mL	30	68005G
ProElut™ C18 GLASS SPE Tubes			
500 mg	6 mL	30	63105G
1 g	6 mL	30	63106G
ProElut™ Florisil GLASS SPE Tubes			
500 mg	6 mL	30	65005G
1 g	6 mL	30	65006G
ProElut™ PSA GLASS SPE Tubes			
500 mg	6 mL	30	63205G
1 g	6 mL	30	63206G
ProElut™ Silica GLASS SPE Tubes			
500 mg	6 mL	30	63005G
1 g	6 mL	30	63006G
2 g	6 mL	30	63061G
ProElut™ PSA / Silica GLASS SPE Tubes			
500 mg / 500 mg	6 mL	30	64363G

ProElut™ PLS GLASS—Specially designed for analysis of Bisphenol A ^{New!}

Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ PLS GLASS SPE Tubes			
200 mg	6 mL	30	68012G

ProElut™ PSX GLASS—Specially designed for analysis of Phthalate Esters ^{New!}

- Used for analysis of flame retardants, plasticizers in textiles

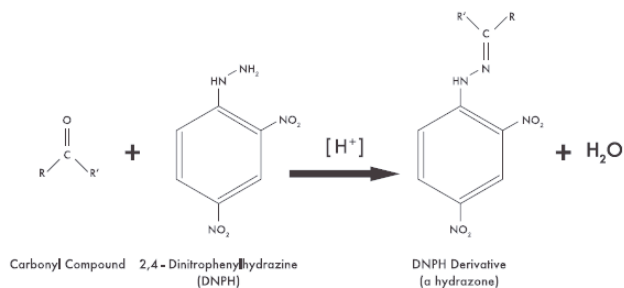
Ordering Information

Mass	Volume	Qty	Cat. No.
ProElut™ PSX GLASS SPE Tubes			
700 mg	6 mL	30	64365G



ProElut™ DNP-H-Silica **New!****Theory of Operation**

ProElut™ DNP-H-Silica cartridges trap aldehydes and ketones in gasses by reacting them with the DNP-H-Silica in the cartridge to form stable hydrazone derivatives. The derivatization reaction takes place during sample collection. The derivatives are later eluted and analyzed.

**Technical Specifications****Background Levels of DNP-H-Silica Derivatives**

µg DNP Derivative per Cartridge			
Compound	ProElut DNP-H-Silica	Shimadzu GL	Waters
Formaldehyde	0.023	0.022	0.034
Acetaldehyde	0.019	0.021	0.032
Acetone	0.025	0.048	0.125

Batch Stability of Background Levels

Compound	Batch A	Batch B	Batch C	Batch D	RSD(%)
Formaldehyde	0.032	0.020	0.027	0.023	0.20
Acetaldehyde	0.029	0.020	0.024	0.019	0.20
Acetone	0.030	0.023	0.034	0.025	0.18

Attentions:

1. Storage Temperature: -20 °C
 2. Expiration Date: 30 days.
- If exceeding the time limit, please detect background of DNP-H-Silica Cartridge.
3. No aldehyde and ketone compounds in operating environment.

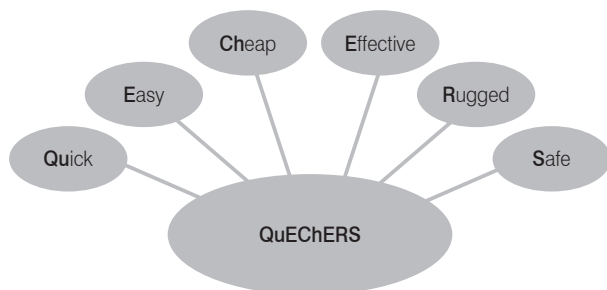
Ordering Information

Mass	Qty	Cat. No.
ProElut™ DNP-H-Silica Cartridge		
400 mg	20	65913

ProElut™ QuEChERS

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 **Quick, Easy, Cheap, Effective, Rugged and Safe**. 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




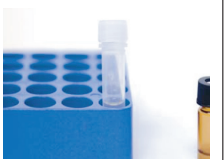


ProElut™ QuEChERS versus Traditional SPE

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 ₂ SO 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

<p>Original QuEChERS</p> <p>Extraction</p> <ol style="list-style-type: none"> 1. Add 10 mL MeCN to 10 g sample 2. Add internal standard 3. Add 4 g MgSO₄ and 1 g NaCl 4. Shake vigorously for 1 min 5. Centrifuge for 5 min <p>Dispersive SPE clean-up</p> <ol style="list-style-type: none"> 6. Remove 1 mL of the upper layer 7. Add 25 mg PSA and 150 mg MgSO₄ to the 1 mL removed 8. Mix for 30 sec and centrifuge for 1 min 	<p>AOAC 2007.01</p> <p>Extraction</p> <ol style="list-style-type: none"> 1. Add 15 mL 1% HOAc in MeCN to 15 g of sample 2. Add internal standard 3. Add 6 g MgSO₄ and 1.5 g NaOAc 4. Shake vigorously for 1 min 5. Centrifuge for 5 min <p>Dispersive SPE clean-up</p> <ol style="list-style-type: none"> 6. Remove 1 mL of the upper layer 7. Add 25 mg PSA and 150 mg MgSO₄ to the 1 mL removed 8. Mix for 30 sec and centrifuge for 1 min
<p>EN 15662</p> <p>Extraction</p> <ol style="list-style-type: none"> 1. Add 10 mL MeCN to 10 g of sample 2. Add internal standard 3. Add 4 g MgSO₄ + 1 g NaCl + 1 g Na₃Citr·2H₂O + 0.5 g Na₃Citr·2H₂O (+ 0.6 mL 5 N NaOH for lemons, limes, etc.) 4. Shake vigorously for 1 min 5. Centrifuge for 5 min <p>Dispersive SPE clean-up</p> <ol style="list-style-type: none"> 6. Remove 1 mL of the upper layer 7. Add 25 mg PSA and 150 mg MgSO₄ (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





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.
AOAC 2007.01	6 g MgSO ₄ , 1.5 g NaOAc with 50 mL Centrifuge Tube	50/pk	64520
EN 15662	4 g MgSO ₄ , 1 g NaCl, 1 g TSCD, 0.5 g DHS with 50 mL Centrifuge Tube	50/pk	64521

Step 2 : Selected Dispersive SPE Kit

	Sample Type	Method	2 mL Clean-up Tube	15 mL Clean-up Tube
	General fruits and vegetables Major interferences: organic acids, carbohydrates, phenols	AOAC	50 mg PSA 150 mg MgSO ₄ Cat#64501	400 mg PSA 1200 mg MgSO ₄ Cat#64502
		EN	25 mg PSA 150 mg MgSO ₄ Cat#64503	150 mg PSA 900 mg MgSO ₄ Cat#64504
	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	400 mg PSA 400 mg C18 1200 mg MgSO ₄ Cat#64506
		EN	25 mg PSA 25 mg C18 150 mg MgSO ₄ Cat#64507	150 mg PSA 150 mg C18 900 mg MgSO ₄ Cat#64508
	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	400 mg PSA 400 mg Carb 1200 mg MgSO ₄ Cat#64510
		EN	25 mg PSA 7.5 mg Carb 150 mg MgSO ₄ Cat#64511	150 mg PSA 45 mg Carb 900 mg MgSO ₄ Cat#64512
	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	400 mg PSA 400 mg C18 400 mg Carb 1200 mg MgSO ₄ Cat#64514

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 MgSO₄ 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

Clean-up Kit Ordering Information

Material	Method	Qty	Cat. No.
ProElut™ QuEChERS Clean-up Kit (2 mL)			
50 mg PSA / 150 mg MgSO ₄	AOAC	100/pk	64501
25 mg PSA / 150 mg MgSO ₄	EN	100/pk	64503
50 mg PSA / 50 mg C18 / 150 mg MgSO ₄	AOAC	100/pk	64505
25 mg PSA / 25 mg C18 / 150 mg MgSO ₄	EN	100/pk	64507
50 mg PSA / 50 mg Carb / 150 mg MgSO ₄	AOAC	100/pk	64509
25 mg PSA / 7.5 mg Carb / 150 mg MgSO ₄	EN	100/pk	64511
50 mg PSA / 50 mg C18 / 50 mg Carb / 150 mg MgSO ₄	AOAC	100/pk	64513
25 mg PSA / 2.5 mg Carb / 150 mg MgSO ₄	EN	100/pk	64515
ProElut™ QuEChERS Clean-up Kit (15 mL)			
400 mg PSA / 1200 mg MgSO ₄	AOAC	50/pk	64502
150 mg PSA / 900 mg MgSO ₄	EN	50/pk	64504
400 mg PSA / 400 mg C18 / 1200 mg MgSO ₄	AOAC	50/pk	64506
150 mg PSA / 150 mg C18 / 900 mg MgSO ₄	EN	50/pk	64508
400 mg PSA / 400 mg Carb / 1200 mg MgSO ₄	AOAC	50/pk	64510
150 mg PSA / 45 mg Carb / 900 mg MgSO ₄	EN	50/pk	64512
400 mg PSA / 400 mg C18 / 400 mg Carb / 1200 mg MgSO ₄	AOAC	50/pk	64514
150 mg PSA / 15 mg Carb / 900 mg MgSO ₄	EN	50/pk	64516

Extraction Kit Ordering Information

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

ProElut™ QuEChERS Clean-up Tube (2 mL) **New!**

Ordering Information

Description	Volume	Qty	Cat. No.
ProElut™ QuE 2 mL Tube, For Quinolone	2 mL	100	64529
ProElut™ QuE 2 mL Tube, For Chloramphenicol	2 mL	100	64531



ProElut™ LLE+

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, domestic was wastewater.

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 diethyl 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 N₂, 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%)

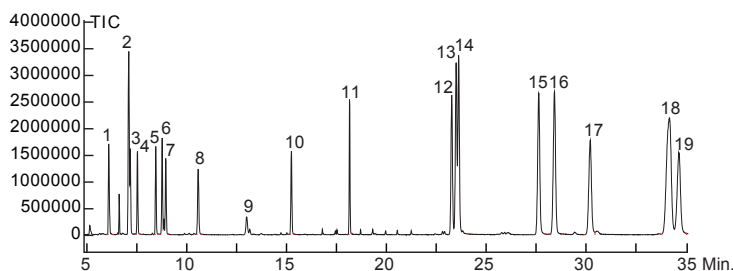
Flow rate: 0.6 mL/min,

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, Ionization: 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

Ordering Information

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

*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.
Diatomite Filter Aid	800 g	62591

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. 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

Syringe Filter	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-Methylpyrrolidone	Isopropyl alcohol	Sodium hydroxide (8N)	Tetrahydrofuran	THF / water (50 / 50)	Toluene	Water		
CA	NR	NR	R	R	NR	NR	NR	R	NR	R	NR	NR	R	R	NR	NR	NR	R	LR	NR	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	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	R	
PES	LR	R	R	R	LR	LR	R	R	R	R	R	R	R	R	R	LR	R	R	-	-	LR	R	R	R	R	
PTFE	R*	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	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	R

R = Resistant

LR = Limited Resistant

NR = NOT Resistant

*UV absorbance was set at 254 nm

ProMax™ Syringe Filters

ProMax™ Syringe Filter Ordering Information

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



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
ProMax™ NY	0.22	50/pk	30026
	0.45	50/pk	30027
ProMax™ PTFE	0.22	50/pk	30028
	0.45	50/pk	30029

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
ProMax™ GF / NY	0.45	100/pk	54839
ProMax™ GF / PTFE	0.45	100/pk	54840
ProMax™ GF / CA	0.45	100/pk	54838

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

Description	Qty	Cat. No.
Clear	100/pk	5320
Clear, with label	100/pk	5321
Amber	100/pk	5322
Amber, with label	100/pk	5323

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

Description	Qty	Cat. No.
Screw cap, blue, open top, with PTFE / Red rubber septa	100/pk	5324
Screw cap, blue, open top, with PTFE / White silicone septa	100/pk	5325
Screw cap, blue, open top, with PTFE / Silicone / PTFE septa	100/pk	5326
Screw cap, black, open top, with Pre-slit PTFE / Silicone septa	100/pk	5327
Screw cap, blue, open top, with PTFE / ULB silicone septa	100/pk	5328
Screw cap, blue, open top, with Pre-slit PTFE / ULB silicone septa	100/pk	5329

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

Autosampler Vials

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

Description	Qty	Cat. No.
Clear	100/pk	3915
Clear, with label	100/pk	3916
Amber	100/pk	3917
Amber, with label	100/pk	3918



Aluminum Cap with Septa for Crimp Top Vials

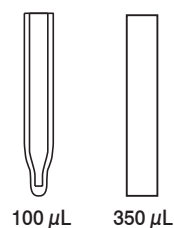
Description	Qty	Cat. No.
Aluminum cap 11 mm, with PTFE / Red rubber septa	100/pk	3919
Aluminum cap 11 mm, with PTFE / White silicone septa	100/pk	3920
Aluminum cap 11 mm, magnetic, with PTFE / White silicone septa for CTC autosamplers	100/pk	3921



Microvolume Inserts

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

Description	Qty	Cat. No.
100 μ L glass conical inserts, clear, 6 x 31 mm	100/pk	3972
100 μ L glass conical inserts, clear, 5.7 x 29 mm, with polyspring	100/pk	3973
300 μ L glass conical inserts, clear, 5.7 x 29 mm, with polyspring	100/pk	3974
350 μ L glass flat bottom inserts, clear, 6 x 31 mm	100/pk	52385



Vial Rack

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

Description	Qty	Cat. No.
Vial rack 12 mm PP 50 holes white	1/pk	52401A
Vial rack 12 mm PP 50 holes blue	1/pk	52401B



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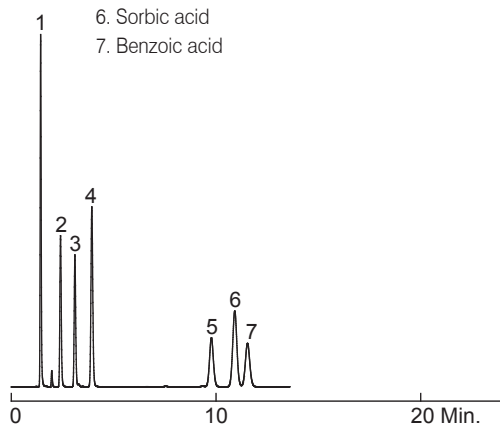
Spursil™

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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 H₂O = 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

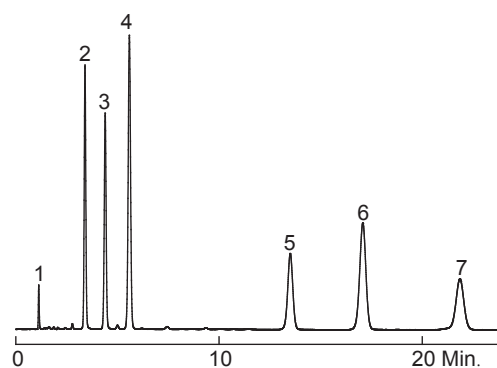


AN: S1167

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 H₂O = 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

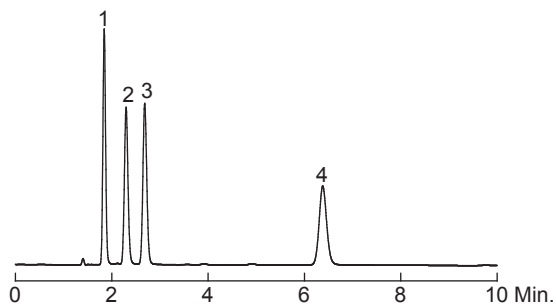


AN: S1168

Alkaloids

Column: Inspire™ 5 µm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: MeOH:20 mM KH₂PO₄ (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

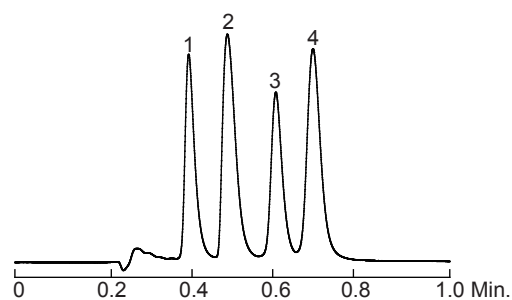


AN: I1101

Antiulcers

Column: Endeavorsil™ 1.8 µm C18, 50 x 2.1 mm
 Cat. No.: **87002**
 Mobile Phase: MeOH:10 mM CH₃COONH₄ (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

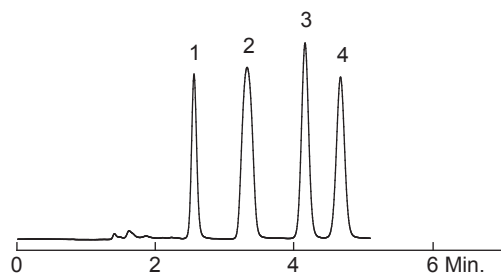


AN: E1101

Pharmaceutical

Antulcers

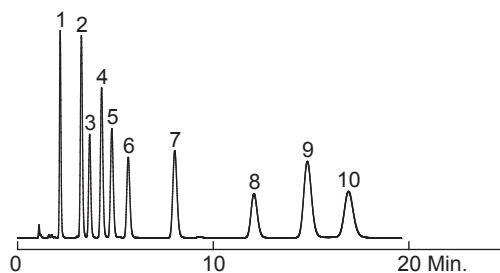
Column: Inspire™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: MeOH:10 mM CH₃COONH₄ (pH 7) = 35:65
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 220 nm
 Sample: 1. Famotidine
 2. Ranitidine
 3. Cimetidine
 4. Nizatidine



AN: I1102

Antibacterials

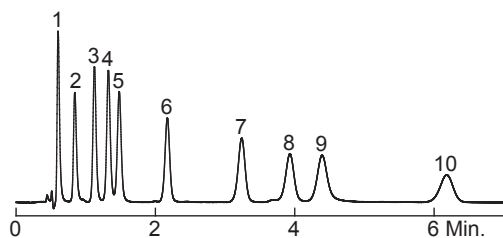
Column: Inspire™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 20:80
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Sulfanilamide 6. Sulfamethoxyipyridazine
 2. Carbadox 7. Furazolidone
 3. Sulfapyridine 8. Sulfamethoxazole
 4. Sulfamerazine 9. Sulfisoxazole
 5. Thiamphenicol 10. Oxolinic acid



AN: I1103

Antibacterials

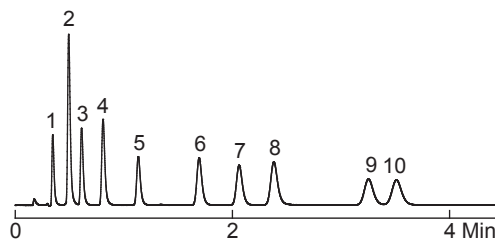
Column: Leapsil™ 2.7 μm C18, 50 x 2.1 mm
 Cat. No.: **86004**
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 20:80
 Flow Rate: 0.3 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Sulfanilamide
 2. Carbadox
 3. Sulfamerazine
 4. Sulfamethazine
 5. Sulfamethoxyipyridazine
 6. Furazolidone
 7. Sulfamethoxazole
 8. Sulfisoxazole
 9. Oxolinic acid
 10. Sulfadimethoxine



AN: L1112

Antibacterials

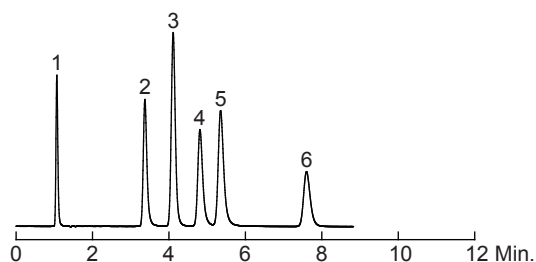
Column: Endeavorsil™ 1.8 μm C18, 50 x 2.1 mm
 Cat. No.: **87002**
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 20:80
 Flow Rate: 0.5 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Sulfanilamide
 2. Carbadox
 3. Sulfamerazine
 4. Sulfamethoxyipyridazine
 5. Furazolidone
 6. Sulfamethoxazole
 7. Sulfisoxazole
 8. Oxolinic acid
 9. Sulfadimethoxine
 10. Sulfaquinoxaline



AN: E1102

Antihistamines

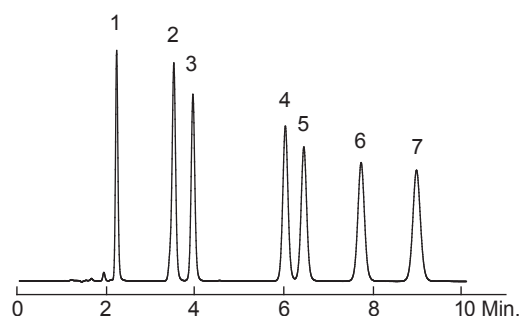
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: MeOH:5 mM NH₄HCO₃ (pH 10) = 75:25
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Maleic acid
 2. Pheniramine
 3. Doxylamine
 4. Chlorpheniramine
 5. Brompheniramine
 6. Diphenhydramine



AN: I1104

Anti-inflammatories

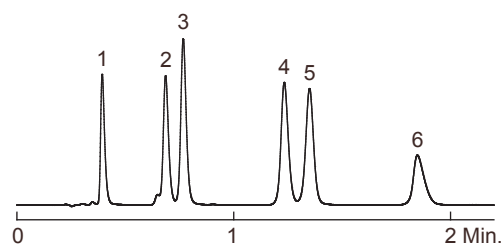
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 55:45
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Phenacetin
 2. Tolmetin
 3. Ketoprofen
 4. Fenoprofen
 5. Flurbiprofen
 6. Diclofenac
 7. Ibuprofen



AN: I1105

Anti-inflammatories

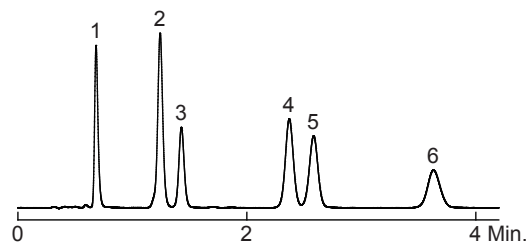
Column: Endeavorsil™ 1.8 µm C18, 50 x 2.1 mm
 Cat. No.: **87002**
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 50:50
 Flow Rate: 0.5 mL/min
 Temperature: 30 °C
 Detection: UV 254 nm
 Sample: 1. Phenacetin
 2. Tolmetin
 3. Ketoprofen
 4. Fenoprofen
 5. Flurbiprofen
 6. Ibuprofen



AN: E1103

Anti-inflammatories

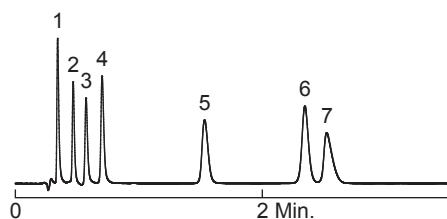
Column: Leapsil™ 2.7 µm C18, 50 x 2.1 mm
 Cat. No.: **86004**
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 50:50
 Flow Rate: 0.3 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Phenacetin
 2. Tolmetin
 3. Ketoprofen
 4. Fenoprofen
 5. Flurbiprofen
 6. Ibuprofen



AN: L1102

β -Blockers at Low pH

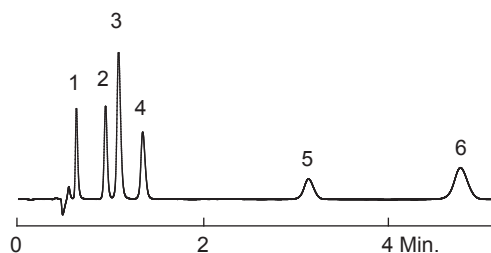
Column: Endeavorsil™ 1.8 μ m C18, 50 x 2.1 mm
 Cat. No.: **87002**
 Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H₂O = 25:75
 Flow Rate: 0.5 mL/min
 Temperature: 30 °C
 Detection: UV 220 nm
 Sample:
 1. Nadolol
 2. Pindolol
 3. Acebutolol
 4. Metoprolol
 5. Labetolol
 6. Propranolol
 7. Alprenolol



AN: E1104

β -Blockers at Low pH

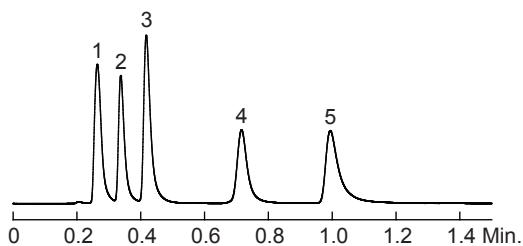
Column: Leapsil™ 2.7 μ m C18, 50 x 2.1 mm
 Cat. No.: **86004**
 Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H₂O = 25:75
 Flow Rate: 0.3 mL/min
 Temperature: 30 °C
 Detection: UV 220 nm
 Sample:
 1. Nadolol
 2. Pindolol
 3. Acebutolol
 4. Metoprolol
 5. Labetolol
 6. Propranolol



AN: L1103

β -Blockers at Neutral pH

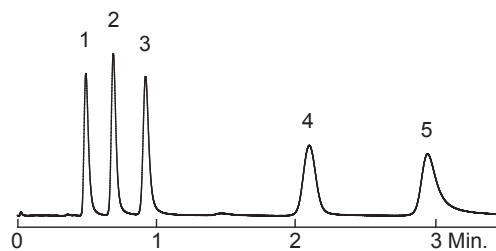
Column: Endeavorsil™ 1.8 μ m C18, 50 x 2.1 mm
 Cat. No.: **87002**
 Mobile Phase: MeCN:20 mM phosphate buffer (pH 7) = 30:70
 Flow Rate: 0.5 mL/min
 Temperature: 30 °C
 Detection: UV 220 nm
 Sample:
 1. Nadolol
 2. Pindolol
 3. Metoprolol
 4. Labetolol
 5. Propranolol



AN: E1105

β -Blockers at Neutral pH

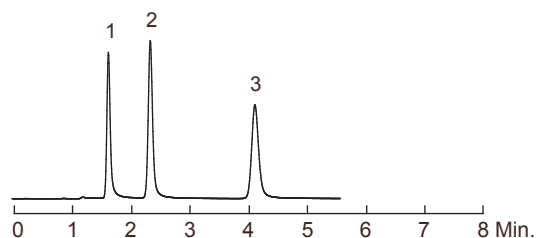
Column: Leapsil™ 2.7 μ m C18, 50 x 2.1 mm
 Cat. No.: **86004**
 Mobile Phase: MeCN:20 mM phosphate buffer (pH 7) = 25:75
 Flow Rate: 0.3 mL/min
 Temperature: Ambient
 Detection: UV 220 nm
 Sample:
 1. Nadolol
 2. Pindolol
 3. Metoprolol
 4. Labetolol
 5. Propranolol



AN: L1104

Catecholamines

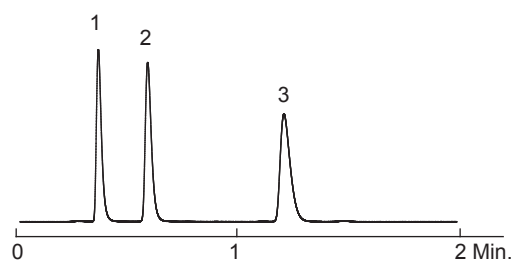
Column: Inspire™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: 20 mM KH₂PO₄, pH 7
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 270 nm
 Sample: 1. Norepinephrine
 2. Epinephrine
 3. Dopamine



AN: I1106

Catecholamines

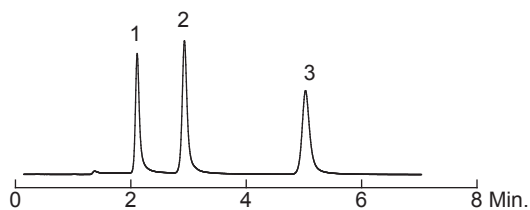
Column: Endeavorsil™ 1.8 μm C18, 50 x 2.1 mm
 Cat. No.: **87002**
 Mobile Phase: 0.1% TFA in H₂O
 Flow Rate: 0.5 mL/min
 Temperature: Ambient
 Detection: UV 270 nm
 Sample: 1. Norepinephrine
 2. Epinephrine
 3. Dopamine



AN: E1106

Catecholamines

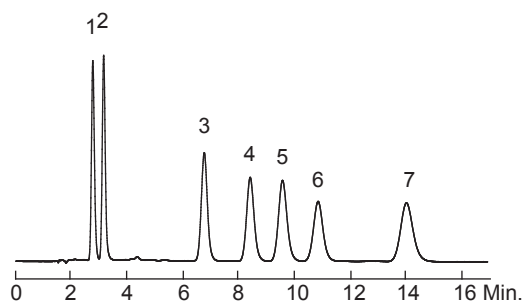
Column: Spursil™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **82001**
 Mobile Phase: 20 mM KH₂PO₄, pH 7
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 270 nm
 Sample: 1. Norepinephrine
 2. Epinephrine
 3. Dopamine



AN: S1152

Cephalosporin Antibiotics

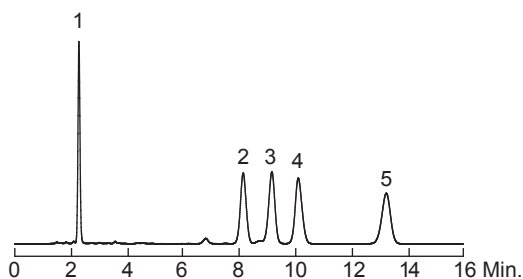
Column: Inspire™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: MeOH:0.1% TFA in H₂O = 30:70
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 230 nm
 Sample: 1. Ceftazidime
 2. Cefadroxil
 3. Cefazoline
 4. Cefaclor
 5. Cephalexin
 6. Cefoxitin
 7. Cefradine



AN: I1123

Cephalosporin Antibiotics

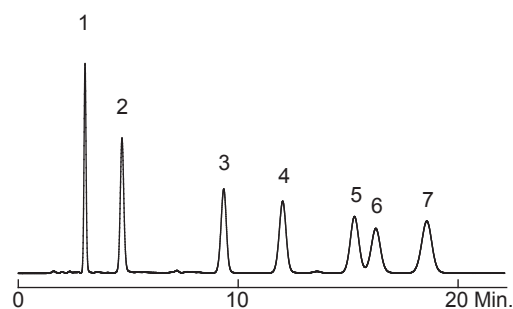
Column: Inspire™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: MeOH:100 mM acetate buffer = 20:80
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample:
 1. Cefadroxil
 2. Cefuroxime
 3. Cefaclor
 4. Cefoxitin
 5. Cefradine



AN: I1107

Cephalosporin Antibiotics

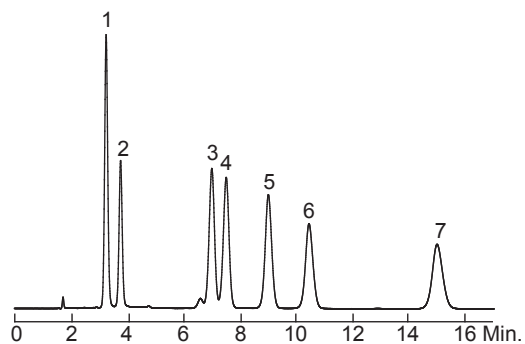
Column: Inspire™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: MeOH:25 mM phosphate buffer (pH 3) = 20:80
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 230 nm
 Sample:
 1. Cefadroxil
 2. Ceftazidime
 3. Cefaclor
 4. Cephalixin
 5. Cefazoline
 6. Cefoxitin
 7. Cefradine



AN: I1108

Cephalosporin Antibiotics

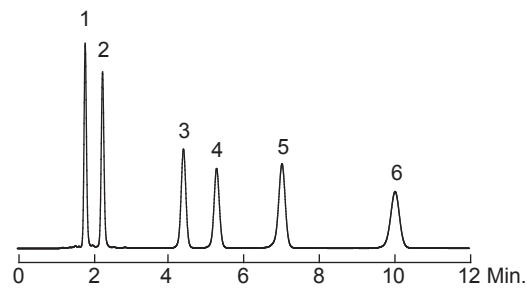
Column: Spursil™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **82001**
 Mobile Phase: MeOH:0.1% TFA in H₂O = 30:70
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 230 nm
 Sample:
 1. Ceftazidime
 2. Cefadroxil
 3. Cefuroxime
 4. Cefazoline
 5. Cefaclor
 6. Cephalixin
 7. Cefradine



AN: I1127

Cephalosporin Antibiotics

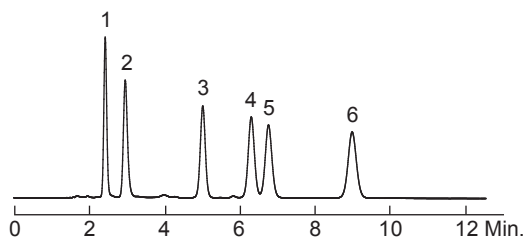
Column: Spursil™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **82001**
 Mobile Phase: MeOH:100 mM acetate buffer = 20:80
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample:
 1. Ceftazidime
 2. Cefadroxil
 3. Cefuroxime
 4. Cefoxitin
 5. Cefaclor
 6. Cefradine



AN: E1113

Cephalosporin Antibiotics

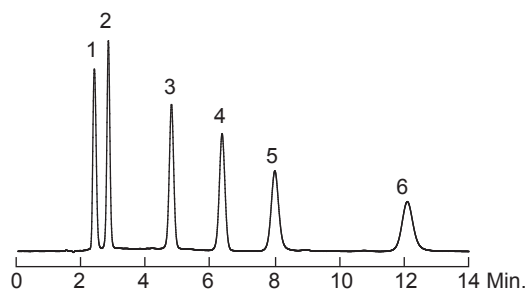
Column: Spursil™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **82001**
 Mobile Phase: MeOH:25 mM phosphate buffer (pH 3) = 25:75
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 230 nm
 Sample: 1. Cefadroxil
 2. Ceftazidime
 3. Cefaclor
 4. Cephalixin
 5. Cefazoline
 6. Cefradine



AN: S1170

Cephalosporin Antibiotics

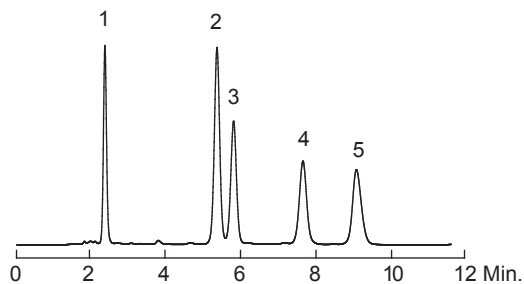
Column: Spursil™ 5 μm C18-EP, 150 x 4.6 mm
 Cat. No.: **82101**
 Mobile Phase: MeOH:0.1% TFA in H₂O = 30:70
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 230 nm
 Sample: 1. Ceftazidime
 2. Cefadroxil
 3. Cephalixin
 4. Cefradine
 5. Cefazoline
 6. Cefoxitin



AN: S1171

Cephalosporin Antibiotics

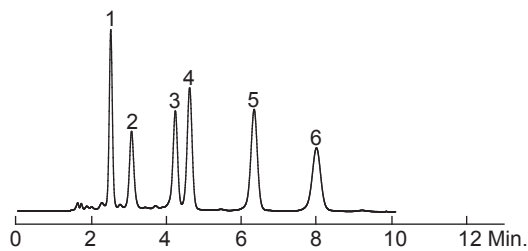
Column: Spursil™ 5 μm C18-EP, 150 x 4.6 mm
 Cat. No.: **82101**
 Mobile Phase: MeOH:100 mM acetate buffer = 20:80
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Ceftazidime
 2. Cephalixin
 3. Cefaclor
 4. Cefradine
 5. Cefoxitin



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. Cephalixin
 5. Cefradine
 6. Cefazoline

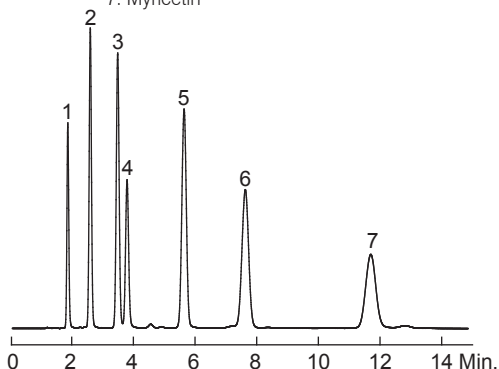


AN: S1173

Applications

Flavonoids

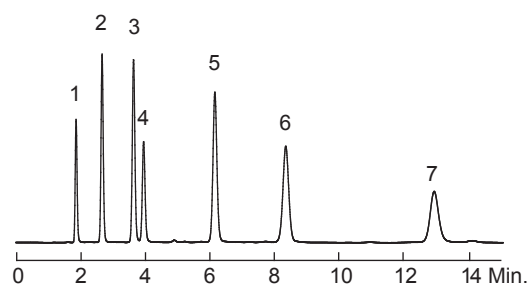
Column: Inspire™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: MeCN:0.085% H₃PO₄ = 20:80
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 280 nm
 Sample: 1. Gallic acid
 2. Catechin
 3. Caffeic acid
 4. Vanillic acid
 5. *p*-Coumaric acid
 6. Quercitrin
 7. Myricetin



AN: I1109

Flavonoids

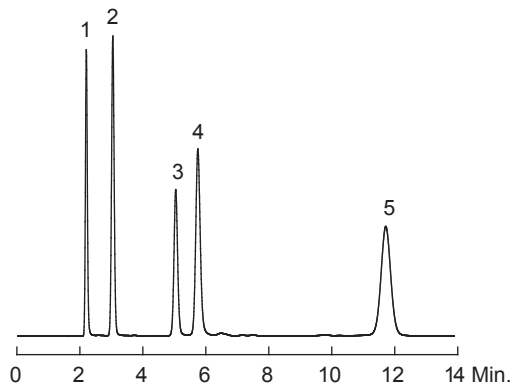
Column: Spursil™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **82001**
 Mobile Phase: MeCN:0.085% H₃PO₄ = 20:80
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 280 nm
 Sample: 1. Gallic acid
 2. Catechin
 3. Caffeic acid
 4. Vanillic acid
 5. *p*-Coumaric acid
 6. Quercitrin
 7. Myricetin



AN: S1154

Flavonoids

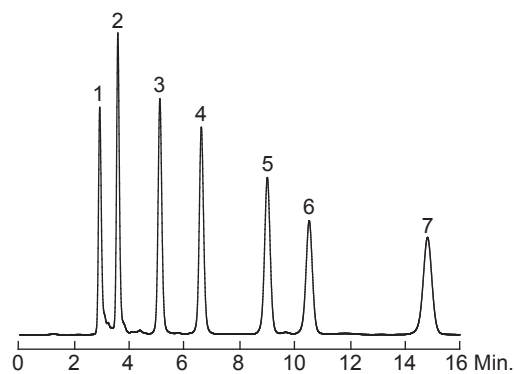
Column: Spursil™ 5 μm C18-EP, 150 x 4.6 mm
 Cat. No.: **82101**
 Mobile Phase: MeCN:0.085% H₃PO₄ = 25:75
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 280 nm
 Sample: 1. Gallic acid
 2. Catechin
 3. Vanillic acid
 4. Caffeic acid
 5. *p*-Coumaric acid



AN: S1169

Penicillins

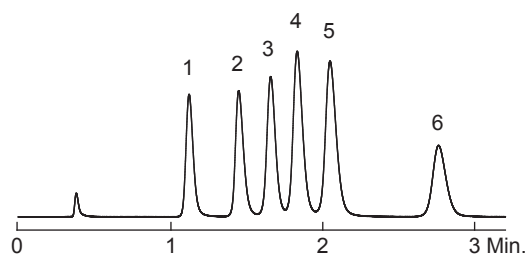
Column: Inspire™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: MeOH:25 mM KH₂PO₄ = 55:45
 Flow Rate: 0.5 mL/min
 Temperature: Ambient
 Detection: UV 220 nm
 Sample: 1. Amoxicillin
 2. Ampicillin
 3. Piperacillin
 4. Penicillin G
 5. Oxacillin
 6. Cloxacillin
 7. Dicloxacillin



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 H₂O = 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

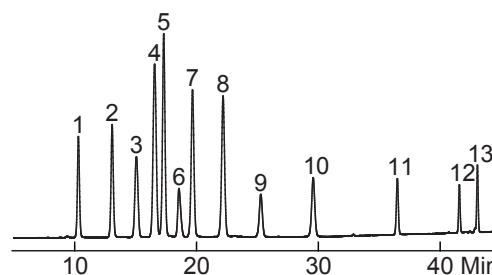


AN: L1105

Quinolones

Column: Inspire™ 5 μm C18, 250 x 4.6 mm
 Cat. No.: **81006**
 Mobile Phase A: MeOH
 Mobile Phase B: 0.2% H₃PO₄ in H₂O
 Flow Rate: 1.0 mL/min
 Temperature: 35 °C
 Detection: UV 254 nm
 Sample: 1. Marbofloxacin 8. Sarafloxacin
 2. Ofloxacin 9. Gatifloxacin
 3. Norfloxacin 10. Sparfloxacin
 4. Enrofloxacin 11. Oxolinic acid
 5. Ciprofloxacin 12. Nalidixic acid
 6. Pazufloxacin 13. Flumequine
 7. Difloxacin

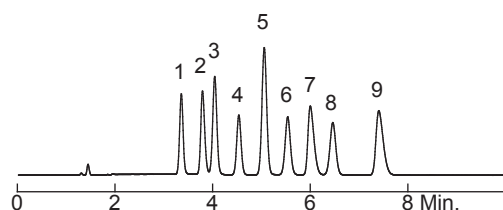
t / min.	0	25	40	42	50
A / %	22	33	65	22	22
B / %	78	67	35	78	78



AN: I1124

TCAs and Benzos

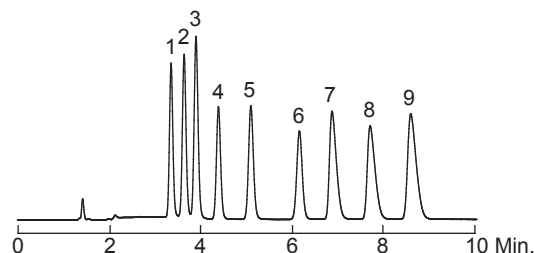
Column: Inspire™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H₂O = 40:60
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Nitrozepam
 2. Nordoxepin
 3. Alprazolam
 4. Diazepam
 5. Oxazepam
 6. Triazolam
 7. Nortriptyline
 8. Clonazepam
 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 H₂O = 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



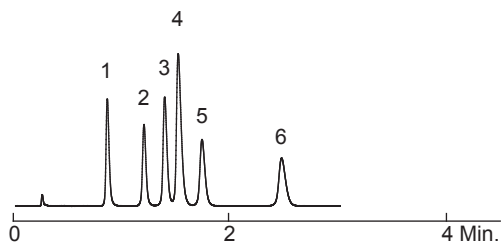
AN: S1155

Applications

Pharmaceutical

TCAs at Low pH

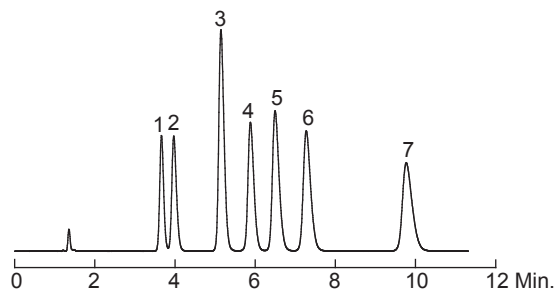
Column: Endeavorsil™ 1.8 μm C18, 50 x 2.1 mm
Cat. No.: **87002**
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H₂O = 35:65
Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Doxepin
2. Desipramine
3. Nortriptyline
4. Amitriptyline
5. Trimipramine
6. Clomipramine



AN: E1107

TCAs at Low pH

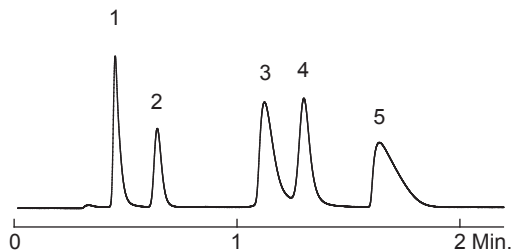
Column: Inspire™ 5 μm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H₂O = 40:60
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Nordoxepin
2. Doxepin
3. Desipramine
4. Nortriptyline
5. Amitriptyline
6. Trimipramine
7. Clomipramine



AN: I1126

Water-Soluble Vitamins

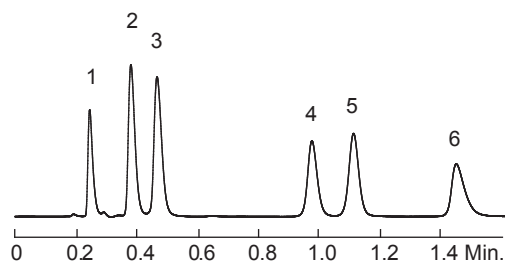
Column: Leapsil™ 2.7 μm C18, 50 x 2.1 mm
Cat. No.: **86004**
Mobile Phase: 10 mM HCOONH₄, (pH 3)
Flow Rate: 0.3 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Pyridoxamine
2. L-Ascorbic acid
3. Pyridoxal
4. Nicotinamide
5. Pyridoxol



AN: L1106

Acidic Compounds

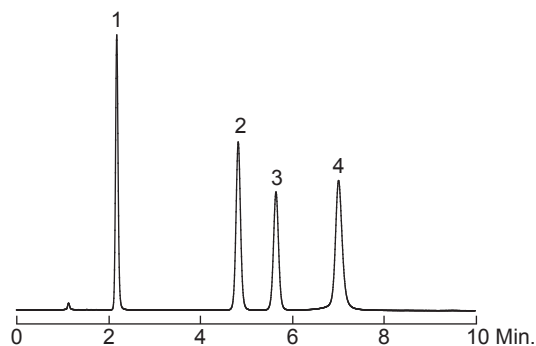
Column: Endeavorsil™ 1.8 µm C18, 50 x 2.1 mm
 Cat. No.: **87002**
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 25:75
 Flow Rate: 0.5 mL/min
 Temperature: 30 °C
 Detection: UV 254 nm
 Sample: 1. L-Ascorbic acid
 2. *p*-Aminobenzoic acid
 3. Homovanillic acid
 4. Acetylsalicylic acid
 5. Sorbic acid
 6. Salicylic acid



AN: E1108

Antifungals

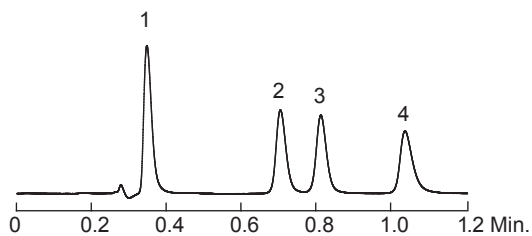
Column: Inspire™ 5 µm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 30:70
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. *p*-Aminobenzoic acid
 2. Acetylsalicylic acid
 3. Benzoic acid
 4. Salicylic acid



AN: I1114

Antifungals

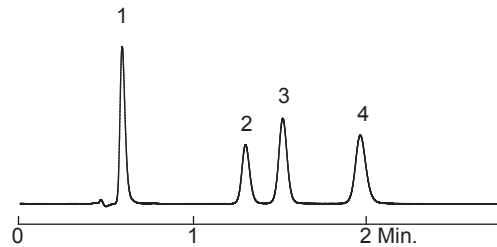
Column: Endeavorsil™ 1.8 µm C18, 50 x 2.1 mm
 Cat. No.: **87002**
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 30:70
 Flow Rate: 0.5 mL/min
 Temperature: 30 °C
 Detection: UV 254 nm
 Sample: 1. *p*-Aminobenzoic acid
 2. Acetylsalicylic acid
 3. Benzoic acid
 4. Salicylic acid



AN: E1109

Antifungals

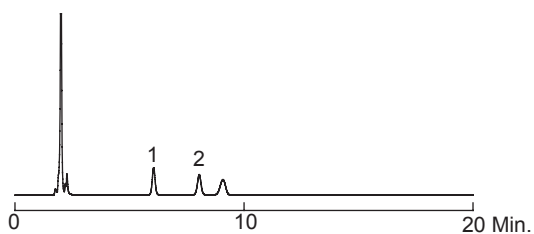
Column: Leapsil™ 2.7 µm C18, 50 x 2.1 mm
 Cat. No.: **86004**
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 30:70
 Flow Rate: 0.3 mL/min
 Temperature: 30 °C
 Detection: UV 254 nm
 Sample: 1. *p*-Aminobenzoic acid
 2. Acetylsalicylic acid
 3. Benzoic acid
 4. Salicylic acid



AN: L1110

Benzoic Acid and Sorbic Acid in milk

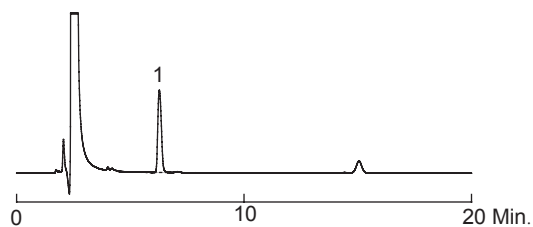
Column: Spursil™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **82001**
 Mobile Phase: MeOH:phosphate buffer = 10:90
 Flow Rate: 1.2 mL/min
 Injection Volume: 10 μL
 Temperature: 40 °C
 Detection: UV 227 nm
 Sample: 1. Benzoic acid
 2. Sorbic acid



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

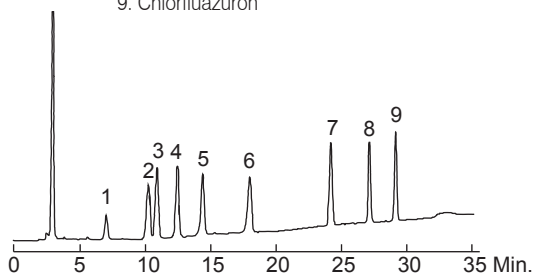


AN: S1157

Benzoylurea and Bishydrazide Mixture

Column: Inspire™ 5 μm C18, 250 x 4.6 mm
 Cat. No.: **81006**
 Mobile Phase A: MeOH
 Mobile Phase B: H₂O
 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

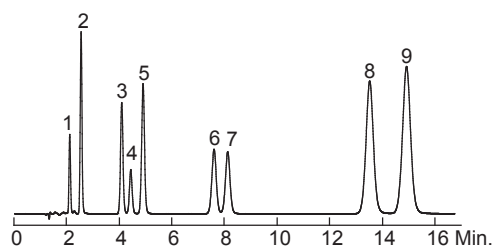
t / min.	0	5	15	30	32	40
A / %	75	75	80	95	75	75
B / %	25	25	20	5	25	25



AN: I1115

Caffeine Metabolites

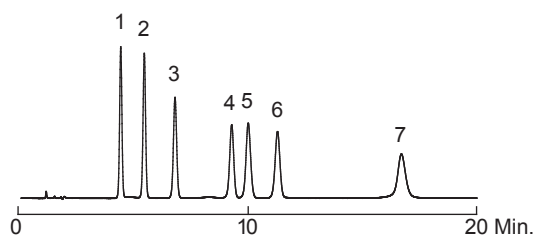
Column: Inspire™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: MeOH:1% CH₃COOH in H₂O = 10:90
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Uric acid
 2. Xanthine
 3. 7-Methylxanthine
 4. 1-Methyluric acid
 5. 3-Methylxanthine
 6. 1,3-Dimethyluric acid
 7. 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 H₂O = 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

