

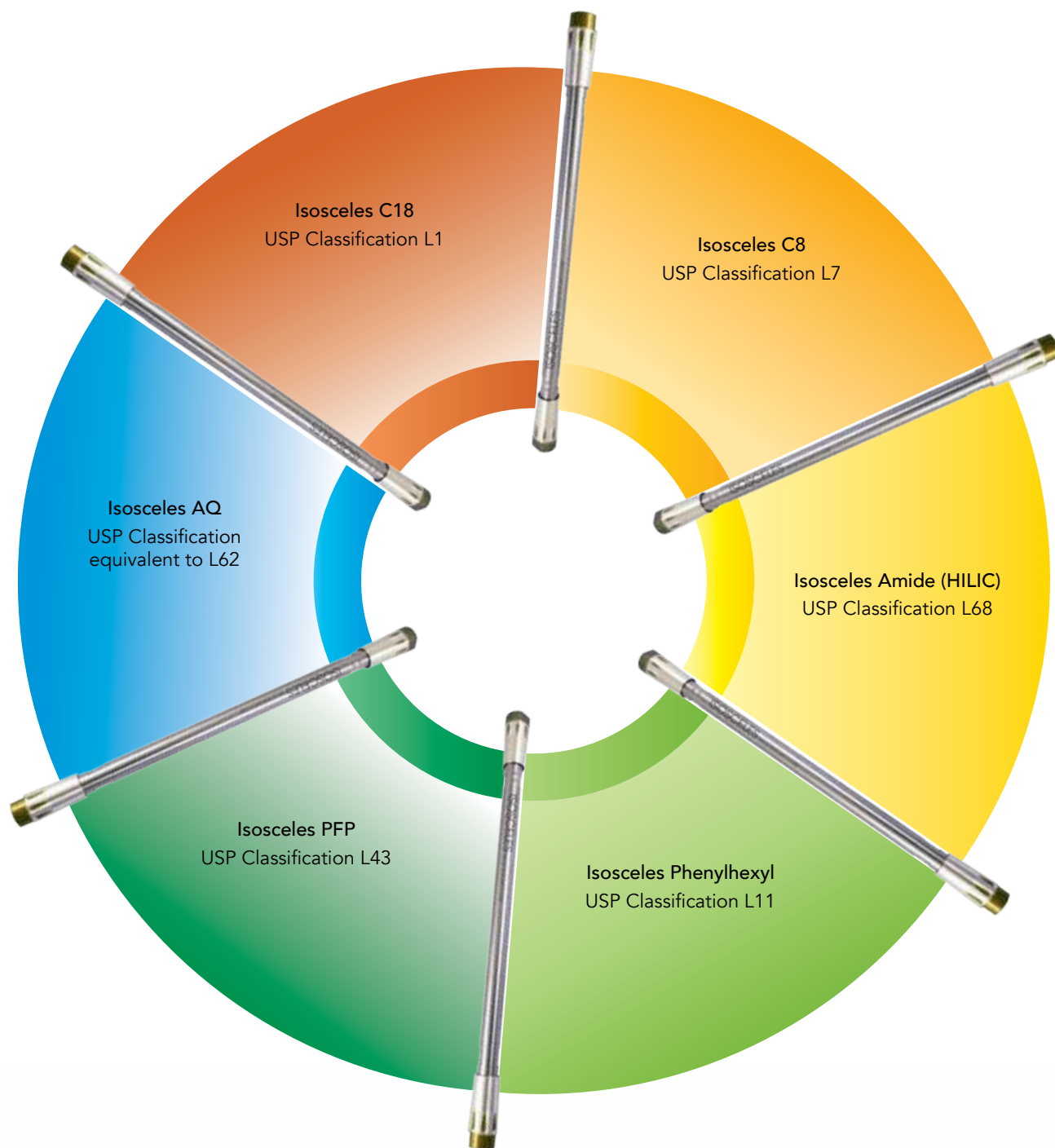


ISOSCELES

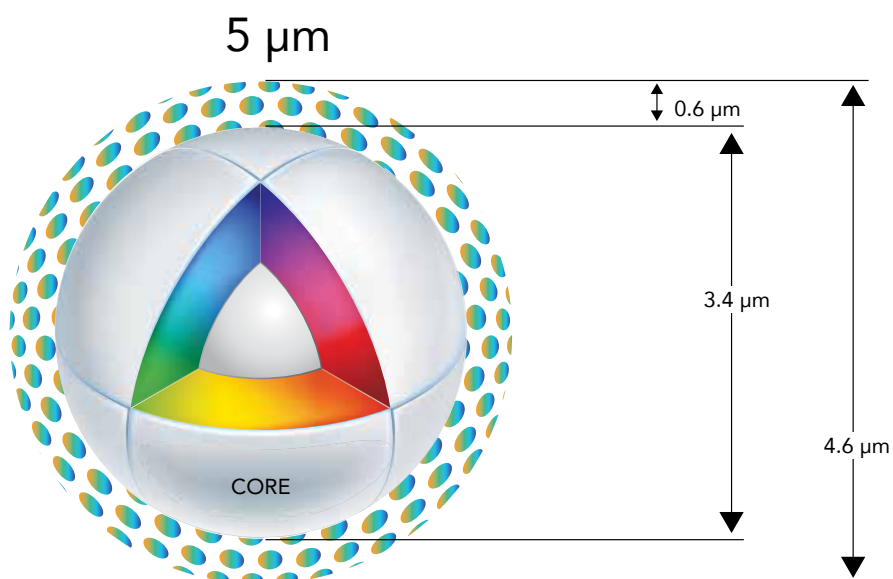
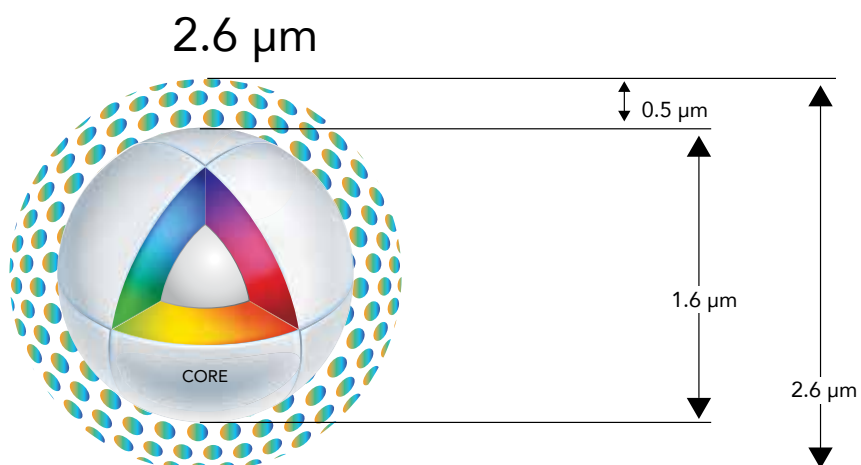
PELLICULAR CORE



Isosceles Chemistry Phases



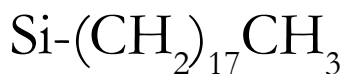
Isosceles Column Phase Selection Guidelines



Pellicular-Core Properties		
Particle Size	2.6 μm	5 μm
Outer Porous Shell	0.5 μm	0.6 μm
Core Diameter	1.6 μm	3.4 μm
Pore Size	95 Å or 160 Å	95 Å
Surface Area	140 or 90 m^2/g	85 m^2/g

Isosceles C18

- USP classification: L1
- Pellicular-core silica
- Particle sizes: 2.6 µm, 5 µm
- Pore size: 95 Å
- Carbon load: 7.5% (2.6 µm), 5.5% (5µm)
- End-capping: proprietary
- pH range 1.5 to 11



The Isosceles C18 is a first choice reversed-phase column that can be used for a wide array of compounds. The broad pH range permits flexibility under various mobile phase conditions. Proprietary end-capping minimizes secondary interactions to provide excellent peak symmetry for a multitude of compounds.