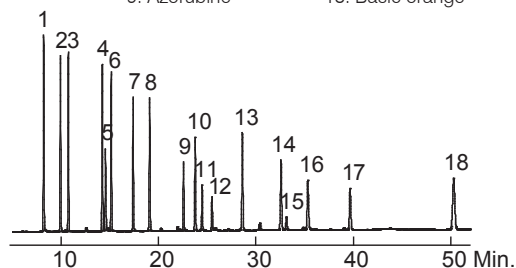


AN: S1158

Colorants

Column: Inspire™ 5 μm C18, 250 x 4.6 mm
 Cat. No.: **81006**
 Mobile Phase A: MeCN
 Mobile Phase B: 0.05 M CH₃COONH₄
 Flow Rate: 1.0 mL/min
 Temperature: 35 °C
 Detection: UV 254 nm
 Sample: 1. Tartrazine 10. Lissamine green B
 2. Amaranth 11. Brilliant blue
 3. Indigotin 12. Acid orange I
 4. Carmine 13. Erythrosine
 5. Brilliant black 14. Acid orange II
 6. Sunset yellow 15. Patent blue V
 7. Fancy red 16. Auramine
 8. Acid red 2G 17. Acid yellow 36
 9. Azorubine 18. Basic orange

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

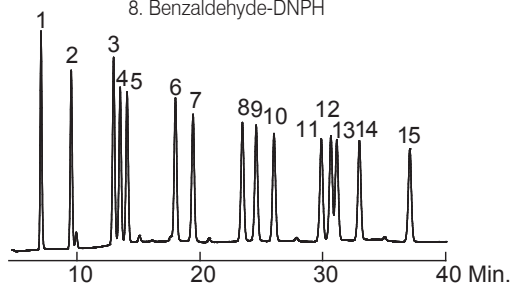


AN: I1117

Derivatized Carbonyl Compounds

Column: Inspire™ 5 μm C18, 250 x 4.6 mm
 Cat. No.: **81006**
 Mobile Phase A: MeOH
 Mobile Phase B: H₂O
 Flow Rate: 1.0 mL/min
 Temperature: 35 °C
 Detection: UV 360 nm
 Injection Volume: 20 μL
 Sample: 1. Formaldehyde-DNPH 9. Isovaleraldehyde-DNPH
 2. Acetaldehyde-DNPH 10. Valeraldehyde-DNPH
 3. Acrolein-DNPH 11. *o*-Tolualdehyde-DNPH
 4. Acetone-DNPH 12. *m*-Tolualdehyde-DNPH
 5. Propionaldehyde-DNPH 13. *p*-Tolualdehyde-DNPH
 6. Crotonaldehyde-DNPH 14. 2,5-Dimethylbenzaldehyde-DNPH
 7. Butyraldehyde-DNPH 15. Hexaldehyde-DNPH
 8. Benzaldehyde-DNPH

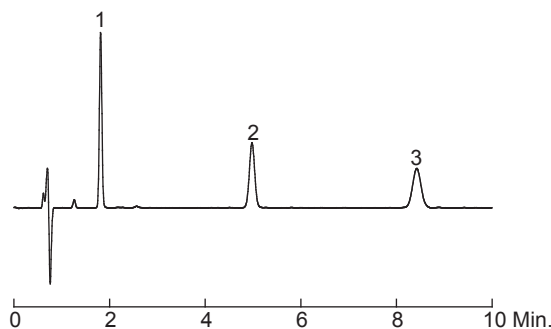
t / min.	0	35	40	41	50
A / %	70	80	80	70	70
B / %	30	20	20	30	30



AN: I1118

Herbicides

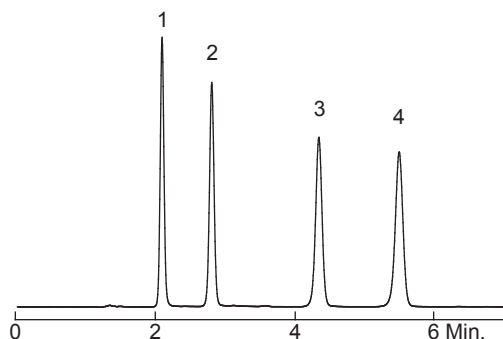
Column: Inspire™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: 0.1% TFA in MeCN:0.1% TFA in H₂O = 40:60
 Flow Rate: 2.0 mL/min
 Temperature: Ambient
 Detection: UV 214 nm
 Sample: 1. Dalapon
 2. 2,4-D
 3. 2,4,5-T



AN: I1119

Herbicides

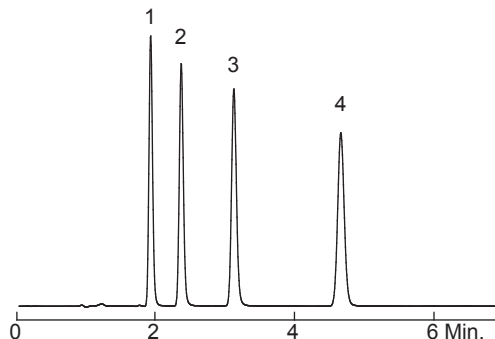
Column: Spursil™ 5 μm C18-EP, 150 x 4.6 mm
 Cat. No.: **82101**
 Mobile Phase: MeCN:H₂O = 60:40
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 214 nm
 Sample: 1. Fenuron
 2. Monuron
 3. Diuron
 4. Linuron



AN: S1159

Herbicides

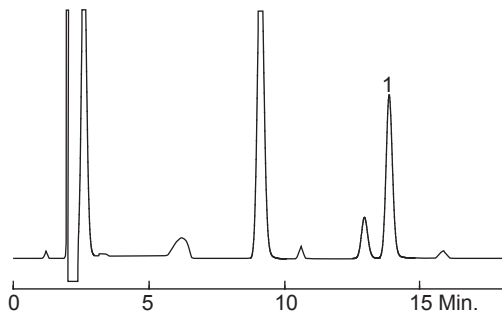
Column: Spursil™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **82001**
 Mobile Phase: MeCN:H₂O = 60:40
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 214 nm
 Sample: 1. Fenuron
 2. Monuron
 3. Diuron
 4. Linuron



AN: S1160

Melamine

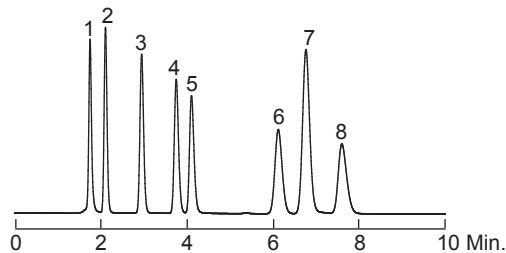
Column: Inspire™ 5 μm C18, 250 x 4.6 mm
 Cat. No.: **81006**
 Mobile Phase: MeCN:Buffer = 8:92
 Flow Rate: 1.0 mL/min
 Temperature: 30 °C
 Detection: UV 214 nm
 Sample: 1. Melamine



AN: I1110

Organic Acids

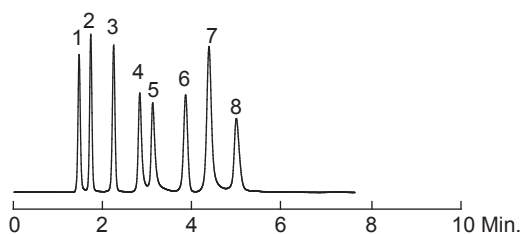
Column: Inspire™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: 25 mM KH₂PO₄, (pH 2.5)
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 210 nm
 Sample: 1. Oxalic acid
 2. Tartaric acid
 3. Malic acid
 4. Lactic acid
 5. Acetic acid
 6. Citric acid
 7. Fumaric acid
 8. Succinic acid



AN: I1112

Organic Acids

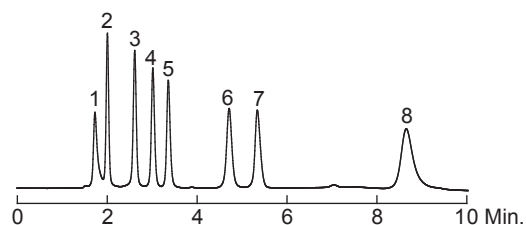
Column: Spursil™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **82001**
 Mobile Phase: 25 mM KH₂PO₄, (pH 2.5)
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 210 nm
 Sample: 1. Oxalic acid
 2. Tartaric acid
 3. Malic acid
 4. Lactic acid
 5. Acetic acid
 6. Citric acid
 7. Fumaric acid
 8. Succinic acid



AN: S1161

Organic Acids

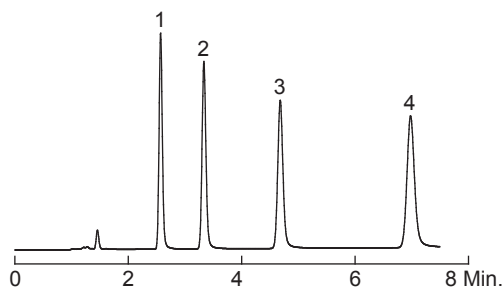
Column: Spursil™ 5 μm C18-EP, 150 x 4.6 mm
 Cat. No.: **82101**
 Mobile Phase: 25 mM KH₂PO₄, (pH 2.5)
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 210 nm
 Sample: 1. Oxalic acid
 2. Tartaric acid
 3. Malic acid
 4. Lactic acid
 5. Acetic acid
 6. Citric acid
 7. Succinic acid
 8. Fumaric acid



AN: S1162

Parabens

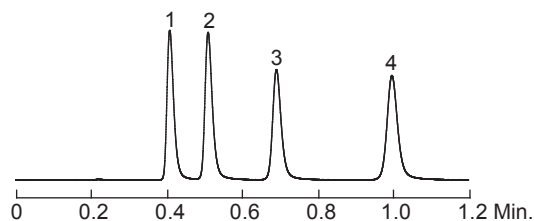
Column: Inspire™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: MeCN:20 mM K₂HPO₄ (pH 7) = 50:50
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 254 nm
 Sample: 1. Methyl paraben
 2. Ethyl paraben
 3. Propyl paraben
 4. Butyl paraben



AN: I1113

Parabens

Column: Endeavorsil™ 1.8 μm C18, 50 x 2.1 mm
 Cat. No.: **87002**
 Mobile Phase: MeCN:20 mM K₂HPO₄ (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

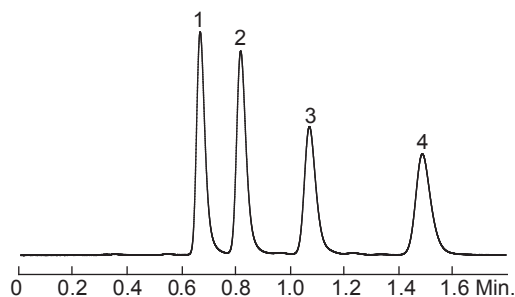


AN: E1110

Applications

Parabens

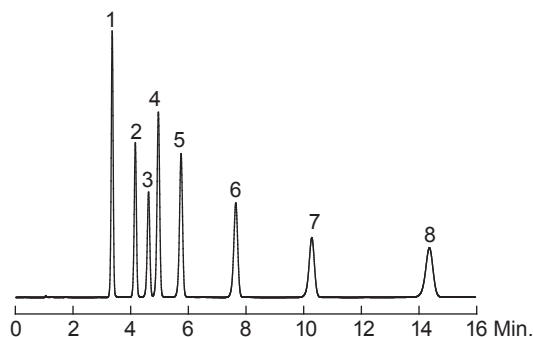
Column: Leapsil™ 2.7 μm C18, 50 x 2.1 mm
 Cat. No.: **86004**
 Mobile Phase: MeCN:20 mM K₂HPO₄ (pH 7) = 55:45
 Flow Rate: 0.3 mL/min
 Temperature: 30 °C
 Detection: UV 254 nm
 Sample: 1. Methyl paraben
 2. Ethyl paraben
 3. Propyl paraben
 4. Butyl paraben



AN: L1108

Phenols

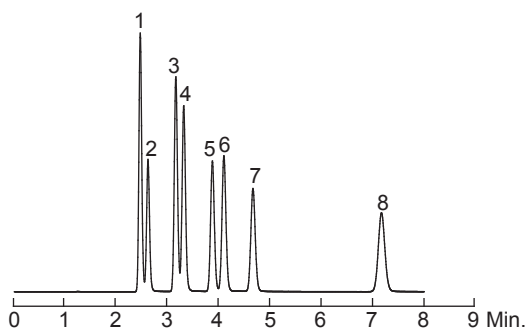
Column: Spursil™ 5 μm C18-EP, 150 x 4.6 mm
 Cat. No.: **82101**
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 55:45
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 280 nm
 Sample: 1. Phenol
 2. 2-Nitrophenol
 3. 4-Nitrophenol
 4. 2-Chlorophenol
 5. 4-Chlorophenol
 6. 4-Chloro-3-methylphenol
 7. 2,4-Dichlorophenol
 8. 2,4,6-Trichlorophenol



AN: S1163

Phenols

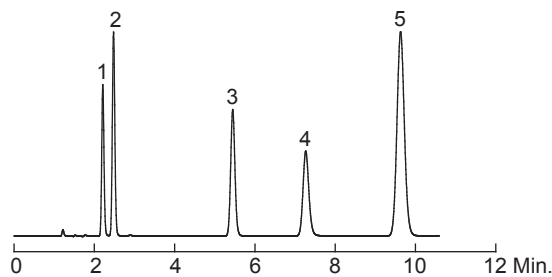
Column: Spursil™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **82001**
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 55:45
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 280 nm
 Sample: 1. Phenol
 2. 4-Nitrophenol
 3. 2-Chlorophenol
 4. 4-Chlorophenol
 5. 2-Nitrophenol
 6. 4-Chloro-3-methylphenol
 7. 2,4-Dichlorophenol
 8. 2,4,6-Trichlorophenol



AN: S1174

Polar Acids

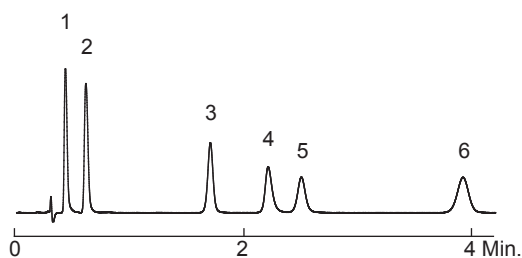
Column: Inspire™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 30:70
 Flow Rate: 0.3 mL/min
 Detection: UV 254 nm
 Sample: 1. *p*-Aminobenzoic acid
 2. Homovanillic acid
 3. Sorbic acid
 4. *p*-Nitrobenzoic acid
 5. *p*-Toluic acid



AN: I1125

Polar Acids

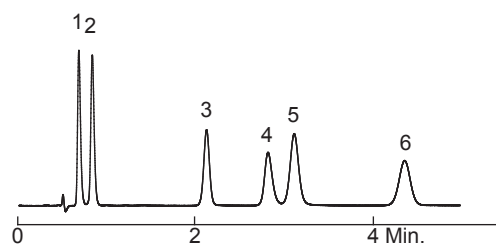
Column: Endeavorsil™ 1.8 μm C18, 50 x 2.1 mm
 Cat. No.: **87002**
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 20:80
 Flow Rate: 0.5 mL/min
 Temperature: 30 °C
 Detection: UV 254 nm
 Sample: 1. *p*-Aminobenzoic acid
 2. Homovanillic acid
 3. Sorbic acid
 4. Salicylic acid
 5. *p*-Chlorobenzoic acid
 6. *p*-Nitrobenzoic acid



AN: E1111

Polar Acids

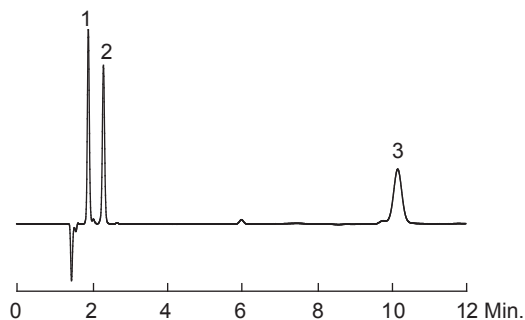
Column: Leapsil™ 2.7 μm C18, 50 x 2.1 mm
 Cat. No.: **86004**
 Mobile Phase: 0.1% HCOOH in MeCN:0.1% HCOOH in H₂O = 25:75
 Flow Rate: 0.3 mL/min
 Detection: UV 254 nm
 Sample: 1. *p*-Aminobenzoic acid
 2. Homovanillic acid
 3. Sorbic acid
 4. Salicylic acid
 5. *p*-Nitrobenzoic acid
 6. *p*-Toluic acid



AN: L1109

Sweeteners

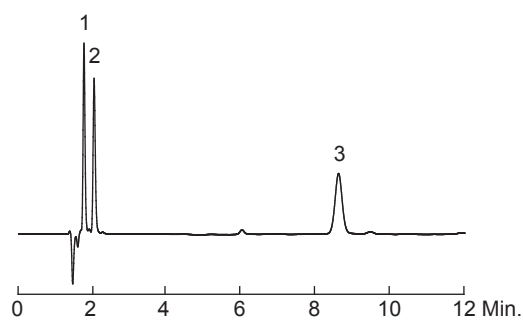
Column: Inspire™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **81001**
 Mobile Phase: MeOH:20 mM CH₃COONH₄ (pH 5) = 30:70
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 210 nm
 Sample: 1. Acesulfame K
 2. Sodium saccharin
 3. Aspartame



AN: I1120

Sweeteners

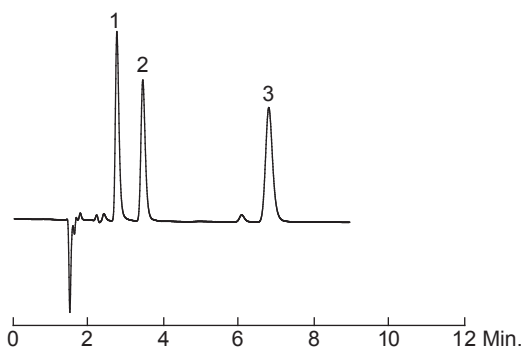
Column: Spursil™ 5 μm C18, 150 x 4.6 mm
 Cat. No.: **82001**
 Mobile Phase: MeOH:20 mM CH₃COONH₄ (pH 5) = 30:70
 Flow Rate: 1.0 mL/min
 Temperature: Ambient
 Detection: UV 210 nm
 Sample: 1. Acesulfame K
 2. Sodium saccharin
 3. Aspartame



AN: S1164

Sweeteners

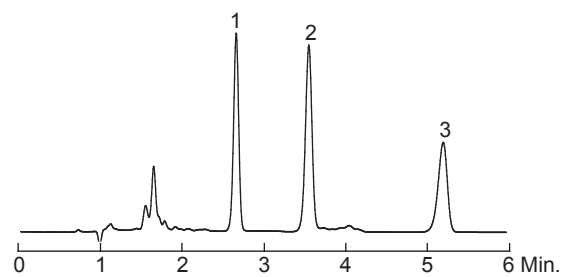
Column: Spursil™ 5 μm C18-EP, 150 x 4.6 mm
Cat. No.: **82101**
Mobile Phase: MeOH:20 mM CH₃COONH₄ (pH 5) = 30:70
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 210 nm
Sample: 1. Acesulfame K
2. Sodium saccharin
3. Aspartame



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 H₂O = 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% CH₃COOH in H₂O

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

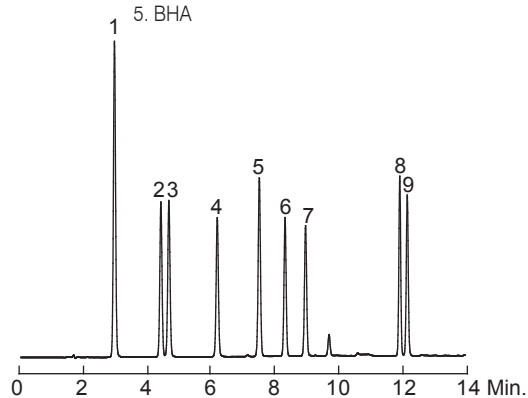
t / min.	0	10
A / %	50	0
B / %	50	100

6. Ionox 100

7. Octyl gallate

8. BHT

9. Lauryl gallate



AN: I1122

Proteins

Column: Bio-Bond™ 5 μm C18, 150 x 4.6 mm

Cat. No.: **84001**

Mobile Phase A: 0.1% TFA in H₂O

Mobile Phase B: 0.1% TFA in MeCN

Flow Rate: 1.0 mL/min

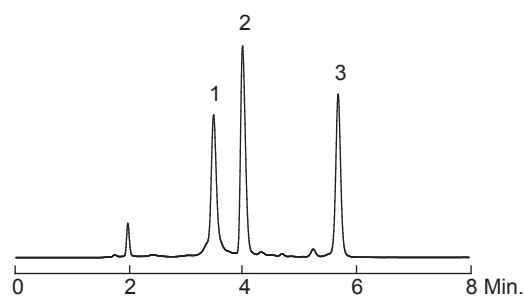
Detection: UV 280 nm

Sample: 1. Cytochrome C

2. Insulin

3. Lysozymes

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

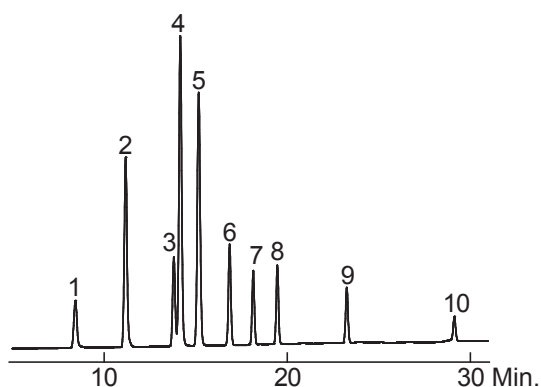


AN: B1101

Others

Phenols

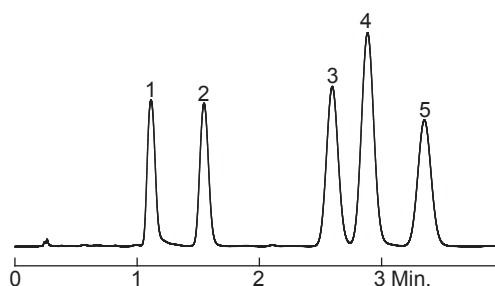
Column: Spursil™ 5 µm C18-EP, 150 x 4.6 mm
Cat. No.: **82101**
Mobile Phase: MeCN:0.1% HCOOH in H₂O = 25:75
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 270 nm
Sample: 1. Phenol 6. 2,4-Dimethylphenol
2. 4-Nitrophenol 7. 4-Chloro-3-methylphenol
3. 2-Chlorophenol 8. 2,4-Dichlorophenol
4. 2,4-Dinitrophenol 9. 2,4,6-Trichlorophenol
5. 2-Nitrophenol 10. Pentachlorophenol



AN: S1166

Steroids

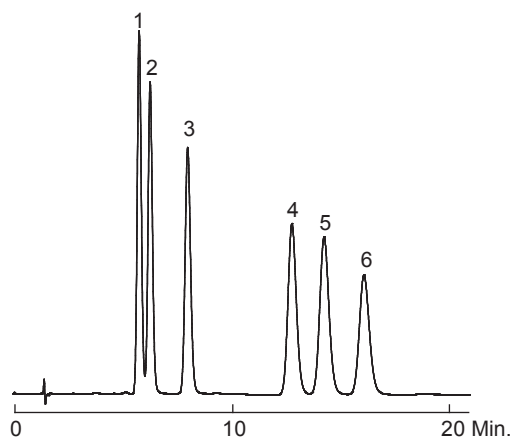
Column: Endeavorsil™ 1.8 µm C18, 50 x 2.1 mm
Cat. No.: **87002**
Mobile Phase: MeOH:H₂O = 50:50
Flow Rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV 254 nm
Sample: 1. Prednisone
2. Prednisolone
3. Dexamethasone
4. Hydrocortisone 21-acetate
5. 11- α -Hydroprogesterone



AN: E1112

Steroids

Column: Inspire™ 5 µm C18, 150 x 4.6 mm
Cat. No.: **81001**
Mobile Phase: MeOH:H₂O = 55:45
Flow Rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 254 nm
Sample: 1. Prednisone 4. Dexamethasone
2. Cortisone 5. Hydrocortisone 21-acetate
3. Prednisolone 6. 11- α -Hydroxyprogesterone



AN: I1123

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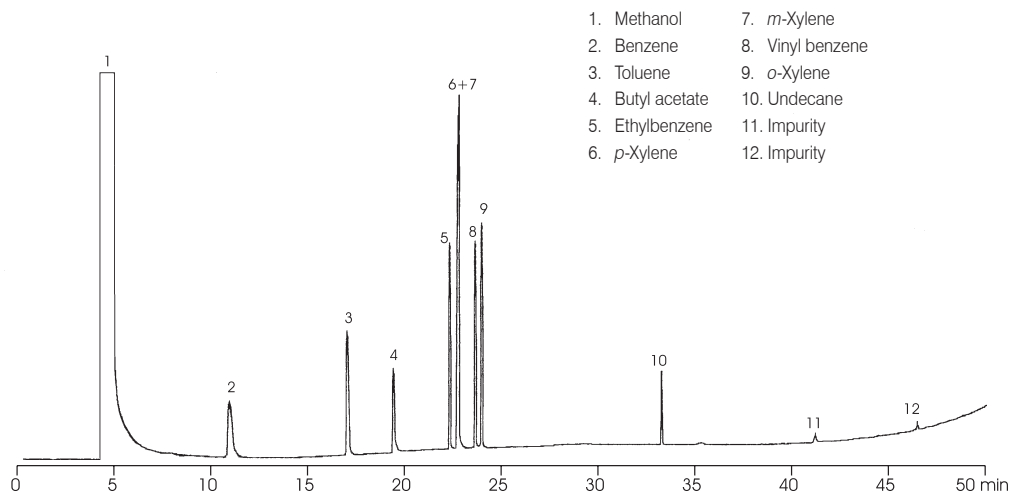
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TVOCs

Column: DM-TVOC, 50 m x 0.32 mm x 1.00 μm
 Cat. No.: 7831
 Index: CEO00010
 Carrier Gas: N₂
 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

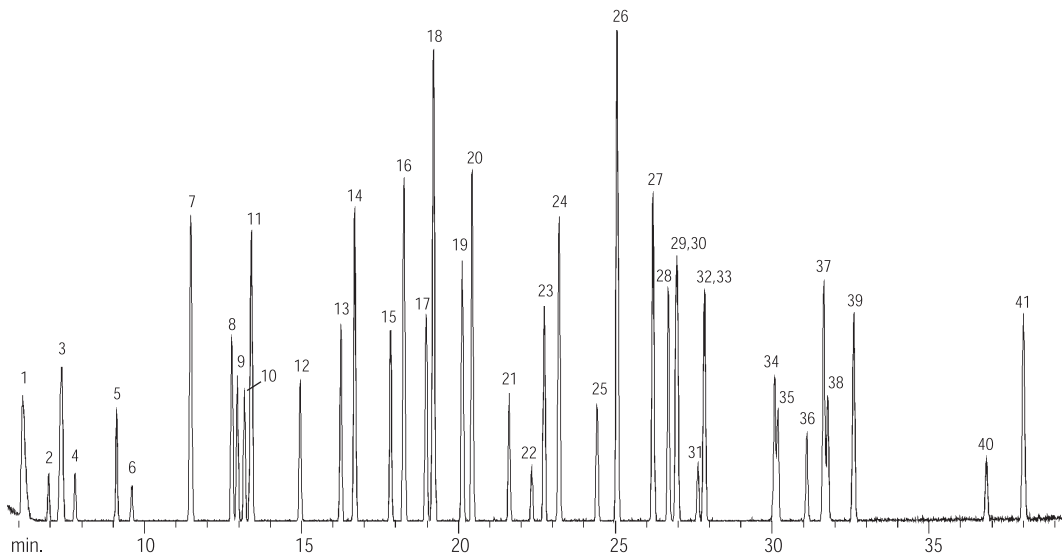


- | | |
|---------------------|---------------------|
| 1. Methanol | 7. <i>m</i> -Xylene |
| 2. Benzene | 8. Vinyl benzene |
| 3. Toluene | 9. <i>o</i> -Xylene |
| 4. Butyl acetate | 10. Undecane |
| 5. Ethylbenzene | 11. Impurity |
| 6. <i>p</i> -Xylene | 12. Impurity |

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

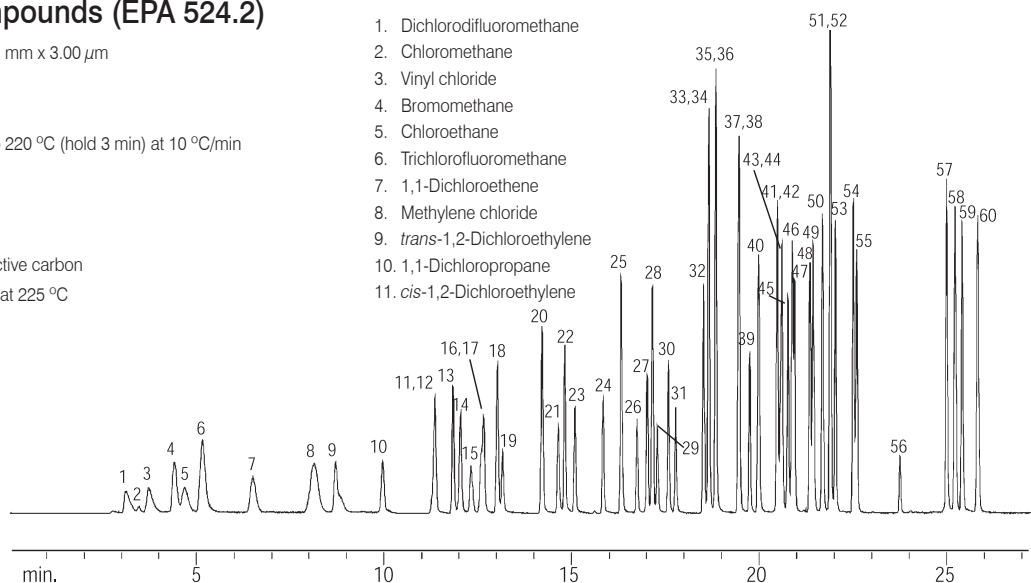


Applications

Volatiles

Volatile Organic Compounds (EPA 524.2)

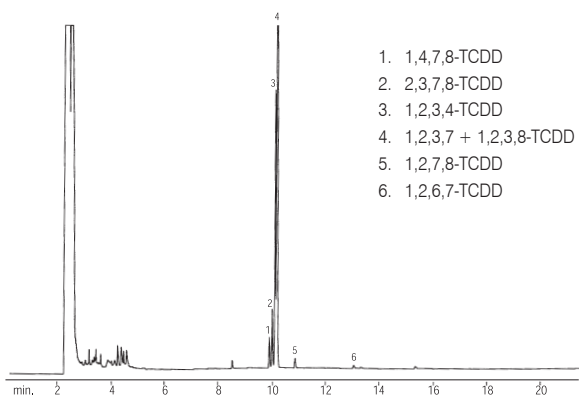
Column: DM-624, 75 m x 0.53 mm x 3.00 μ m
 Cat. No.: 7752
 Index: CER00011
 Oven Temp.: 35 $^{\circ}$ C (hold 8 min) to 220 $^{\circ}$ C (hold 3 min) at 10 $^{\circ}$ C/min
 Detector: MS, 250 $^{\circ}$ C
 Scan Range: 45 - 300 AMU
 Purging Time: 11 min
 Sorbent Tube: Tenax / Silica gel / Active carbon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



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

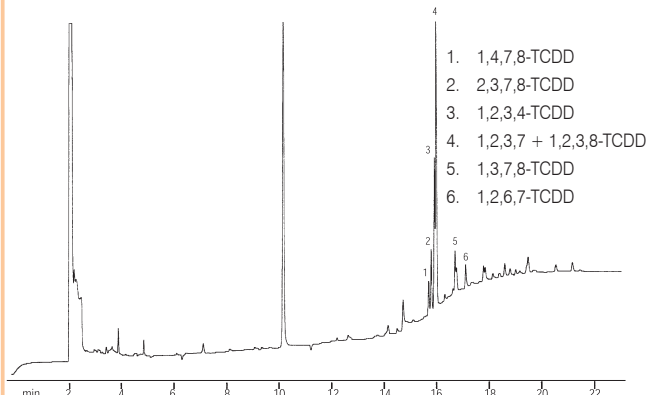
Dioxins

Column: DM-2330, 60 m x 0.25 mm x 0.20 μ m
 Cat. No.: 8624
 Index: CER00108
 Oven Temp.: 200 $^{\circ}$ C (hold 1 min) to 250 $^{\circ}$ C (hold 15 min) at 8 $^{\circ}$ C/min,
 to 275 $^{\circ}$ C (hold 5 min) at 15 $^{\circ}$ C/min
 Carrier Gas: H₂, 40 cm/sec
 Injection: Splitless, 275 $^{\circ}$ C
 Sample: TCDD isomers, 2.0 μ L
 Detector: ECD, 21 kHz full scale, 275 $^{\circ}$ C



Dioxins

Column: DM-2330, 60 m x 0.32 mm x 0.20 μ m
 Cat. No.: 8634
 Index: CER00109
 Oven Temp.: 200 $^{\circ}$ C (hold 1 min) to 240 $^{\circ}$ C (hold 6 min) at 3 $^{\circ}$ C/min,
 to 275 $^{\circ}$ C (hold 30 min) at 15 $^{\circ}$ C/min
 Carrier Gas: H₂, 40 cm/sec
 Injection: Cold on-column, 275 $^{\circ}$ C
 Sample: TCDD isomers, 1.5 μ L
 Detector: ECD, 5 kHz full scale, 275 $^{\circ}$ C



PAHs

Column: DM-PAH, 30 m x 0.25 mm x 0.25 μ m

Cat. No.: **8862**

Index: CER1160

Sample: EPA 8310 PAHs in dichloromethane solution, 10 ppm

Oven Temp.: 65 $^{\circ}$ C (hold 0.5 min) to 220 $^{\circ}$ C at 15 $^{\circ}$ C/min,
to 330 $^{\circ}$ C (hold 15 min) at 4 $^{\circ}$ C/min

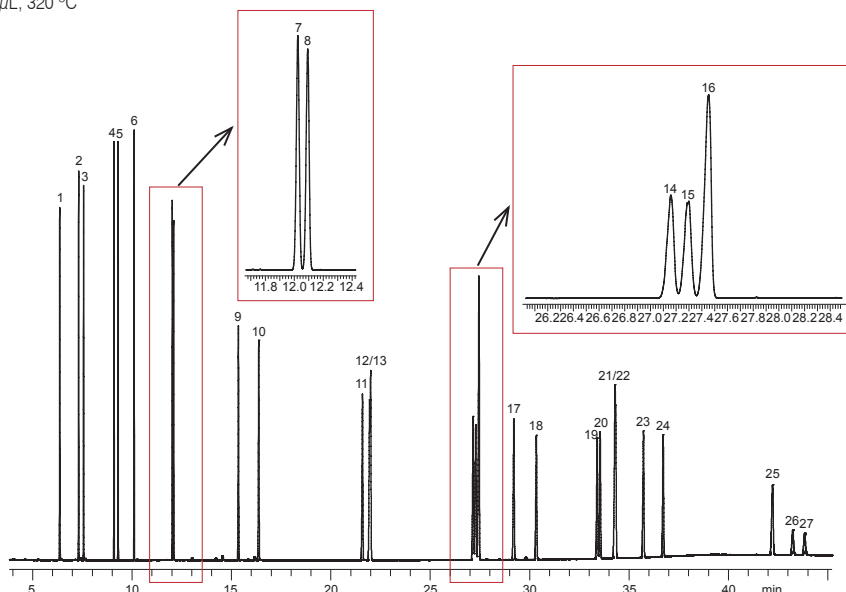
Carrier Gas: He, 2.0 mL/min

Injection: Splitless (hold 1.75 min), 0.5 μ L, 320 $^{\circ}$ C

Makeup Gas: 75 mL/min

Detector: FID, 320 $^{\circ}$ C

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



PAHs (EPA 610)

Column: DM-5 MS / LB, 30 m x 0.25 mm x 0.25 μ m

Cat. No.: **8721**

Index: CER00595

Oven Temp.: 40 $^{\circ}$ C (hold 2 min) to 250 $^{\circ}$ C at 25 $^{\circ}$ C/min
to 265 $^{\circ}$ C at 5 $^{\circ}$ C/min, to 300 $^{\circ}$ C (hold 4 min) at 25 $^{\circ}$ C/min

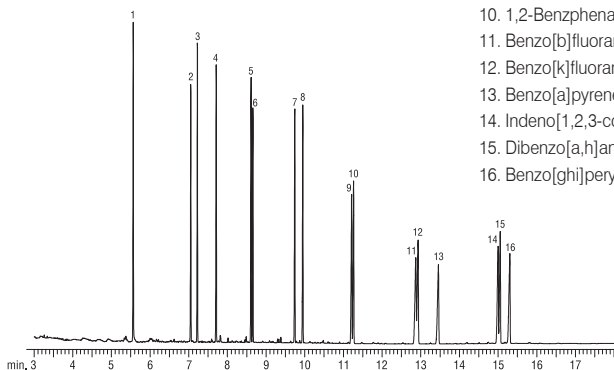
Carrier Gas: H₂, 4 mL/min constant flow

Injection: Splitless hold 2 min, 330 $^{\circ}$ C
2 mm splitless inlet liner w / wool

Sample: PAHs standard, 1.0 μ L, 50 μ g/mL

Detector: FID, 350 $^{\circ}$ C

- Naphthalene
- Acenaphthylene
- Acenaphthene
- Fluorene
- Phenanthrene
- Anthracene
- Fluoranthene
- Pyrene
- Benzo[a]anthracene
- 1,2-Benzphenanthrene
- Benzo[b]fluoranthene
- Benzo[k]fluoranthene
- Benzo[a]pyrene
- Indeno[1,2,3-cd]pyrene
- Dibenzo[a,h]anthracene
- Benzo[ghi]perylene



V.S.

PAHs (EPA 610)

Column: DM-5 MS / LB, 30 m x 0.25 mm x 0.50 μ m

Cat. No.: **8723**

Index: CER00549

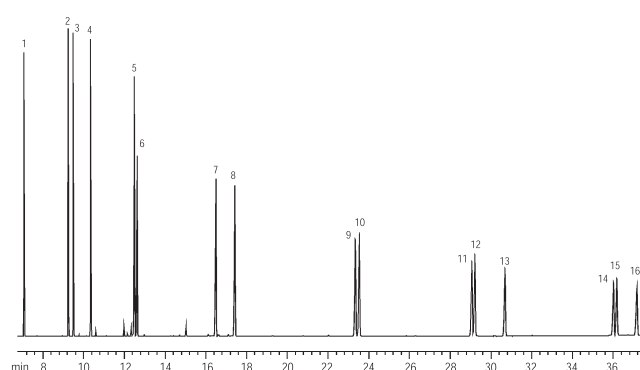
Oven Temp.: 40 $^{\circ}$ C (hold 1 min) to 200 $^{\circ}$ C at 20 $^{\circ}$ C/min
to 310 $^{\circ}$ C (hold 5 min) at 4 $^{\circ}$ C/min

Carrier Gas: H₂, 40 cm/sec

Injection: Splitless hold 1 min, 300 $^{\circ}$ C

Sample: PAHs standard, 1.0 μ L, 20 ng/ μ L

Detector: FID, 310 $^{\circ}$ C

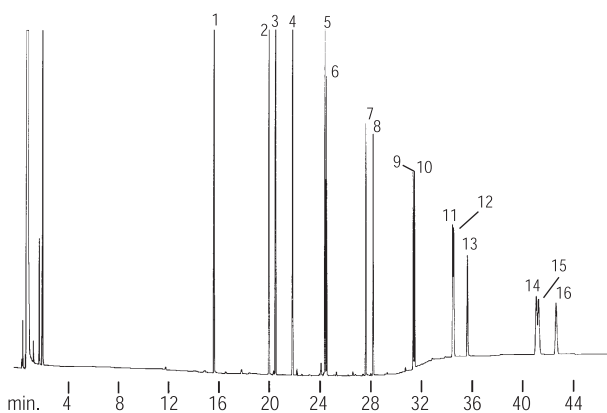


Semi-volatiles

PAHs (EPA 610)

Column: DM-5, 30 m x 0.53 mm x 1.50 μ m
 Cat. No.: 7251
 Index: CER00043
 Oven Temp.: 4 $^{\circ}$ C (hold 6 min) to 300 $^{\circ}$ C (hold 15 min) at 10 $^{\circ}$ C/min
 Carrier Gas: H₂, 80 cm/sec
 Injection: Direct, 300 $^{\circ}$ C
 Sample: PAHs standard, 2.5 μ L
 Detector: FID, 8 x 10⁻¹¹ AFS, 300 $^{\circ}$ C

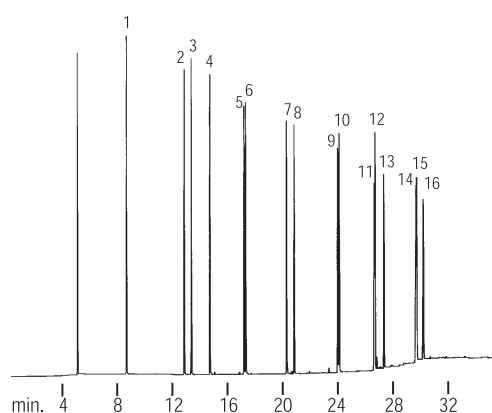
- | | |
|-------------------|----------------------------|
| 1. Naphthalene | 9. Benzo[a]anthracene |
| 2. Acenaphthylene | 10. 1,2-Benzphenanthrene |
| 3. Acenaphthene | 11. Benzo[b]fluoranthene |
| 4. Fluorene | 12. Benzo[k]fluoranthene |
| 5. Phenanthrene | 13. Benzo[a]pyrene |
| 6. Anthracene | 14.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



PAHs (EPA 610)

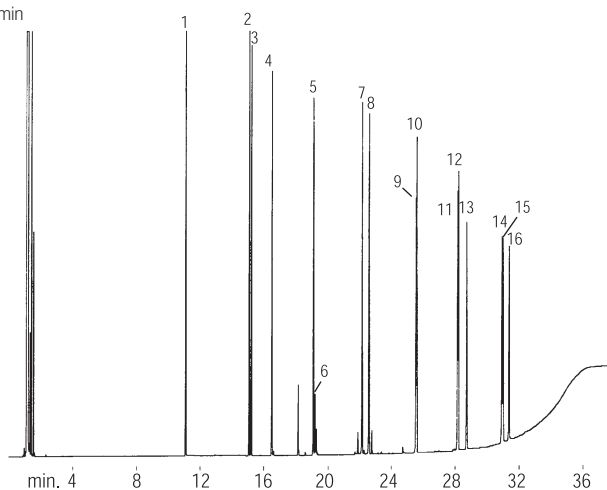
Column: DM-5, 30 m x 0.32 mm x 0.25 μ m
 Cat. No.: 7231
 Index: CER00376
 Oven Temp.: 35 $^{\circ}$ C (hold 4 min) to 325 $^{\circ}$ C at 10 $^{\circ}$ C/min
 Carrier Gas: H₂, 40 cm/sec
 Injection: Direct, cold on-column
 Sample: PAHs standard, 0.5 μ L
 Detector: FID, 8 x 10⁻¹¹ AFS, 325 $^{\circ}$ C

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



PAHs (EPA 610)

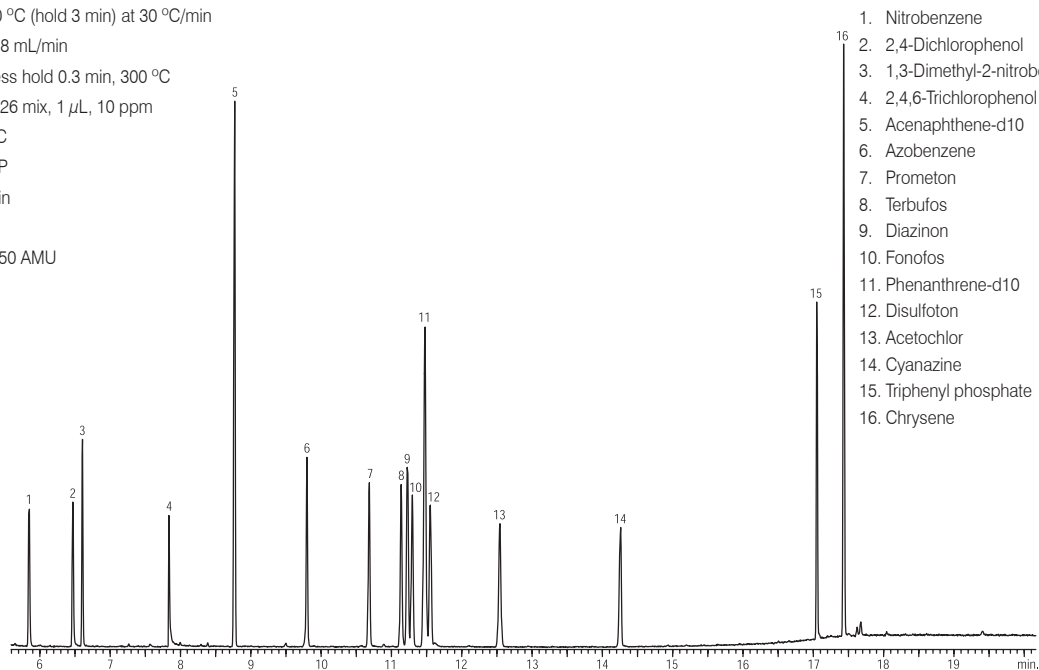
Column: DM-200, 30 m x 0.25 mm x 0.25 μ m
 Cat. No.: 8321
 Index: CER00044
 Oven Temp.: 40 $^{\circ}$ C (hold 4 min) to 340 $^{\circ}$ C at 10 $^{\circ}$ C/min
 Carrier Gas: H₂, 40 cm/sec
 Injection: Split, 40:1, 340 $^{\circ}$ C
 Sample: PAHs standard, 1.2 μ L
 Detector: FID, 16 x 10⁻¹¹ AFS, 340 $^{\circ}$ 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 |

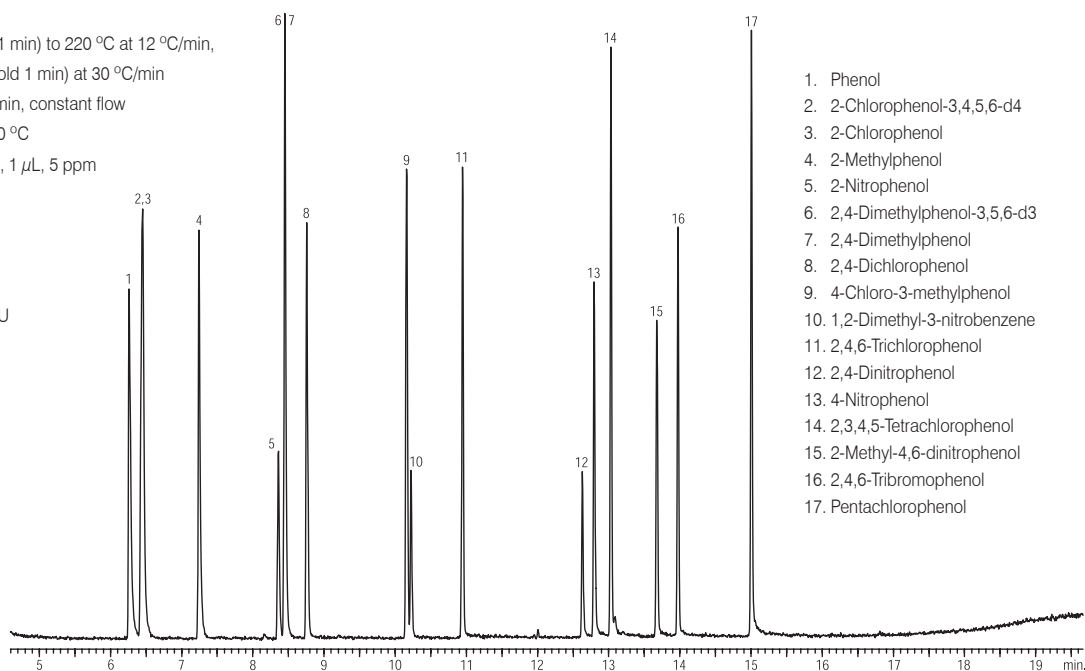
Volatile Organic Compounds (EPA 526)

Column: DM-5 MS / LB, 30 m x 0.25 mm x 0.25 μ m
 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 μ L, 10 ppm
 Transfer line Temp.: 280 °C
 Tune: DFTPP
 Solvent Delay: 5.5 min
 Ionization: EI
 Scan Range: 35 - 550 AMU
 Detector: MS



Phenols (EPA 528)

Column: DM-5 MS / LB, 30 m x 0.25 mm x 0.25 μ m
 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 μ L, 5 ppm
 Transfer line Temp.: 280 °C
 Tune: DFTPP
 Solvent Delay: 5.5 min
 Ionization: EI
 Scan Range: 35 - 550 AMU
 Detector: MS



Semi-volatiles

Semi-volatile Organic Compounds

Column: DM-5MS / LB, 30 m x 0.25 mm x 0.50 μ m

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

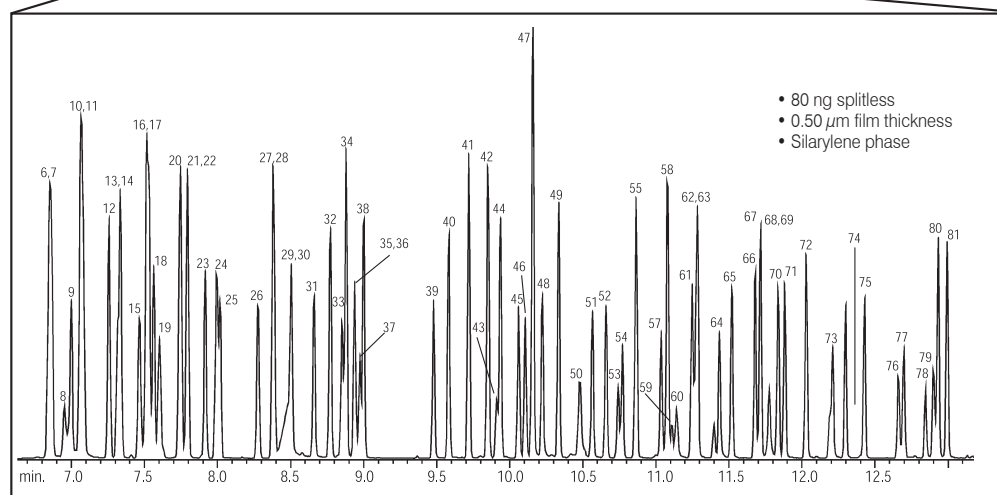
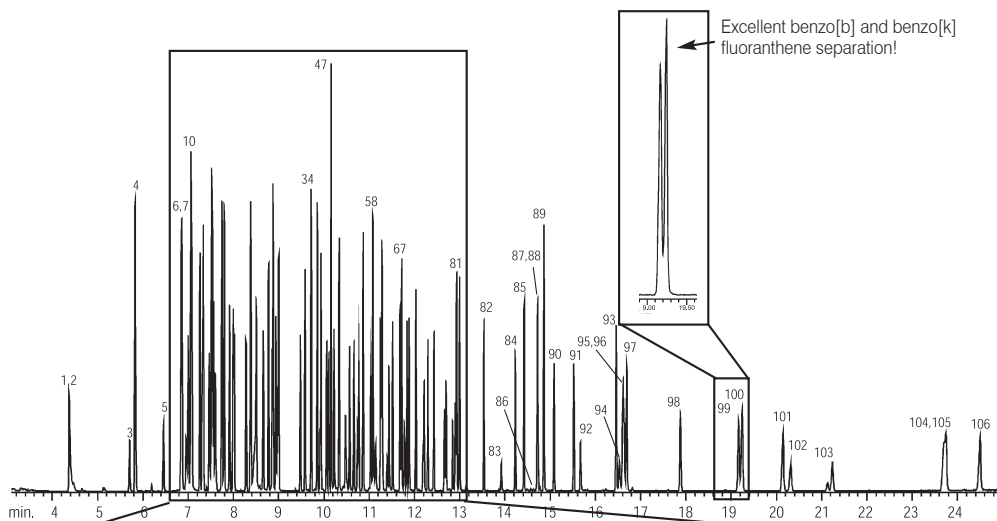
Injection: Splitless, 300 °C