Features & Benefits

- Pellicular-core offers comparable resolution and peak capacity to sub-2 µm non-core particles but at 50% lower back pressure under the same mobile phase conditions
- Proprietary end-capping minimizes peak tailing to produce sharp symmetrical peaks for basic compounds
- Ideal for separations of molecules up to 5000 Da
- Use of 2 µm inlet frits reduces clogging due to particulates versus sub-2 µm non-core particles
- Excellent for R&D or routine analysis

Isosceles C18, 2.6 µm Ordering Information

Part No.	Description
TR-2.6C18-05021	Isosceles C18, 50 x 2.1mm, 2.6µm PC
TR-2.6C18-05046	Isosceles C18, 50 x 4.6mm, 2.6µm PC
TR-2.6C18-10021	Isosceles C18, 100 x 2.1mm, 2.6µm PC
TR-2.6C18-10046	Isosceles C18, 100 x 4.6mm, 2.6µm PC
TR-2.6C18-03046	Isosceles C18, 30 x 4.6mm, 2.6µm PC
TR-2.6C18-15021	Isosceles C18, 150 x 2.1mm, 2.6µm PC

Isosceles C18, 5 µm Ordering Information

Part No.	Description
TR-5C18-05021	Isosceles C18, 50 x 2.1mm, 5µm PC
TR-5C18-05046	Isosceles C18, 50 x 4.6mm, 5µm PC
TR-5C18-10021	Isosceles C18, 100 x 2.1mm, 5µm PC
TR-5C18-10046	Isosceles C18, 100 x 4.6mm, 5µm PC
TR-5C18-03046	Isosceles C18, 30 x 4.6mm, 5µm PC
TR-5C18-15021	Isosceles C18, 150 x 2.1mm, 5µm PC
TR-5C18-15046	Isosceles C18, 150 x 4.6mm, 5µm PC
TR-5C18-25046	Isosceles C18, 250 x 4.6mm, 5µm PC

*Note. Other dimensions available upon request.

Isosceles C18 Application

Drug Metabolism Test Mix

Column: **Isosceles C18**

2.6 μ m, 50 x 2.1 mm

Mobile Phase:

A: 0.1% formic acid
in water, (v/v)

B: acetonitrile

Flow rate: 0.3 mL/min

Gradient:

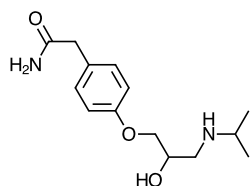
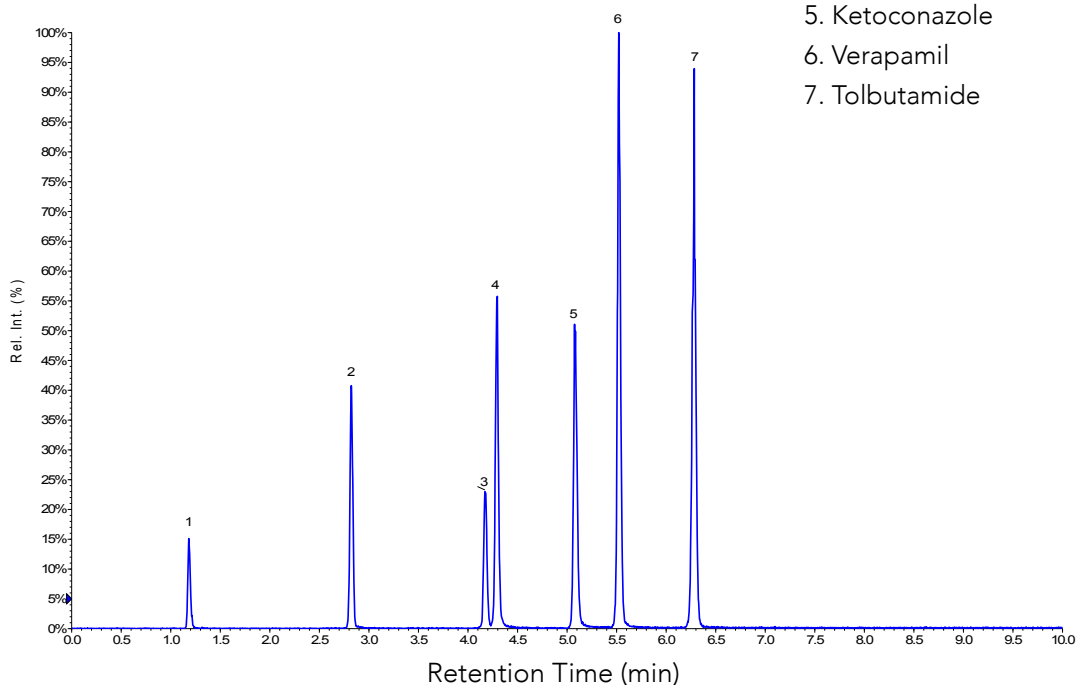
Time (min)	Profile A	Profile B
0	95	5
10	35	65
10.1	95	5
13.1	95	5