Sample: EPA 8270 standard, 80 ng

Scan Range: 35 - 550 AMU

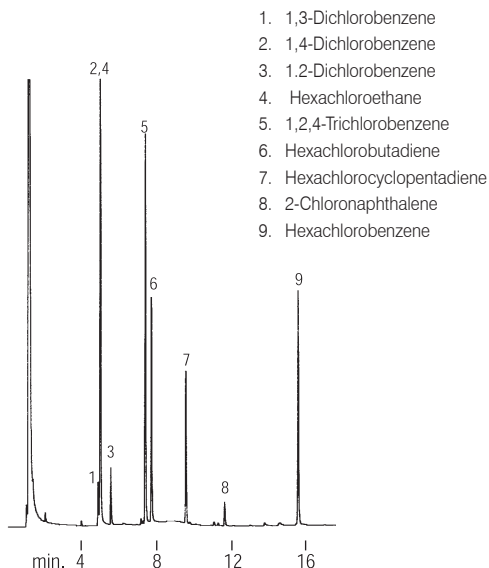
Detector: MS, 280 °C

- | | | |
|-------------------------------------|--------------------------------|---------------------------------|
| 1. N-Nitrosodimethylamine | 25. Nitrobenzene | 49. 2-Chloronaphthalene |
| 2. Pyridine | 26. Isophorone | 50. 2-Nitroaniline |
| 3. Methyl methanesulfonate | 27. 2,4-Dimethylphenol | 51. 1,4-Naphthoquinone |
| 4. 2-Fluorophenol | 28. 2-Nitrophenol | 52. Dimethylphthalate |
| 5. Ethyl methanesulfonate | 29. Benzoic acid | 53. 1,3-Dinitrobenzene |
| 6. Phenol-d6 | 30. bis(2-Chloroethoxy)methane | 54. 2,6-Dinitrotoluene |
| 7. Phenol | 31. 2,4-Dichlorophenol | 55. Acenaphthylene |
| 8. Aniline | 32. 1,2,4-Trichlorobenzene | 56. 3-Nitroaniline |
| 9. bis(2-Chloroethyl)ether | 33. Naphthalene-d8 | 57. Acenaphthene-d10 |
| 10. 2-Chlorophenol-d4 | 34. Naphthalene | 58. Acenaphthene |
| 11. 2-Chlorophenol | 35. 2,6-Dichlorophenol | 59. 2,4-Dinitrophenol |
| 12. 1,3-Dichlorobenzene | 36. 4-Chloroaniline | 60. 4-Nitrophenol |
| 13. 1,4-Dichlorobenzene-d4 | 37. Hexachloropropene | 61. Pentachlorobenzene |
| 14. 1,4-Dichlorobenzene | 38. Hexachlorobutadiene | 62. 2,4-Dinitrotoluene |
| 15. Benzyl alcohol | 39. 4-Chloro-3-methylphenol | 63. Dibenzofuran |
| 16. 1,2-Dichlorobenzene-d4 | 40. Isosafrole | 64. 2,3,4,6-Tetrachlorophenol |
| 17. 1,2-Dichlorobenzene | 41. 2-Methylnaphthalene | 65. Diethyl phthalate |
| 18. 2-Methylphenol | 42. 1-Methylnaphthalene | 66. 4-Chlorophenyl phenyl ether |
| 19. bis(2-Chloroisopropyl)ether | 43. Hexachlorocyclopentadiene | 67. Fluorene |
| 20. 4-Methylphenol / 3-Methylphenol | 44. 1,2,4,5-Tetrachlorobenzene | 68. 4-Nitroaniline |
| 21. N-Nitroso-di-n-propylamine | 45. 2,4,6-Trichlorophenol | 69. 4,6-Dinitro-2-methylphenol |
| 22. Acetophenone | 46. 2,4,5-Trichlorophenol | 70. Diphenylamine |
| 23. Hexachloroethane | 47. 2-Fluorobiphenyl | 71. Azobenzene |
| 24. Nitrobenzene-d5 | 48. Safrole | 72. 2,4,6-Tribromophenol |



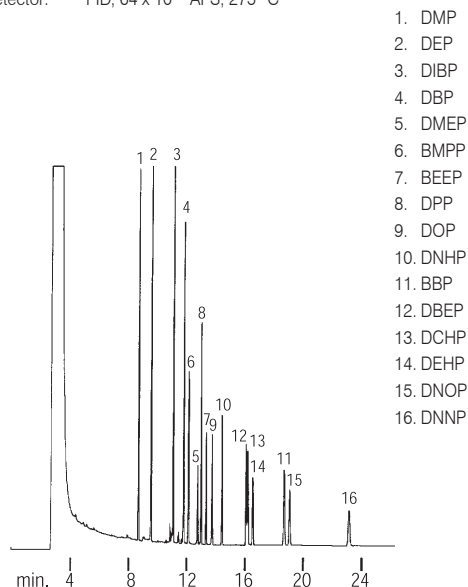
Chlorinated Hydrocarbons (EPA 612)

Column: DM-200, 30 m x 0.53 mm x 0.50 μ m
 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 μ L
 Detector: 220 °C



PAEs (EPA 8060)

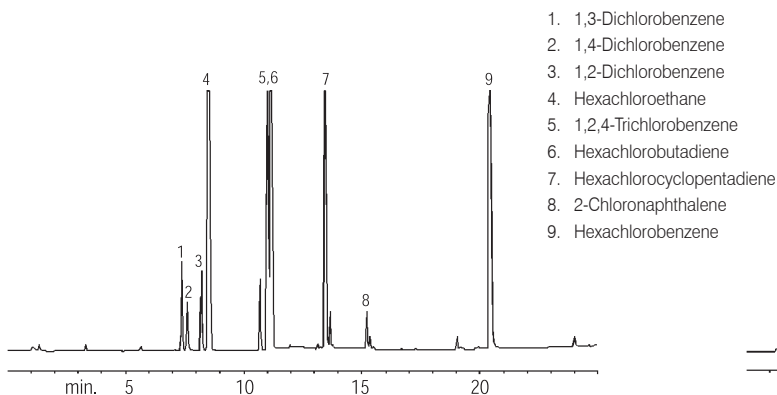
Column: DM-17, 30 m x 0.32 mm x 1.00 μ m
 Cat. No.: 7451
 Index: CER00037
 Oven Temp.: 100 °C to 275 °C (hold 10 min) at 15 °C/min
 Carrier Gas: He, 20 cm/sec
 Injection: Direct, 275 °C
 Sample: PAEs, 1.5 μ L, 60 μ g/mL
 Detector: FID, 64×10^{-11} AFS, 275 °C



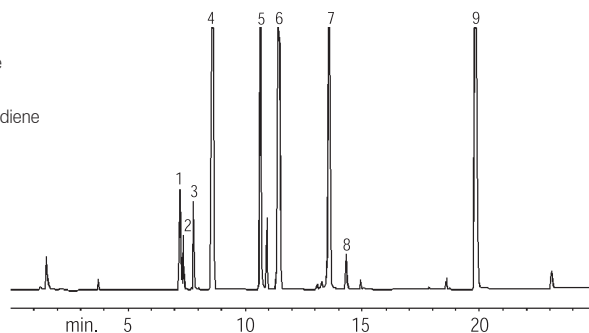
Chlorinated Hydrocarbons (EPA 612)

Column: DM-35, 30 m x 0.53 mm x 1.00 μ m
 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 μ L
 Detector: 300 °C

V.S.



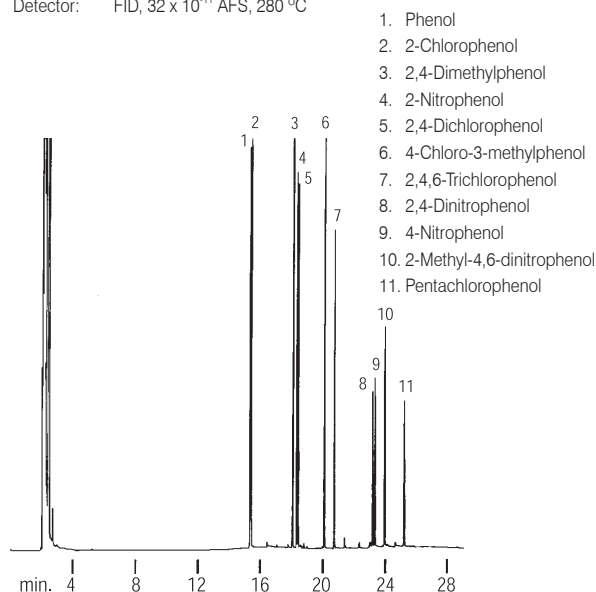
Column: DM-5, 30 m x 0.53 mm x 0.50 μ m
 Cat. No.: 7247
 Index: CER00053
 Oven Temp.: 40 °C to 250 °C (hold 5 min) at 8 °C/min
 Carrier Gas: He, 35 cm/sec, 40 °C
 Injection: Direct, 250 °C
 Sample: Chlorinated hydrocarbons, 0.1 μ L
 Detector: 300 °C



Pesticides

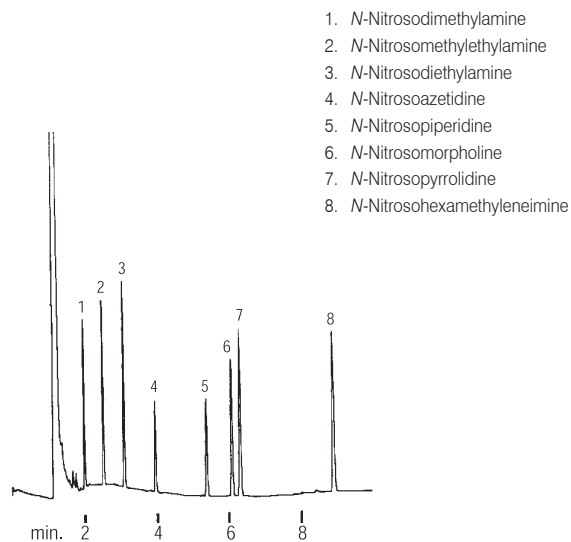
Phenols (EPA 604)

Column: DM-17, 30 m x 0.25 mm x 0.25 μ m
 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 μ L, 3 - 5 ng/ μ L
 Detector: FID, 32 x 10⁻¹¹ AFS, 280 °C



Nitrosamines

Column: DM-200, 30 m x 0.53 mm x 0.50 μ m
 Cat. No.: 8347
 Index: CER00040
 Oven Temp.: 100 °C (hold 1 min) to 200 °C at 5 °C/min
 Carrier Gas: H₂, 40 cm/sec
 Injection: Split, 40 cc/min, 250 °C
 Sample: Nitrosamines mix, 1.0 μ L, 10 μ g/mL
 Detector: FID, 16 x 10⁻¹² AFS, 250 °C

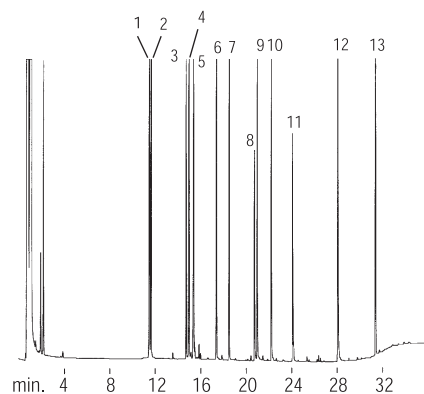
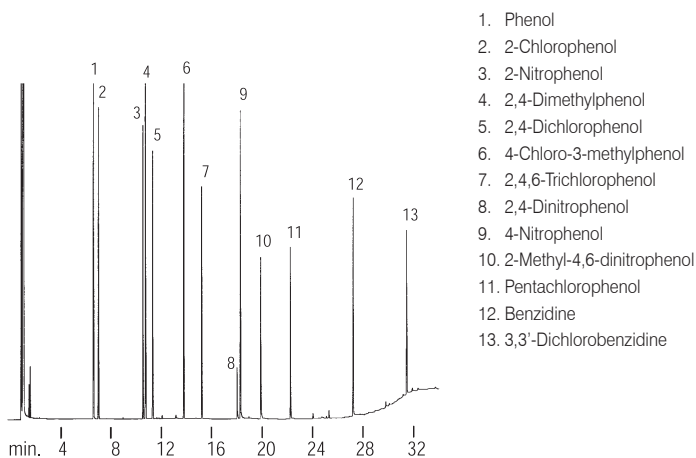


Benzidines / Phenols (EPA 604 / 605)

Column: DM-5, 30 m x 0.32 mm x 1.00 μ m
 Cat. No.: 7235
 Index: CER00032
 Oven Temp.: 110 °C to 290 °C at 8 °C/min
 Carrier Gas: H₂, 40 cm/sec
 Injection: Split, 100:1, 310 °C
 Sample: Phenols / Benzidines mix, 1.5 μ L
 Detector: FID, 2 x 10⁻¹¹ AFS, 310 °C

V.S.

Column: DM-5, 30 m x 0.53 mm x 1.50 μ m
 Cat. No.: 7251
 Index: CER00033
 Oven Temp.: 40 °C (hold 6 min) to 300 °C (hold 15 min) at 10 °C/min
 Carrier Gas: H₂, 80 cm/sec
 Injection: Direct, 300 °C
 Sample: Phenols / Benzidines mix, 2.5 μ L
 Detector: FID, 8 x 10⁻¹¹ AFS, 300 °C



Organophosphorus Pesticides (EPA 8140 / 8141 / 8141A)

Column: DM-35, 30 m x 0.32 mm x 0.25 μm

Cat. No.: 7931

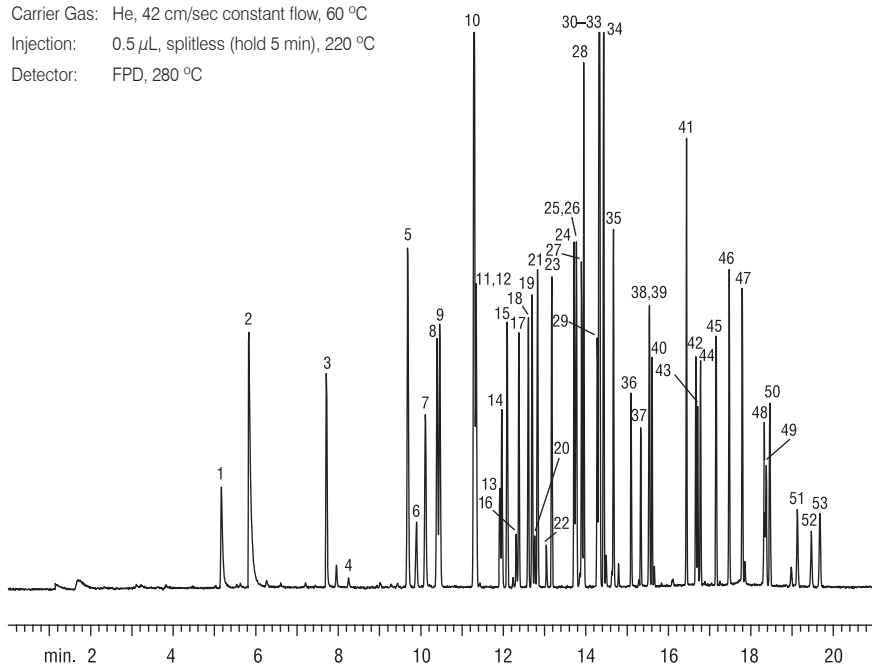
Index: CER00696

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

Organochlorine Pesticides

Column: DM-5, 30 m x 0.25 mm x 0.25 μm

Cat. No.: 7221

Index: CER00083

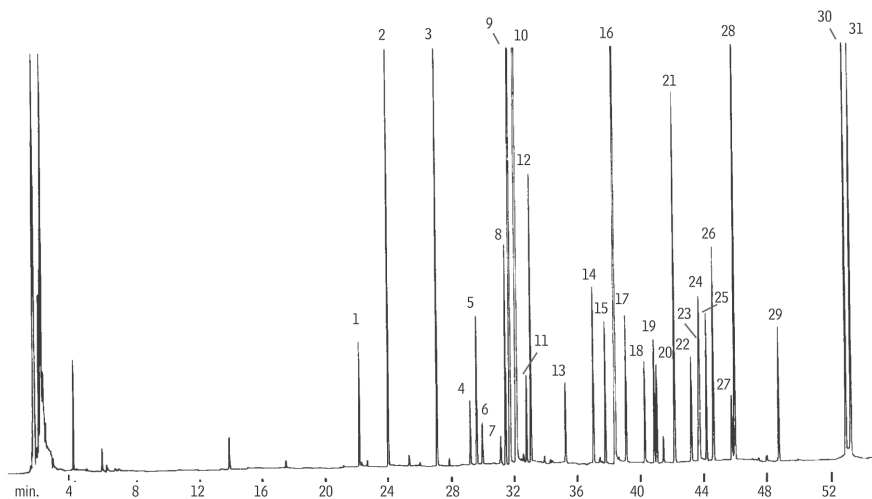
Oven Temp.: 60 °C to 300 °C (hold 10 min) at 4 °C/min

Carrier Gas: He, 30 cm/sec

Injection: Splitless, 250 °C

Sample: Pesticides mix, 2.0 μL

Detector: 320 °C



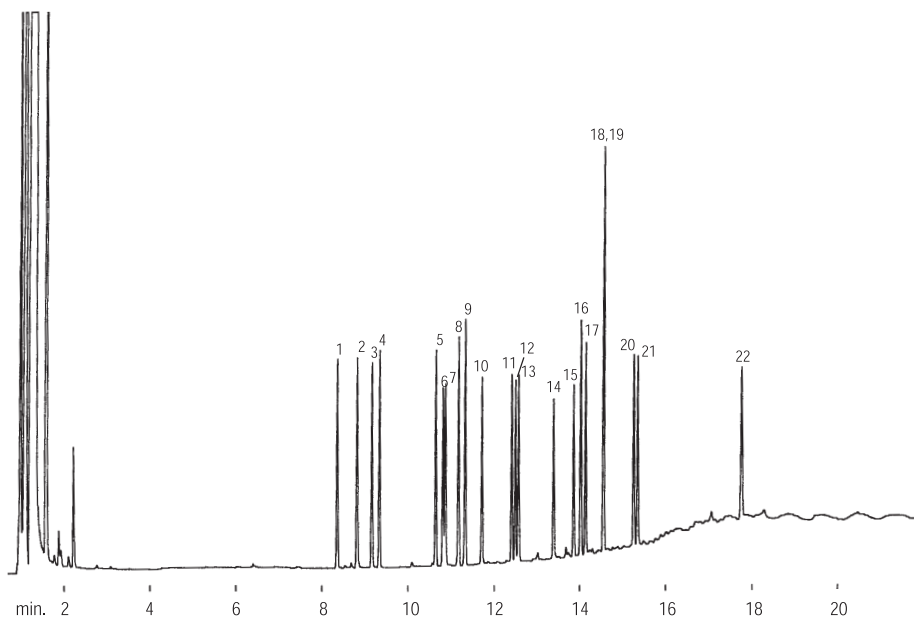
- | | | |
|-------------------------------|---------------------------------|---|
| 1. Etridiazole 50 pg/μL | 11. δ-BHC 20 pg/μL | 22. Endrin 30 pg/μL |
| 2. Chlorneb 1000 pg/μL | 12. Chlorothalonil 50 pg/μL | 23. Endosulfan II 30 pg/μL |
| 3. Propachlor 1000 pg/μL | 13. Heptachlor 20 pg/μL | 24. Chlorobenzilate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

Pesticides

Nitrogen-Containing Herbicides

Column: DM-35, 30 m x 0.53 mm x 1.00 μ m
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 μ L
Detector: FID, 16 x 10⁻¹¹ AFS, 290 °C

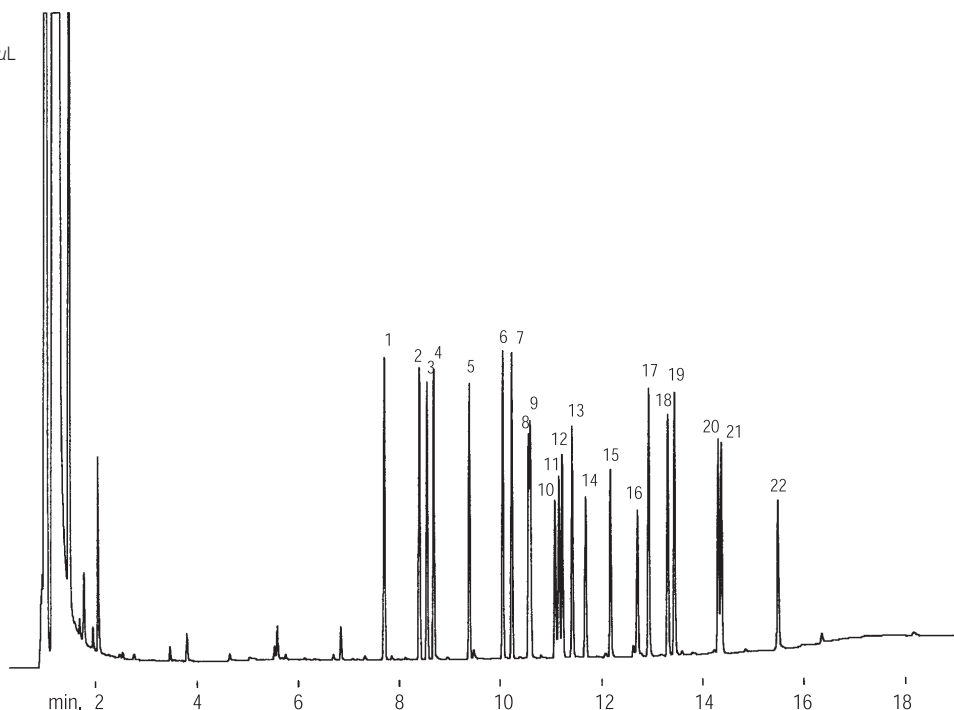
- | | |
|---------------|----------------|
| 1. Eptam | 13. Simazine |
| 2. Sutan | 14. Terbacil |
| 3. Vernam | 15. Sencor |
| 4. Tillam | 16. Dual |
| 5. Ordram | 17. Paarlán |
| 6. Treflan | 18. Prowl |
| 7. Balan | 19. Bromacil |
| 8. Ro-Neet | 20. Oxadiazon |
| 9. Propachlor | 21. GOAL |
| 10. Tolban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



Nitrogen-Containing Herbicides

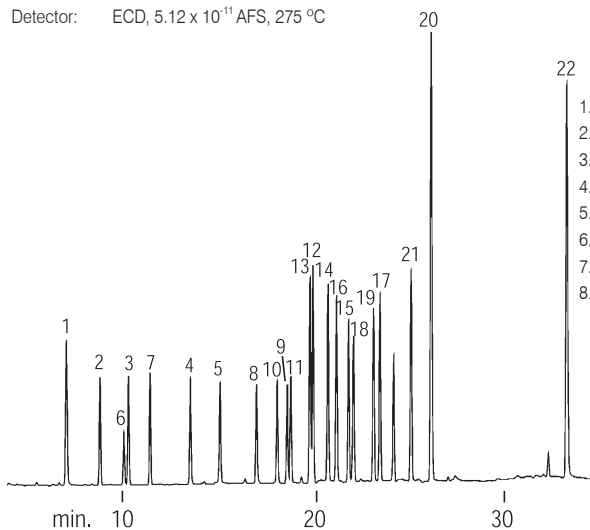
Column: DM-5, 30 m x 0.53 mm x 0.50 μ m
Cat. No.: 7247
Index: CER00087
Oven Temp.: 60 °C (hold 1 min) to 290 °C (hold 5 min) at 15 °C/min
Carrier Gas: He, 40 cm/sec
Injection: Direct, 290 °C
Sample: Nitrogen-containing herbicides, 0.2 μ L
Detector: FID, 16 x 10⁻¹¹ AFS, 290 °C

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



Organochlorine Pesticides (EPA 8081)

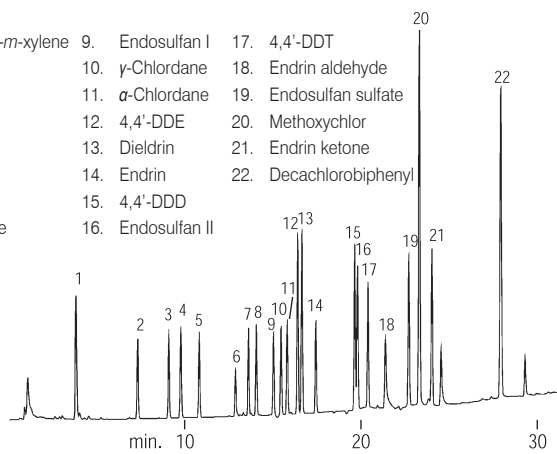
Column: DM-5, 30 m x 0.53 mm x 0.50 μ m
 Cat. No.: 7247
 Index: CER00408
 Oven Temp.: 150 °C (hold 5 min) to 275 °C (hold 5 min) at 4 °C/min
 Carrier Gas: He, 40 cm/sec
 Injection: Direct, 200 °C
 Sample: Pesticides mix, 1.0 μ L, 80 - 800 ng/mL
 Detector: ECD, 5.12 x 10⁻¹¹ AFS, 275 °C



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)

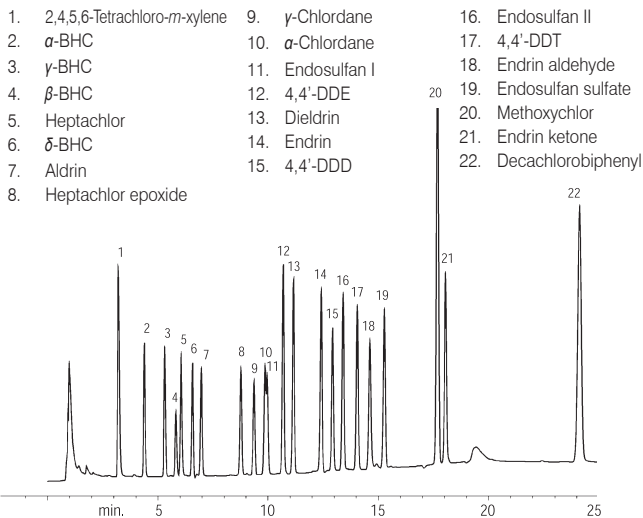
Column: DM-1701, 30 m x 0.53 mm x 0.50 μ m
 Cat. No.: 7347
 Index: CER00409
 Oven Temp.: 150 °C (hold 5 min) to 275 °C (hold 5 min) at 4 °C/min
 Carrier Gas: He, 40 cm/sec, 150 °C
 Injection: Direct, 200 °C
 Sample: Organochlorine pesticides, 1.0 μ L, 80 - 800 ng/mL
 Detector: ECD, 5.12 x 10⁻¹⁰ AFS,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



1. 2,4,5,6-Tetrachloro-*m*-xylene
2. α -BHC
3. γ -BHC
4. 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)

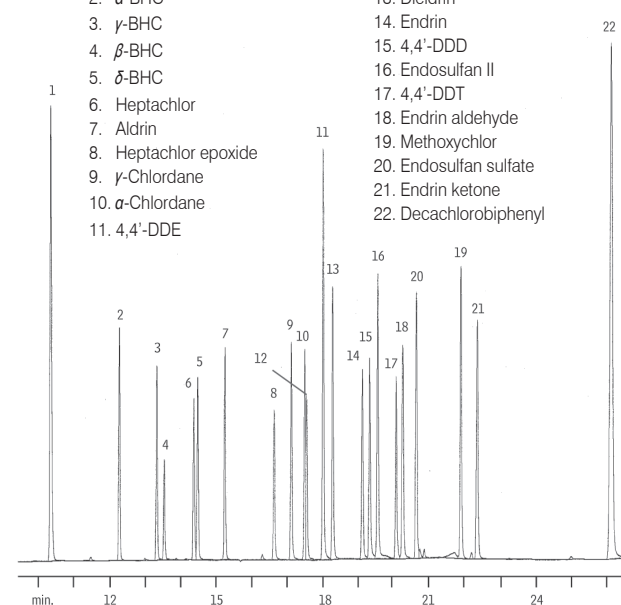
Column: DM-17, 30 m x 0.53 mm x 1.00 μ m
 Cat. No.: 7451
 Index: CER00410
 Oven Temp.: 150 °C (hold 5 min) to 275 °C (hold 5 min) at 8 °C/min
 Carrier Gas: He, 40 cm/sec, 150 °C
 Injection: Direct, 200 °C
 Sample: Pesticides, 1.0 μ L
 Detector: ECD, 5.12 X 10⁻¹⁰ AFS, 275 °C



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 μ m
 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

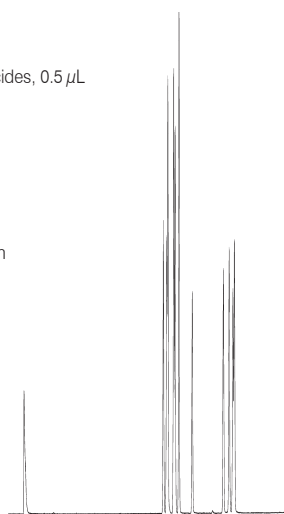
Applications

Pesticides

Triazine Herbicides (EPA 619)

Column: DM-17, 30 m x 0.53 mm x 0.50 μ m
 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 μ L
 Detector: TSD, 275 °C

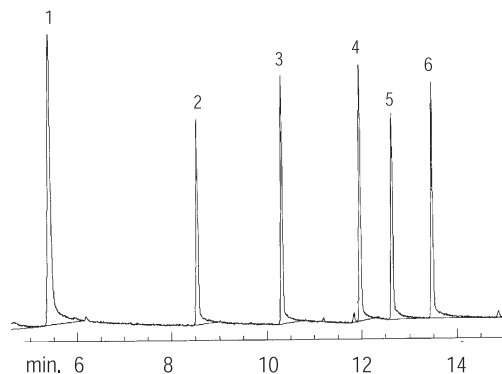
- | | |
|------------------|----------------|
| 1. Atraton | 7. Secbumeton |
| 2. Prometon | 8. Terbutryne |
| 3. Terbutylazine | 9. Ametryne |
| 4. Atrazine | 10. Simetryne |
| 5. Simazine | 11. Prometryne |
| 6. Propazine | |



Butyl Tins

Column: DM-5, 30 m x 0.32 mm x 0.50 μ m
 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-column direct, 250 °C
 Detector: FPD with 610 nm filter, 250 °C

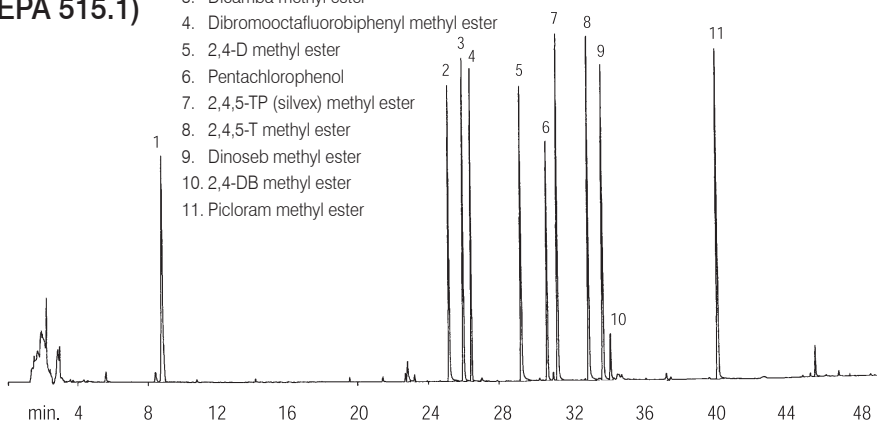
1. Tetrapropyltin
2. Tetrabutyltin
3. Tributyltin
4. Dibutyltin
5. Tripropyltin
6. Monobutyltin



Chlorophenoxyacid Herbicides (EPA 515.1)

Column: DM-17, 30 m x 0.25 mm x 0.50 μ m
 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 μ L
 Detector: ECD, 320 °C

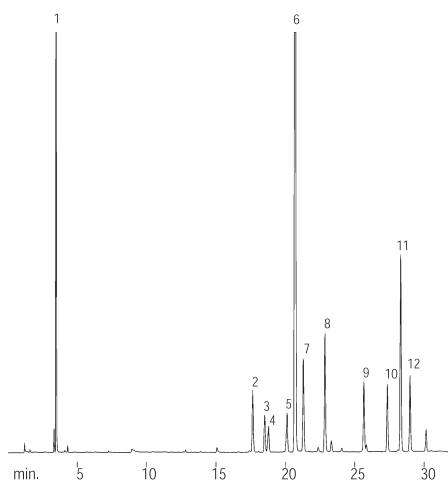
1. Dalapon methyl ester
2. 2,4-Dichlorophenylacetic acid methyl ester
3. Dicamba methyl ester
4. Dibromooctafluorobiphenyl methyl ester
5. 2,4-D methyl ester
6. Pentachlorophenol
7. 2,4,5-TP (silvex) methyl ester
8. 2,4,5-T methyl ester
9. Dinoseb methyl ester
10. 2,4-DB methyl ester
11. Picloram methyl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



Chlorophenoxyacid Herbicides (EPA 615)

Column: DM-35, 30 m x 0.53 mm x 1.00 μ m
 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 μ L
 Detector: ECD w / anode purge, 275 °C

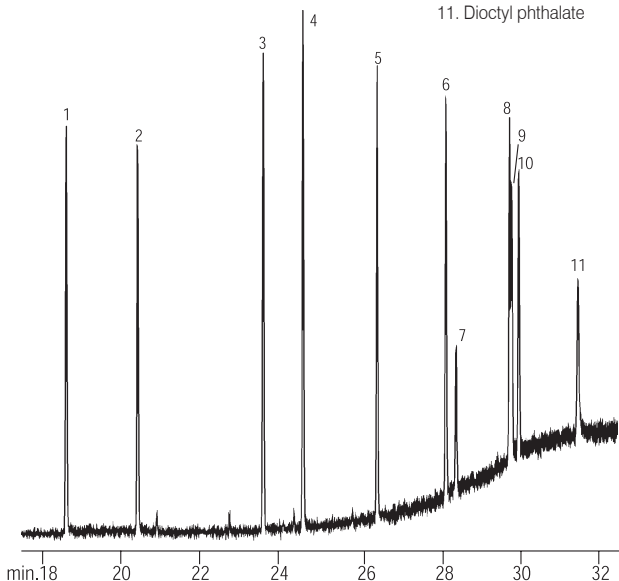
1. Dalapon
2. DCAA (SS)
3. Dicamba
4. MCPP
5. MCPA
6. DBOB (IS)
7. Dichlorprop
8. 2,4-D
9. 2,4,5-TP
10. 2,4,5-T
11. Dinoseb
12. 2,4-DB



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

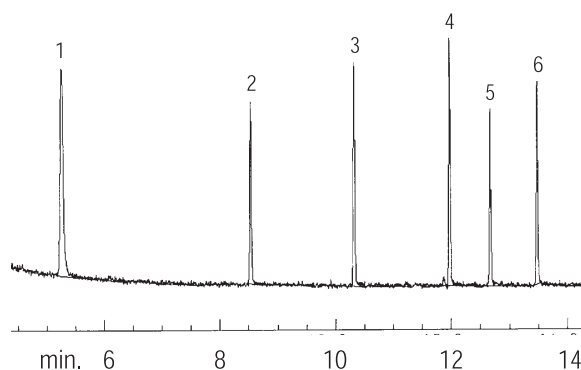
1. Dimethyl phthalate
2. Diethyl phthalate
3. Isobutyl phthalate
4. Dibutyl phthalate
5. Dipentyl phthalate
6. Dihexyl phthalate
7. Benzyl ethyl phthalate
8. Diheptyl phthalate
9. 2-Ethylhexyl phthalate
10. Cyclohexyl phthalate
11. Dioctyl phthalate



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

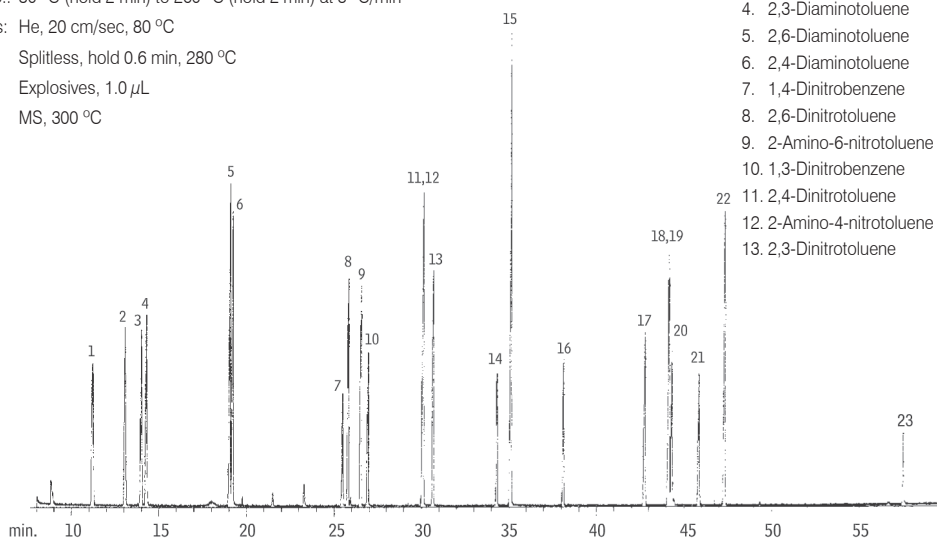
1. Tetrapropyltin
2. Tetrabutyltin
3. Tributyltin
4. Dibutyltin
5. Tripropyltin
6. Monobutyltin



Explosives

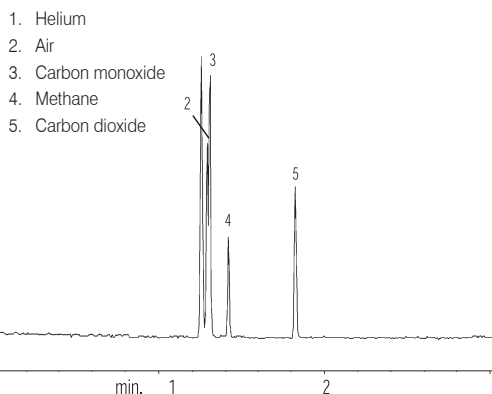
Column: DM-200, 30 m x 0.25 mm x 0.25 μm
 Cat. No.: 8321
 Index: CER00060
 Oven Temp.: 80 °C (hold 2 min) to 260 °C (hold 2 min) at 3 °C/min
 Carrier Gas: He, 20 cm/sec, 80 °C
 Injection: Splitless, hold 0.6 min, 280 °C
 Sample: Explosives, 1.0 μL
 Detector: MS, 300 °C

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



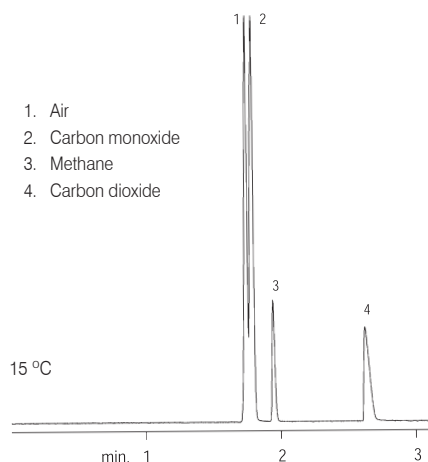
Permanent Gases

Column: DM-PLOT Q
30 m x 0.32 mm x 10.00 μ m
Cat. No.: **8818**
Index: CSR00169
Oven Temp.: 30 $^{\circ}$ C
Carrier Gas: H₂, 38 cm/sec
Injection: Split, 40:1, 30 $^{\circ}$ C
Sample Concentration: 2 - 5 mol %, 30 μ L
Detector: TCD, 200 $^{\circ}$ C



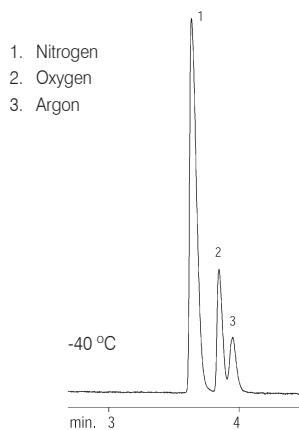
Permanent Gases

Column: DM-PLOT Q
30 m x 0.32 mm x 10.00 μ m
Cat. No.: **8818**
Index: CSR00174L
Carrier Gas: H₂, 34 cm/sec
Injection Temp.: 15 $^{\circ}$ C
Split Ratio: 40:1
Sample Concentration: 2 - 5 mol %
Detector: TCD, 15 $^{\circ}$ C



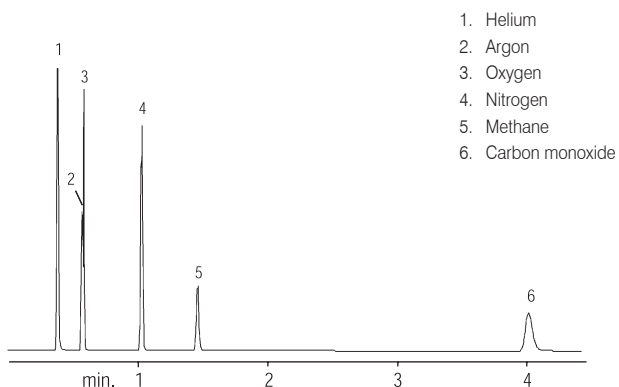
Permanent Gases

Column: DM-PLOT Q
30 m x 0.32 mm x 10.00 μ m
Cat. No.: **8818**
Index: CSR00174R
Carrier Gas: H₂, 20 cm/sec
Injection Temp.: -40 $^{\circ}$ C
Split Ratio: 40:1
Sample Concentration: 2 - 5 mol %
Detector: TCD, -40 $^{\circ}$ C



Permanent Gases

Column: DM-PLOT MS 5A, 30 m x 0.32 mm x 30.00 μ m
 Cat. No.: **8822**
 Index: CSR00165
 Oven Temp.: 70 °C
 Carrier Gas: H₂, 64 cm/sec
 Injection Temp.: Split, 70 °C
 Sample Concentration: 2 - 5 mol%, 20 μ L
 Detector: TCD, high sensitivity, 200 °C

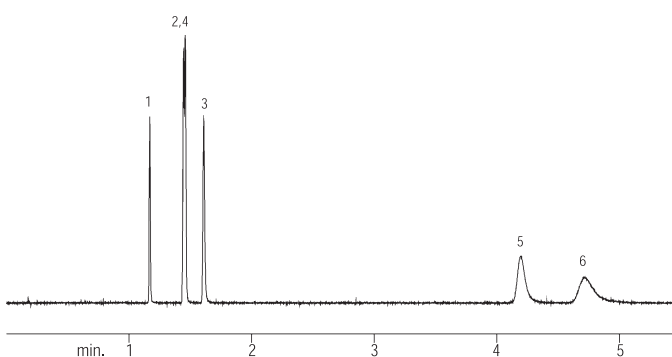


Permanent Gases

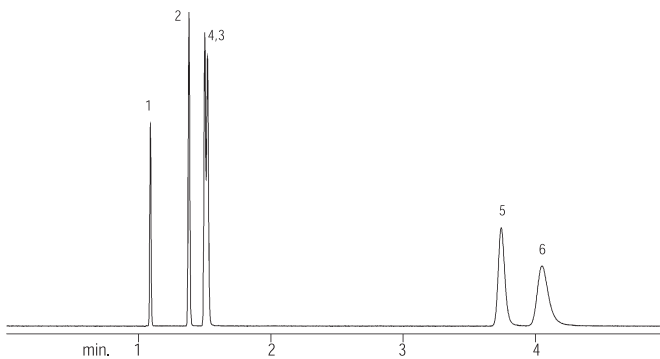
Column: DM-PLOT Q / DM-PLOT S / DM-PLOT U,
 30 m x 0.32 mm x 10.00 μ m
 Cat. No.: **8818 / 8810 / 8824**
 Index: CSR00180
 Oven Temp.: 50 °C
 Carrier Gas: H₂
 Injection: Split, 20:1, 200 °C
 Sample: 1000 ppm (v/v) in He, 100 μ L
 Detector: FID, 200 °C

1. Methane
2. Ethylene
3. Ethane
4. Acetylene
5. Propylene
6. Propane

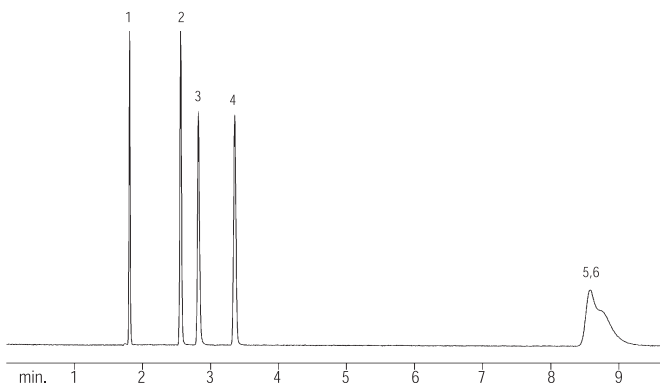
DM-PLOT Q has least selective for functional groups



DM-PLOT S has selective for polar, unsaturated compounds

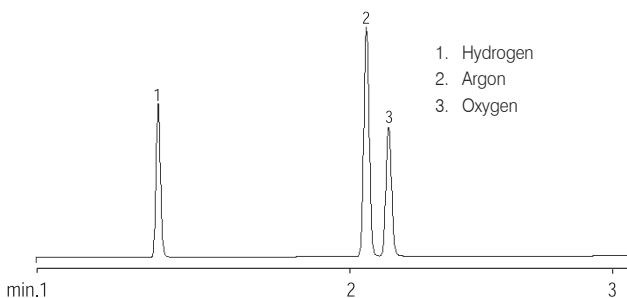


DM-PLOT U has most selective for unsaturated compounds



Permanent Gases

Column: DM-PLOT MS 5A, 30 m x 0.53 mm x 20.00 μ m
 Cat. No.: **8823**
 Index: CSR00170
 Oven Temp.: 27 °C
 Carrier Gas: He, 34 cm/sec
 Injection: Sample loop, 0.5 mL
 Detector: Valco HID



Applications

Petrochemicals

Refinery Gas

Column: DM-PLOT Alumina / Na₂SO₄,
30 m x 0.53 mm x 10.00 μm

Sample: Refinery gas

Cat. No.: **8806**

Index: CSR01139

Injection: Split, 10 μL, 200 °C

Split Vent Flow Rate: 40 mL/min

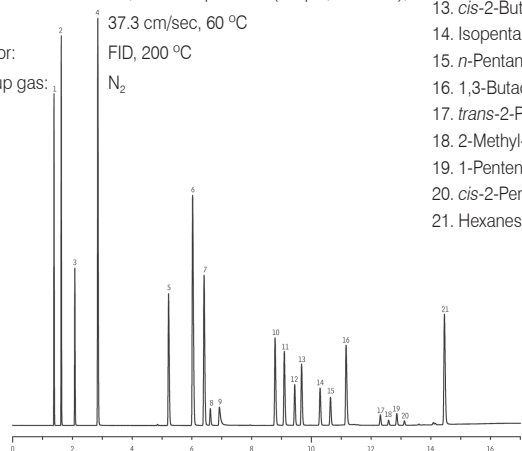
Oven Temp.: 60 °C (hold 2 min) to 200 °C (hold 1 min)
at 10 °C/min

Carrier Gas: He, constant pressure (5.0 psi, 34.5 kPa),
37.3 cm/sec, 60 °C

Detector: FID, 200 °C

Make up gas: N₂

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

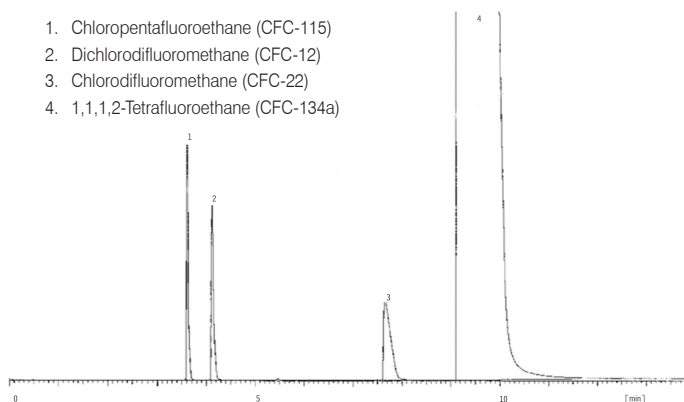
Injection: Split, 500 μL

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

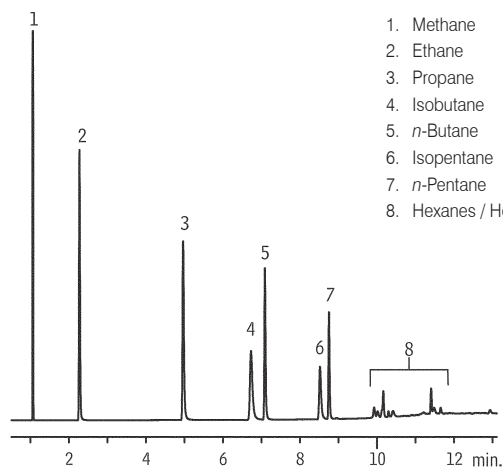
Carrier Gas: He, 5.7 mL/min

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 x 0.53 mm x 10.00 μm

Cat. No.: **8813**

Index: CSR01086

Sample: Butane lighter fluid

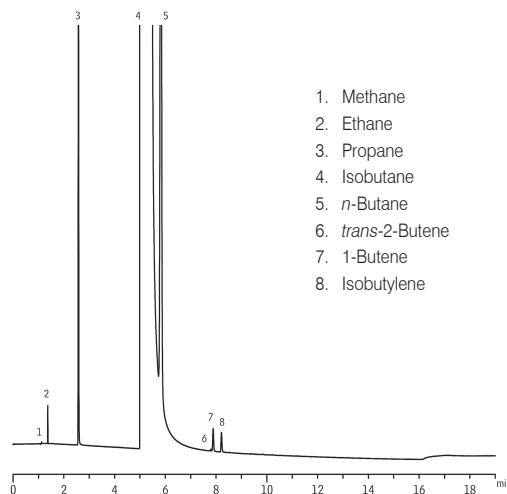
Injection: Valve, 100 μL, 200 °C

Oven Temp.: 45 °C (hold 1 min) to 200 °C (hold 3.5 min) at 10 °C/min

Carrier Gas: H₂, constant pressure (8.0 psi, 55.2 kPa) 74 cm/sec 45 °C

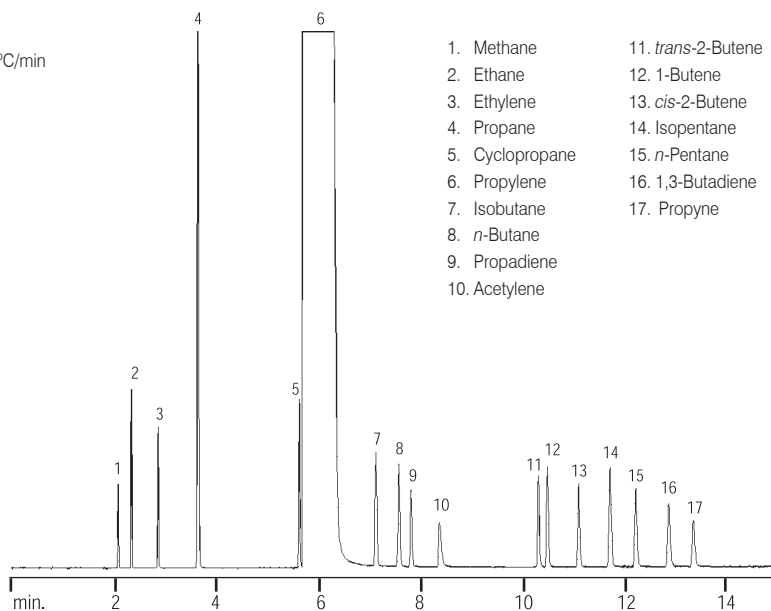
Detector: FID, 200 °C

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



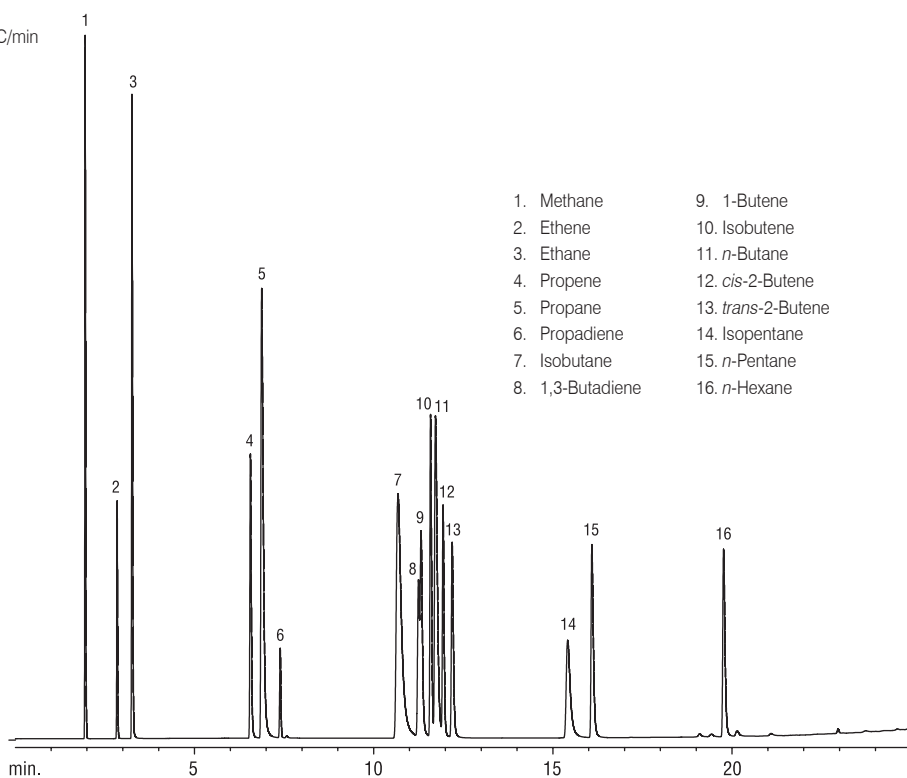
Propylene Purity

Column: DM-PLOT Alumina, 50 m x 0.53 mm x 6.00 μ m
 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 μ L
 Detector: FID, 1.28 x 10⁻¹⁰ AFS, 200 °C



Hydrocarbon Gases

Column: DM-PLOT Q, 30 m x 0.32 mm x 10.00 μ m
 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 μ L
 Detector: FID, 240 °C



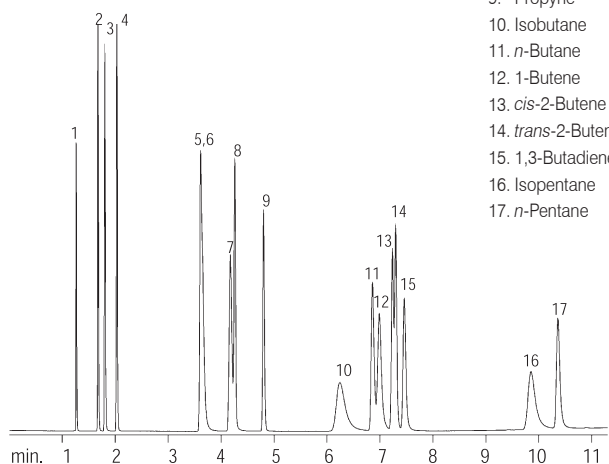
Applications

Petrochemicals

Hydrocarbon Gases

Column: DM-PLOT U, 30 m x 0.32 mm x 10.00 μ m
 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 μ L, 40 mL/min, 40:1, 250 °C
 Detector: FID, 1.28×10^{-10} AFS, 250 °C

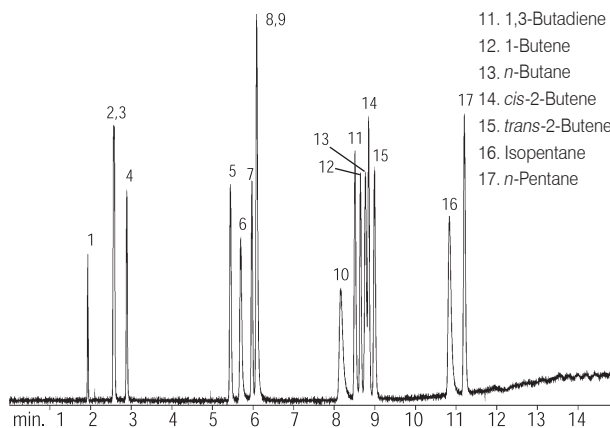
1. Methane
2. Ethylene
3. Ethane
4. Acetylene
5. Propane
6. Propylene
7. Cyclopropane
8. Propadiene
9. Propyne
10. Isobutane
11. *n*-Butane
12. 1-Butene
13. *cis*-2-Butene
14. *trans*-2-Butene
15. 1,3-Butadiene
16. Isopentane
17. *n*-Pentane



Hydrocarbon Gases

Column: DM-PLOT Q, 30 m x 0.32 mm x 10.00 μ m
 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 μ L, 40 mL/min, 40:1, 250 °C
 Detector: FID, 1.28×10^{-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

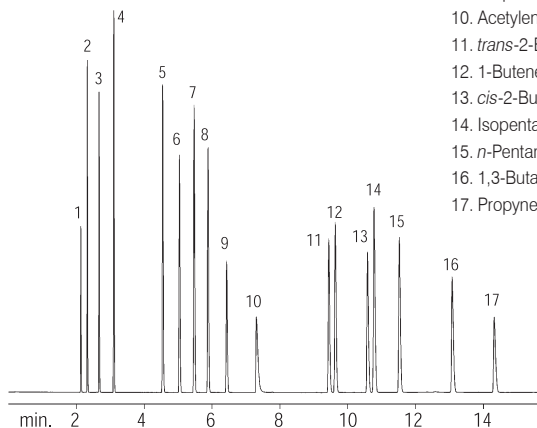


Applications

Refinery Gas

Column: DM-PLOT Alumina, 50 m x 0.53 mm x 6.00 μ m
 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 μ L, 1,000 ppm
 Detector: FID, 1.28×10^{-10} AFS, 200 °C

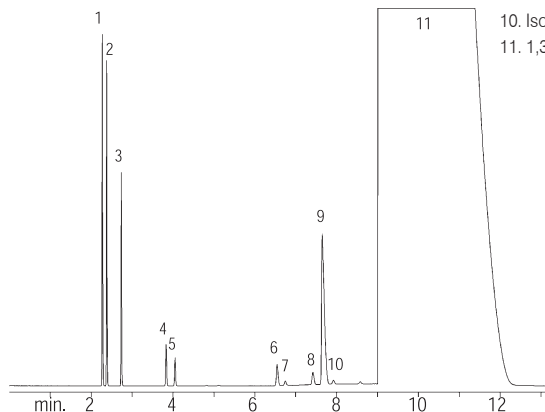
1. Methane
2. Ethane
3. Ethylene
4. Propane
5. Cyclopropane
6. Propylene
7. Isobutane
8. *n*-Butane
9. Propadiene
10. Acetylene
11. *trans*-2-Butene
12. 1-Butene
13. *cis*-2-Butene
14. Isopentane
15. *n*-Pentane
16. 1,3-Butadiene
17. Propyne



1,3-Butadiene Purity

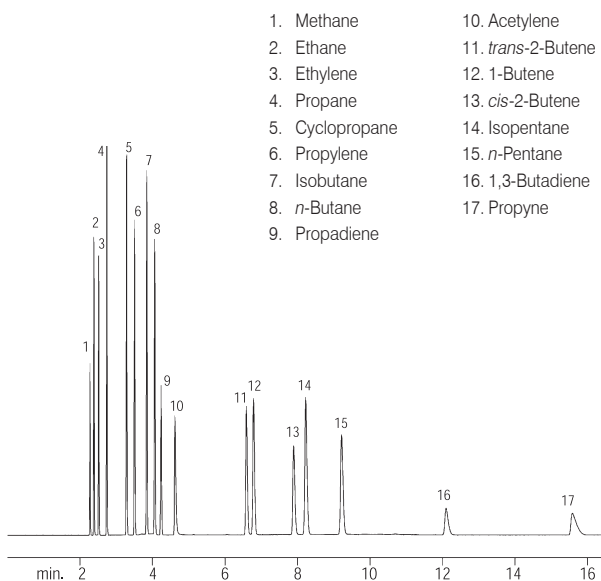
Column: DM-PLOT Alumina, 50 m x 0.53 mm x 6.00 μ m
 Cat. No.: **8801**
 Index: CSR00186
 Oven Temp.: 80 °C
 Carrier Gas: He, 42 cm/sec, 80 °C
 Injection: Gastight syringe, 40 mL/min, 200 °C
 Sample: 99+% 1,3-Butadiene, 500 μ L
 Detector: FID, 1.28×10^{-10} AFS, 200 °C

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



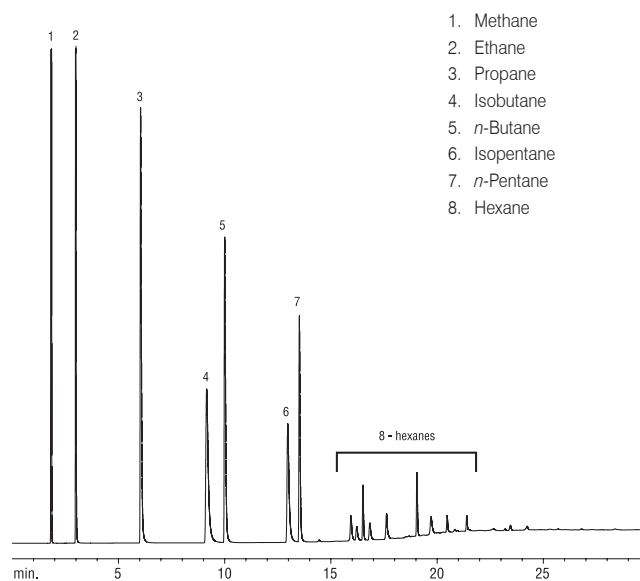
Hydrocarbons

Column: DM-PLOT Alumina, 50 m x 0.53 mm x 6.00 μ m
 Cat. No.: **8801**
 Index: CSR00551
 Oven Temp.: 80 $^{\circ}$ C
 Carrier Gas: He, 42 cm/sec, 80 $^{\circ}$ C
 Injection: Gastight syringe, 40 mL/min, 200 $^{\circ}$ C
 Sample: 200 μ L, 1,000 ppm
 Detector: FID, 1.28 x 10⁻¹⁰ AFS, 200 $^{\circ}$ C



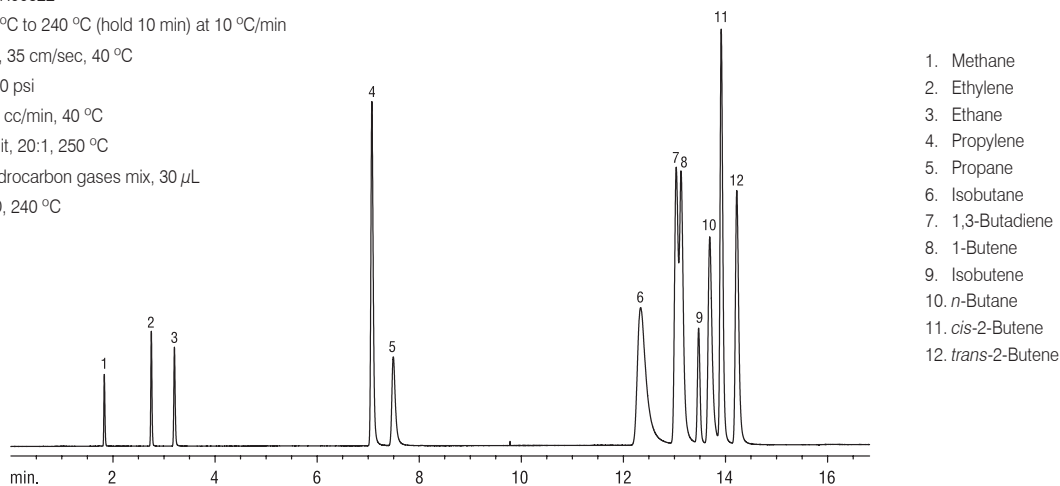
Hydrocarbon Gases

Column: DM-PLOT Q, 30 m x 0.32 mm x 10.00 μ m
 Cat. No.: **8818**
 Index: CSR00523
 Oven Temp.: 40 $^{\circ}$ C to 240 $^{\circ}$ C (hold 10 min) at 10 $^{\circ}$ C/min
 Carrier Gas: He, 35 cm/sec, 40 $^{\circ}$ C
 Head Pressure: 18.0 psi
 Column flow rate: 1.5 mL/min, 40 $^{\circ}$ C
 Injection: Split, 20:1, 250 $^{\circ}$ C
 Sample: Hydrocarbon gases mix, 30 μ L
 Detector: FID, 240 $^{\circ}$ C



Hydrocarbon Gases

Column: DM-PLOT Q, 30 m x 0.32 mm x 10.00 μ m
 Cat. No.: **8818**
 Index: CSR00522
 Oven Temp.: 35 $^{\circ}$ C to 240 $^{\circ}$ C (hold 10 min) at 10 $^{\circ}$ C/min
 Carrier Gas: He, 35 cm/sec, 40 $^{\circ}$ C
 Head Pressure: 18.0 psi
 Column flow rate: 1.5 cc/min, 40 $^{\circ}$ C
 Injection: Split, 20:1, 250 $^{\circ}$ C
 Sample: Hydrocarbon gases mix, 30 μ L
 Detector: FID, 240 $^{\circ}$ C



Petrochemicals

Petroleum Oxygenates

Column: DM-Wax, 30 m x 0.53 mm x 1.00 μ m

Cat. No.: 7551

Index: CSR00196

Oven Temp.: 45 °C (hold 4 min) to 220 °C at 6 °C/min

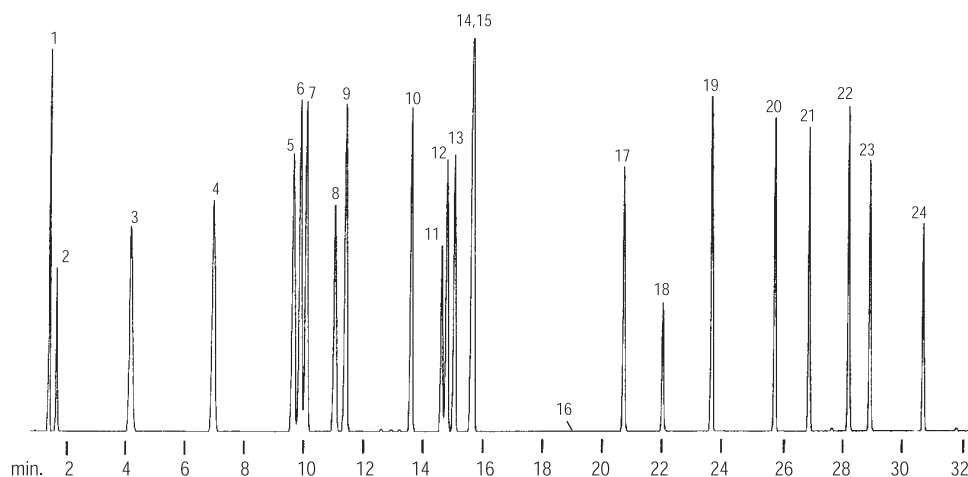
Carrier Gas: H₂, 40 cm/sec

Injection: Direct, 220 °C

Sample: Synthetic blend, 0.2 μ L, 15 - 30 ng/ μ L

Detector: FID, 16 x 10⁻¹¹ AFS, 220 °C

- | | | | |
|---------------------|------------------------------|------------------------------|------------------------------------|
| 1. Heptane | 7. <i>m</i> -Xylene | 13. <i>m</i> -Diethylbenzene | 19. Acetophenone |
| 2. C3 oxide | 8. Cumene | 14. α -Methylstyrene | 20. 2-Phenyl-2-propanol |
| 3. Benzene | 9. <i>o</i> -Xylene | 15. <i>o</i> -Diethylbenzene | 21. α -Methylbenzyl alcohol |
| 4. Toluene | 10. Styrene | 16. Phenylacetylene | 22. Benzyl alcohol |
| 5. Ethylbenzene | 11. 2-Methylpentanol | 17. Benzaldehyde | 23. Phenylethyl alcohol |
| 6. <i>p</i> -Xylene | 12. <i>p</i> -Diethylbenzene | 18. Monopropylene glycol | 24. Phenol |



Petroleum Oxygenates

Column: DM-TCEP, 60 m x 0.25 mm x 0.40 μ m

Cat. No.: 7809

Index: CSR00195

Oven Temp.: 60 °C (hold 5 min) to 100 °C (hold 10 min) at 5 °C/min

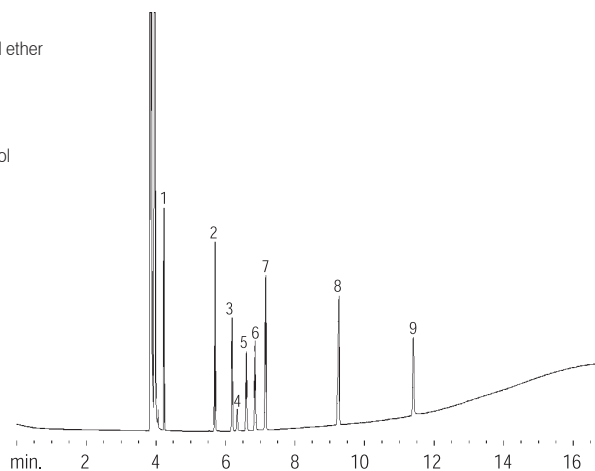
Carrier Gas: He, 30 cm/sec, 80 °C

Injection: Split, 46 mL/min, 200 °C

Sample: 1.0 μ L, 500 ppm

Detector: FID, 6.4 x 10⁻¹¹ AFS, 200 °C

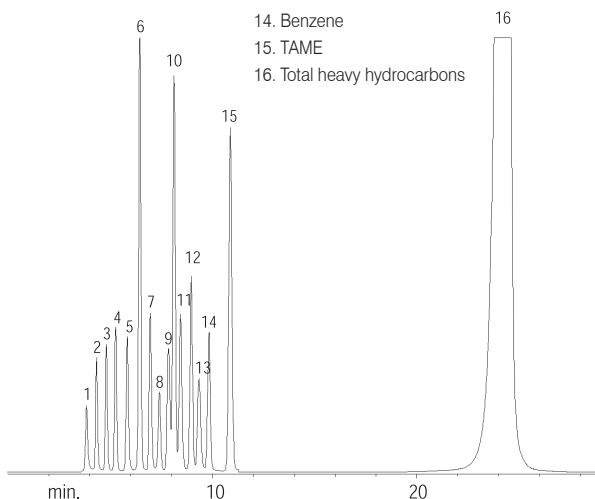
1. Methyl *tert*-butyl ether
2. *n*-Undecane
3. *tert*-Butanol
4. Methanol
5. Isopropyl alcohol
6. Ethanol
7. *n*-Dodecane
8. *n*-Tridecane
9. *n*-Butanol



Petroleum Oxygenates

Column: DM-1, 30 m x 0.53 mm x 3.00 μ m
 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 μ L
 Detector: FID, 250 °C

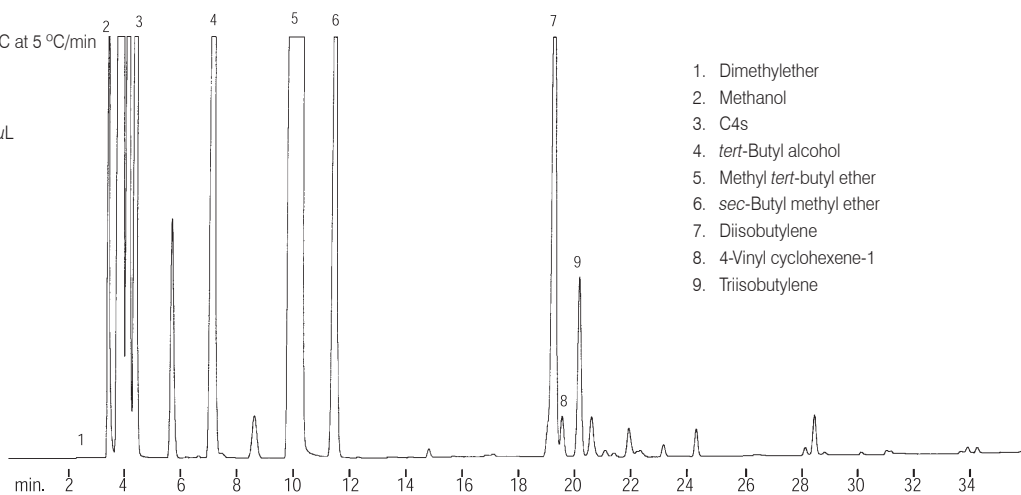
1. Methanol
2. Ethanol
3. Isopropanol
4. *tert*-butanol
5. *n*-Propanol
6. Methyl *tert*-butyl ether
7. *sec*-Butanol
8. DIPE
9. Isobutanol
10. Ethyl *tert*-butyl ether
11. *tert*-Amyl ether
12. Dimethoxyethane
13. *n*-Butanol
14. Benzene
15. TAME
16. Total heavy hydrocarbons



Oxygenates MTBE

Column: DM-1, 30 m x 0.53 mm x 5.00 μ m
 Cat. No.: 7157
 Index: CSR00197
 Oven Temp.: 40 °C (hold 8 min) to 200 °C at 5 °C/min
 Carrier Gas: H₂, 40 cm/sec
 Injection: Direct, 200 °C
 Sample: Methyl *tert*-butyl ether, 0.1 μ L
 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



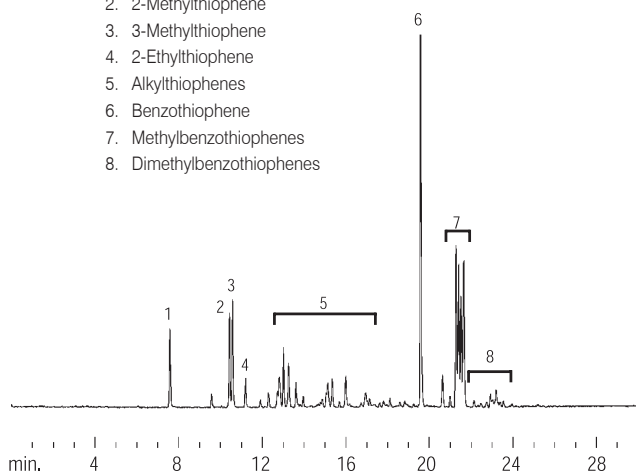
Applications

Petrochemicals

Sulfur in Gasoline

Column: DM-1, 30 m x 0.32 mm x 4.00 μ m
 Cat. No.: 7143
 Index: CSR00198
 Oven Temp.: 40 $^{\circ}$ C (hold 3 min) to 275 $^{\circ}$ C (hold 5 min) at 10 $^{\circ}$ C/min
 Carrier Gas: He, 70 cm/sec
 Injection: Split, 10:1, 275 $^{\circ}$ C
 Sample: Sulfur in gasoline, 1.0 μ L, 300 ppm
 Detector: SCD, 275 $^{\circ}$ C

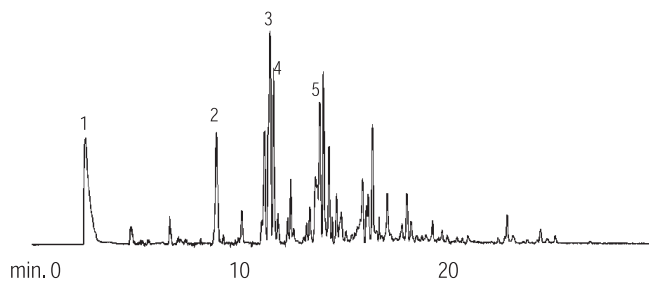
1. Thiophene
2. 2-Methylthiophene
3. 3-Methylthiophene
4. 2-Ethylthiophene
5. Alkylthiophenes
6. Benzothiophene
7. Methylbenzothiophenes
8. Dimethylbenzothiophenes



Sulfur in Naphtha

Column: DM-1, 30 m x 0.32 mm x 4.00 μ m
 Cat. No.: 7143
 Index: CSR00199
 Oven Temp.: 35 $^{\circ}$ C to 275 $^{\circ}$ C (hold 5 min) at 10 $^{\circ}$ C/min
 Carrier Gas: He, 24 cm/sec
 Injection: Split, 10:1, 275 $^{\circ}$ C
 Sample: Sulfur in naphtha, 1.0 μ L, 500 ppm
 Detector: AED, 181 nm, 275 $^{\circ}$ C

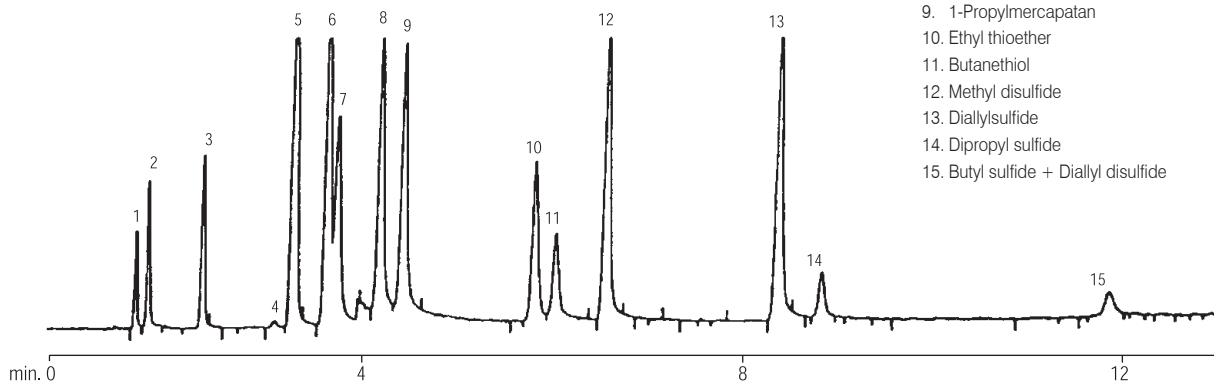
1. Hydrogen sulfide
2. Thiophene
3. 2-Methylthiophene
4. 3-Methylthiophene
5. 2-Ethylthiophene



Sulfide

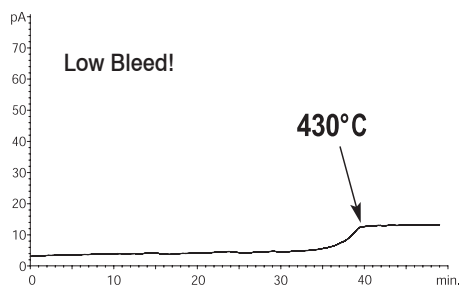
Column: DM-1, 60 m x 0.53 mm x 5.00 μ m
 Cat. No.: 7158
 Index: CSR00200
 Oven Temp.: 50 $^{\circ}$ C to 200 $^{\circ}$ C at 15 $^{\circ}$ C/min
 Carrier Gas: He, 30 cm/sec, 50 $^{\circ}$ C
 Injection: Direct, 50 $^{\circ}$ C
 Sample: Sulfide mix, 100 μ L
 Detector: FPD, 230 $^{\circ}$ C

1. Hydrogen sulfide
2. Sulfur dioxide + Carbonyl sulfide
3. Methanethiol
4. Ethanethiol
5. Carbon disulfide
6. Methyl sulfide
7. 2-Propylmercaptan
8. Allylmercaptan
9. 1-Propylmercaptan
10. Ethyl thioether
11. Butanethiol
12. Methyl disulfide
13. Diallylsulfide
14. Dipropyl sulfide
15. Butyl sulfide + Diallyl disulfide



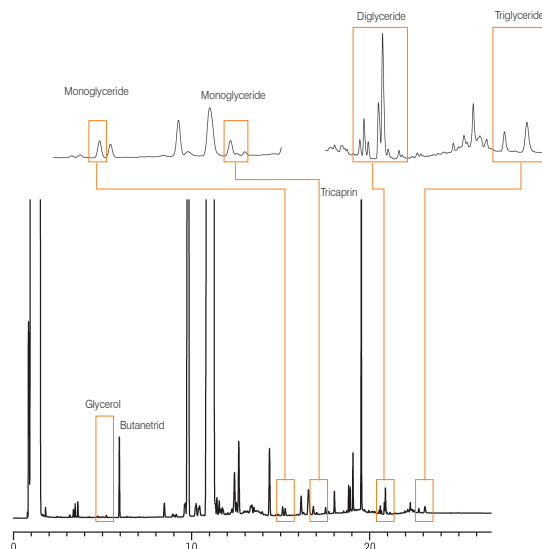
Bleed Profile

Column: DM-1HT SimDist Metal, 5 m x 0.53 mm x 0.10 μ m
 Cat.No.: **8870**
 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



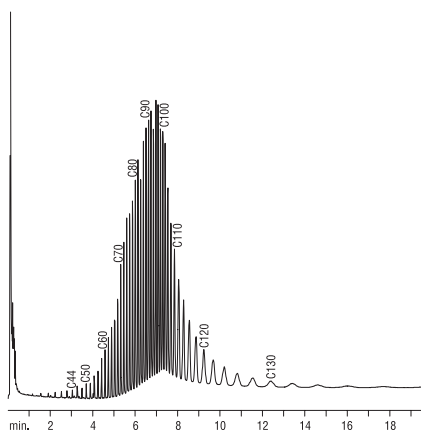
Glycerin in Biodiesel (ASTM D6584)

Column: DM-BDTG Metal, 14 m x 0.53 mm x 0.16 μ m (with 2 m Integra-Gap, total length 16 m)
 Cat. No.: **8864**
 Index: CSR00969
 Sample: Biodiesel (B100) in *n*-hexane
 Injection: 1 μ L 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: H₂, 4 mL/min
 Detector: FID, 380 °C



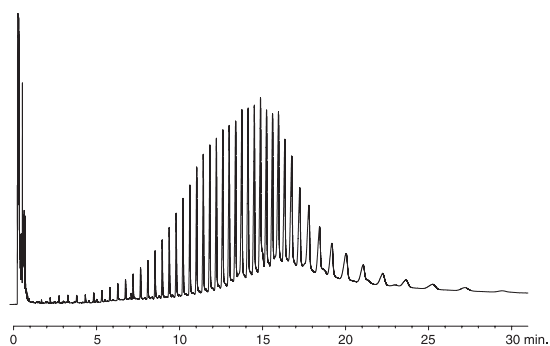
Hydrocarbons, C44 - C100

Column: DM-1HT SimDist Metal, 5 m x 0.53 mm x 0.10 μ m
 Cat. No.: **8870**
 Index: CSR00543
 Solvent: Carbon disulfide
 Injection: On-column
 Oven Temp.: 40 °C to 430 °C (hold 30 min) at 60 °C/min
 Carrier Gas: H₂, 1.0 psi
 Sample: Polywax 1000, 0.2 μ L
 Detector: FID, 430 °C



Hydrocarbons, C44 - C100

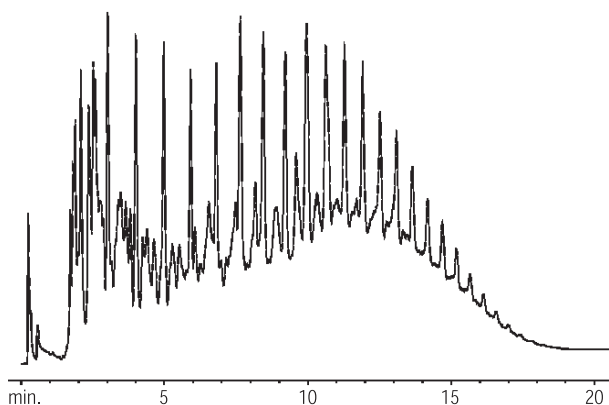
Column: DM-1HT SimDist Metal, 5 m x 0.53 mm x 0.10 μ m
 Cat. No.: **8870**
 Index: CSR00531
 Injection: On-column, 0.2 μ L
 Oven Temp.: 40 °C to 430 °C (hold 25 min) at 60 °C/min
 Carrier Gas: He, 60 cm/sec, 1.0 psi
 Sample: Polywax 1000, 0.2 μ L
 Flow Rate: 7.8 mL/min
 Detector: FID, 430 °C



Petrochemicals

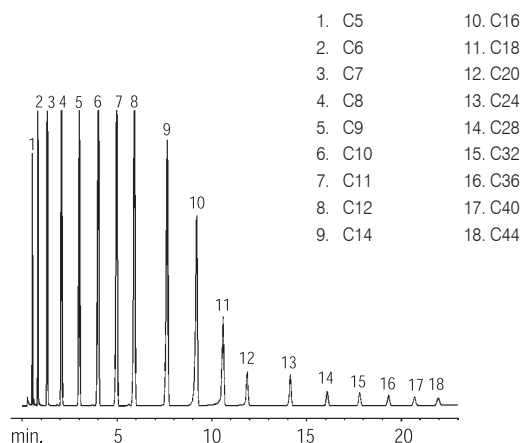
Simulated Distillation

Column: DM-2887, 10 m x 0.53 mm x 2.65 μ m
 Cat. No.: **7808**
 Index: CSR00227
 Oven Temp.: 35 $^{\circ}$ C to 360 $^{\circ}$ C (hold 5 min) at 15 $^{\circ}$ C/min
 Carrier Gas: N₂, 112 cm/sec
 Injection: Direct, 360 $^{\circ}$ C
 Sample: 0.1 - 0.01 wt% Hydrocarbon in CS₂ solvent, 1.0 μ L



Simulated Distillation

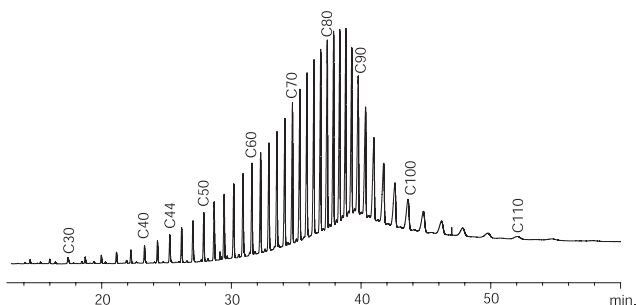
Column: DM-2887, 10 m x 0.53 mm x 2.65 μ m
 Cat. No.: **7808**
 Index: CSR00226
 Oven Temp.: 35 $^{\circ}$ C to 360 $^{\circ}$ C (hold 5 min) at 15 $^{\circ}$ C/min
 Carrier Gas: N₂, 112 cm/sec
 Injection: Direct, 360 $^{\circ}$ C
 Sample: 0.1 - 0.01 wt% Hydrocarbon in CS₂ solvent, 1.0 μ L



Applications

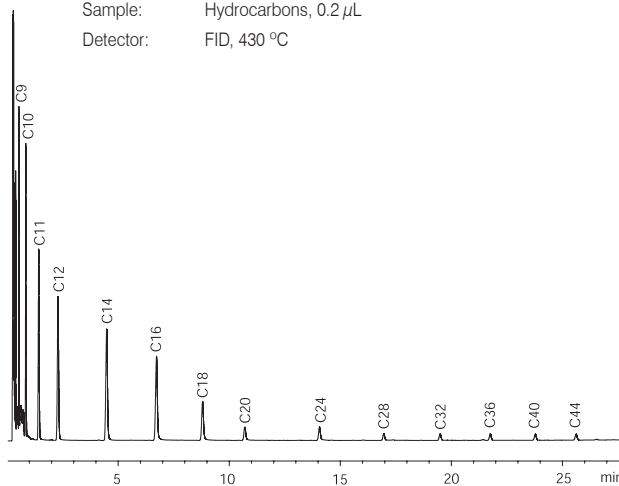
Hydrocarbons, C30 - C110

Column: DM-1HT SimDist Metal, 5 m x 0.53 mm x 0.10 μ m
 Cat. No.: **8870**
 Index: CSR00530
 Oven Temp.: 40 $^{\circ}$ C to 430 $^{\circ}$ C (hold 30 min) at 10 $^{\circ}$ C/min
 Carrier Gas: He, 60 cm/sec
 Injection: On-column
 Flow Rate: 7.8 mL/min
 Head Pressure: 1.0 psi
 Solvent: CS₂
 Sample: Polywax 1000, 0.2 μ L
 Detector: FID, 430 $^{\circ}$ C



Hydrocarbons, C10 - C44

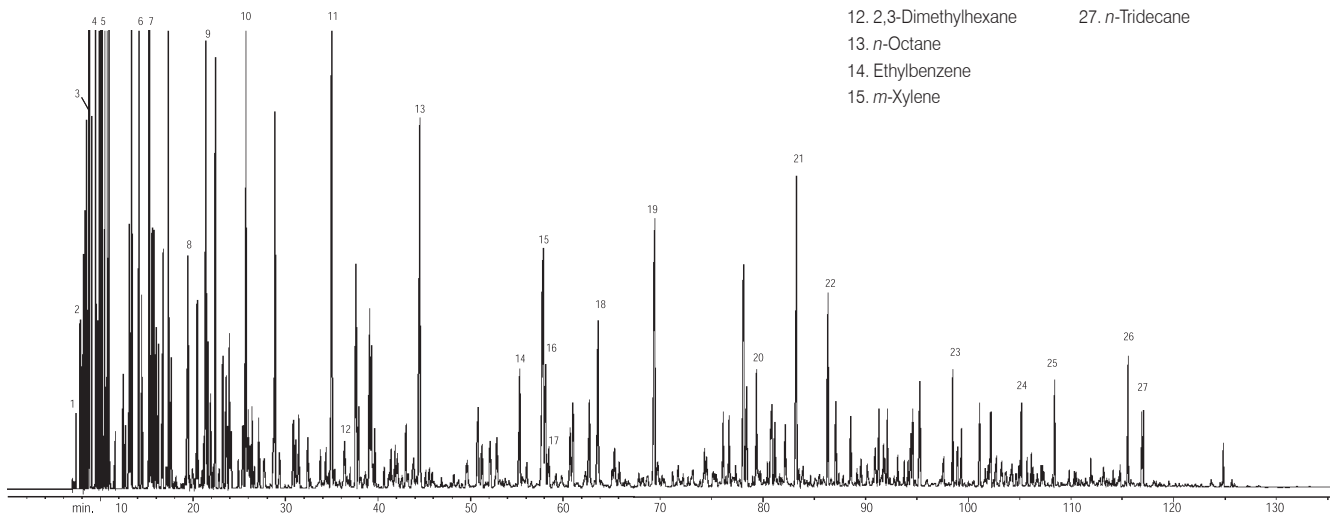
Column: DM-1HT SimDist Metal, 5 m x 0.53 mm x 0.10 μ m
 Cat. No.: **8870**
 Index: CSR00529
 Oven Temp.: 40 $^{\circ}$ C to 430 $^{\circ}$ C (hold 30 min) at 10 $^{\circ}$ C/min
 Carrier Gas: He, 60 cm/sec
 Injection: On-column
 Flow Rate: 7.8 mL/min
 Head Pressure: 1.0 psi
 Solvent: CS₂
 Sample: Hydrocarbons, 0.2 μ L
 Detector: FID, 430 $^{\circ}$ C



Detailed Hydrocarbons Analysis

Column: DM-PONA, 100 m x 0.25 mm x 0.50 μ m
 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 μ L
 Detector: FID, 4 x 10⁻¹² AFS, 250 °C

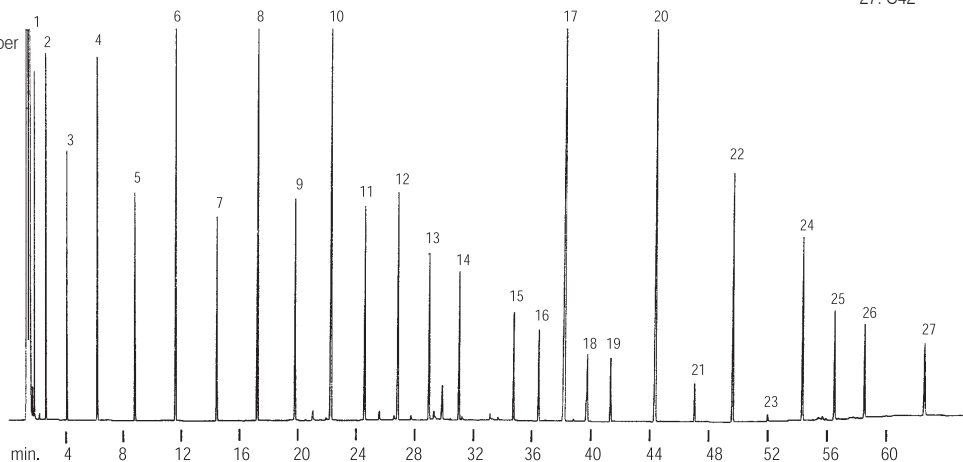
- | | |
|----------------------------------|----------------------------|
| 1. Propane | 16. <i>p</i> -Xylene |
| 2. <i>iso</i> -Butane / Methanol | 17. 2,3-Dimethylheptane |
| 3. <i>n</i> -Butane | 18. <i>o</i> -Xylene |
| 4. <i>iso</i> -Pentane | 19. <i>n</i> -Nonane |
| 5. <i>n</i> -Pentane | 20.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



Hydrocarbons, C7 - C42

Column: DM-1, 30 m x 0.25 mm x 0.10 μ m
 Cat. No.: 7119
 Index: CSR00216
 Oven Temp.: 40 °C to 340 °C at 5 °C/min
 Carrier Gas: H₂, 40 cm/sec, 40 °C
 Injection: Direct, 340 °C
 Sample: 0.2 μ L Injection of a synthetic hydrocarbons mix, 0.1 mg/mL per component
 Detector: FID, 64 x 10⁻¹¹ AFS, 340 °C

- | | | | | |
|--------|---------|---------|---------|---------|
| 1. C7 | 6. C12 | 11. C17 | 16. C23 | 21. C30 |
| 2. C8 | 7. C13 | 12. C18 | 17. C24 | 22. C32 |
| 3. C9 | 8. C14 | 13. C19 | 18. C25 | 23. C34 |
| 4. C10 | 9. C15 | 14. C20 | 19. C26 | 24. C36 |
| 5. C11 | 10. C16 | 15. C22 | 20. C28 | 25. C38 |
| | | | | 26. C40 |
| | | | | 27. C42 |

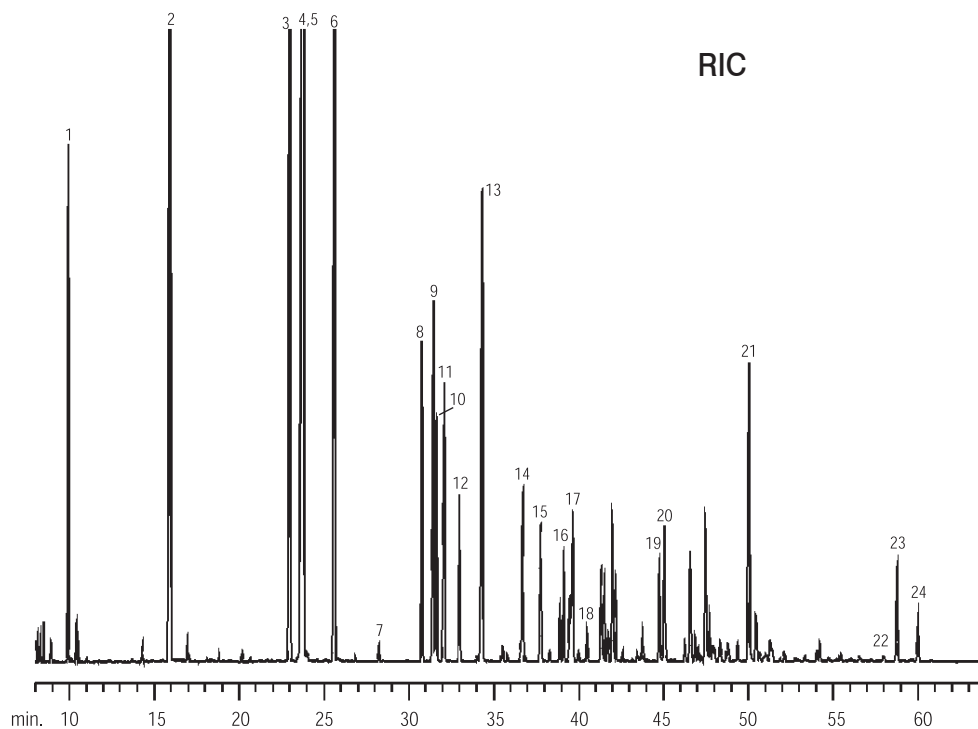
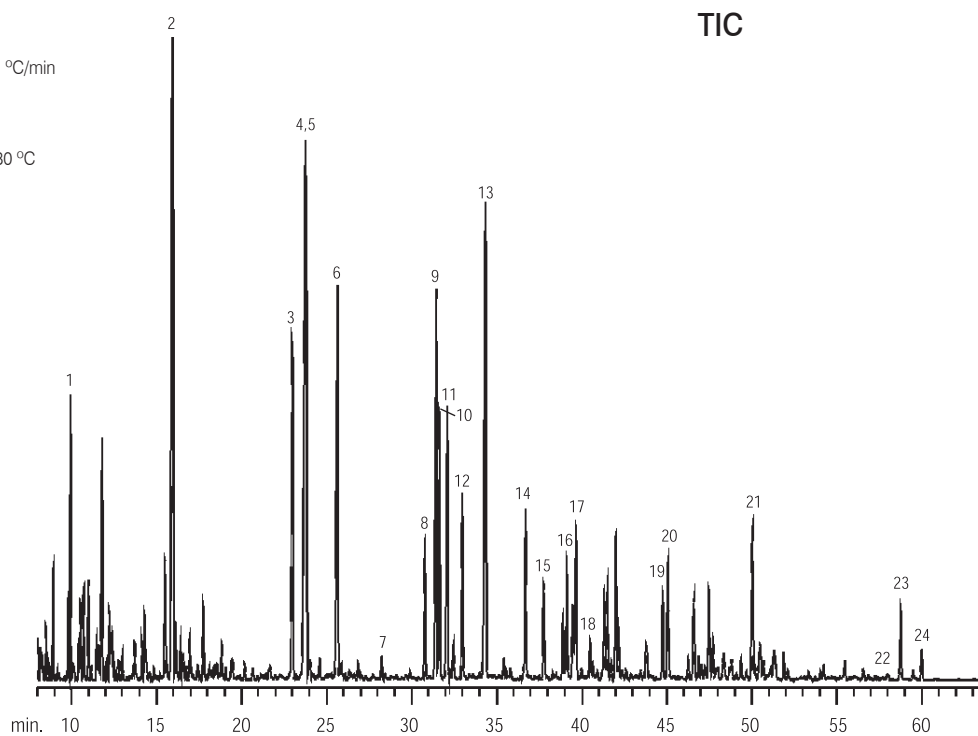


Applications

Gasoline Aromatics

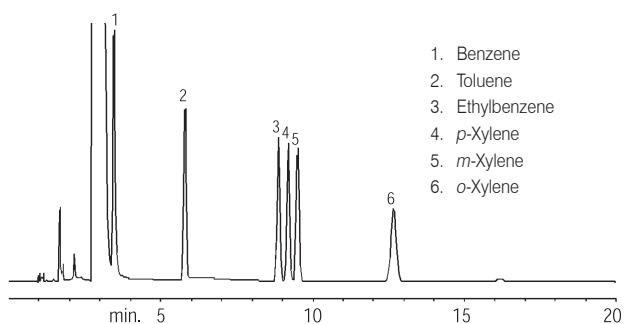
Column: DM-1, 60 m x 0.25 mm x 1.00 μ m
 Cat. No.: 7126
 Index: CSR00215
 Oven Temp.: 50 $^{\circ}$ C (hold 1 min) to 190 $^{\circ}$ C at 2 $^{\circ}$ C/min
 Injection: Split, 200:1, 250 $^{\circ}$ C
 Sample: Neat gasoline, 1.0 μ L
 Detector: MS, 45 - 300 m/e, 1 scan/sec, 280 $^{\circ}$ C

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)

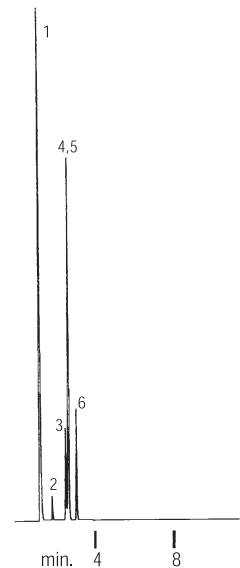
Column: DM-Wax, 30 m x 0.53 mm x 1.00 μm
 Cat. No.: 7551
 Index: CSR00191
 Oven Temp.: 50 $^{\circ}\text{C}$
 Carrier Gas: H_2 , 40 cm/sec
 Injection: Direct, 250 $^{\circ}\text{C}$
 Sample: Benzene, toluene, xylene, 0.1 μL
 Detector: FID, 16×10^{-11} AFS, 250 $^{\circ}\text{C}$



1. Benzene
2. Toluene
3. Ethylbenzene
4. *p*-Xylene
5. *m*-Xylene
6. *o*-Xylene

Aromatics (Benzene / Toluene / Xylene)

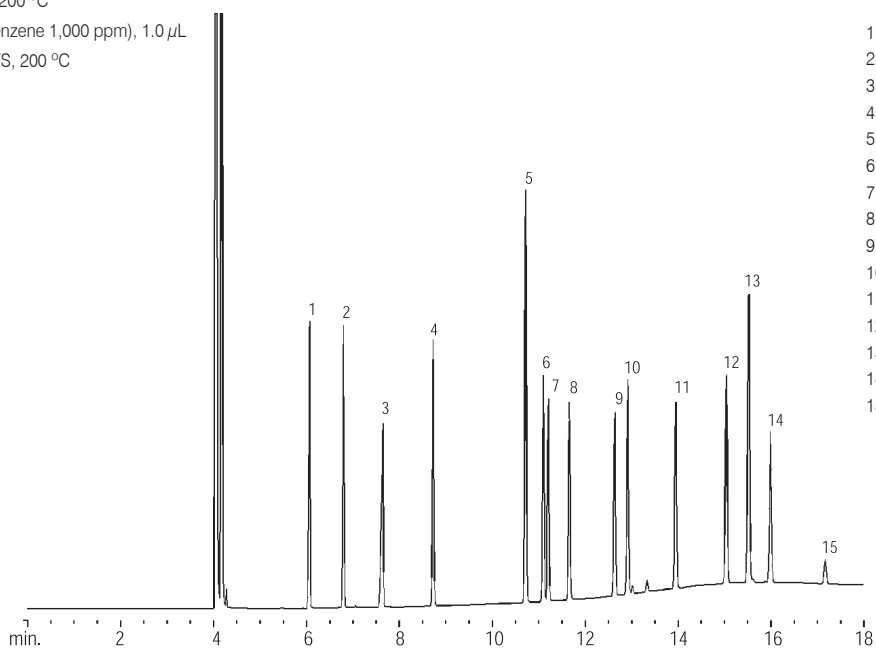
Column: DM-200, 30 m x 0.53 mm x 0.50 μm
 Cat. No.: 8347
 Index: CSR00189
 Oven Temp.: 60 $^{\circ}\text{C}$
 Carrier Gas: He, 40 cm/sec
 Injection: Direct, 250 $^{\circ}\text{C}$
 Sample: Benzene, toluene, xylene standard, 0.1 μL
 Detector: FID, 4×10^{-11} AFS, 250 $^{\circ}\text{C}$



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 $^{\circ}\text{C}$ (hold 5 min) to 100 $^{\circ}\text{C}$ (hold 10 min) at 5 $^{\circ}\text{C}/\text{min}$
 Carrier Gas: He, 30 cm/sec, 80 $^{\circ}\text{C}$
 Injection: Split, 46 mL/min, 200 $^{\circ}\text{C}$
 Sample: 500 ppm (Ethylbenzene 1,000 ppm), 1.0 μL
 Detector: FID, 6.4×10^{-11} AFS, 200 $^{\circ}\text{C}$



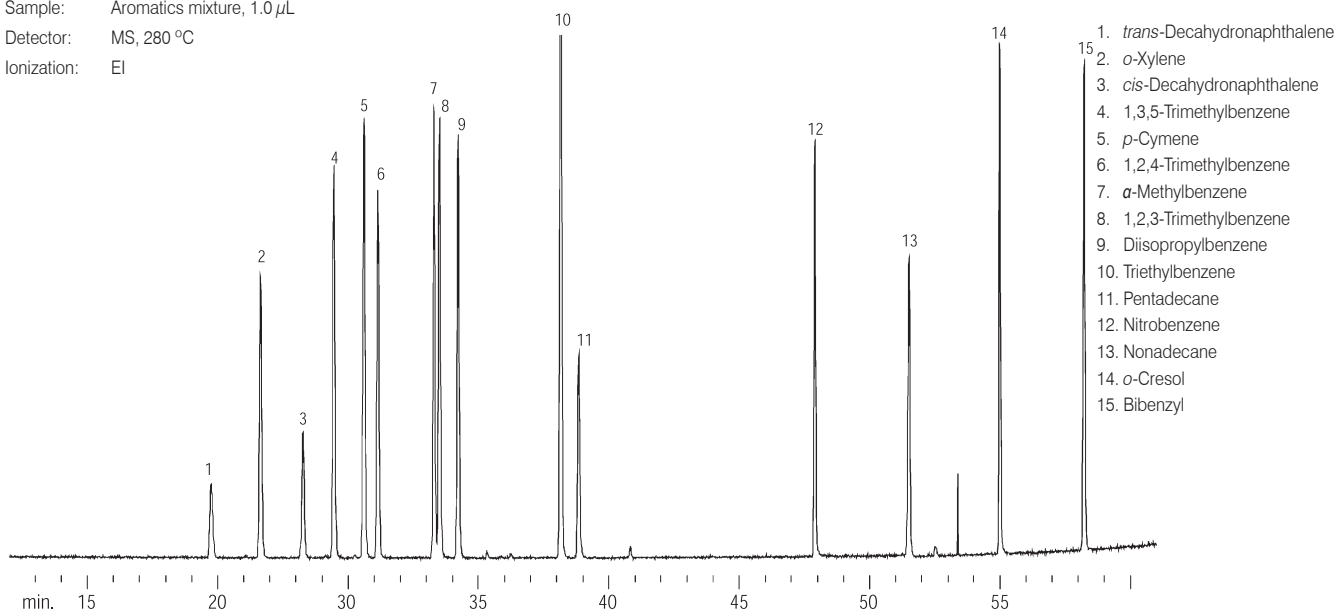
1. *n*-Undecane
2. Benzene
3. *n*-Dodecane
4. Toluene
5. Ethylbenzene
6. *p*-Xylene
7. *m*-Xylene
8. Cumene
9. *n*-Propylbenzene
10. *o*-Xylene
11. Mesitylene
12. 1-Ethyl-2-methylbenzene
13. *m*-Diethylbenzene
14. *p*-Diethylbenzene
15. *o*-Diethylbenzene

Applications

Petrochemicals

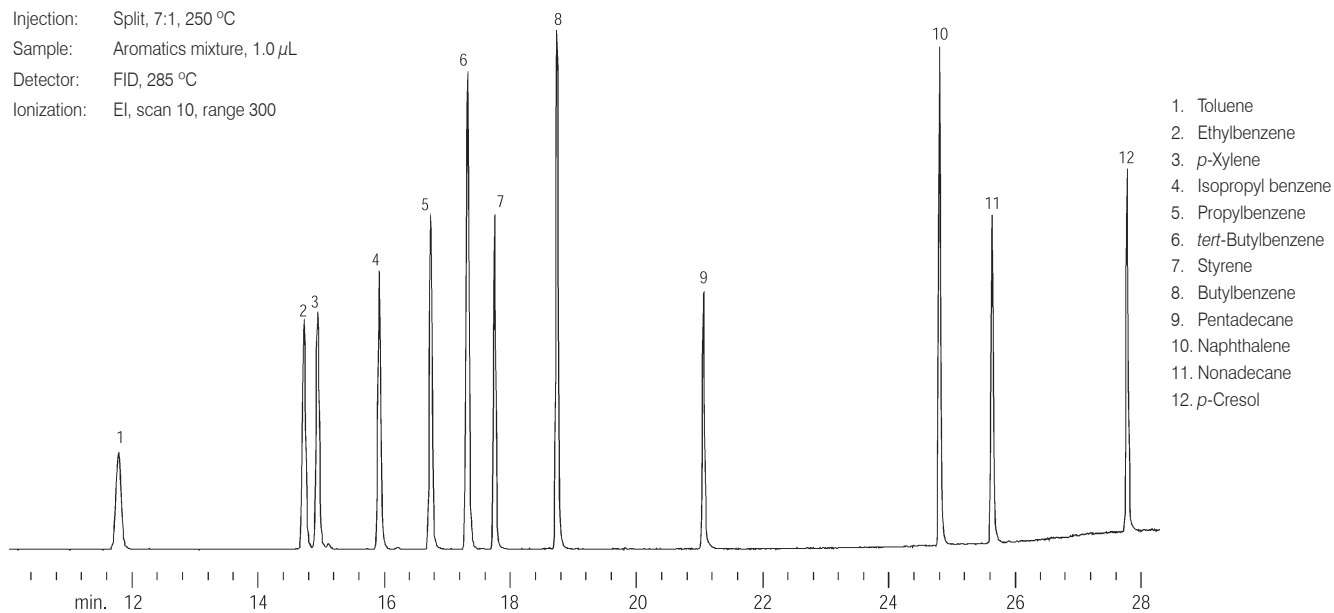
Aromatics

Column: DM-Wax, 60 m x 0.53 mm x 1.00 μ m
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 μ L
Detector: MS, 280 °C
Ionization: EI



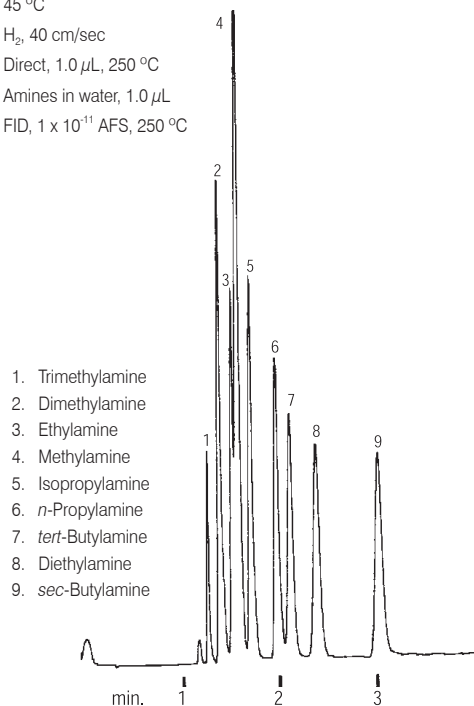
Aromatics

Column: DM-Wax, 60 m x 0.53 mm x 1.00 μ m
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 μ L
Detector: FID, 285 °C
Ionization: EI, scan 10, range 300



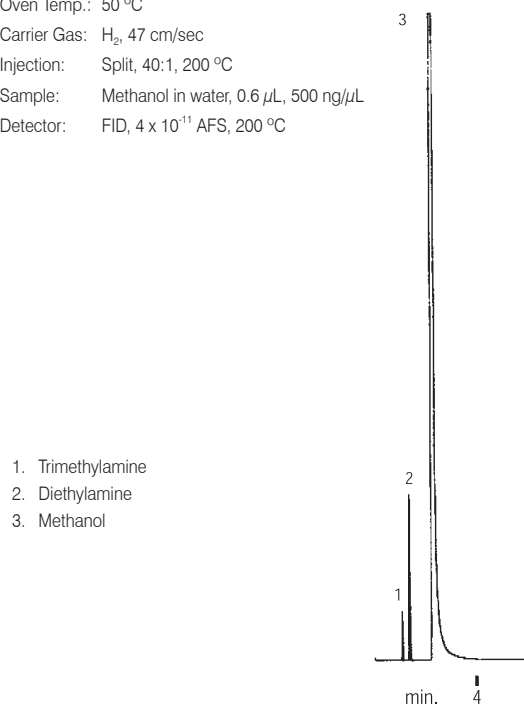
Primary Amines (Low MW)

Column: DM-Wax Amine, 30 m x 0.53 mm x 1.00 μ m
 Cat. No.: 7833
 Index: CCR00304
 Oven Temp.: 45 $^{\circ}$ C
 Carrier Gas: H₂, 40 cm/sec
 Injection: Direct, 1.0 μ L, 250 $^{\circ}$ C
 Sample: Amines in water, 1.0 μ L
 Detector: FID, 1 x 10⁻¹¹ AFS, 250 $^{\circ}$ C



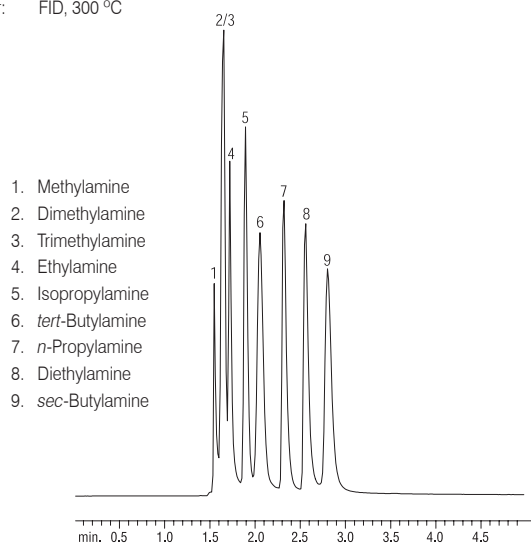
Amines (Low MW)

Column: DM-Wax Amine, 30 m x 0.53 mm x 1.00 μ m
 Cat. No.: 7833
 Index: CCR00305
 Oven Temp.: 50 $^{\circ}$ C
 Carrier Gas: H₂, 47 cm/sec
 Injection: Split, 40:1, 200 $^{\circ}$ C
 Sample: Methanol in water, 0.6 μ L, 500 ng/ μ L
 Detector: FID, 4 x 10⁻¹¹ AFS, 200 $^{\circ}$ C



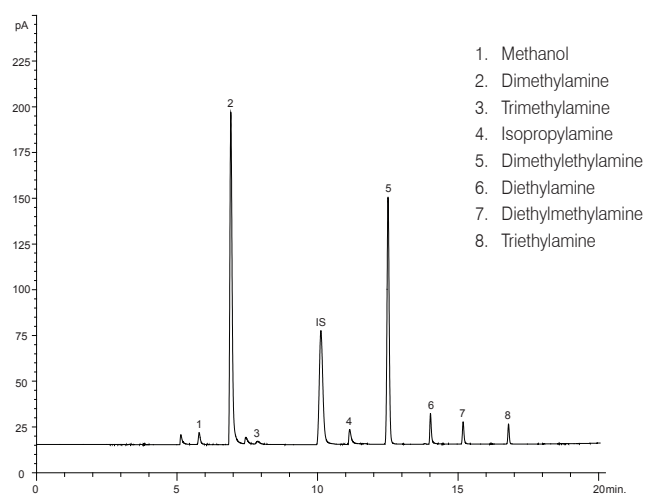
Primary Amines

Column: DM-35 Amine, 30 m x 0.53 mm x 1.00 μ m
 Cat. No.: 7825
 Index: CCR00578
 Oven Temp.: 35 $^{\circ}$ 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 μ L
 Detector: FID, 300 $^{\circ}$ C



Short Chain Amines in Water

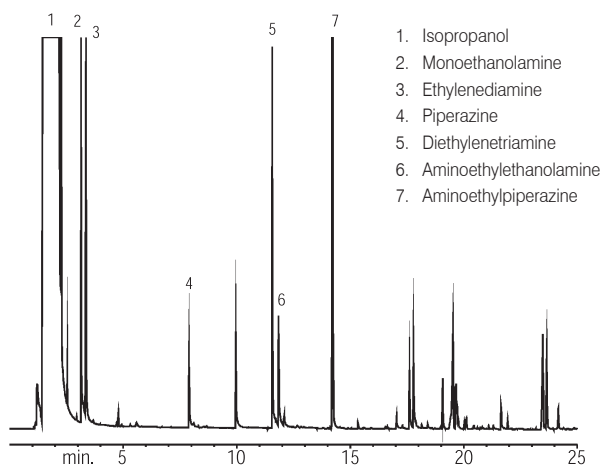
Column: DM-Volatile Amine, 60 m x 0.32 mm
 Cat. No.: 8857
 Index: CGN1154
 Sample: 200 - 1,000 ppm Short chain amines in water
 Injection: Split, 15:1, 1.0 μ L, 220 $^{\circ}$ C
 Oven Temp.: 40 $^{\circ}$ C (hold 10 min) to 250 $^{\circ}$ C (hold 10 min) at 20 $^{\circ}$ C/min
 Carrier Gas: H₂, 2.0 mL/min, 35 cm/sec, 40 $^{\circ}$ C
 Detector: FID, 250 $^{\circ}$ C



Amines

Ethylenediamines

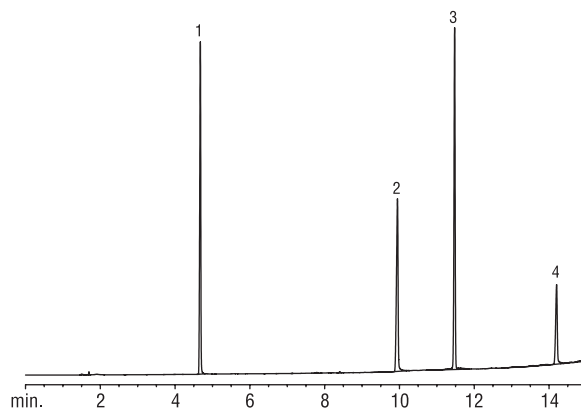
Column: DM-5 Amine, 30 m x 0.25 mm x 0.50 μ m
 Cat. No.: 7815
 Index: CCR00298
 Oven Temp.: 40 °C (hold 4 min) to 315 °C (hold 5 min) at 10 °C/min
 Carrier Gas: H₂, 43 cm/sec, 40 °C
 Injection: Split, 20:1, 315 °C
 Sample: Ethylenediamines, 3.0 μ L, 5 - 80 ng
 Detector: FID, 6.4 x 10⁻¹¹ AFS, 315 °C



Ethanolamines

Column: DM-35 Amine, 30 m x 0.32 mm x 1.00 μ m
 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 μ g/mL Ethanolamines standard in water, 1.0 μ L
 Detector: FID, 300 °C

1. Monoethanolamine
2. Diethanolamine
3. Triethylene glycol monomethylether
4. Triethanolamine

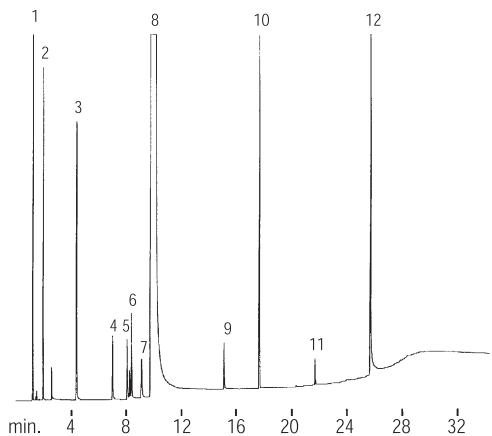


Hexamethylenediamine

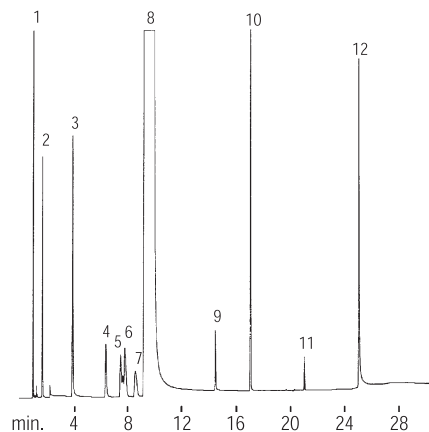
Column: DM-Wax Amine, 30 m x 0.32 mm x 0.25 μ m
 Cat. No.: 7829
 Index: CCR00302
 Oven Temp.: 95 °C (hold 6 min) to 235 °C (hold 4 min) at 7 °C/min
 Carrier Gas: H₂, 40 cm/sec
 Injection: Direct, 250 °C
 Sample: Hexamethylenediamine, 0.4 μ L, 10 - 100 ng
 Detector: FID, 2 x 10⁻¹¹ AFS, 250 °C

V.S.

Column: DM-Wax Amine, 30 m x 0.53 mm x 0.50 μ m
 Cat. No.: 7837
 Index: CCR00303
 Oven Temp.: 95 °C (hold 6 min) to 235 °C (hold 2 min) at 7 °C/min
 Carrier Gas: H₂, 40 cm/sec
 Injection: Direct, 255 °C
 Sample: Hexamethylenediamine, 0.2 μ L
 Detector: FID, 64 x 10⁻¹¹, 255 °C

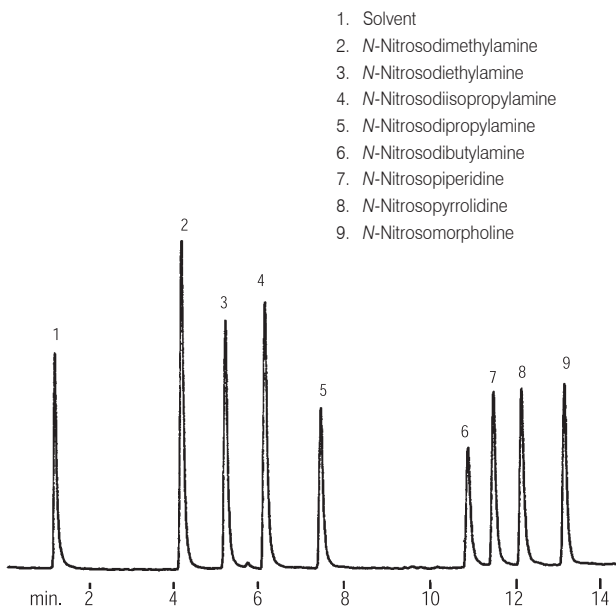


1. Cyclohexane
2. Hexamethyleimine
3. 1,4-Diaminobutane
4. Pentamethylenediamine
5. 1,2-Diaminocyclohexane
6. 1,5-Diamino-2-Methylpentane
7. Aminomethylcyclopentylamine
8. Hexamethylenediamine
9. 6-Aminocapronitrile
10. *n*-Valeramide
11. Adiponitrile
12. *bis*-Hexamethylenetriamine



Nitrosamines

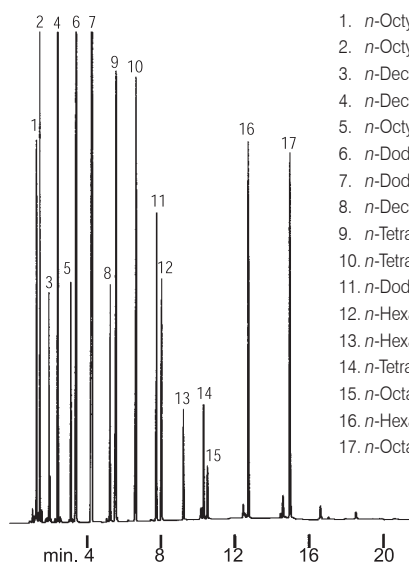
Column: DM-Wax Amine, 60 m x 0.53 mm x 1.00 μ m
 Cat. No.: 7836
 Index: CCR00306
 Oven Temp.: 100 °C (hold 1 min) to 170 °C at 5 °C/min
 Carrier Gas: He, 100 cm/sec
 Injection: Direct, 200 °C
 Sample: Nitrosamines, 1.0 μ g/mL
 Detector: TSD, 200 °C



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

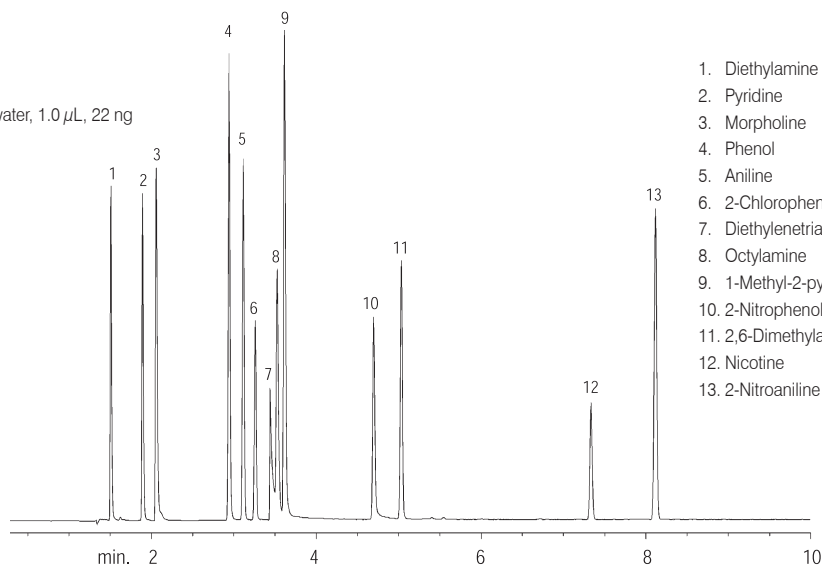
Column: DM-Wax, 30 m x 0.53 mm x 0.50 μ m
 Cat. No.: 7547
 Index: CCR00307
 Oven Temp.: 100 °C to 250 °C (hold 5 min) at 8 °C/min
 Carrier Gas: H₂, 40 cm/sec
 Injection: Split, 40:1, 250 °C
 Sample: Mix, 0.5 μ L
 Detector: FID, 128 x 10⁻¹¹ AFS, 250 °C



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 μ m
 Cat. No.: 7817
 Index: CCR00301
 Oven Temp.: 120 °C to 220 °C at 10 °C/min
 Carrier Gas: H₂, 38 cm/sec, 120 °C
 Injection: Split, 25:1, 305 °C
 Sample: Miscellaneous amines and phenols in water, 1.0 μ L, 22 ng
 Detector: FID, 6.4 x 10⁻¹¹ AFS, 305 °C



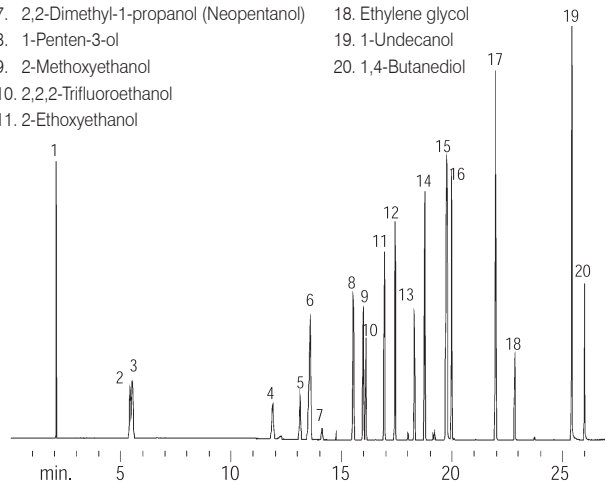
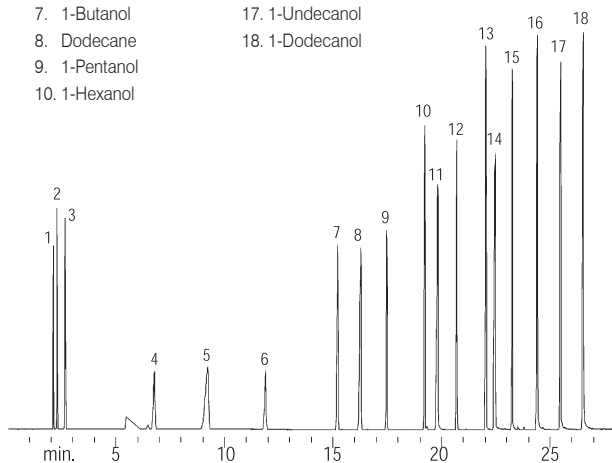
1. Diethylamine
2. Pyridine
3. Morpholine
4. Phenol
5. Aniline
6. 2-Chlorophenol
7. Diethylenetriamine
8. Octylamine
9. 1-Methyl-2-pyrrolidinone
10. 2-Nitrophenol
11. 2,6-Dimethylaniline
12. Nicotine
13. 2-Nitroaniline

Alcohols

Column: DM-Wax, 60 m x 0.53 mm x 1.00 μ m
 Cat. No.: 7552
 Index: CCR00288
 Oven Temp.: 45 $^{\circ}$ C (hold 10 min) to 250 $^{\circ}$ C (hold 20 min) at 12 $^{\circ}$ C/min
 Carrier Gas: He, 51 cm/sec, 50 $^{\circ}$ C
 Injection: Split, 8:1, 250 $^{\circ}$ C
 Sample: Alcohols, 1.0 μ L
 Detector: MS, 250 $^{\circ}$ C
 Ionization: EI

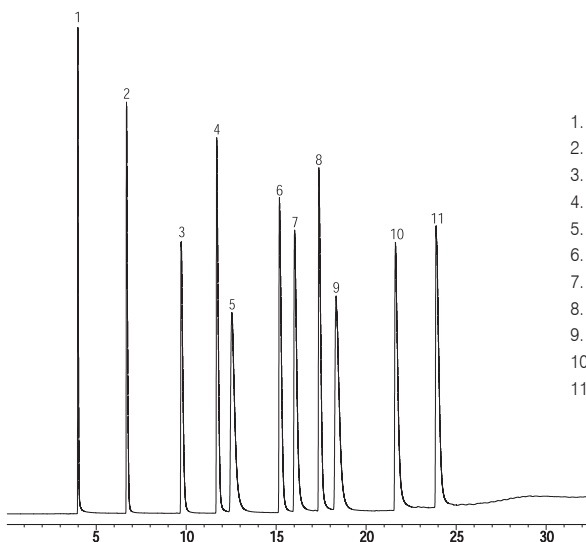
- | | |
|---------------|-----------------|
| 1. Pentane | 11. Tetradecane |
| 2. Hexane | 12. 1-Heptanol |
| 3. Heptane | 13. 1-Octanol |
| 4. Ethanol | 14. Hexadecane |
| 5. Decane | 15. 1-Nonanol |
| 6. 1-Propanol | 16. 1-Decanol |
| 7. 1-Butanol | 17. 1-Undecanol |
| 8. Dodecane | 18. 1-Dodecanol |
| 9. 1-Pentanol | |
| 10. 1-Hexanol | |

- | | |
|---|--------------------------------|
| 1. Pentane | 12. 1-Pentanol |
| 2. Methanol | 13. 2-Methyl-1-pentanol |
| 3. 2-Methyl-2-propanol (<i>tert</i> -Butylalcohol) | 14. 2,2-Dimethyl-1-pentanol |
| 4. 2-Methyl-3-buten-2-ol | 15. Tetradecane |
| 5. 3-Buten-2-ol | 16. <i>trans</i> -2-Hexen-1-ol |
| 6. Undecane | 17. 1-Octanol |
| 7. 2,2-Dimethyl-1-propanol (Neopentanol) | 18. Ethylene glycol |
| 8. 1-Penten-3-ol | 19. 1-Undecanol |
| 9. 2-Methoxyethanol | 20. 1,4-Butanediol |
| 10. 2,2,2-Trifluoroethanol | |
| 11. 2-Ethoxyethanol | |



Alcohols

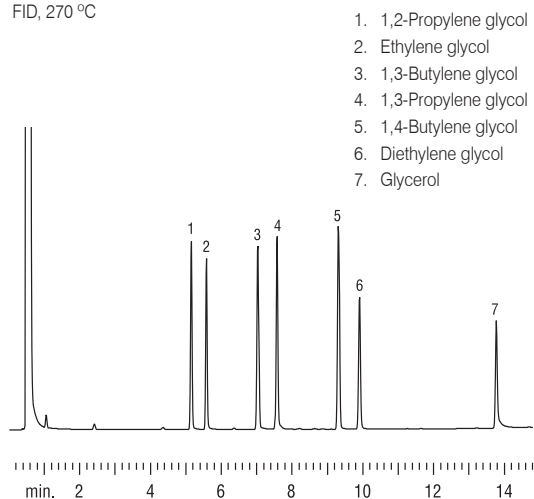
Column: DM-PLOT Q, 30 m x 0.32 mm x 10.00 μ m
 Cat. No.: 8818
 Index: CCR00495
 Oven Temp.: 100 $^{\circ}$ C to 240 $^{\circ}$ C (hold 10 min) at 5 $^{\circ}$ C/min
 Carrier Gas: He, 31 cm/sec, 100 $^{\circ}$ C
 Head Pressure: 18.0 psi
 Column Flow Rate: 1.1 cc/min, 100 $^{\circ}$ C
 Injection: Split, 70:1, 250 $^{\circ}$ C
 Sample: Alcohols, 1.0 μ L
 Detector: FID, 270 $^{\circ}$ C



- | |
|-------------------------|
| 1. Methanol |
| 2. Ethanol |
| 3. 2-Propanol |
| 4. 1-Propanol |
| 5. <i>tert</i> -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 |

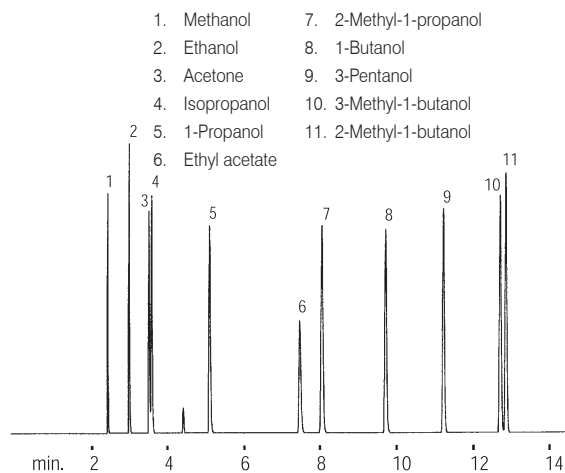
Glycols

Column: DM-Wax, 30 m x 0.53 mm x 1.00 μ m
 Cat. No.: 7551
 Index: CER00476
 Oven Temp.: 80 °C to 200 °C (hold 10 min) at 8 °C/min
 Solvent: H₂O: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 μ L, 150 ppm
 Detector: FID, 270 °C



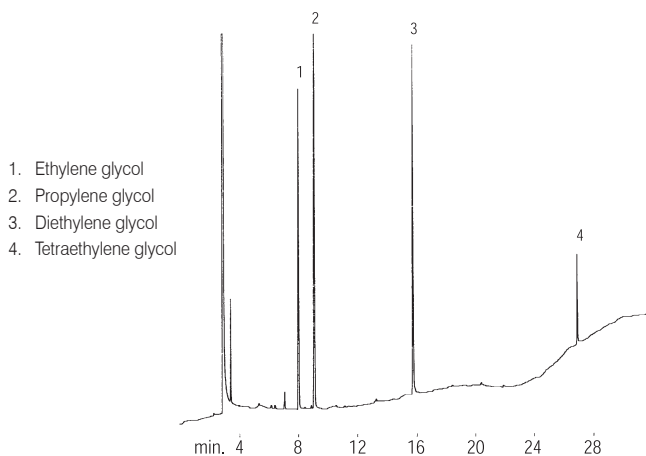
Alcohols

Column: DM-5, 60 m x 0.32 mm x 1.00 μ m
 Cat. No.: 7236
 Index: CCR00292
 Oven Temp.: 25 °C (hold 4 min) to 80 °C (hold 5 min) at 8 °C/min
 Carrier Gas: H₂, 40 cm/sec
 Injection: Split, 40:1, 200 °C
 Sample: Alcohol mix, 0.03 μ L
 Detector: FID, 128 x 10⁻¹¹ AFS, 200 °C



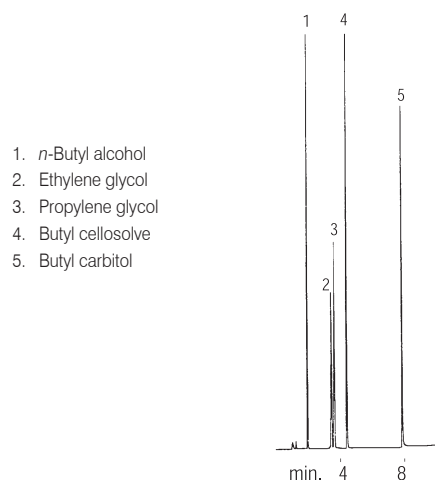
Glycols

Column: DM-200, 60 m x 0.53 mm x 3.00 μ m
 Cat. No.: 8356
 Index: CCR00326
 Oven Temp.: 40 °C to 250 °C (hold 15 min) at 8 °C/min
 Carrier Gas: H₂, 40 cm/sec
 Injection: Split, 19:1, 200 °C
 Sample: Glycols, 1.0 μ L, 50 ng on-column
 Detector: FID, 6.4 x 10⁻¹¹ AFS, 250 °C



Glycols / Alcohols

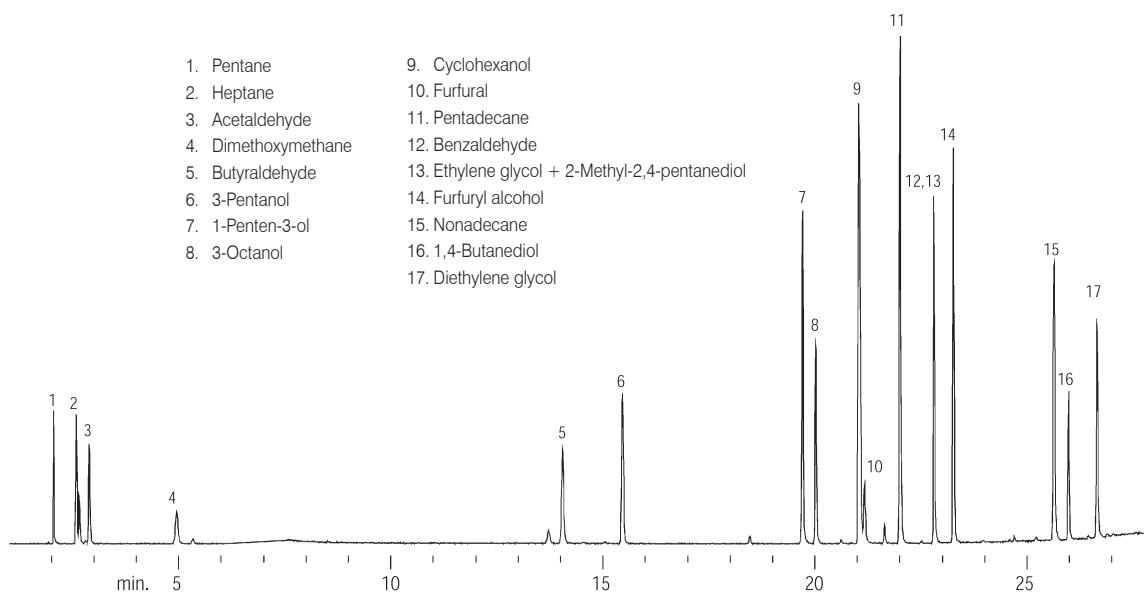
Column: DM-5, 30 m x 0.53 mm x 1.00 μ m
 Cat. No.: 7249
 Index: CCR00327
 Oven Temp.: 40 °C to 185 °C (hold 5 min) at 15 °C/min
 Carrier Gas: He, 40 cm/sec
 Injection: Direct, 150 °C
 Sample: Glycols and alcohols, 1.0 μ L, 100 ppm
 Detector: FID, 8 x 10⁻¹¹ AFS, 200 °C



Aldehydes / Ketones

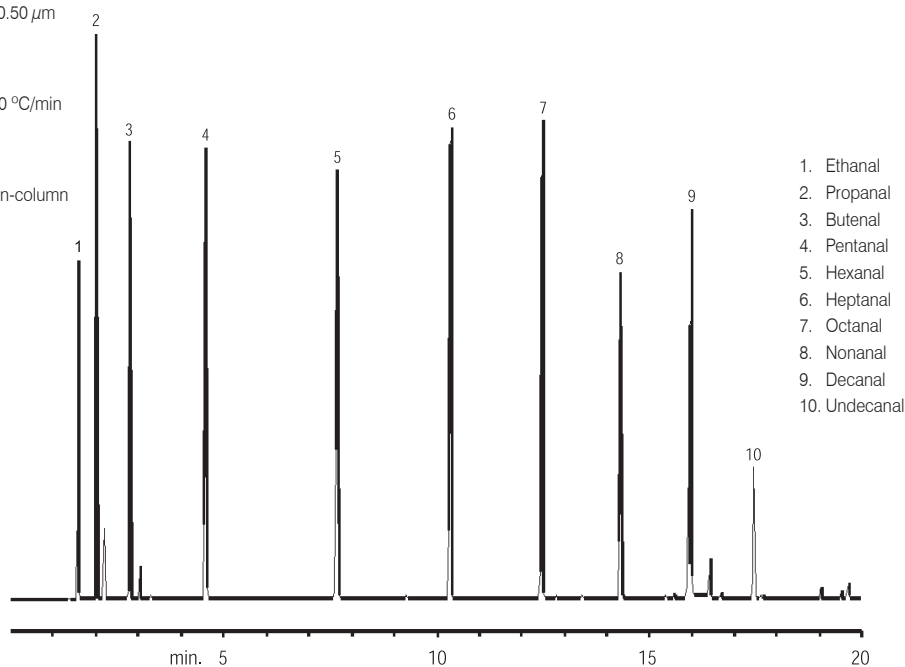
Alcohols / Aldehydes

Column: DM-Wax, 60 m x 0.53 mm x 1.00 μ m
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 μ L
Detector: FID, 285 °C
Ionization: EI, scan 10, range 300



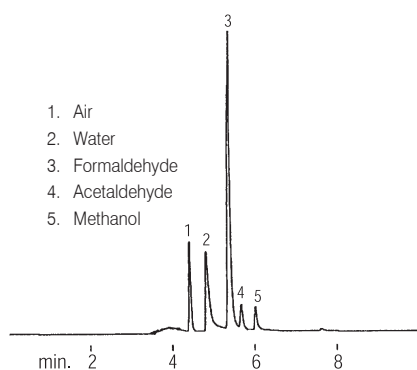
Aldehydes

Column: DM-InertWax, 30 m x 0.25 mm x 0.50 μ m
Cat. No.: 8523
Index: CCR00300
Oven Temp.: 40 °C (hold 5 min) to 200 °C at 10 °C/min
Carrier Gas: H₂, 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



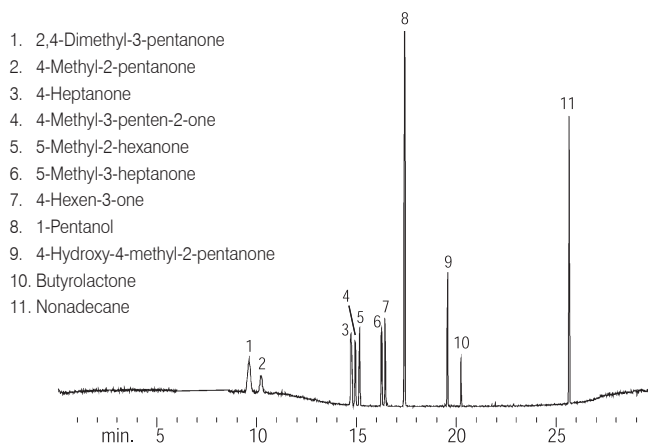
Formaldehyde

Column: DM-1701, 60 m x 0.25 mm x 1.00 μ m
 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 μ L
 Detector: TCD, 8 mV, 175 °C



Ketones

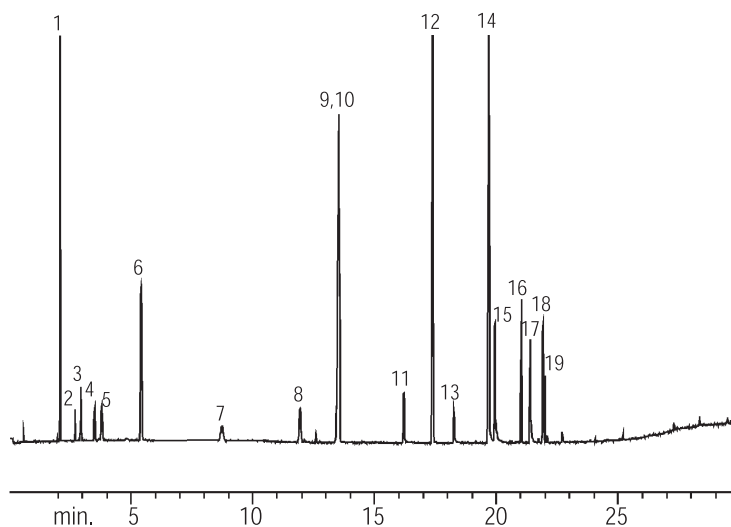
Column: DM-Wax, 60 m x 0.53 mm x 1.00 μ m
 Cat. No.: 7552
 Index: CCR00316
 Oven Temp.: 45 °C (hold 10 min) to 250 °C (hold 20 min) at 12 °C/min
 Carrier Gas: He, 51 cm/sec, 50 °C
 Injection: Split, 8:1, 250 °C
 Sample: Ketones, 1.0 μ L
 Detector: MSD, 250 °C
 Ionization: EI



Aldehydes

Column: DM-Wax, 60 m x 0.53 mm x 1.00 μ m
 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 μ L
 Detector: MSD, 250 °C
 Ionization: EI

- | | |
|----------------------|---------------------------|
| 1. Pentane | 11. Heptanal |
| 2. Acetaldehyde | 12. 1-Pentanol |
| 3. Dimethoxymethane | 13. Octanal |
| 4. Propanal | 14. Tetradecane |
| 5. 2-Methyl propanal | 15. Nonanal |
| 6. Methanol | 16. 2-Furancarboxaldehyde |
| 7. Pentanal | 17. Decanal |
| 8. 2-Butenal | 18. Benzaldehyde |
| 9. Hexanal | 19. 1-Octanol |
| 10. Undecane | |



Esters

Esters

Column: DM-Wax, 60 m x 0.53 mm x 1.00 μ m

Cat. No.: 7552

Index: CCR00314

Oven Temp.: 45 °C (hold 10 min) to 250 °C (hold 20 min) at 12 °C/min

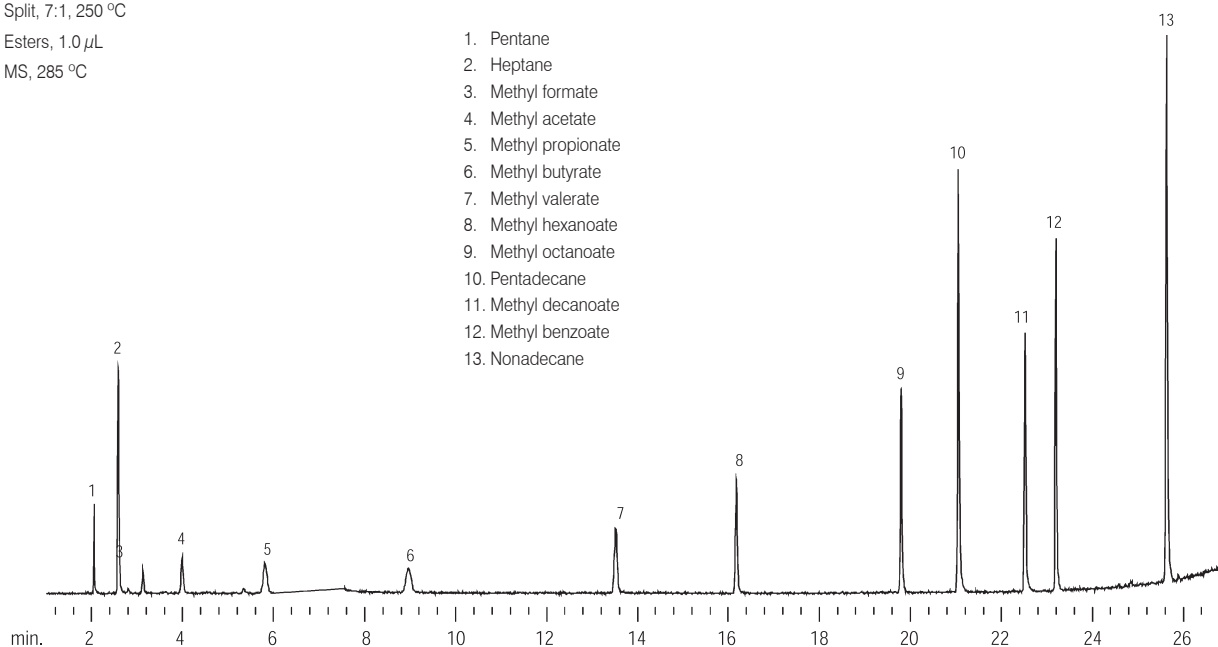
Carrier Gas: He, 50 cm/sec, 50 °C

Injection: Split, 7:1, 250 °C

Sample: Esters, 1.0 μ L

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 μ m

Cat. No.: 7552

Index: CCR00318

Oven Temp.: 40 °C (hold 10 min) to 245 °C (hold 20 min) at 4 °C/min

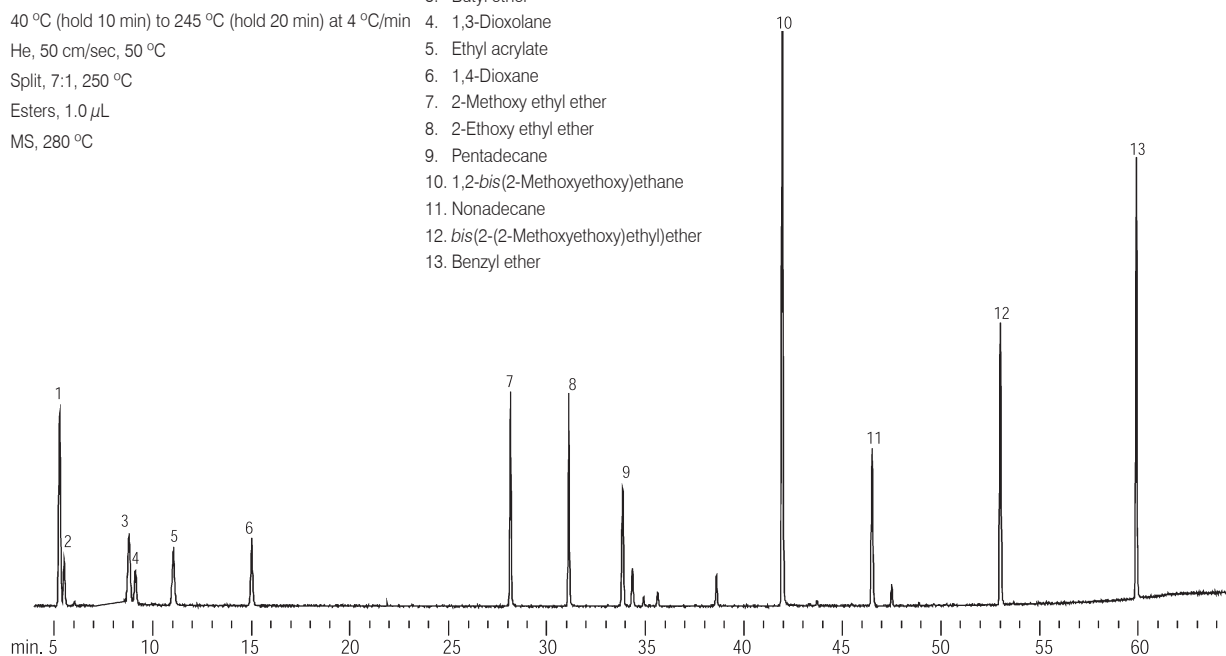
Carrier Gas: He, 50 cm/sec, 50 °C

Injection: Split, 7:1, 250 °C

Sample: Esters, 1.0 μ L

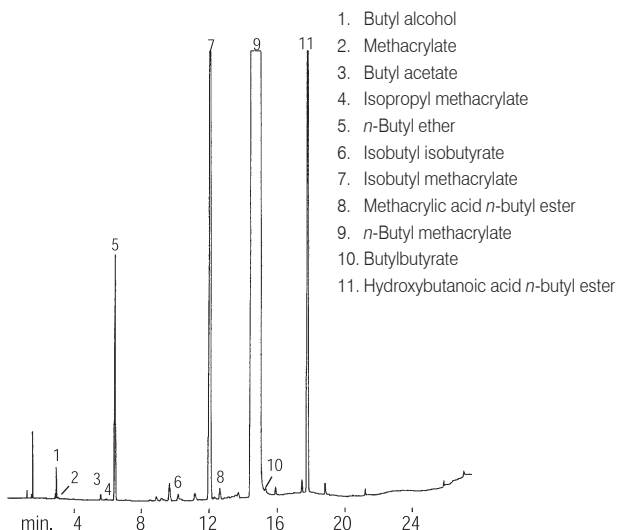
Detector: MS, 280 °C

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



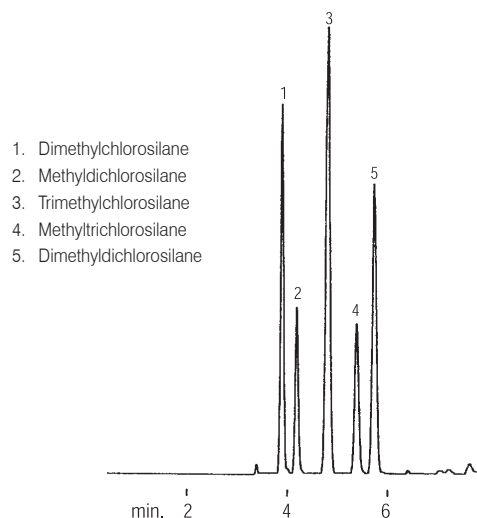
Acrylic Esters

Column: DM-1701, 30 m x 0.32 mm x 1.00 μ m
 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: H₂, 40 cm/sec
 Injection: Split, 56:1, 250 °C
 Sample: Acrylic esters, 0.5 μ L
 Detector: FID, 4 x 10⁻¹¹ AFS, 250 °C



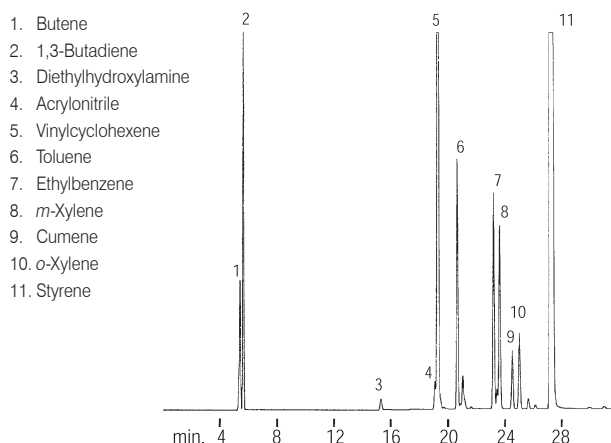
Silanes

Column: DM-200, 60 m x 0.53 mm x 3.00 μ m
 Cat. No.: 8356
 Index: CCR00362
 Oven Temp.: 40 °C to 250 °C (hold 5 min) at 8 °C/min
 Carrier Gas: H₂, 40 cm/sec
 Injection: Split, 40 mL/min, 200 °C
 Sample: Silanes, 0.5 μ L
 Detector: FID, 1.02 x 10⁻⁹ AFS, 270 °C



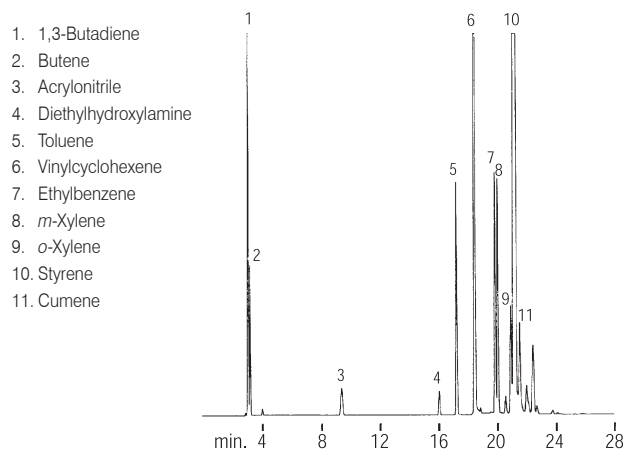
Styrene Impurities

Column: DM-Wax, 30 m x 0.53 mm x 0.50 μ m
 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



Styrene Impurities

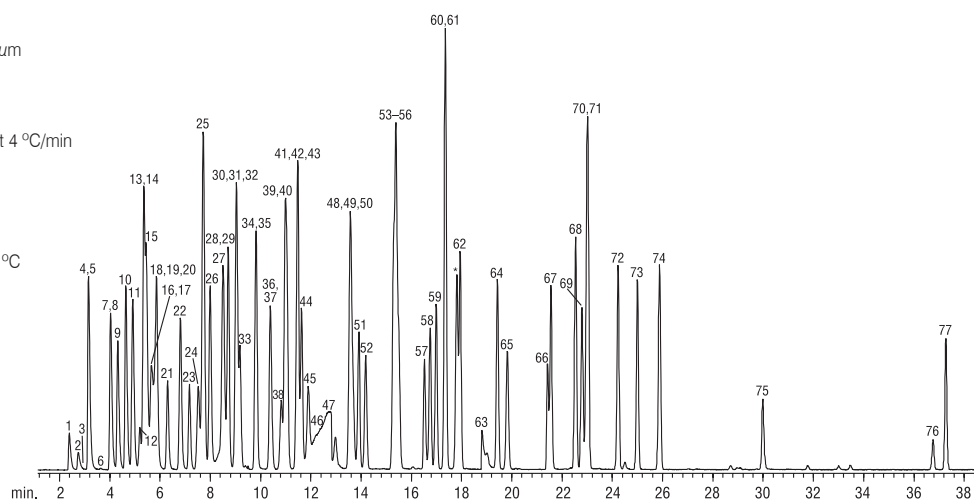
Column: DM-1701, 30 m x 0.53 mm x 3.00 μ m
 Cat. No.: 7355
 Index: CCR00357
 Oven Temp.: 40 °C (hold 10 min) to 150 °C (hold 15 min) at 12 °C/min
 Carrier Gas: He, 20 cm/sec, 40 °C
 Injection: Split, 40 cc/min, 150 °C
 Sample: 95% Styrene, 0.5 mL
 Detector: FID, 16 x 10⁻¹¹ AFS, 150 °C



Solvents

USP Solvents

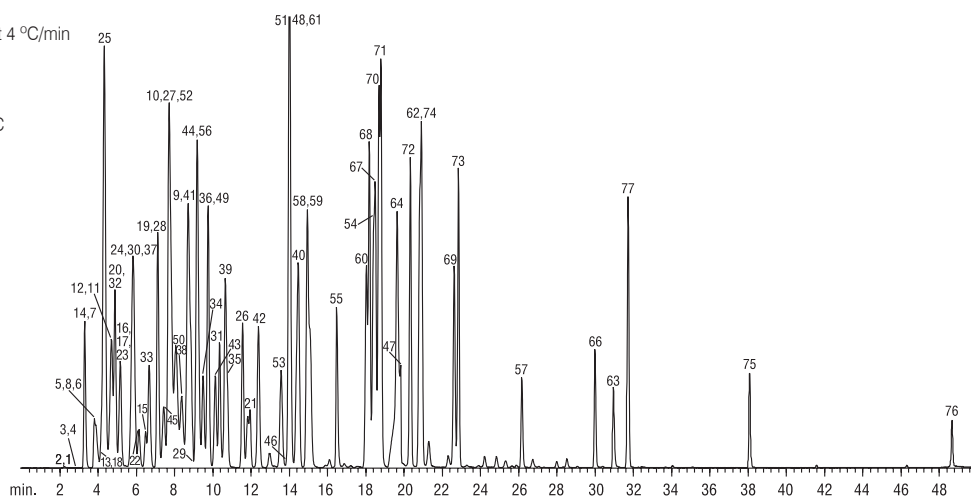
Column: DM-1, 60 m x 0.53 mm x 3.00 μ m
 Cat. No.: **7156**
 Index: CER00463
 Oven Temp.: 35 $^{\circ}$ C (hold 4 min) to 250 $^{\circ}$ C at 4 $^{\circ}$ C/min
 septa purge 5 mL/min
 Carrier Gas: He, 45.6 cm/sec, 35 $^{\circ}$ C
 Head Pressure: 11.0 psi constant pressure
 Injection: Split, 100 mL/min, ~1:13, 250 $^{\circ}$ C
 Sample: Solvents, ~1.3% each
 Detector: MS
 Scan Range: 10 AMU - 260 AMU



- | | | | | |
|---------------------|--------------------------------------|-----------------------------|---------------------------|-----------------------------------|
| 1. Formaldehyde | 17. Methylal | 33. Chloroform | 49. Trichloroethylene | 65. 1,1-Diethoxypropane |
| 2. Water | 18. 1,1-Dichloroethene | 34. Tetrahydrofuran | 50. Isooctane | 66. <i>N,N</i> -Dimethylacetamide |
| 3. Chloromethane | 19. Methyl acetate | 35. 2-Methoxyethanol | 51. 2-Ethoxyethanol | 67. Chlorobenzene |
| 4. Methanol | 20. Methylene chloride | 36. 1,2-Dichloroethane | 52. <i>n</i> -Heptane | 68. Ethylbenzene |
| 5. Acetaldehyde | 21. Nitromethane | 37. Methyl cyclopentane | 53. Isoamyl alcohol | 69. Isoamyl acetate |
| 6. Ethylene oxide | 22. 1-Propanol | 38. 1,1,1-Trichloroethane | 54. Hexanone | 70. <i>p</i> -Xylene |
| 7. Chloroethane | 23. <i>trans</i> -1,2-Dichloroethane | 39. 1,2-Dimethoxyethane | 55. Pyridine | 71. <i>m</i> -Xylene |
| 8. Ethanol | 24. Methyl <i>tert</i> -butyl ether | 40. Methyl isopropyl ketone | 56. Methyl cyclohexane | 72. <i>o</i> -Xylene |
| 9. Acetonitrile | 25. 2-Methylpentane (spiked at 9%) | 41. 2,2-Dimethoxypropane | 57. Dimethyl formamide | 73. Anisole |
| 10. Acetone | 26. 2-Butanone | 42. Isopropyl acetate | 58. 1,1,2-Trichloroethane | 74. Isopropyl benzene (Cumene) |
| 11. 2-Propanol | 27. 2-Butanol | 43. 1-Butanol | 59. 1-Pentanol | 75. 1-Methyl-2-pyrrolidinone |
| 12. 2-Chloropropane | 28. <i>cis</i> -1,2-Dichloroethane | 44. Benzene | 60. Isobutyl acetate | 76. Sulfolane |
| 13. Diethyl ether | 29. Acetic acid | 45. Carbon tetrachloride | 61. Toluene | 77. 1,2,3,4-Tetrahydronaphthalene |
| 14. Pentane | 30. Isopropyl ether | 46. Ethylene glycol | 62. 2-Hexanone | |
| 15. Ethyl formate | 31. Ethyl acetate | 47. Formamide | 63. Dimethyl sulfoxide | |
| 16. Formic acid | 32. Hexane | 48. 1,4-Dioxane | 64. Butyl acetate | |

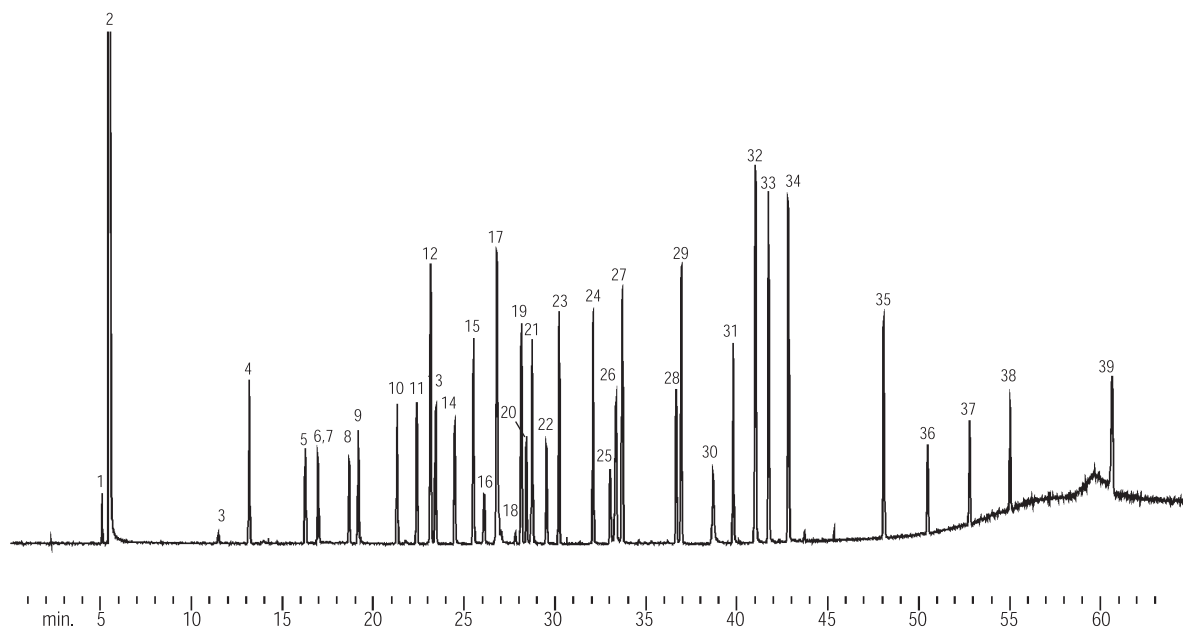
USP Solvents

Column: DM-200, 60 m x 0.53 mm x 3.00 μ m
 Cat. No.: **8356**
 Index: CER00464
 Oven Temp.: 35 $^{\circ}$ C (hold 4 min) to 250 $^{\circ}$ C at 4 $^{\circ}$ C/min
 Head Pressure: 11.0 psi constant pressure
 Carrier Gas: He, 45.6 cm/sec, 35 $^{\circ}$ C
 Injection: Split, 100 mL/min, 1:13, 250 $^{\circ}$ 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 μ m
 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 μ L
 Detector: MS full scan, 285 °C

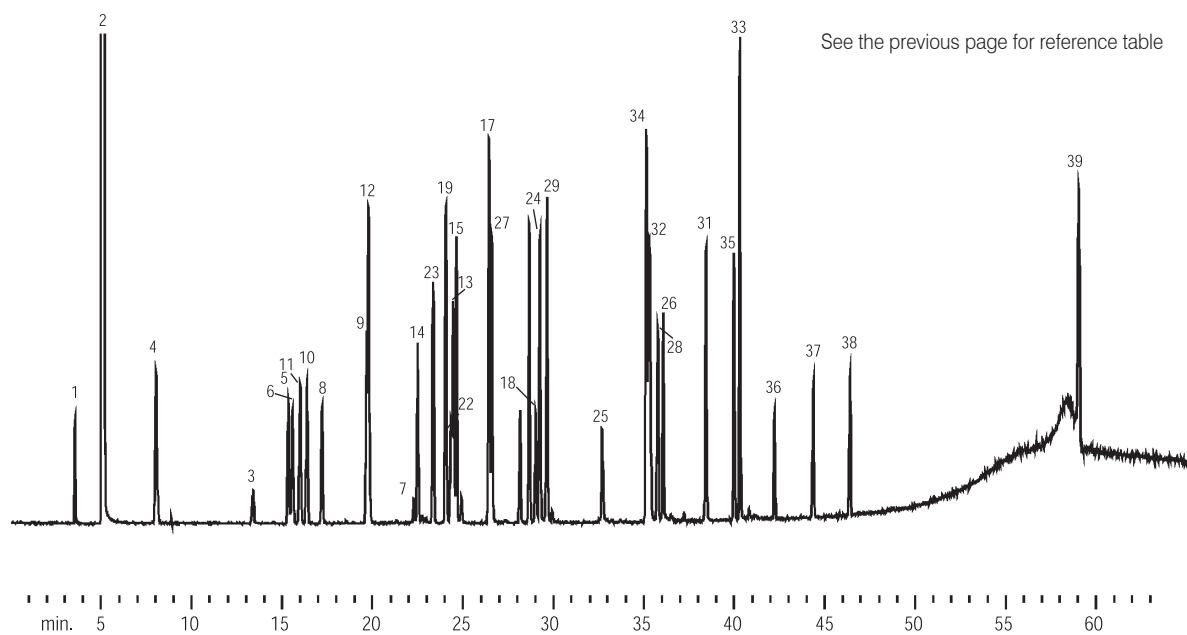


1. Pentane	22. Hexachloroethane	43. 1-Nitropropane	64. 1-Dodecanol	85. 2-Methyl-2,4-pentanediol
2. Methylene chloride	23. Undecane	44. Dimethyl formamide	65. Tetraethylene glycol	86. Butoxyethanol
3. Ethylene glycol	24. 1-Nonanol	45. 2-Methyl-3-pentanol	66. Dibenzyl	87. 1,2,3-Trichloropropane
4. Heptane	25. <i>p</i> -Methoxyphenol	46. Toluene	67. Diethyl phthalate	88. 1,4-Butanediol
5. Cyclopentanol	26. Triethylene glycol	47. Ethyl chloroacetate	68. Tributyl phosphate	89. Methyl hexanoate
6. 3-Hexanol	27. Dodecane	48. Dimethylacetamide	69. Diphenyl sulfone	90. 1,2,4-Trimethylbenzene
7. Acetamide	28. Undecanal	49. <i>p</i> -Xylene	70. Allyl alcohol	91. 2-Ethyl-1-hexanol
8. 2-Methyl-1-pentanol	29. Tridecane	50. <i>sec</i> -Tetrachloroethane	71. -	92. Dipentene
9. Furfuryl alcohol	30. -	51. Benzaldehyde	72. Isopropyl acetate	93. Tetrahydrofurfuryl acetate
10. Butyl ether	31. Dodecanal	52. <i>o</i> -Chlorotoluene	73. Benzene	94. -
11. Nonane	32. Dicyclohexylamine	53. 2,6-Dimethyl-4-heptanone	74. 2-Nitropropane	95. Decahydronaphthalene
12. Cumene	33. <i>bis</i> (2,2-Methoxy)ethyl ether	54. 2-Octanone	75. Nitroethane	96. -
13. Ethyl amyl ketone	34. Pentadecane	55. <i>o</i> -Cresol	76. Pentanal	97. -
14. Heptanol	35. Heptadecane	56. α -Methylbenzyl alcohol	77. 2-Bromobutane	98. 2-Decanol
15. Butyl butanoate	36. Octadecane	57. 5-Nonanone	78. 1-Chloropentane	99. 1,2- <i>bis</i> (2-Methoxyethoxy)ethane
16. -	37. Nonadecane	58. Nonanal	79. Cyclopentanone	100. 2-Phenoxyethanol
17. Benzyl alcohol	38. Eicosane	59. Decanal	80. 2-Hexanol	101. -
18. Dipropylene glycol	39. Acetyl tributyl citrate	60. -	81. Butyl acetate	102. Benzyl ether
19. Diethylbenzene	40. 2-Buten-1-ol	61. 1-Decanol	82. 2-Ethyl-1-butanol	
20. -	41. Formamide	62. 1-Undecanol	83. 3-Ethyl-3-pentanol	
21. -	42. 3-Pentanol	63. 2-Dodecanone	84. 1,4-Dichlorobutane	

Solvents

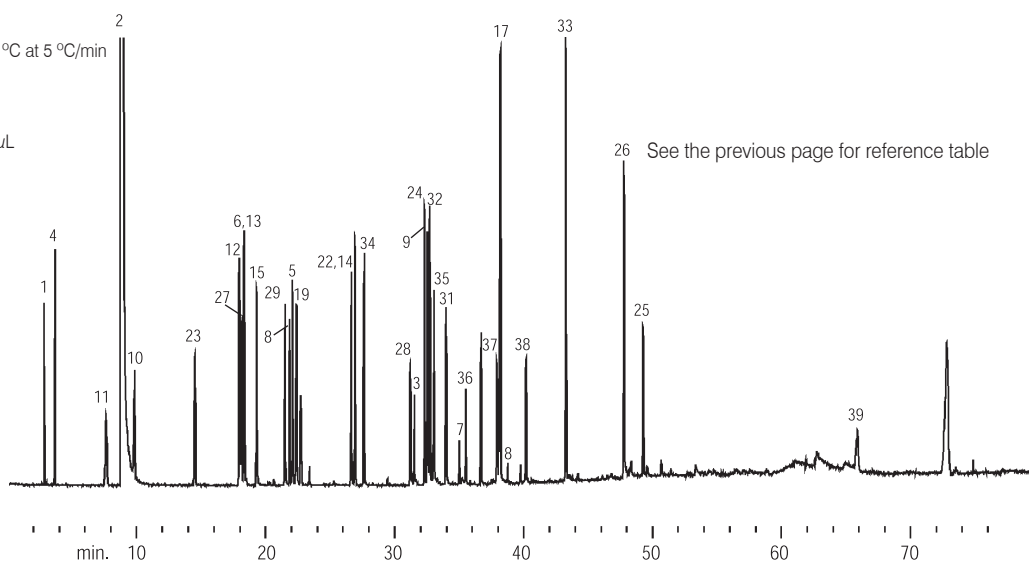
Solvents Mixture #1

Column: DM-200, 60 m x 0.53 mm x 3.00 μ m
Cat. No.: 8356
Index: CCR00336
Oven Temp.: 40 $^{\circ}$ C (hold 5 min) to 285 $^{\circ}$ C at 5 $^{\circ}$ C/min
Carrier Gas: He, 40 cm/sec
Injection: Split, 50 mL/min, 275 $^{\circ}$ C
Sample: Solvents mixture #1, 1.0 μ L
Detector: MS, TIC mode, 285 $^{\circ}$ C



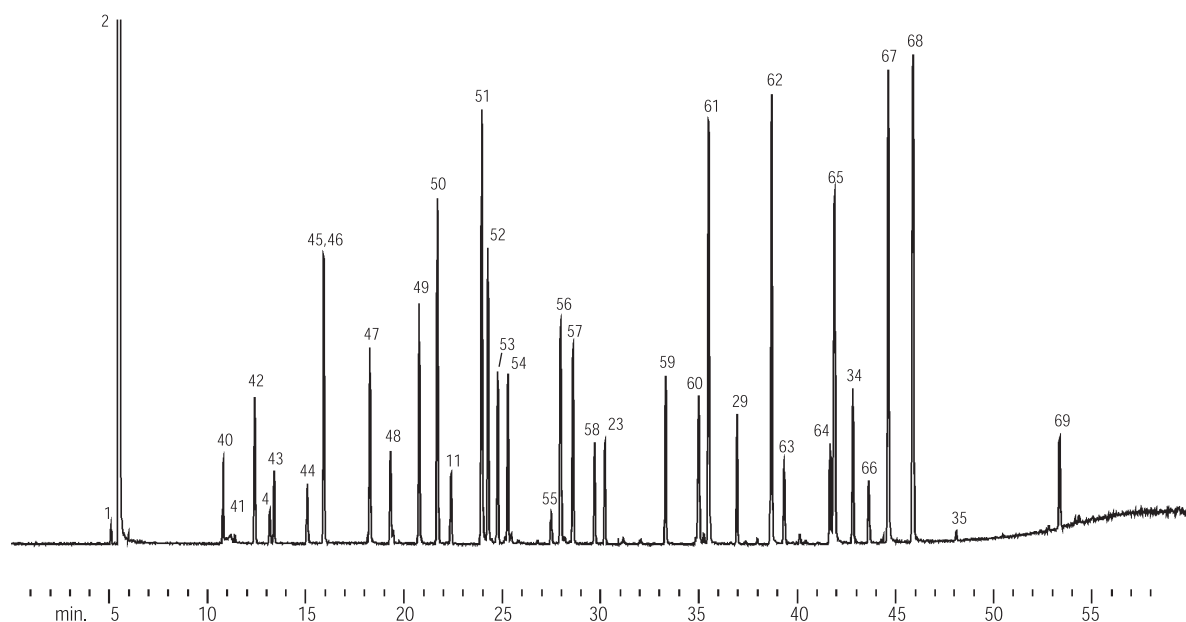
Solvents Mixture #1

Column: DM-Wax, 60 m x 0.53 mm x 1.00 μ m
Cat. No.: 7552
Index: CCR00337
Oven Temp.: 40 $^{\circ}$ C (hold 5 min) to 250 $^{\circ}$ C at 5 $^{\circ}$ C/min
Carrier Gas: He, 40 cm/sec
Injection: Split, 50 mL/min, 275 $^{\circ}$ C
Sample: Solvents mixture #1, 1.0 μ L
Detector: MS full scan, 285 $^{\circ}$ C



Solvents Mixture #2

Column: DM-1, 60 m x 0.53 mm x 3.00 μ m
 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 μ L
 Detector: MS full scan, 285 °C



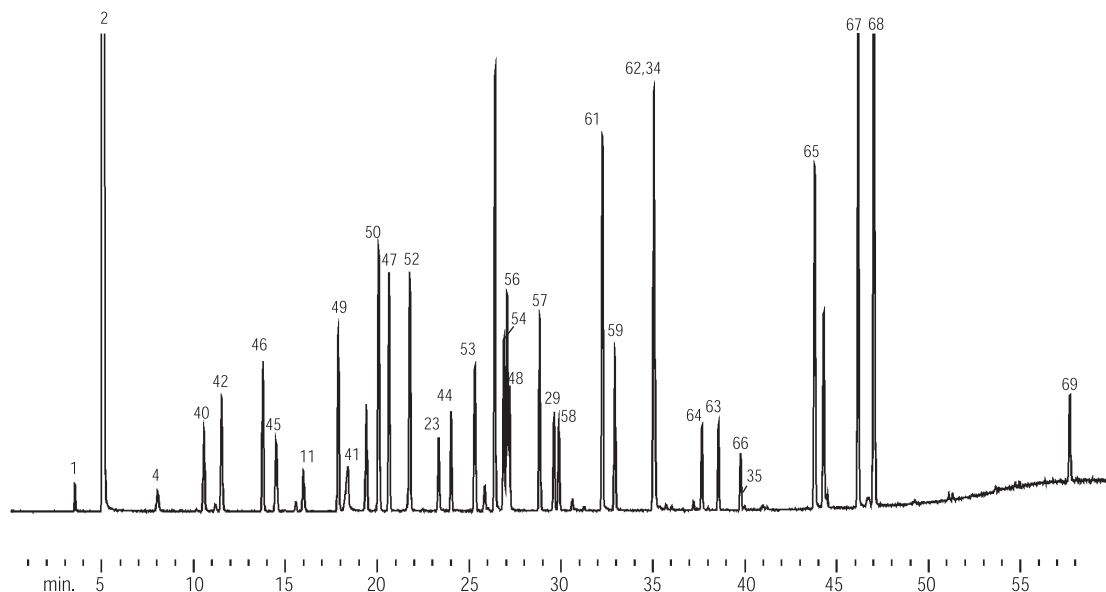
1. Pentane	22. Hexachloroethane	43. 1-Nitropropane	64. 1-Dodecanol	85. 2-Methyl-2,4-pentanediol
2. Methylene chloride	23. Undecane	44. Dimethyl formamide	65. Tetraethylene glycol	86. Butoxyethanol
3. Ethylene glycol	24. 1-Nonanol	45. 2-Methyl-3-pentanol	66. Dibenzyl	87. 1,2,3-Trichloropropane
4. Heptane	25. <i>p</i> -Methoxyphenol	46. Toluene	67. Diethyl phthalate	88. 1,4-Butanediol
5. Cyclopentanol	26. Triethylene glycol	47. Ethyl chloroacetate	68. Tributyl phosphate	89. Methyl hexanoate
6. 3-Hexanol	27. Dodecane	48. Dimethylacetamide	69. Diphenyl sulfone	90. 1,2,4-Trimethylbenzene
7. Acetamide	28. Undecanal	49. <i>p</i> -Xylene	70. Allyl alcohol	91. 2-Ethyl-1-hexanol
8. 2-Methyl-1-pentanol	29. Tridecane	50. <i>sec</i> -Tetrachloroethane	71. -	92. Dipentene
9. Furfuryl alcohol	30. -	51. Benzaldehyde	72. Isopropyl acetate	93. Tetrahydrofurfuryl acetate
10. Butyl ether	31. Dodecanal	52. <i>o</i> -Chlorotoluene	73. Benzene	94. -
11. Nonane	32. Dicyclohexylamine	53. 2,6-Dimethyl-4-heptanone	74. 2-Nitropropane	95. Decahydronaphthalene
12. Cumene	33. <i>bis</i> (2,2-Methoxy)ethyl ether	54. 2-Octanone	75. Nitroethane	96. -
13. Ethyl amyl ketone	34. Pentadecane	55. <i>o</i> -Cresol	76. Pentanal	97. -
14. Heptanol	35. Heptadecane	56. α -Methylbenzyl alcohol	77. 2-Bromobutane	98. 2-Decanol
15. Butyl butanoate	36. Octadecane	57. 5-Nonanone	78. 1-Chloropentane	99. 1,2- <i>bis</i> (2-Methoxyethoxy)ethane
16. -	37. Nonadecane	58. Nonanal	79. Cyclopentanone	100. 2-Phenoxyethanol
17. Benzyl alcohol	38. Eicosane	59. Decanal	80. 2-Hexanol	101. -
18. Dipropylene glycol	39. Acetyl tributyl citrate	60. -	81. Butyl acetate	102. Benzyl ether
19. Diethylbenzene	40. 2-Buten-1-ol	61. 1-Decanol	82. 2-Ethyl-1-butanol	
20. -	41. Formamide	62. 1-Undecanol	83. 3-Ethyl-3-pentanol	
21. -	42. 3-Pentanol	63. 2-Dodecanone	84. 1,4-Dichlorobutane	

Solvents

Solvents Mixture #2

Column: DM-200, 60 m x 0.53 mm x 3.00 μ m
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 μ L
Detector: MS full scan, 285 °C

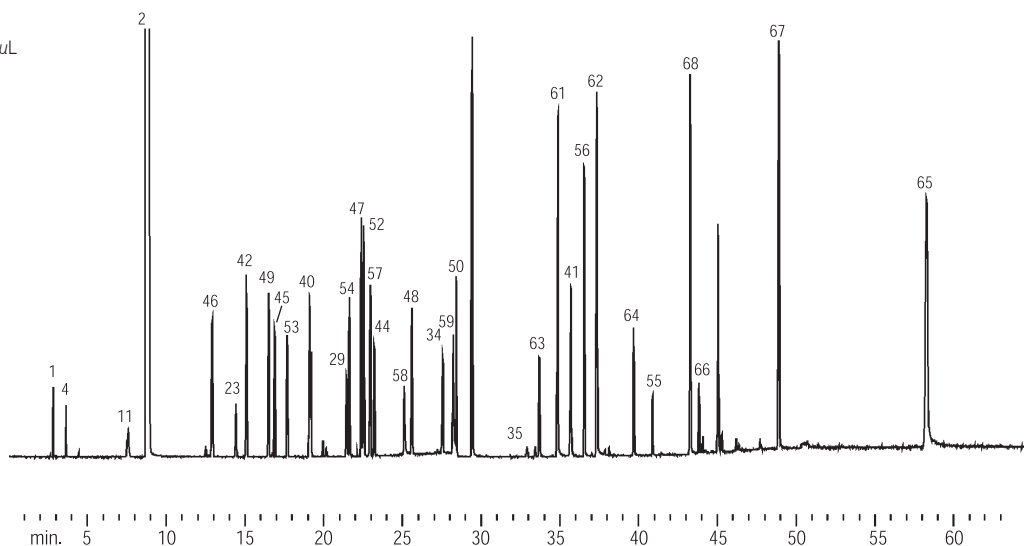
See the previous page for reference table



Solvents Mixture #2

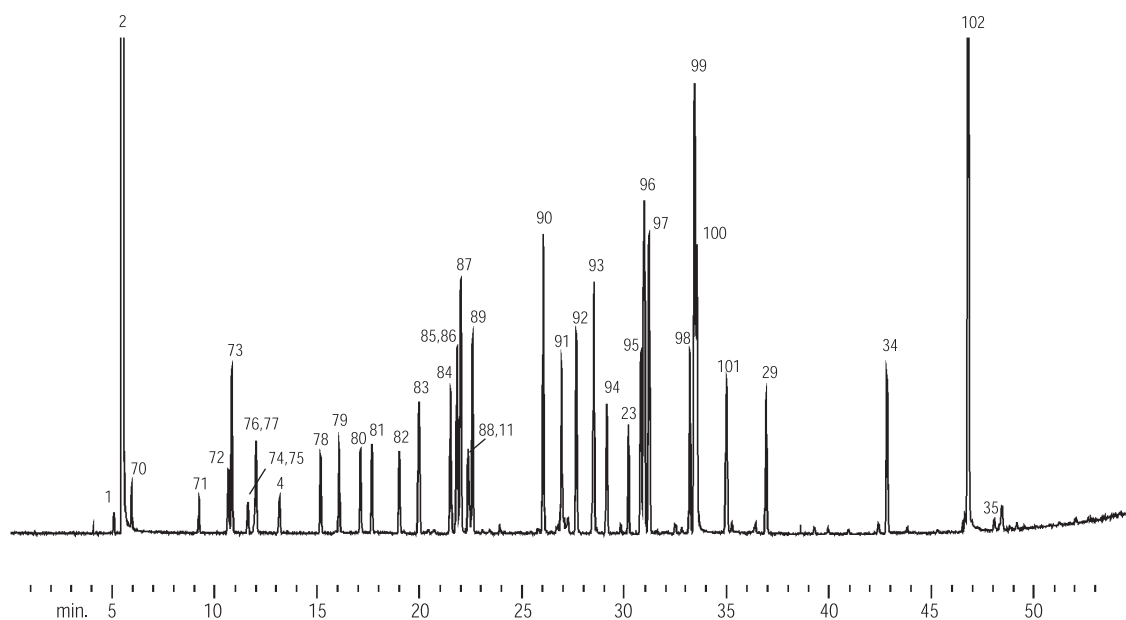
Column: DM-Wax, 60 m x 0.53 mm x 1.00 μ m
Cat. No.: 7552
Index: CCR00340
Oven Temp.: 40 °C (hold 5 min) to 250 °C at 5 °C/min
Carrier Gas: He, 40 cm/sec
Injection: Split, 50 mL/min, 275 °C
Sample: Solvents mixture #2, 1.0 μ L
Detector: MS full scan, 285 °C

See the previous page for reference table



Solvents Mixture #3

Column: DM-1, 60 m x 0.53 mm x 3.00 μ m
 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 μ L
 Detector: MS full scan, 285 °C



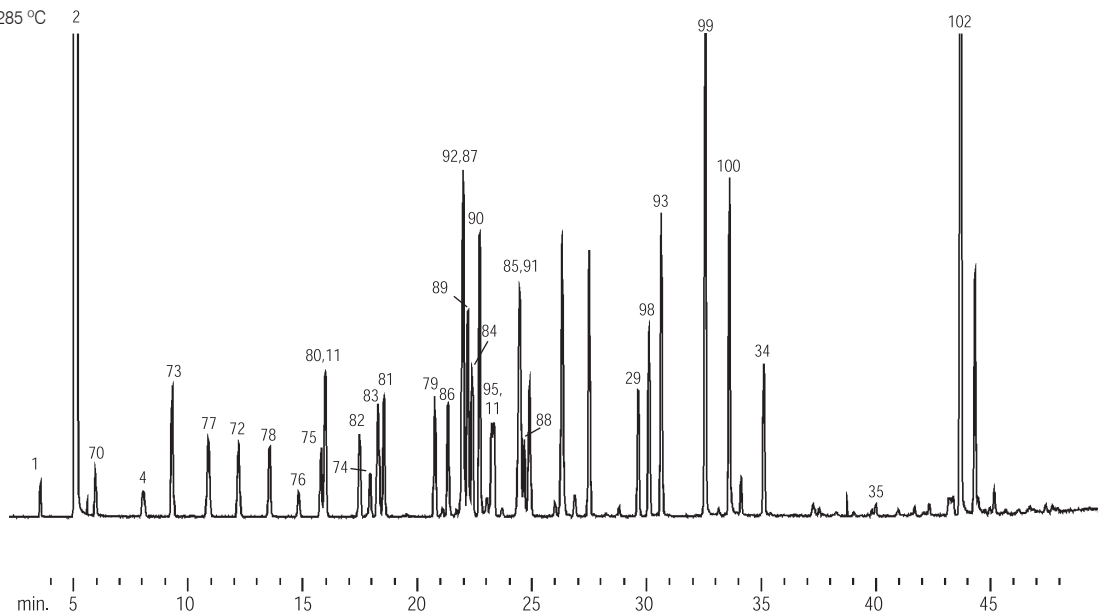
1. Pentane	22. Hexachloroethane	43. 1-Nitropropane	64. 1-Dodecanol	85. 2-Methyl-2,4-pentanediol
2. Methylene chloride	23. Undecane	44. Dimethyl formamide	65. Tetraethylene glycol	86. Butoxyethanol
3. Ethylene glycol	24. 1-Nonanol	45. 2-Methyl-3-pentanol	66. Dibenzyl	87. 1,2,3-Trichloropropane
4. Heptane	25. <i>p</i> -Methoxyphenol	46. Toluene	67. Diethyl phthalate	88. 1,4-Butanediol
5. Cyclopentanol	26. Triethylene glycol	47. Ethyl chloroacetate	68. Tributyl phosphate	89. Methyl hexanoate
6. 3-Hexanol	27. Dodecane	48. Dimethylacetamide	69. Diphenyl sulfone	90. 1,2,4-Trimethylbenzene
7. Acetamide	28. Undecanal	49. <i>p</i> -Xylene	70. Allyl alcohol	91. 2-Ethyl-1-hexanol
8. 2-Methyl-1-pentanol	29. Tridecane	50. <i>sec</i> -Tetrachloroethane	71. -	92. Dipentene
9. Furfuryl alcohol	30. -	51. Benzaldehyde	72. Isopropyl acetate	93. Tetrahydrofurfuryl acetate
10. Butyl ether	31. Dodecanal	52. <i>o</i> -Chlorotoluene	73. Benzene	94. -
11. Nonane	32. Dicyclohexylamine	53. 2,6-Dimethyl-4-heptanone	74. 2-Nitropropane	95. Decahydronaphthalene
12. Cumene	33. <i>bis</i> (2,2-Methoxy)ethyl ether	54. 2-Octanone	75. Nitroethane	96. -
13. Ethyl amyl ketone	34. Pentadecane	55. <i>o</i> -Cresol	76. Pentanal	97. -
14. Heptanol	35. Heptadecane	56. α -Methylbenzyl alcohol	77. 2-Bromobutane	98. 2-Decanol
15. Butyl butanoate	36. Octadecane	57. 5-Nonanone	78. 1-Chloropentane	99. 1,2- <i>bis</i> (2-Methoxyethoxy)ethane
16. -	37. Nonadecane	58. Nonanal	79. Cyclopentanone	100. 2-Phenoxyethanol
17. Benzyl alcohol	38. Eicosane	59. Decanal	80. 2-Hexanol	101. -
18. Dipropylene glycol	39. Acetyl tributyl citrate	60. -	81. Butyl acetate	102. Benzyl ether
19. Diethylbenzene	40. 2-Buten-1-ol	61. 1-Decanol	82. 2-Ethyl-1-butanol	
20. -	41. Formamide	62. 1-Undecanol	83. 3-Ethyl-3-pentanol	
21. -	42. 3-Pentanol	63. 2-Dodecanone	84. 1,4-Dichlorobutane	

Solvents

Solvents Mixture #3

Column: DM-200, 60 m x 0.53 mm x 3.00 μ m
Cat. No.: 8356
Index: CCR00342
Oven Temp.: 40 $^{\circ}$ C (hold 5 min) to 285 $^{\circ}$ C at 5 $^{\circ}$ C/min
Carrier Gas: He, 40 cm/sec
Injection: Split, 50 mL/min, 275 $^{\circ}$ C
Sample: Solvents mixture #3, 1.0 μ L
Detector: MS full scan, 285 $^{\circ}$ C

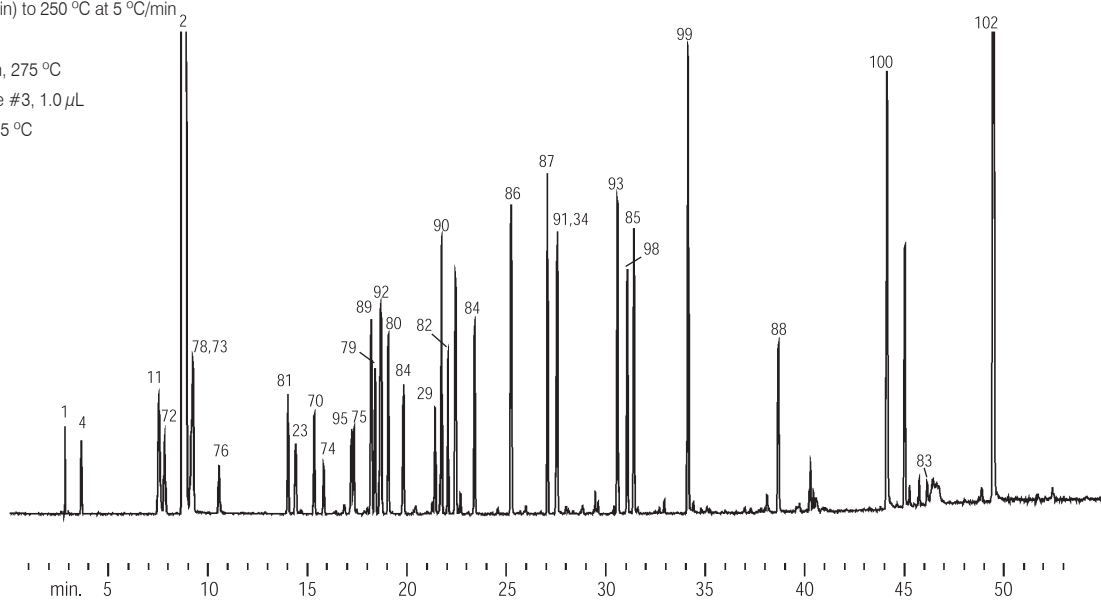
See the previous page for reference table



Solvents Mixture #3

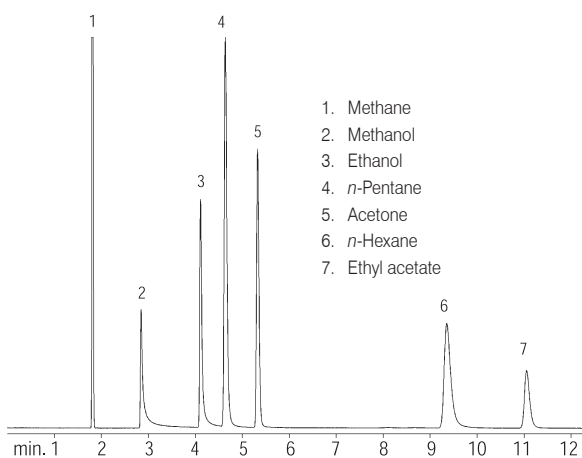
Column: DM-Wax, 60 m x 0.53 mm x 1.00 μ m
Cat. No.: 7552
Index: CCR00343
Oven Temp.: 40 $^{\circ}$ C (hold 5 min) to 250 $^{\circ}$ C at 5 $^{\circ}$ C/min
Carrier Gas: He, 40 cm/sec
Injection: Split, 50 mL/min, 275 $^{\circ}$ C
Sample: Solvents mixture #3, 1.0 μ L
Detector: MS full scan, 285 $^{\circ}$ C

See the previous page for reference table



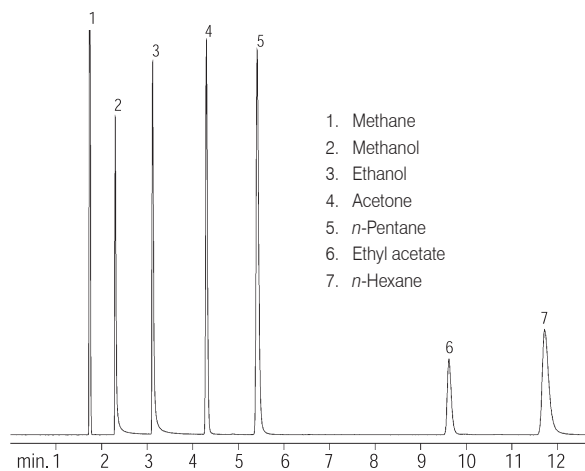
Polar Solvents

Column: DM-PLOT U, 30 m x 0.32 mm x 10.00 μ m
 Cat. No.: 8824
 Index: CSR00182
 Oven Temp.: 150 °C constant
 Carrier Gas: H₂
 Injection: Split, 20:1, 200 °C
 Sample: 50 ppm (w / v) each in He, 20 μ L
 Detector: FID, 200 °C



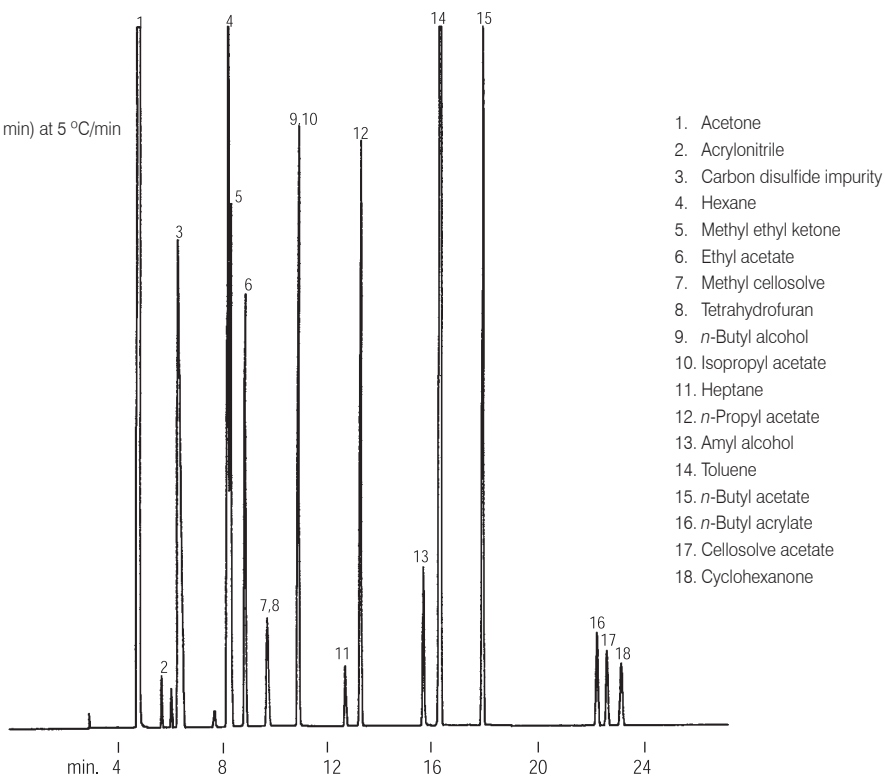
Polar Solvents

Column: DM-PLOT Q, 30 m x 0.32 mm x 10.00 μ m
 Cat. No.: 8818
 Index: CSR00181
 Oven Temp.: 150 °C constant
 Carrier Gas: H₂
 Injection: Split, 20:1, 200 °C
 Sample: 50 ppm (w / v) each in He, 20 μ L
 Detector: FID, 200 °C



Solvents

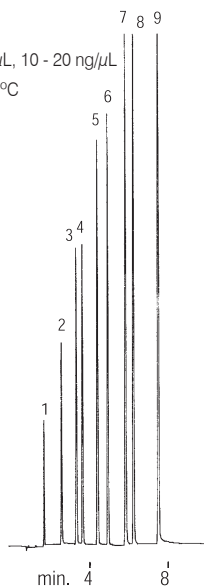
Column: DM-5, 60 m x 0.32 mm x 3.00 μ m
 Cat. No.: 7242
 Index: CCR00346
 Oven Temp.: 50 °C (hold 4 min) to 120 °C (hold 20 min) at 5 °C/min
 Carrier Gas: H₂, 40 cm/sec, 50 °C
 Injection: Split, 300 °C
 Sample: in CS₂ solvent, 1.0 μ L
 Detector: FID, 128 x 10¹² AFS, 300 °C



Fatty Acids (Free)

Column: DM-1, 30 m x 0.53 mm x 5.00 μ m
 Cat. No.: 7157
 Index: CCR00281
 Oven Temp.: 60 °C to 180 °C at 15 °C/min
 Carrier Gas: H₂, 50 cm/sec
 Injection: Direct, 250 °C
 Sample: Fatty acids (free), 0.2 μ L, 10 - 20 ng/ μ L
 Detector: FID, 4 x 10⁻¹¹ AFS, 250 °C

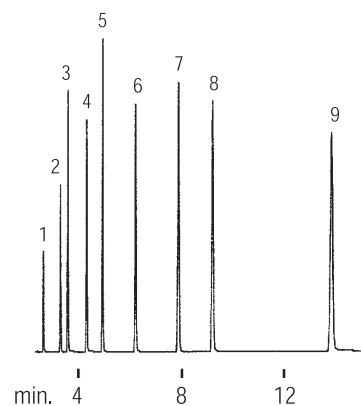
1. Acetic acid
2. Propionic acid
3. Isobutyric acid
4. *n*-Butyric acid
5. Isovaleric acid
6. *n*-Valeric acid
7. Isocaproic acid
8. Caproic acid
9. Heptanoic acid



Fatty Acids (Free)

Column: DM-FFAP, 30 m x 0.25 mm x 0.25 μ m
 Cat. No.: 7621
 Index: CCR00280
 Oven Temp.: 145 °C, constant
 Carrier Gas: H₂, 40 cm/sec
 Injection: Split, 50:1, 250 °C
 Sample: Fatty acids (free), 1.0 μ L, 10 - 20 ng/ μ L
 Detector: FID, 2 x 10⁻¹¹ AFS, 250 °C

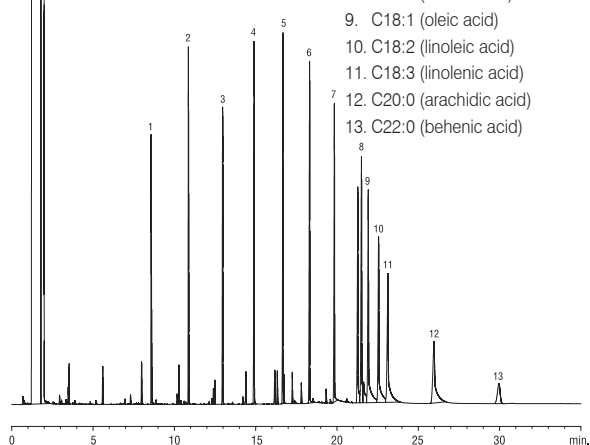
1. Acetic acid
2. Propionic acid
3. Isobutyric acid
4. *n*-Butyric acid
5. Isovaleric acid
6. *n*-Valeric acid
7. Isocaproic acid
8. Caproic acid
9. Heptanoic acid



Fatty Acids (Free)

Column: DM-FFAP, 30 m x 0.32 mm x 0.25 μ m
 Cat. No.: 7631
 Index: CFR00653
 Oven Temp.: 40 °C to 250 °C (hold 15 min) at 10 °C/min
 Carrier Gas: H₂
 Injection: Splitless, 0.25 min, 250 °C
 Sample: Free fatty acid mix, 1.0 μ L
 Flow Rate: 6.0 mL/min
 Make up gas: 75 mL/min
 Solvent: H₂O
 Concentration: 5 mg/mL in MeOH
 Detector: FID, 250 °C

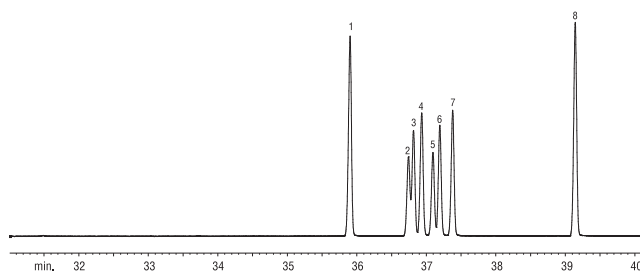
1. C4:0 (butyric acid)
2. C6:0 (caproic acid)
3. C8:0 (caprylic acid)
4. C10:0 (capric acid)
5. C12:0 (lauric acid)
6. C14:0 (myristic acid)
7. C16:0 (palmitic acid)
8. C18:0 (stearic acid)
9. C18:1 (oleic acid)
10. C18:2 (linoleic acid)
11. C18:3 (linolenic acid)
12. C20:0 (arachidic acid)
13. C22:0 (behenic acid)



FAMES (*cis* / *trans* Isomers)

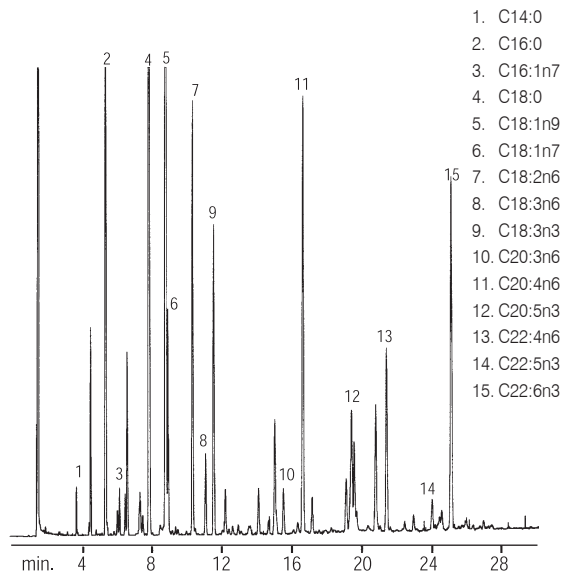
Column: DM-2560, 100 m x 0.25 mm x 0.20 μ m
 Cat. No.: 8858
 Index: CFR00652
 Sample: 10 mg/mL *cis* / *trans* FAMES mix in methylene chloride
 Injection: Split, 20:1, 1 μ L, 225 °C
 Oven Temp.: 100 °C (hold 4 min) to 240 °C (hold 10 min) at 3 °C/min
 Carrier Gas: H₂, 1.2 mL/min
 Detector: FID, 250 °C

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 petroselinatate (*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)

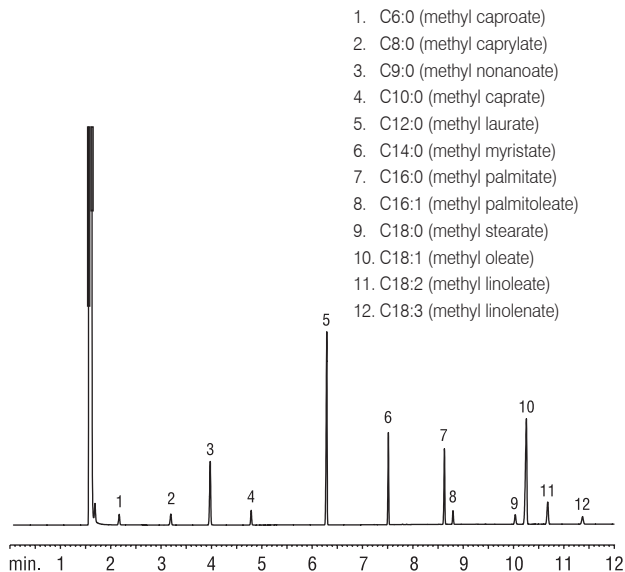
Column: DM-2330, 30 m x 0.32 mm x 0.20 μ m
 Cat. No.: 8633
 Index: CFR00119
 Oven Temp.: 160 °C to 250 °C (hold 10 min) at 2 °C/min
 Carrier Gas: H₂, 40 cm/sec
 Injection: Split, 260 °C
 Sample: PUFA (animal source) mix, 0.1 μ L
 Detector: FID, 8 x 10⁻¹¹ AFS, 260 °C



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 μ m
 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 μ L
 Detector: FID, 300 °C

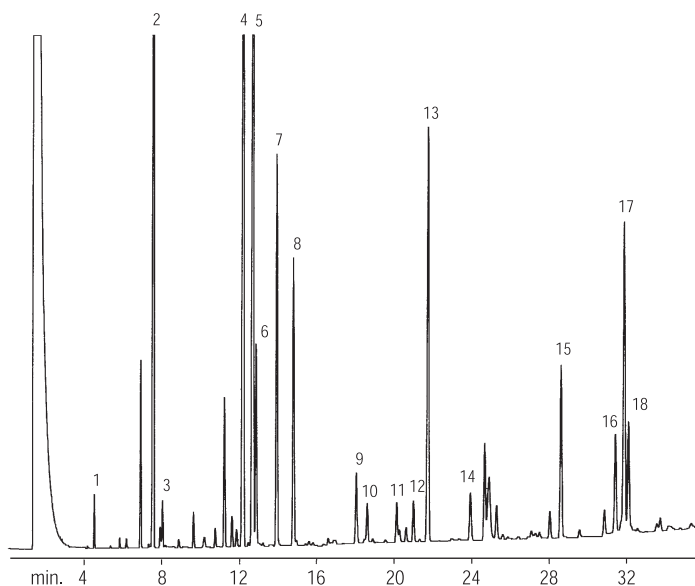


1. C6:0 (methyl caproate)
2. C8:0 (methyl caprylate)
3. C9:0 (methyl nonanoate)
4. C10:0 (methyl caprate)
5. C12:0 (methyl laurate)
6. C14:0 (methyl myristate)
7. C16:0 (methyl palmitate)
8. C16:1 (methyl palmitoleate)
9. C18:0 (methyl stearate)
10. C18:1 (methyl oleate)
11. C18:2 (methyl linoleate)
12. C18:3 (methyl linolenate)

PUFA (Animal Source)

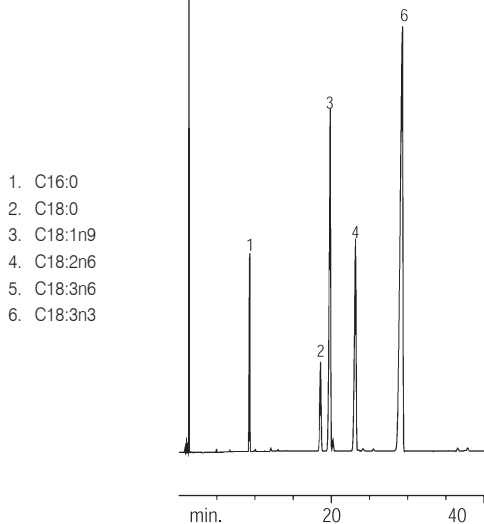
Column: DM-Wax, 30 m x 0.25 mm x 0.25 μ m
 Cat. No.: 7521
 Index: CFR00117
 Oven Temp.: 160 °C to 250 °C (hold 10 min) at 2 °C/min
 Carrier Gas: H₂, 40 cm/sec
 Injection: Split, 20:1, 260 °C
 Sample: PUFA mix, 0.1 μ L
 Detector: FID, 8 x 10⁻¹¹ AFS, 260 °C

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)

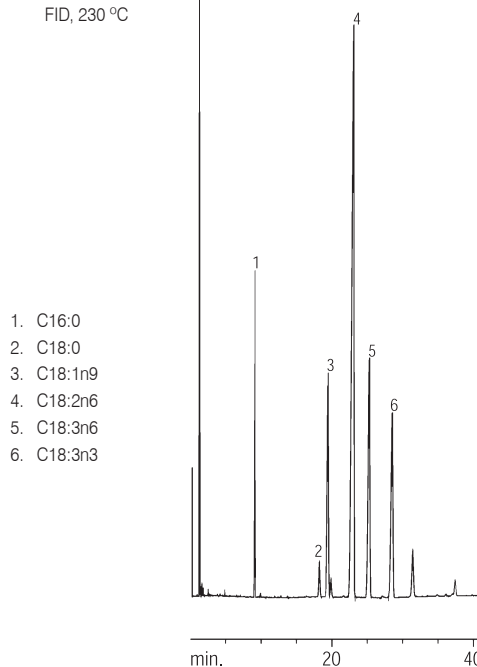
Column: DM-FAMEWAX, 30 m x 0.25 mm x 0.25 μ m
 Cat. No.: **7811**
 Index: CFR00364
 Oven Temp.: 165 $^{\circ}$ C (hold 30 min) to 220 $^{\circ}$ C (hold 15 min) at 1.5 $^{\circ}$ C/min
 Carrier Gas: He, 40 cm/sec
 Injection Temp.: 225 $^{\circ}$ C
 Detector: FID, 230 $^{\circ}$ C



1. C16:0
2. C18:0
3. C18:1n9
4. C18:2n6
5. C18:3n6
6. C18:3n3

FAMES (Black Currant Seed Oil)

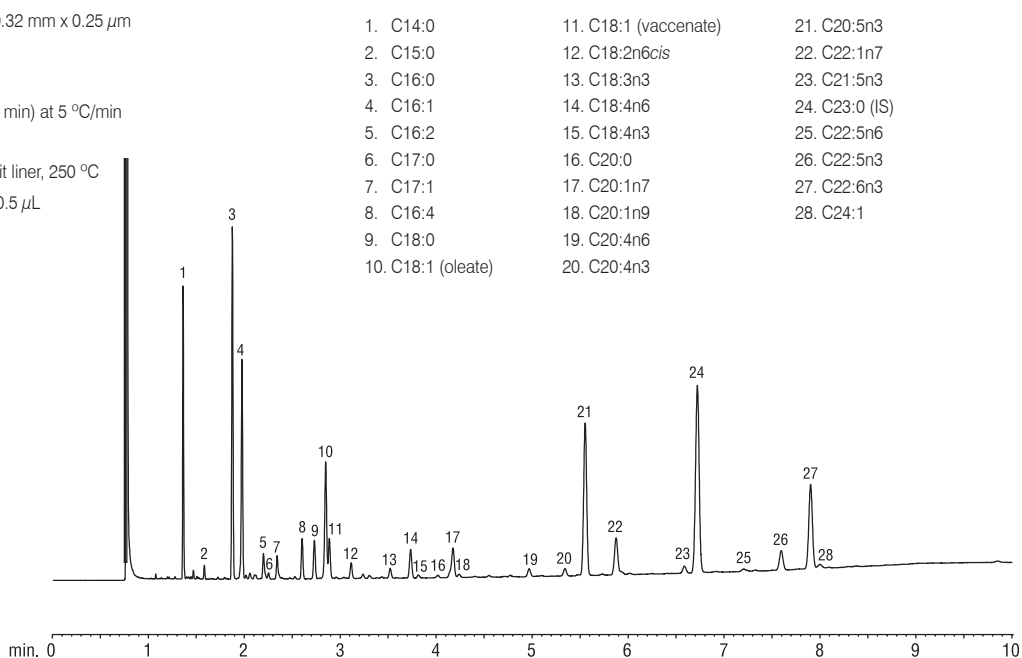
Column: DM-FAMEWAX, 30 m x 0.25 mm x 0.25 μ m
 Cat. No.: **7811**
 Index: CFR00365
 Oven Temp.: 165 $^{\circ}$ C (hold 30 min) to 220 $^{\circ}$ C (hold 15 min) at 1.5 $^{\circ}$ C/min
 Carrier Gas: He, 40 cm/sec
 Injection Temp.: 225 $^{\circ}$ C
 Detector: FID, 230 $^{\circ}$ C



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 μ m
 Cat. No.: **7813**
 Index: CFR00568
 Oven Temp.: 195 $^{\circ}$ C to 240 $^{\circ}$ C (hold 1 min) at 5 $^{\circ}$ C/min
 Carrier Gas: H₂, 62 cm/sec
 Injection: Split, 150:1, 3 mm ID split liner, 250 $^{\circ}$ C
 Sample: 12 mg/mL total FAMES, 0.5 μ L
 Detector: FID, 250 $^{\circ}$ C

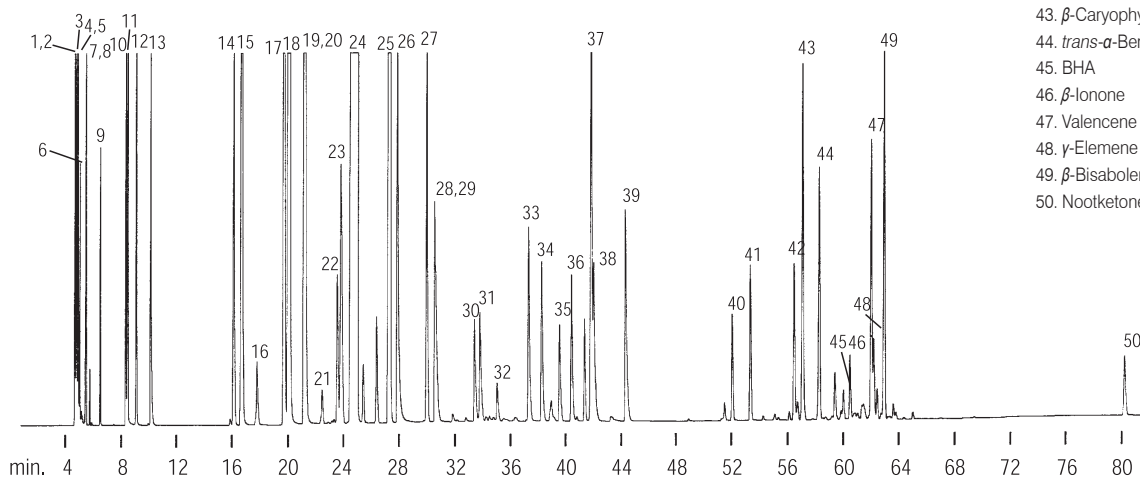


- | | | |
|--------------------|-----------------------|----------------|
| 1. C14:0 | 11. C18:1 (vaccenate) | 21. C20:5n3 |
| 2. C15:0 | 12. C18:2n6cis | 22. C22:1n7 |
| 3. C16:0 | 13. C18:3n3 | 23. C21:5n3 |
| 4. C16:1 | 14. C18:4n6 | 24. C23:0 (IS) |
| 5. C16:2 | 15. C18:4n3 | 25. C22:5n6 |
| 6. C17:0 | 16. C20:0 | 26. C22:5n3 |
| 7. C17:1 | 17. C20:1n7 | 27. C22:6n3 |
| 8. C16:4 | 18. C20:1n9 | 28. C24:1 |
| 9. C18:0 | 19. C20:4n6 | |
| 10. C18:1 (oleate) | 20. C20:4n3 | |

Flavor Volatiles

Column: DM-1, 60 m x 0.32 mm x 0.50 μ m
 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 μ L
 Detector: FID, 64 x 10⁻¹¹ AFS, 260 °C

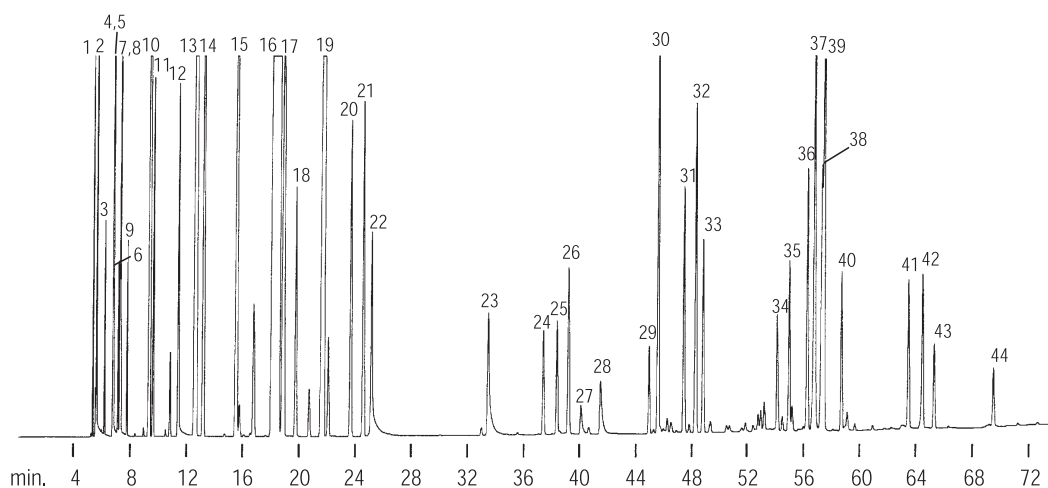
- | | | | |
|-----------------------|-----------------------------|-----------------------------------|-------------------------------------|
| 1. Methanol | 11. Ethyl butyrate | 21. α -Phellandrene | 31. <i>trans</i> -Limonene monoxide |
| 2. Acetaldehyde | 12. Furfural | 22. α -Terpinene | 32. Citronellal |
| 3. Ethanol | 13. <i>trans</i> -2-Hexenal | 23. <i>p</i> -Cymene | 33. Terpinene-4-ol |
| 4. Acetone | 14. α -Thujene | 24. δ -Limonene | 34. α -Terpineol |
| 5. Isopropyl alcohol | 15. α -Pinene | 25. γ -Terpinene | 35. Decanal |
| 6. Methylene chloride | 16. Camphene | 26. Octanol | 36. <i>d</i> / <i>l</i> Carveol |
| 7. Hexane | 17. Sabinene | 27. Terpinolene | 37. Neral |
| 8. Ethyl acetate | 18. β -Pinene | 28. Nonanal | 38. Carvone |
| 9. Ethyl propionate | 19. Octanal | 29. Linalool | 39. Geranial |
| 10. <i>n</i> -Hexanal | 20. Myrcene | 30. <i>cis</i> -Limonene monoxide | 40. Neryl acetate |



Flavor Volatiles

Column: DM-Wax, 60 m x 0.53 mm x 1.00 μ m
 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 μ L
 Detector: FID, 64 X 10⁻¹¹ AFS, 260 °C

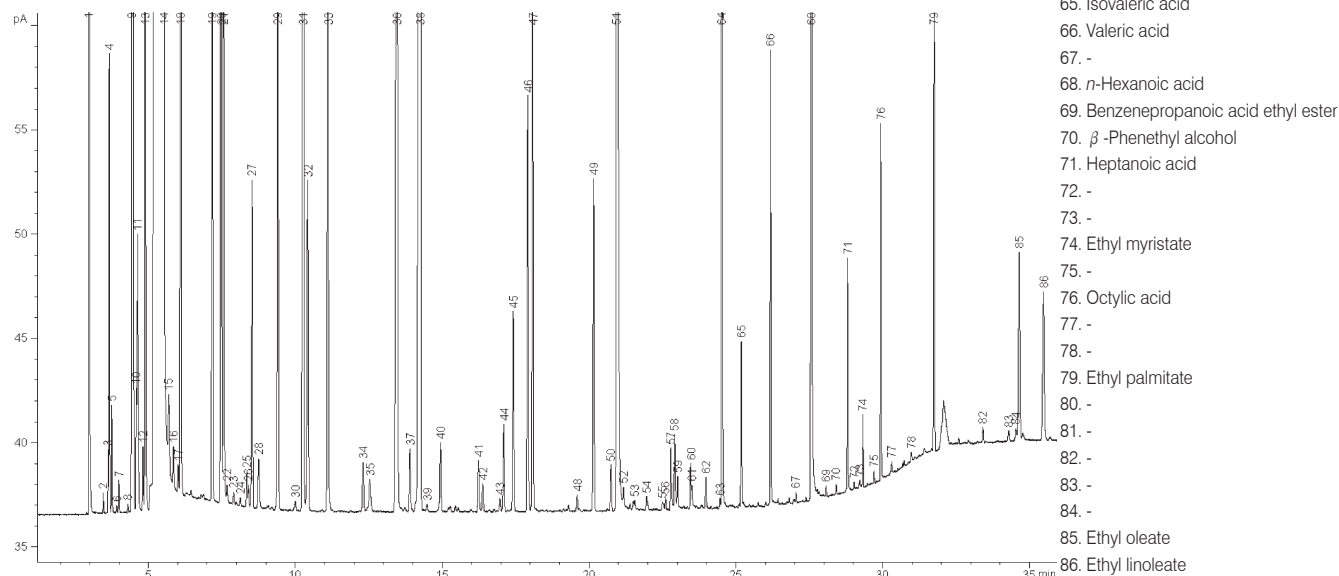
- | | | | |
|-----------------------|-----------------------------|--|---------------------------------|
| 1. Hexane | 12. <i>n</i> -Hexanal | 23. Nonanal | 34. Neral |
| 2. Acetaldehyde | 13. β -Pinene | 24. <i>cis</i> -Limonene monoxide | 35. α -Terpineol |
| 3. Acetone | 14. Sabinene | 25. <i>trans</i> -Limonene | 36. Neryl acetate |
| 4. Methanol | 15. Myrcene | 26. Furfural | 37. Valencene |
| 5. Ethyl acetate | 16. δ -Limonene | 27. Citronellal | 38. Geranial |
| 6. Isopropyl alcohol | 17. 1,8-Cineole | 28. Decanal | 39. Carvone |
| 7. Ethanol | 18. <i>trans</i> -2-Hexenal | 29. Linalool | 40. Geranyl acetate |
| 8. Methylene chloride | 19. γ -Terpinene | 30. Octanol | 41. <i>d</i> / <i>l</i> Carveol |
| 9. Ethyl propionate | 20. <i>p</i> -Cymene | 31. <i>trans</i> - α -Bergamotene | 42. α -Ionone |
| 10. α -Pinene | 21. Terpinolene | 32. β -Caryophyllene | 43. <i>d</i> / <i>l</i> Carveol |
| 11. Ethyl butyrate | 22. Octanal | 33. Terpinene-4-ol | 44. β -Ionone |



Concentrated Liquors

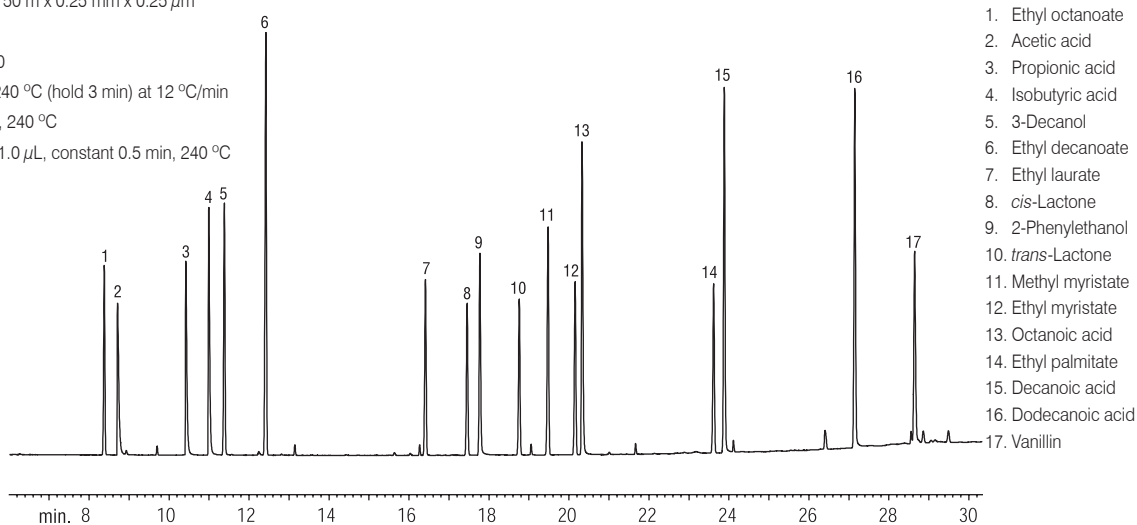
Column: DM-Wax, 30 m x 0.25 mm x 0.25 μ m
 Cat. No.: 7521
 Index: CFO00011
 Oven Temp.: 37 °C (hold 2 min) to 70 °C at 3 °C/min
 70 °C (hold 1 min) to 130 °C at 6 °C/min
 130 °C to 220 °C at 10 °C/min
 to 220 °C (hold 10 min)
 Carrier Gas: High purity nitrogen, 1 mL/min
 Injection: 260 °C, Split ratio 30:1
 Detector: FID, 260 °C

- | | | | |
|----------------------------|-------------------------------|------------------------|---------------------------------|
| 1. Acetaldehyde | 17. 2-Ethoxy butane | 33. <i>n</i> -Butanol | 49. Ethyl octanoate |
| 2. Propanal | 18. 2-Pentanone | 34. - | 50. - |
| 3. Isobutanol | 19. <i>sec</i> -Butyl alcohol | 35. - | 51. Acetic acid |
| 4. Acetone | 20. Ethyl butyrate | 36. Isoamyl alcohol | 52. Furfural |
| 5. Ethyl formate | 21. <i>n</i> -Propanol | 37. - | 53. - |
| 6. - | 22. - | 38. Ethyl caproate | 54. - |
| 7. - | 23. - | 39. - | 55. Benzaldehyde |
| 8. - | 24. - | 40. <i>n</i> -Pentanol | 56. Ethyl nonanoate |
| 9. Ethyl acetate + Acetal | 25. Ethyl isovalerate | 41. Acetoin | 57. Propionic acid |
| 10. Methanol | 26. Diethoxy isopentane | 42. - | 58. <i>L</i> -2,3-Butanediol |
| 11. 2-Butanone | 27. Diethoxy-3-methylbutane | 43. Propyl hexanoate | 59. Capryl alcohol |
| 12. 2-Methyl butyraldehyde | 28. - | 44. 2-Heptanol | 60. Isobutyric acid |
| 13. 3-Methyl butyraldehyde | 29. Isobutyl alcohol | 45. Ethyl heptanoate | 61. <i>meso</i> -2,3-Butanediol |
| 14. Ethanol | 30. Isoamyl acetate | 46. Ethyl lactate | 62. Hexyl hexanoate |
| 15. Ethyl propionate | 31. <i>sec</i> -Pentanol | 47. <i>n</i> -Hexanol | 63. Ethyl caprate |
| 16. Ethyl isobutyrate | 32. Ethyl valerate | 48. Butyl hexanoate | 64. <i>n</i> -Butanoic acid |



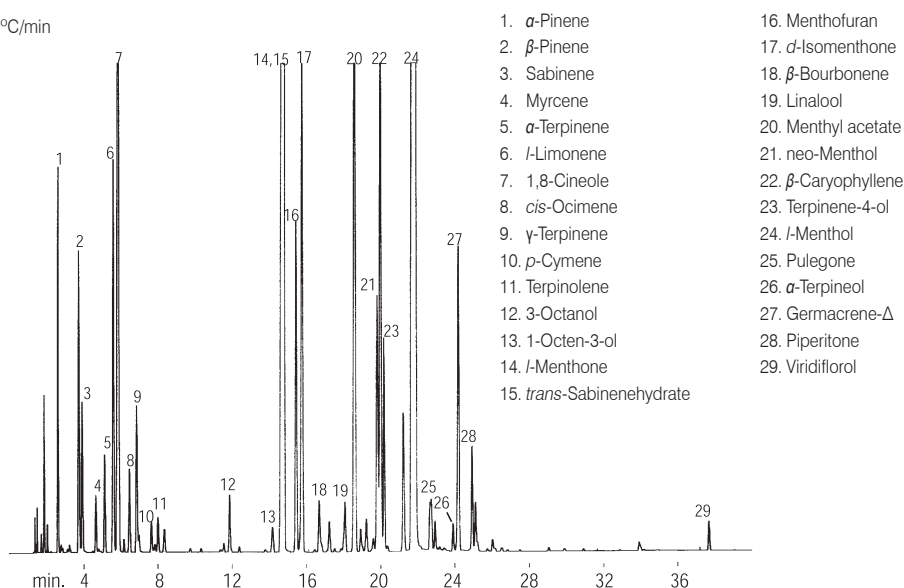
Alcoholic Standard: Acids and Esters

Column: DM-FFAP, 50 m x 0.25 mm x 0.25 μ m
 Cat. No.: 7672
 Index: CFR00500
 Oven Temp.: 70 °C to 240 °C (hold 3 min) at 12 °C/min
 Carrier Gas: H₂, 28 psi, 240 °C
 Injection: Splitless, 1.0 μ L, constant 0.5 min, 240 °C
 Detector: FID



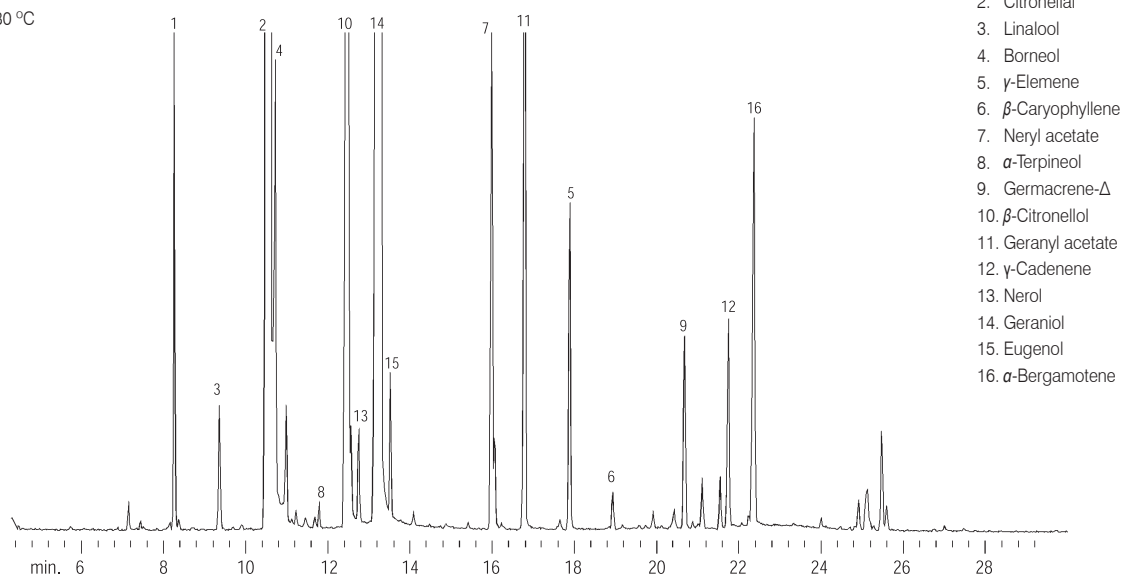
Peppermint Oil

Column: DM-Wax, 30 m x 0.25 mm x 0.50 μ m
 Cat. No.: 7521
 Index: CFR00141
 Oven Temp.: 75 °C (hold 4 min) to 240 °C at 4 °C/min
 Carrier Gas: H₂, 40 cm/sec, 75 °C
 Injection: Split, 1.0 μ L, 50:1, 250 °C
 Sample: Peppermint oil, 1.0 μ L
 Detector: FID, 16 x 10⁻¹¹ AFS, 250 °C



Citronella Java Oil

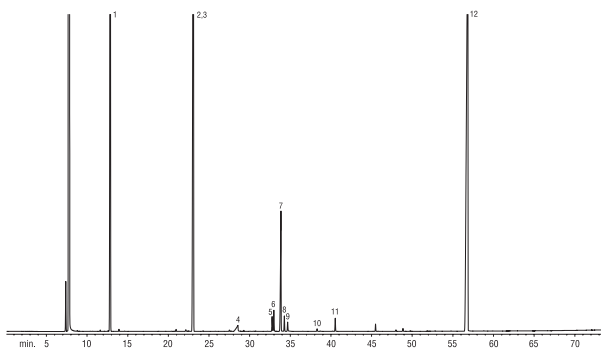
Column: DM-1, 60 m x 0.25 mm x 0.25 μ m
 Cat. No.: 7122
 Index: CFR00144
 Oven Temp.: 100 °C to 260 °C (hold 1 min) at 4 °C/min
 Carrier Gas: He, 30 cm/sec, 50 °C
 Injection: Split, 100 cc/min, 250 °C
 Sample: Citronella java oil, 1.0 μ L
 Detector: MS, 280 °C



Fragrance

Column: DM-1, 60 m x 0.25 mm x 0.25 μ m
 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 μ L
 Detector: FID, 300 °C

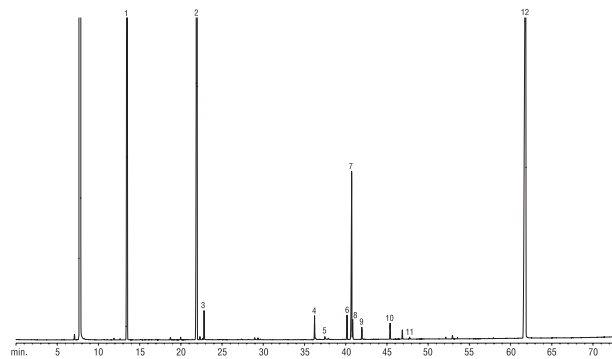
1. Ethyl butyrate
2. Limonene
3. Eucalyptol
4. Benzoic acid
5. Cinnamic aldehyde
6. Geraniol
7. Hydroxycitronellal
8. Thymol
9. Cinnamyl alcohol
10. Vanillin
11. Cinnamyl acetate
12. Benzyl salicylate



Fragrance

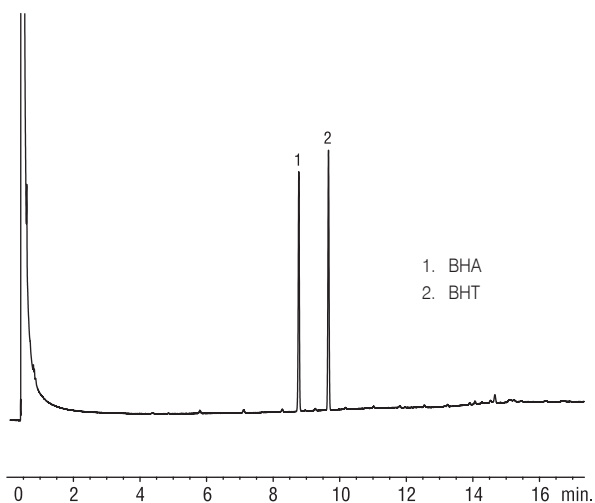
Column: DM-1701, 60 m x 0.25 mm x 0.25 μ m
 Cat. No.: 7322
 Index: CFR00658
 Oven Temp.: 50 °C to 270 °C at 3 °C/min
 Carrier Gas: He
 Injection: Split, 40:1, 285 °C
 Sample: 5% FMA mix in acetone, 1.0 μ L
 Detector: FID, 300 °C

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

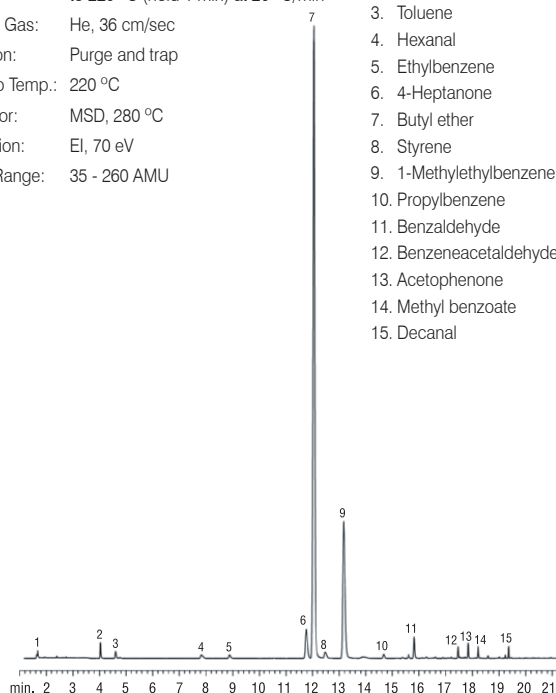
Column: DM-17, 30 m x 0.53 mm x 1.00 μ m
 Cat. No.: 7451
 Index: CFR00630
 Oven Temp.: 50 °C to 240 °C (hold 3 min) at 15 °C/min
 Carrier Gas: He, 60 cm/sec, 50 °C
 Injection: Direct, 280 °C
 Sample: 50 ppm BHA / BHT each in MeOH, 1.0 μ L
 Detector: FID, 280 °C



Food Packaging Volatiles

Column: DM-5MS, 30 m x 0.25 mm x 0.50 μ m
 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

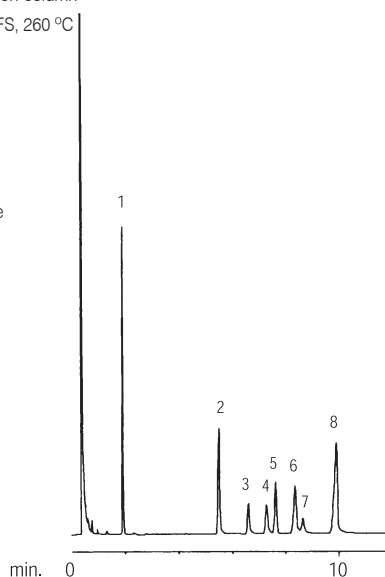
1. Tetrahydrofuran
2. 1-Butanol
3. Toluene
4. Hexanal
5. Ethylbenzene
6. 4-Heptanone
7. Butyl ether
8. Styrene
9. 1-Methylethylbenzene
10. Propylbenzene
11. Benzaldehyde
12. Benzeneacetaldehyde
13. Acetophenone
14. Methyl benzoate
15. Decanal



Neutral Sterols

Column: DM-225, 30 m x 0.25 mm x 0.25 μ m
 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 μ L, 200 ng on-column
 Detector: FID, 8×10^{-11} AFS, 260 °C

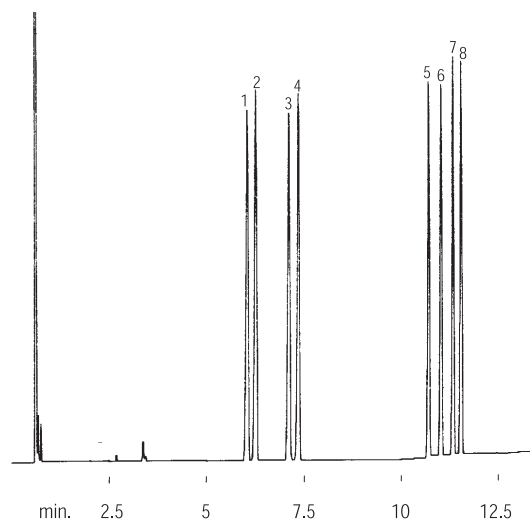
1. 5- α -Cholestane
2. Coprosterol
3. Cholesterol
4. Brassicasterol
5. Coprostanone
6. Campesterol
7. Stigmasterol
8. β -Sitosterol



Sugars (Alditol Acetates)

Column: DM-225, 30 m x 0.25 mm x 0.25 μ m
 Cat. No.: 8421
 Index: CFR00128
 Oven Temp.: 190 °C (hold 5 min) to 250 °C (hold 5 min) at 8 °C/min
 Carrier Gas: H₂, 42 cm/sec, 40 °C
 Injection: Split, 50:1, 260 °C
 Sample: Alditol acetates derivative, 0.5 μ L
 Detector: FID, 16×10^{-11} AFS, 260 °C

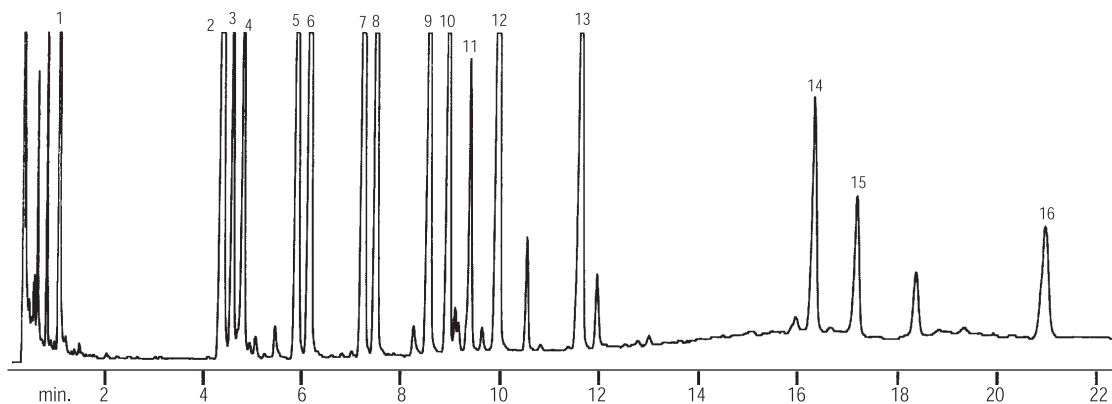
1. Rhamnitol
2. Fucitol
3. Ribitol
4. Arabinitol
5. Mannitol
6. Galactitol
7. Glucitol
8. Inositol



Sugars (Alditol Acetates)

Column: DM-2330, 30 m x 0.32 mm x 0.20 μ m
 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 μ L
 Detector: FID, 2×10^{-11} AFS, 275 °C

- | | |
|-------------------|--------------------------------------|
| 1. Glyceraldehyde | 10. Galactitol |
| 2. Deoxyribitol | 11. Glucitol |
| 3. Rhamnitol | 12. Inositol |
| 4. Fucitol | 13. Glucoheptitol |
| 5. Ribitol | 14. <i>n</i> -Acetyl galactose amine |
| 6. Arabinitol | 15. <i>n</i> -Acetyl glucose amine |
| 7. Xylitol | 16. 2-Keto-3-deoxyoctanate |
| 8. Deoxyglucitol | |
| 9. Mannitol | |

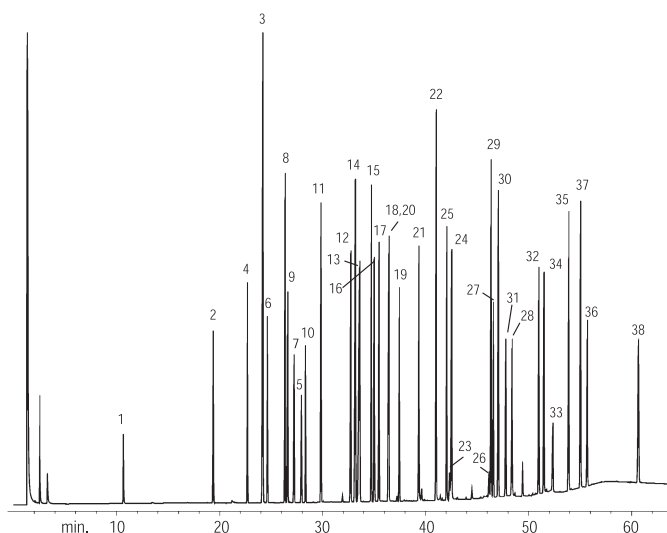


Basic Drugs (Underivatized)

Column: 30 m x 0.25 mm x 0.25 μ m
 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 μ L, 1000 ng/ μ L
 Detector: FID, 1.28 x 10⁻¹⁰ AFS, 320 °C

DM-35

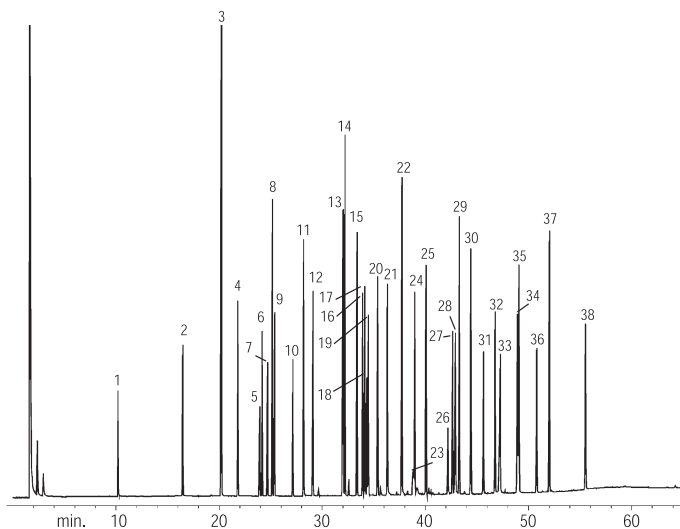
Index: CPR00236



- | | |
|----------------------|--------------------|
| 1. Nicotine | 20. Bupivacaine |
| 2. Benzocaine | 21. Scopolamine |
| 3. Cotinine | 22. Codeine |
| 4. Meperidine | 23. Morphine |
| 5. Caffeine | 24. Diazepam |
| 6. Benzphetamine | 25. Chlorpromazine |
| 7. Ketamine | 26. Temazepam |
| 8. Diphenhydramine | 27. Flunitrazepam |
| 9. Lidocaine | 28. Bromazepam |
| 10. Phenyltoloxamine | 29. Prazepam |
| 11. Tripeleminamine | 30. Acetopromazine |
| 12. Phenothiazine | 31. Flurazepam |
| 13. Dextromethorphan | 32. Papaverine |
| 14. Methadone | 33. Clonazepam |
| 15. Amitriptyline | 34. Haloperidol |
| 16. Trimipramine | 35. Alprazolam |
| 17. Tetracaine | 36. Triazolam |
| 18. Pyrilamine | 37. Thioridazine |
| 19. Medazepam | 38. Trazodone |

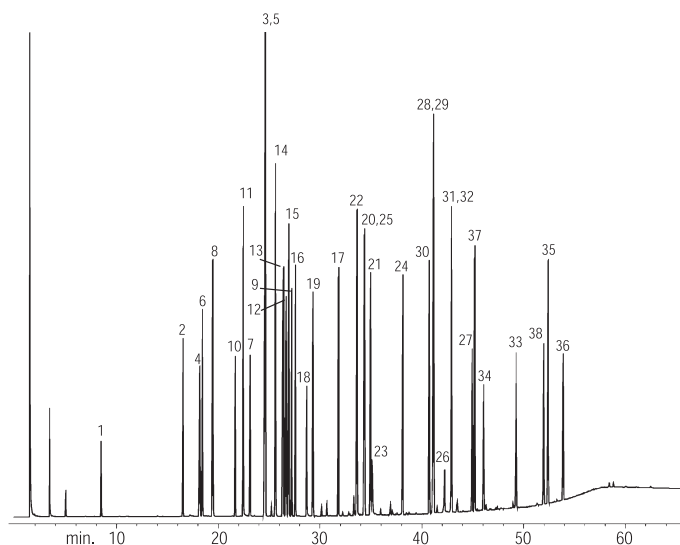
DM-5

Index: CPR00235



DM-200

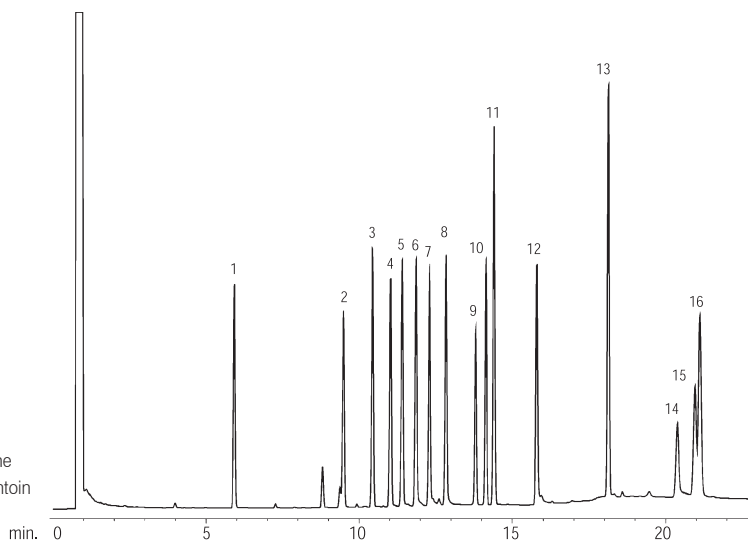
Index: CPR00237



Acidic / Neutral Drugs (Underivatized)

Column: DM-35, 30 m x 0.53 mm x 1.00 μ m
 Cat. No.: 7951
 Index: CPR00262
 Oven Temp.: 100 $^{\circ}$ C to 280 $^{\circ}$ C (hold 5 min) at 10 $^{\circ}$ C/min
 Carrier Gas: He, 40 cm/sec, 100 $^{\circ}$ C
 Injection: Splitless, 0.5 min, 250 $^{\circ}$ C
 Sample: Acidic / Neutral drugs, 1.0 μ L, 50 μ g/mL
 Detector: FID, 5.12 x 10⁻¹⁰ AFS, 250 $^{\circ}$ C

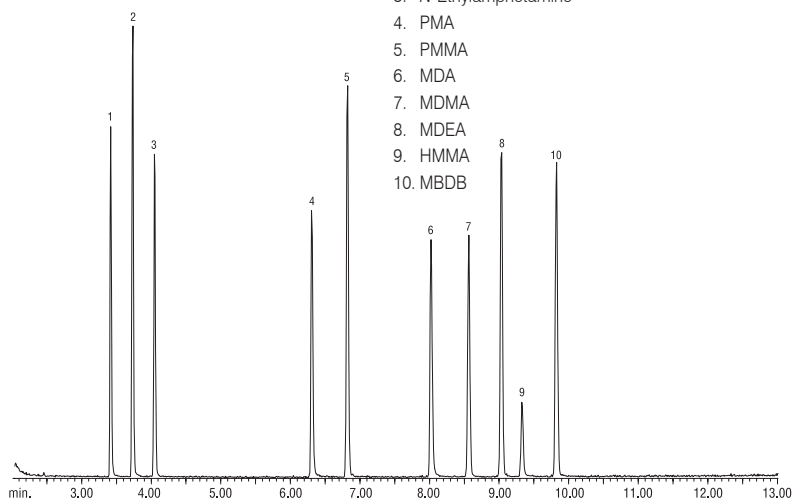
1. Ethosuximide
2. Barbitol
3. Methyprylon
4. Aprobarbital
5. Butalbital
6. Amobarbital
7. Pentobarbital
8. Secobarbital
9. Meprobamate
10. Carisoprodal
11. Glutethimide
12. Phenobarbital
13. Methaqualone
14. Primidone
15. Carbamazepine
16. Diphenylhydantoin



Sympathomimetic Amines Drugs

Column: DM-35 Amine, 30 m x 0.25 mm x 0.50 μ m
 Cat. No.: 7821
 Index: CPR00574
 Oven Temp.: 150 $^{\circ}$ C to 240 $^{\circ}$ C at 7 $^{\circ}$ C/min
 Carrier Gas: He, 30 cm/sec
 Injection: Split, 250 $^{\circ}$ C
 Sample: Sympathomimetic amines drugs, 1.0 μ L, 1,000 ng/ μ L
 Detector: MS
 Scan Range: 40 - 450 AMU
 Ionization: EI, scan

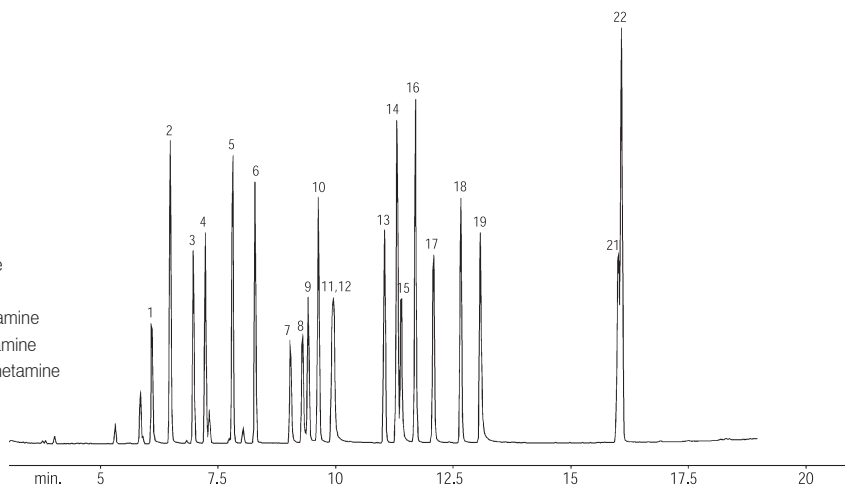
1. Amphetamine
2. Methamphetamine
3. N-Ethylamphetamine
4. PMA
5. PMMA
6. MDA
7. MDMA
8. MDEA
9. HMMA
10. MBDB



Sympathomimetic Amines Drugs

Column: DM-5 Amine, 30 m x 0.25 mm x 0.50 μ m
 Cat. No.: 7815
 Index: CPR00438
 Oven Temp.: 100 $^{\circ}$ C to 310 $^{\circ}$ C at 10 $^{\circ}$ C/min
 Injection: Split, 45 mL/min
 Detector: MS

- | | |
|------------------------|---------------------------------------|
| 1. Phenylethylamine | 12. Pseudoephedrine |
| 2. Amphetamine | 13. Phenmetrazine |
| 3. Phentermine | 14. Phendimetrazine |
| 4. Methamphetamine | 15. Methylenedioxyamphetamine |
| 5. Fenfluramine | 16. Diethylpropion |
| 6. Mephentermine | 17. Methylenedioxymethamphetamine |
| 7. Cathinone | 18. Methylenedioxyethylamphetamine |
| 8. Phenylpropanolamine | 19. 4-Methyl-2,5-dimethoxyamphetamine |
| 9. Methcathinone | 20. Phenylephrine |
| 10. Nicotine | 21. Caffeine |
| 11. Ephedrine | 22. Benzphetamine |

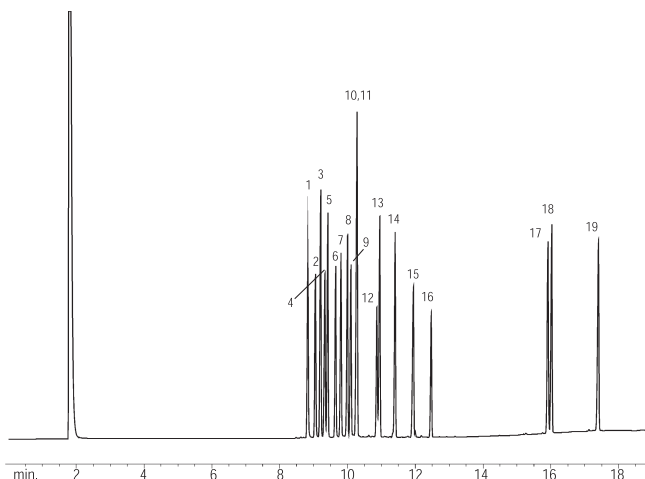


Applications

Steroids, Anabolic

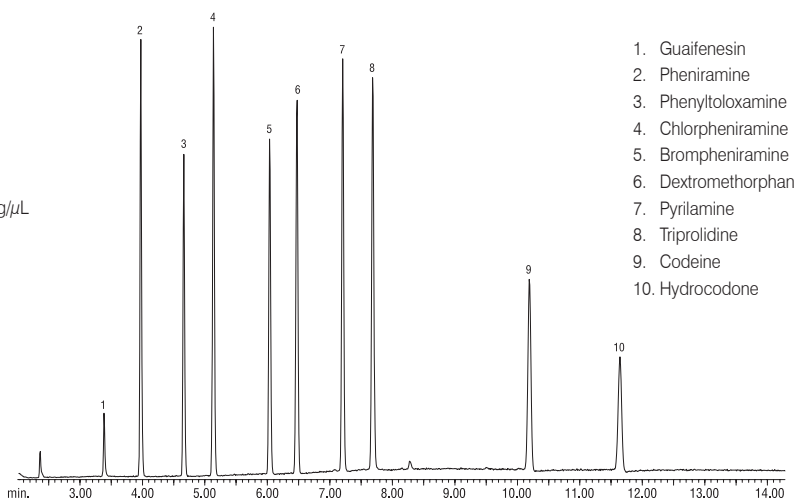
Column: DM-5, 30 m x 0.25 mm x 0.10 μ m
 Cat. No.: 7219
 Index: CPR00255
 Oven Temp.: 180 °C to 340 °C (hold 3 min) at 10 °C/min
 Carrier Gas: He, 35 cm/sec, 180 °C
 Injection: Split, 50:1, 280 °C
 Sample: Anabolic steroids, 0.5 μ L, 1,000 ng/ μ L
 Detector: FID, 1.28 x 10⁻¹⁰ AFS, 340 °C

- | | |
|--|--|
| 1. 5-Androstene-3 β , 17 β -diol | 11. Bolasterone |
| 2. 17 α -Methyl-5-androstene-3 β , 17 β -diol | 12. Oxymethalone |
| 3. 5 α -Androstan-17 β -ol-3-one | 13. 19-Nortestosterone-17-propionate |
| 4. 19-Nortestosterone | 14. Testosterone propionate |
| 5. 17 α -Methylandrostan-17 β -ol-3-one | 15. Fluoxymesterone |
| 6. Mesterolone | 16. 4-Chlorotestosterone-17-acetate |
| 7. Testosterone | 17. Testosterone-17 β -cypionate |
| 8. 17 α -Methyltestosterone | 18. 1-Dehydrotestosterone benzoate |
| 9. 1-Dehydrotestosterone | 19. 1-Dehydrotestosterone undecylenate |
| 10. 1-Dehydro-17 α -methyltestosterone | |



Cold Medicine

Column: DM-35 Amine, 30 m x 0.25 mm x 0.50 μ m
 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 μ L, 1,000 ng/ μ L
 Detector: MS
 Scan Range 40 - 450 AMU
 Ionization EI, scan

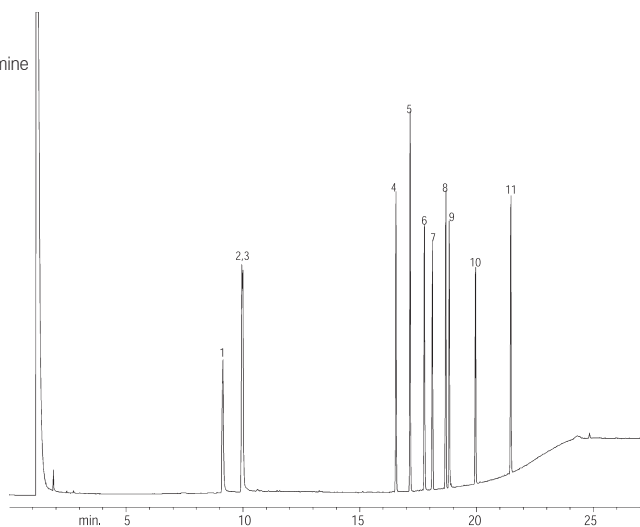


1. Guaifenesin
2. Pheniramine
3. Phenyltoloxamine
4. Chlorpheniramine
5. Brompheniramine
6. Dextromethorphan
7. Pyrilamine
8. Triprolidine
9. Codeine
10. Hydrocodone

Antihistamines

Column: DM-5 Amine, 30 m x 0.32 mm x 1.00 μ m
 Cat. No.: 7817
 Index: CPR00247
 Oven Temp.: 130 °C (hold 5 min) to 305 °C (hold 5 min) at 10 °C/min
 Carrier Gas: H₂, 43 cm/sec, 130 °C
 Injection: Split, 50:1, 305 °C
 Sample: Antihistamines, 1.0 μ L, 1,000 ng/ μ L
 Detector: FID, 6.4 x 10⁻¹¹ AFS, 305 °C

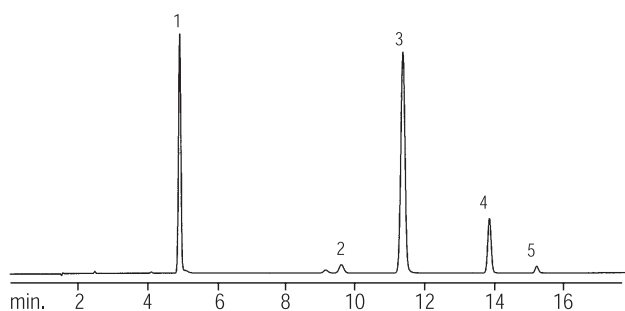
1. Phenylpropanolamine
2. Ephedrine
3. Pseudoephedrine
4. Pheniramine
5. Diphenhydramine
6. Doxylamine
7. Phenyltoloxamine
8. Methapyrilene
9. Chlorpheniramine
10. Brompheniramine
11. Triprolidine



Organic Volatile Impurities (USP 467)

Column: DM-624, 30 m x 0.53 mm x 3.00 μ m + 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

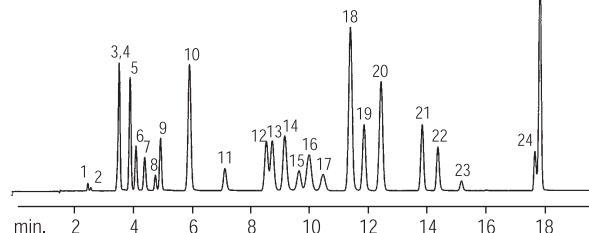
1. Methylene chloride
2. Chloroform
3. Benzene
4. Trichloroethylene
5. 1,4-Dioxane



Organic Volatile Impurities

Column: DM-624, 30 m x 0.53 mm x 3.00 μ m
 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

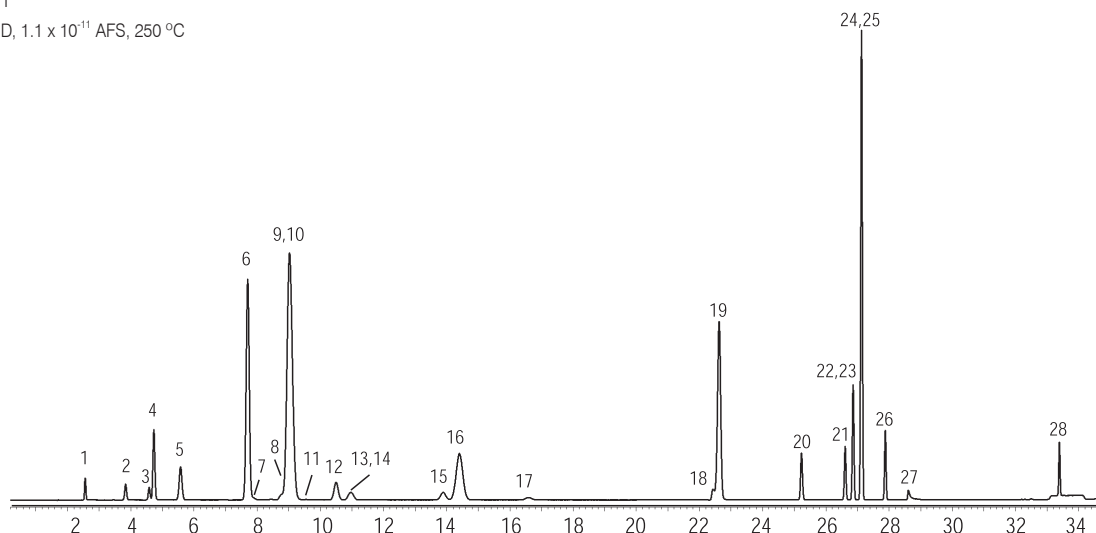
- | | | |
|-----------------------|---------------------------|------------------------|
| 1. Ethylene oxide | 10. <i>n</i> -Hexane | 19. 1,2-Dichloroethane |
| 2. Methanol | 11. <i>n</i> -Propanol | 20. Heptane |
| 3. Ethanol | 12. Methyl ethyl ketone | 21. Trichloroethylene |
| 4. Diethyl ether | 13. Ethyl acetate | 22. <i>n</i> -Butanol |
| 5. 1,1-Dichloroethene | 14. Tetrahydrofuran | 23. 1,4-Dioxane |
| 6. Acetone | 15. Chloroform | 24. Pyridine |
| 7. Isopropanol | 16. 1,1,1-Trichloroethane | 25. Toluene |
| 8. Acetonitrile | 17. Carbon tetrachloride | |
| 9. Methylene chloride | 18. Benzene | |



EP Class 1 and Class 2 Solvents

Column: DM-624, 30 m x 0.53 mm x 3.00 μ m
 Cat. No.: 7751
 Index: CPR00553
 Oven Temp.: 40 °C (hold 20 min) to 240 °C (hold 20 min) at 10 °C/min
 Carrier Gas: H₂, 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

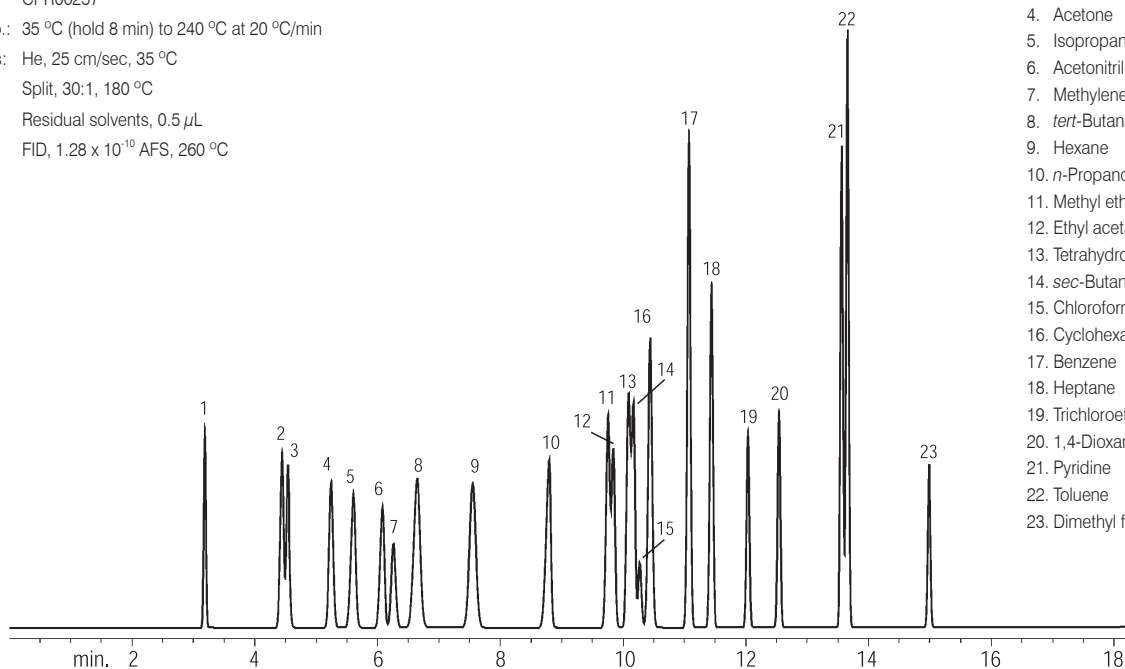
- | | | |
|-----------------------------------|---------------------------|-----------------------------------|
| 1. Methanol | 10. 1,1,1-Trichloroethane | 19. Toluene |
| 2. 1,1-Dichloroethene | 11. Carbon tetrachloride | 20. 2-Hexanone |
| 3. Acetonitrile | 12. Benzene | 21. Chlorobenzene |
| 4. Dichloromethane | 13. 1,2-Dimethoxyethane | 22. DMF |
| 5. Hexane | 14. 1,2-Dichloroethane | 23. Ethylbenzene |
| 6. <i>cis</i> -1,2-Dichloroethene | 15. 1,1,2-Trichloroethene | 24. <i>m</i> -Xylene |
| 7. Nitromethane | 16. Methyl cyclohexane | 25. <i>p</i> -Xylene |
| 8. Chloroform | 17. 1,4-Dioxane | 26. <i>o</i> -Xylene |
| 9. Cyclohexane | 18. Pyridine | 27. <i>N,N</i> -Dimethylacetamide |
| | | 28. 1,2,3,4-Tetrahydronaphthalene |



Residual Solvents

Column: DM-624, 30 m x 0.53 mm x 3.00 μ m
 Cat. No.: 7751
 Index: CPR00257
 Oven Temp.: 35 $^{\circ}$ C (hold 8 min) to 240 $^{\circ}$ C at 20 $^{\circ}$ C/min
 Carrier Gas: He, 25 cm/sec, 35 $^{\circ}$ C
 Injection: Split, 30:1, 180 $^{\circ}$ C
 Sample: Residual solvents, 0.5 μ L
 Detector: FID, 1.28×10^{-10} AFS, 260 $^{\circ}$ 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

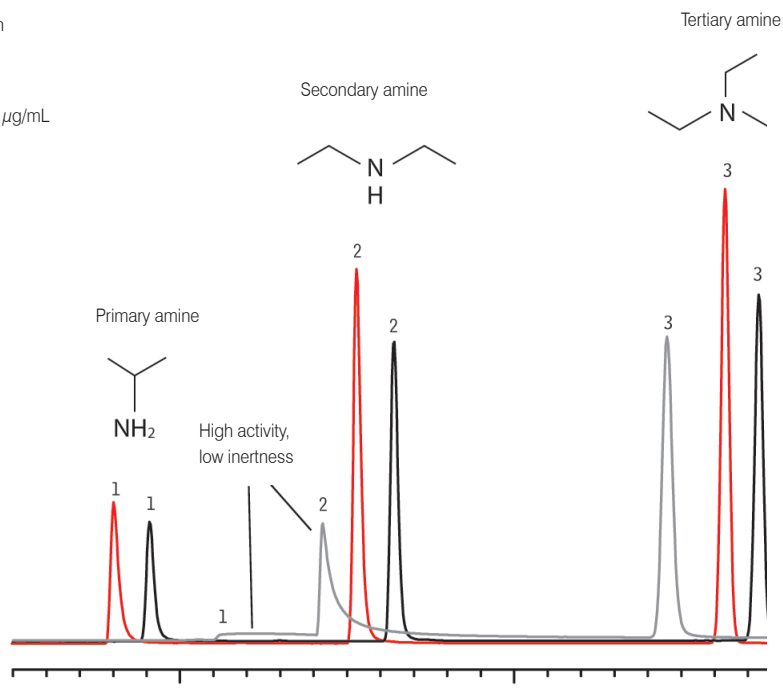


Applications

Primary, Secondary and Tertiary Amines

Column: DM-624MS, 30 m x 0.32 mm x 1.80 μ m
 Cat. No.: 8838
 Index: CPR1162
 Oven Temp.: 50 $^{\circ}$ C (hold 1 min) to 200 $^{\circ}$ C (hold 5 min) at 20 $^{\circ}$ C/min
 Carrier Gas: He, 37 cm/sec
 Injection: Split, 20:1, 1.0 μ L, 250 $^{\circ}$ C
 Sample: Primary, secondary and tertiary amines in DMSO, 100 μ g/mL
 Detector: FID, 250 $^{\circ}$ C

1. Isopropylamine 100 μ g/mL
2. Diethylamine 100 μ g/mL
3. Triethylamine 100 μ g/mL



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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 for 1 min, shock in thermostatic water bath for 30 min at 60 °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% H₃PO₄ as the sample solution to be purified.

*Histamine extract: MeOH:50 mM KH₂PO₄ = 1:1

3. Sample purification

ProElut™ PXC 150 mg / 6 mL (**Cat#68204**)

Condition: 6 mL MeOH / 6 mL H₂O

Load: 6 mL supernatant

Wash 1: 6 mL 0.1 M HCl

Wash 2: 6 mL solution of NH₄OH:MeOH:H₂O = 5:5:90

Elute: 6 mL solution of NH₄OH:MeOH:H₂O = 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 °C

Detection: FLD Ex: 345 nm, Em: 445 nm

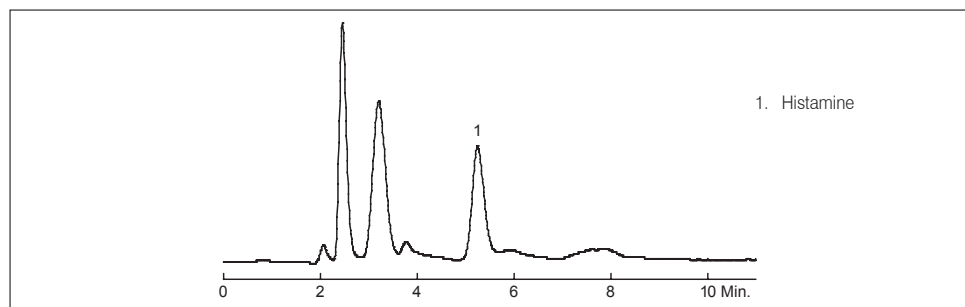
Injection Volume: 10 μL

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

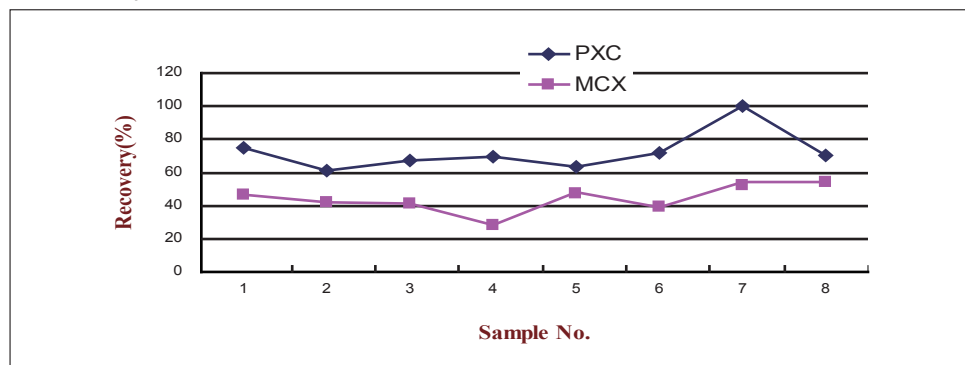
5.1. Recovery

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



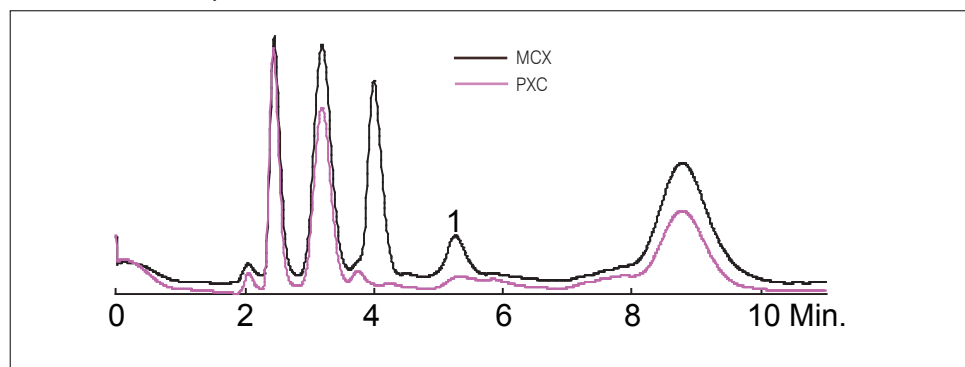
Chromatogram of aquatic products extracts - spiked histamine in aquatic products (10 mg/kg)

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 H₂O

Load*: supernatant

Wash 1: 3 mL deionized water

Wash 2: 3 mL MeOH

Elute: 3 mL 5 % NH₄OH in MeOH

Reconstitute: Evaporate at 50 °C by N₂, reconstitute to 1 mL with MeOH:H₂O (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 °C

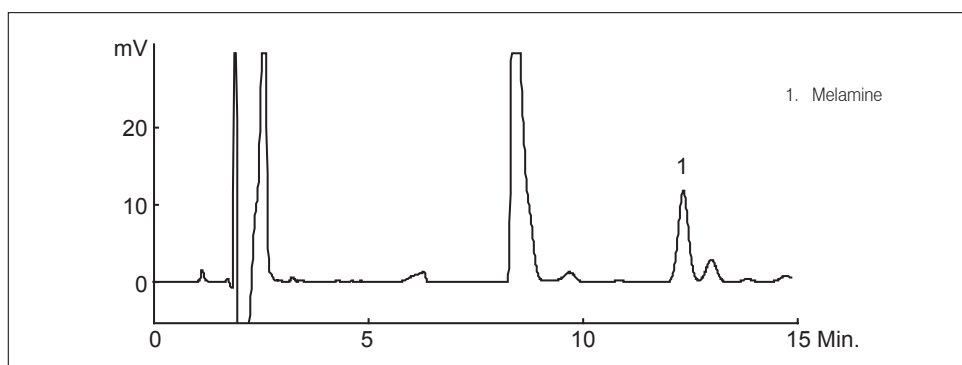
Detection: UV 240 nm

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

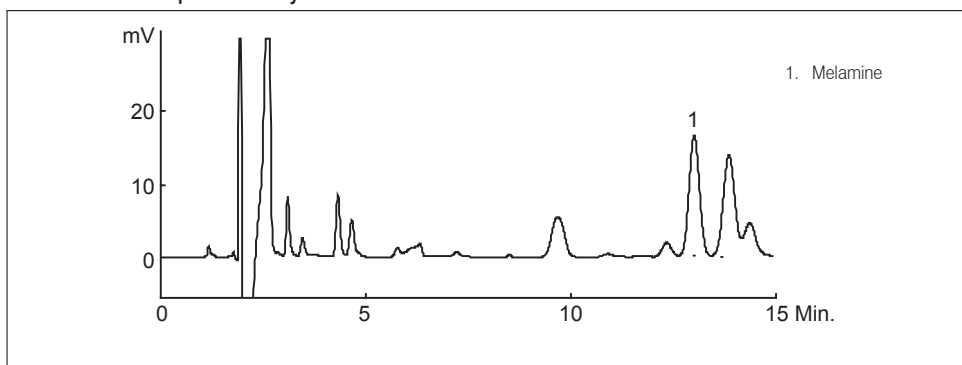
5. Recovery

5.1. Milk powder sample recovery



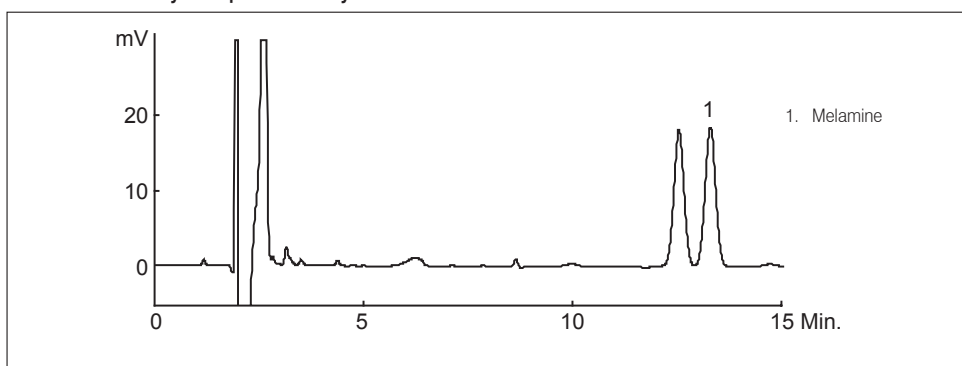
Chromatogram of milk powder extracts - spiked melamine in milk powder, 0.5 mg/kg

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 °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 H₂O

Load: Add sample

Wash 1: 3 mL H₂O

Wash 2: 3 mL MeOH:H₂O = 5:95

Elute: 5 mL MeOH

Reconstitute: Evaporate at 30 °C by N₂, 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 % CH₃COOH in H₂O

Flow Rate: 1.0 mL/min

Temperature: 35 °C

Detection: UV 270 nm

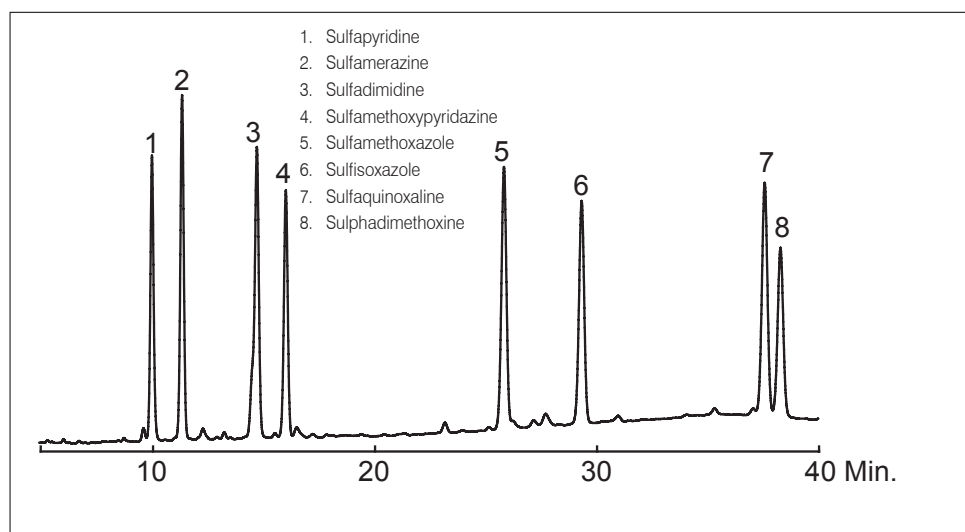
Injection Volume: 20 μL

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
Sulfamethoxyipyridazine	0.1	94.4	4.8
	1.0	91.8	3.8
Sulfamethoxazole	0.1	85.3	4.9
	1.0	84.1	3.6
Sulfisoxazole	0.1	93.7	6.4
	1.0	92.8	4.8
Sulfaquinoxaline	0.1	88.5	5.1
	1.0	86.2	3.9
Sulphadimethoxine	0.1	84.6	5.3
	1.0	82.9	3.2



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 H₂O), 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 H₂O

Load: Add sample

Wash 1: 6 mL H₂O

Wash 2: 6 mL MeOH

Elute: 6 mL MeOH (5 % NH₄OH)

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 % CH₃COOH in H₂O

Flow Rate: 1.0 mL/min

Temperature: 35 °C

Detection: UV 270 nm

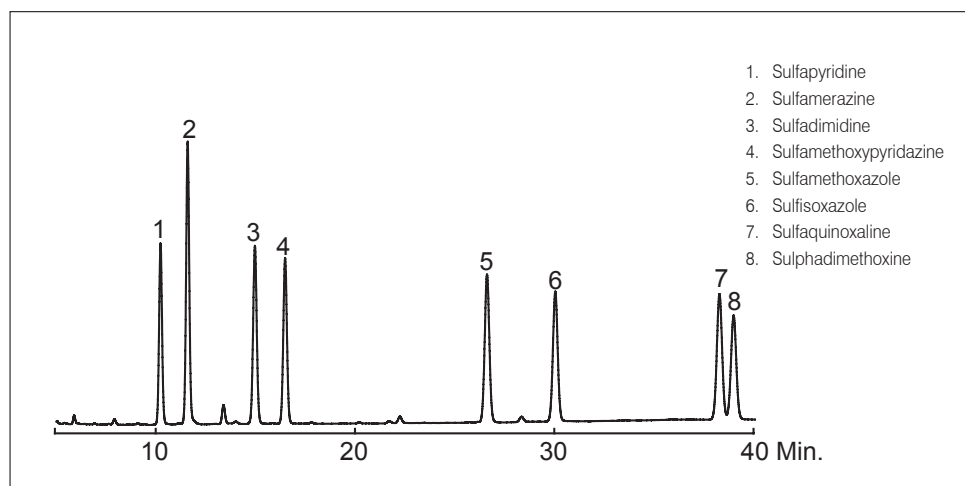
Injection Volume: 20 μL

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 H₂O / 3 mL 30 mM HCl
Load: Add sample
Wash 1: 3 mL deionized water
Wash 2: 3 mL MeOH
Elute: 5 mL MeOH (4% NH₄OH), evaporate to near dry at 50 °C by N₂

4. Derivatization

Add 100 μ L toluene and 100 μ L *bis*-trimethylsilyl trifluoroacetamide (BSTFA), vortex for 20 sec, seal, heat for 1 h at 80 °C, add 300 μ L of toluene after cooling as the sample solution.

5. GC-MS method

GC conditions

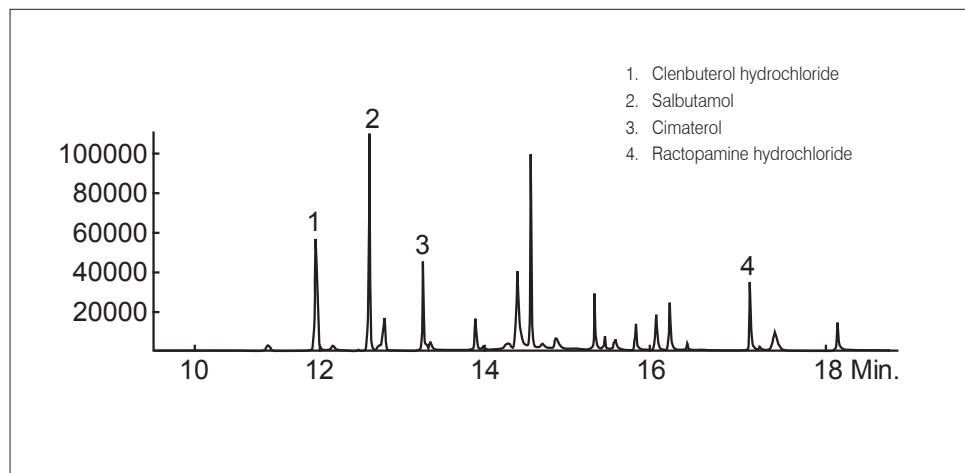
Column: DM-5MS 30 m x 0.25 mm x 0.25 μ m (Cat#8221)
Inlet Temperature: 220 °C
Injection Mode: Splitless
Injection Volume: 1 μ L
Temperature Program: Heating to 70 °C in 0.6 min, then heating to 200 °C with 25 °C/min in 6 min, finally heating to 280 °C with 25 °C/min in 5 min
Carrier Gas: He > 99.999%, flow rate: 0.9 mL/min

MS conditions

Interface Temperature: 280 °C
Solvent Delay: 8 min
EI Temperature: 230 °C
Quadrupole Temperature: 160 °C
Ion Monitoring: Qualitative ion 86, 243, 262, 277, quantitative ion 86

5. Recovery

Compounds	Spike Level ($\mu\text{g}/\text{kg}$)					
	1.0		10.0		100	
	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)

Food

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:H₂O = 97:3

Flow Rate: 1.0 mL/min

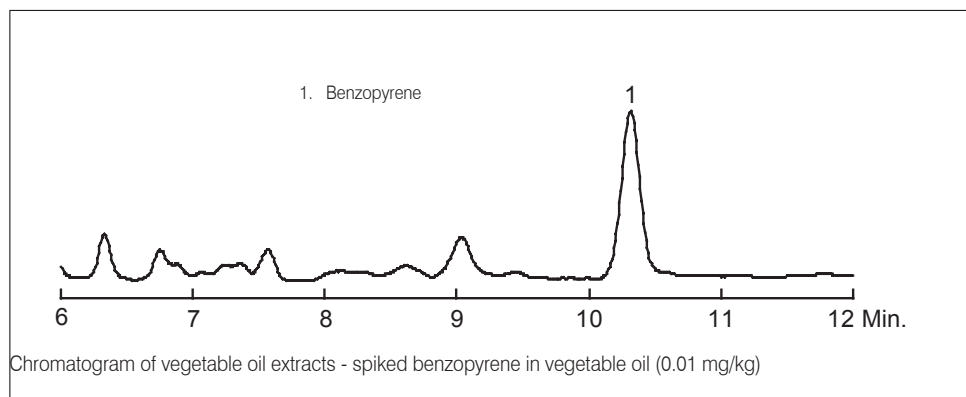
Temperature: 30 °C

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



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

Weigh 5.0 g of homogenized sample, add 20 mL of Mcllvaine buffer*, vortex 2 min, centrifuge at 4,000 rpm for 5 min, collect supernatant. Wash lower residue with 20 mL, and then 10 mL Mcllvaine 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.

*Mcllvaine buffer: Disodium hydrogen phosphate ($\text{Na}_2\text{HPO}_4 \cdot 12\text{H}_2\text{O}$) 27.6 g, citric acid ($\text{C}_6\text{H}_8\text{O}_7 \cdot \text{H}_2\text{O}$) 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 available 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

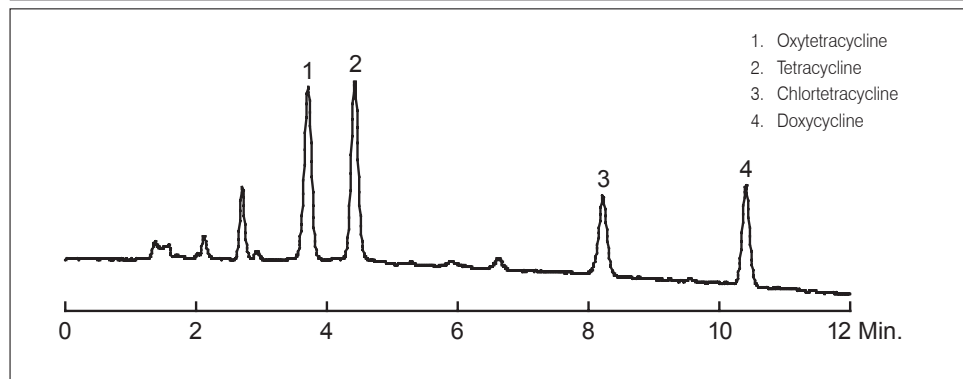
Injection Volume: 20 μL

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 H₂O, 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 H₂O

Load: Adding sample

Wash: 3 mL H₂O / 3 mL MeOH

Elute: 3 mL MeOH (5 % NH₄OH)

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

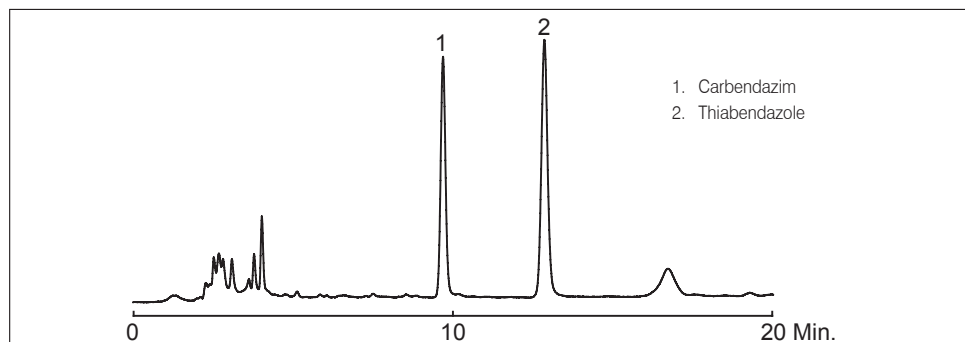
Injection Volume: 20 μL

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

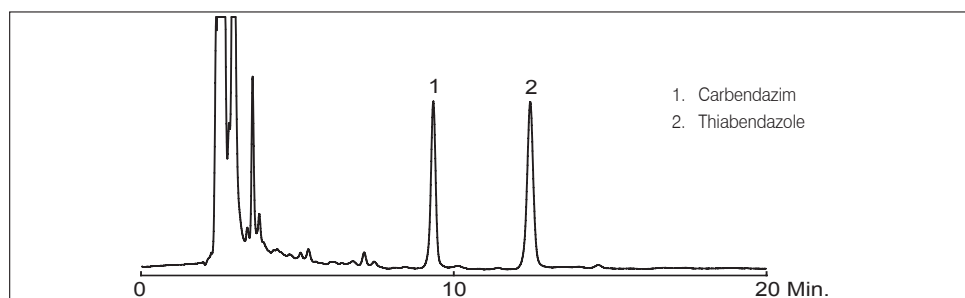
Compounds	Spike Level (mg/L)	Recovery (%)	RSD (%) (n = 3)
Carbendazim	0.1	87.0	8.0
	0.5	99.7	3.5
Thiabendazole	0.1	83.1	7.8
	0.5	102.6	3.8



Chromatography of fungicides - spiked fungicides in grape juice (0.1 mg/L)

5.2. Orange juice

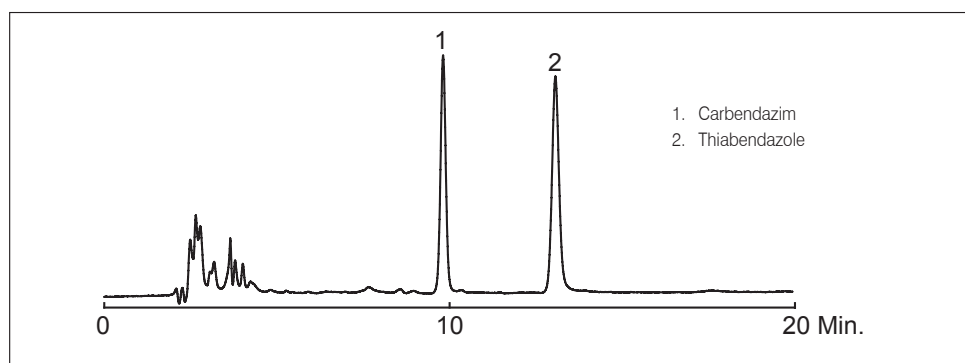
Compounds	Spike Level (mg/L)	Recovery (%)	RSD (%) (n = 3)
Carbendazim	0.1	100.4	2.6
	0.5	94.4	4.5
Thiabendazole	0.1	98.1	3.1
	0.5	98.3	1.9



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 H₂O, add 20 mL Mcllvaine buffer*, vortex for 2 min, centrifuge at 4,000 rpm for 10 min, take 20 mL supernatant as the sample solution.

*Mcllvaine buffer: Disodium hydrogen phosphate (Na₂HPO₄•12H₂O) 27 g, citric acid (C₆H₈O₇•H₂O) 12 g, EDTA disodium salt 37.2 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 H₂O

Load*: 20 mL sample

Wash 1: 6 mL H₂O

Wash 2: 6 mL 10 % MeOH in H₂O

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 available 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 H₂O, B: MeOH:MeCN = 1:1

Flow Rate: 1.0 mL/min

Temperature: 30 °C

Detection: UV 365 nm

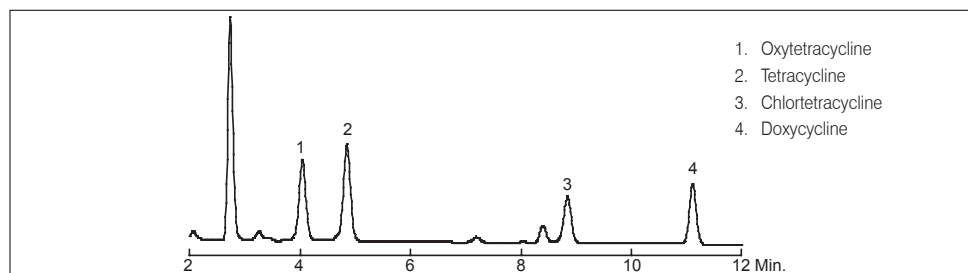
Injection Volume: 20 μL

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 H₃PO₄

3. Sample purification

ProElut™ PLS 60 mg / 3 mL (Cat#68003)

Condition: 3 mL MeOH:MTBE = 10:90 / 3 mL MeOH / 3 mL H₂O

Load: 100 mL sample, flow rate ≤ 5 mL/min

Wash: 3 mL H₂O

Elute: 3 mL MeOH:MTBE = 10:90

Reconstitute: Evaporate at 40 °C by N₂, reconstitute to 1 mL with MeCN:H₂O (50:50, V / V) solution

4. HPLC method

Column: Inspire™ 5 μm C18, 150 x 4.6 mm (Cat#81001)

Mobile Phase: A: 1% CH₃COOH in H₂O, B: 1% CH₃COOH in MeCN

Flow Rate: 1.0 mL/min

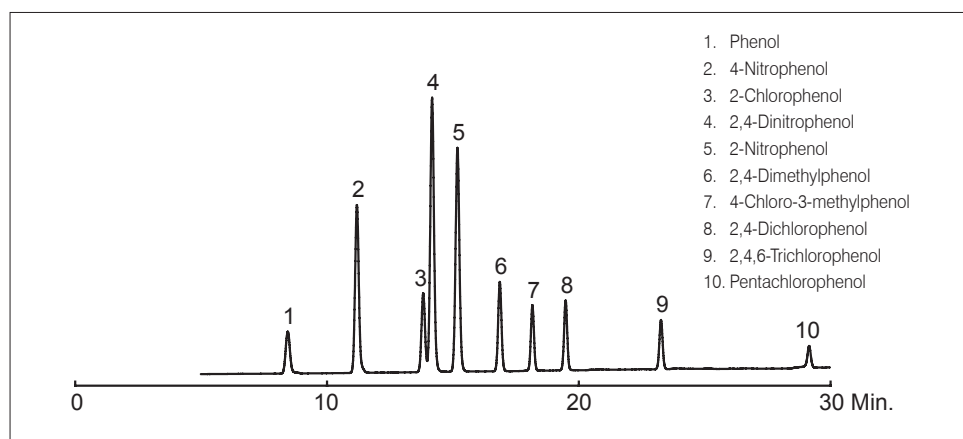
Temperature: Ambient

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 H₂O

Load: Up to 500 mL sample, flow rate ≤ 15 mL/min

Wash: 3 mL 5 % MeOH / H₂O

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: H₂O, B: MeCN

Flow Rate: 1.0 mL/min

Temperature: 30 °C

Detection: UV 230 nm

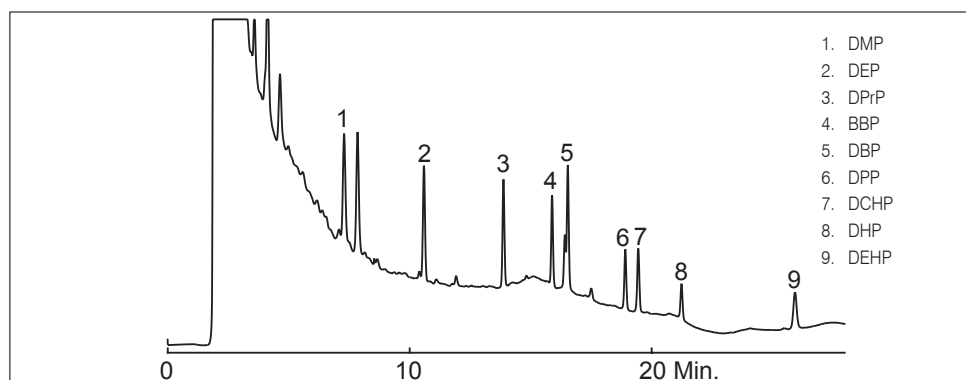
Injection Volume: 20 μL

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 μ L H₃PO₄

3. Sample purification

ProElut™ PLS 60 mg / 3 mL (Cat#68003)

Condition: 3 mL MeOH / 3 mL H₂O

Load: 2 mL sample

Wash: 3 mL 5 % MeOH in H₂O

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 μ m C18, 250 x 4.6 mm (Cat#81006)

Mobile Phase: MeOH:MeCN:10 mM oxalic acid in H₂O = 15:15:70

Flow Rate: 1.0 mL/min

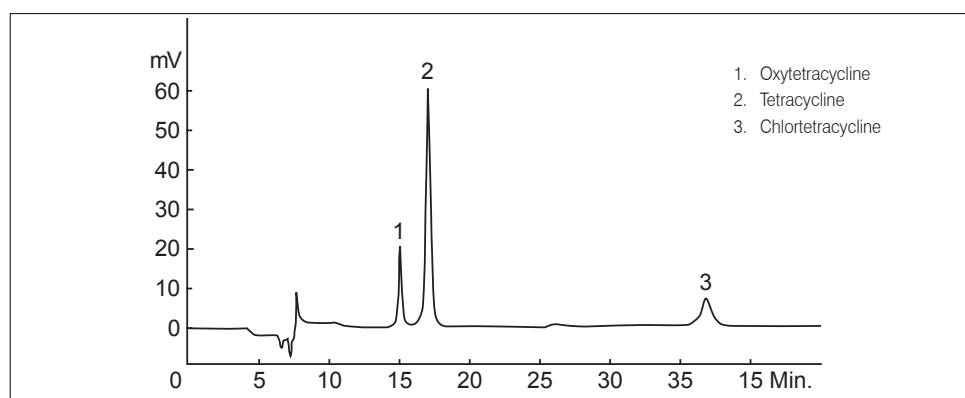
Temperature: 30 °C

Detection: UV 365 nm

Injection Volume: 20 μ L

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)

Others

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 m² 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 H₂O

Load: Adding sample

Wash: 6 mL 5 % MeOH in H₂O

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% CH₃COOH in H₂O = 40:60

Flow Rate: 1.0 mL/min

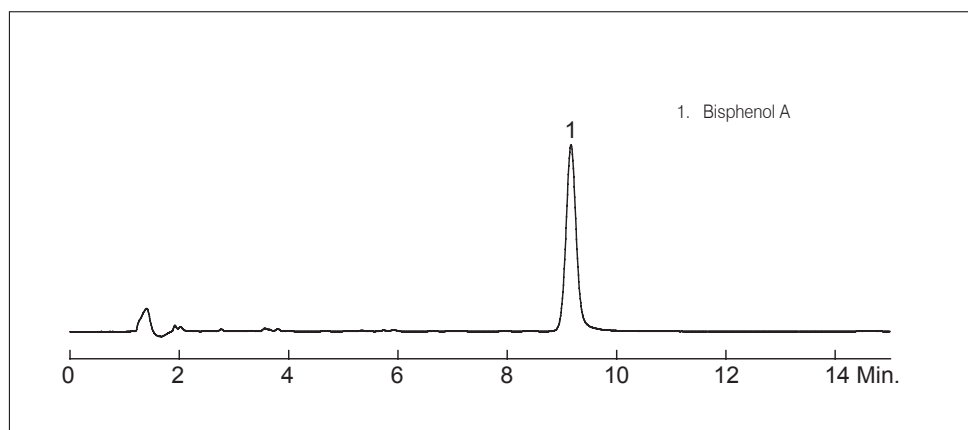
Temperature: 30 °C

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)

A		
Acebutolol	10, 17, 21, 33, 67, 71, 73, 162	
Acenaphthene	6, 67, 72, 95, 124, 185, 186, 187, 188	
Acenaphthene-d10	187, 188	
Acenaphthylene	95, 124, 185, 186, 188	
Acesulfame K	175, 176	
Acetaldehyde	171, 216, 217, 220, 231, 232	
Acetaldehyde-DNPH	171	
Acetamide	221, 223, 225	
Acetaminophen	7, 159	
Acetanilide	7, 38, 77	
Acetic acid	28, 172, 173, 220, 228, 232	
Acetochlor	187	
Acetoin	232	
Acetone	171, 215, 220, 227, 231, 232, 239, 240	
Acetone-DNPH	171	
Acetonitrile	220, 239, 240	
Acetophenone	5, 15, 36, 188, 202, 234	
Acetopromazine	236	
Acetylaceton	8	
Acetylene	108, 197, 198, 199, 200, 201	
n-Acetyl galactose amine	235	
n-Acetyl glucose amine	235	
Acetylsalicylic acid	31, 61, 159	
Acetyl tributyl citrate	221, 223, 225	
Acid orange I	171	
Acid orange II	171	
Acid red 2G	171	
Acid yellow 36	171	
Acrolein-DNPH	171	
Acrylonitrile	219, 227	
Acyclovir	33	
Adenine	30, 38, 60	
Adiponitrile	212	
ADP	48	
Air	196, 217	
Ala	80	
Aldrin	191, 193	
Alkylthiophenes	204	
Allyl alcohol	221, 223, 225	
Allylmercaptan	204	
Aloe emodin	58	
Alpranolol	10, 162	
Alprazolam	27, 48, 167, 236	
Alprenolo	21	
Alprenolol	42, 67, 71, 73	
Amaranth	171	
Ametryne	194	
4-Amino-2,6-dinitrotoluene	195	
2-Amino-4,6-dinitrotoluene	195	
2-Amino-4-nitrotoluene	195	
2-Amino-6-nitrotoluene	195	
p-Aminobenzoic acid	18, 66, 159, 169, 174, 175	
2-Aminobutyric acid	80	
6-Aminocapronitrile	212	
Aminoethylthanolamine	212	
Aminoethylpiperazine	212	
Aminomethylcyclopentylamine	212	
4-Aminosalicylic acid	31, 61	
Amitriptyline	6, 11, 18, 24, 25, 41, 49, 54, 67	
	72, 74, 76, 167, 168, 236	
Amobarbital	237	
Amoxicillin	166	
AMP	48	
Amphetamine	237	
Ampicillin	166	
Amyl alcohol	227	
Amylbenzene	5, 63	
tert-Amyl ether	203	
5 α -Androstan-17 β -ol-3-one	238	
5-Androstene-3 β ,17 β -diol	238	
Aniline	8, 15, 16, 23, 65, 119, 188, 213	
Anisole	220	
Anisoxide	184	
Anthracene	95, 124, 185, 186, 188	
Aprobarbital	237	
Arabinitol	235	
Aramite	188	
Arg	80	
Argon	110, 196, 197	
L-Ascorbic acid	7, 12, 19, 31, 40, 44, 75, 159, 168, 169	
Asp	80	
Aspartam	175, 176	
Aspartame	23, 69	
Aspirin	7, 12, 14, 19, 38, 77, 169	
Aspon	191	
ATP	48	
Atraton	194	
Atrazine	192, 194	
Auramine	171	
Azinphos-ethyl	191	
Azinphos-methyl	191	
Azobenzene	187, 188	
Azorubine	171	
B		
Balan	192	
Barbital	237	
Basic orange	171	
BBP	189, 258	
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About Dikma

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