Temperature: 30 °C

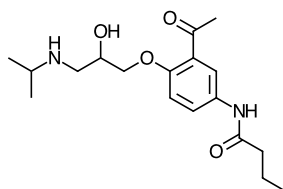
Detection: LC-ESI-MRM

Sample:

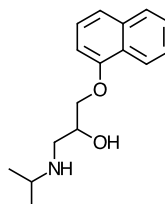
1. Atenolol
2. Acebutolol
3. Propranolol
4. Dextromethorphan
5. Ketoconazole
6. Verapamil
7. Tolbutamide



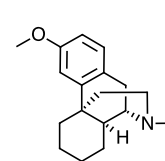
1. Atenolol



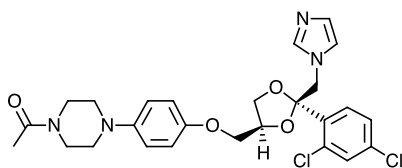
2. Acebutolol



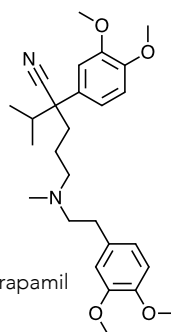
3. Propranolol



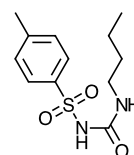
4. Dextromethorphan



5. Ketoconazole



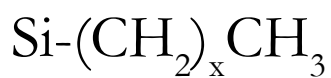
6. Verapamil



7. Tolbutamide

Isosceles AQ

- USP classification: equivalent to L62
- Pellicular-core silica
- Particle size: 2.6 µm
- Outer porous shell: 0.5 µm with 160 Å pores
- Carbon load: 4.5%
- End-capping: proprietary
- Recommended pH range: 2 to 8 (under 100% aqueous conditions)



The Isosceles AQ can be used in separations requiring the retention of highly polar compounds. The Isosceles AQ phase chemistry and pore structure work in combination to maximize retention of highly polar compounds but prevent pore de-wetting even under 100% aqueous conditions.

Features & Benefits

- Pellicular-core offers comparable resolution and peak capacity to sub-2 µm non-core particles but at 50% lower back pressure under the same mobile phase conditions
- Provides strong retention for polar compounds even in 100% aqueous environments

Isosceles AQ, 2.6 µm Ordering Information

Part No.	Description
TR-2.6AQ-05021	Isosceles AQ, 50 x 2.1mm, 2.6µm PC
TR-2.6AQ-05046	Isosceles AQ, 50 x 4.6mm, 2.6µm PC
TR-2.6AQ-10021	Isosceles AQ, 100 x 2.1mm, 2.6µm PC
TR-2.6AQ-10046	Isosceles AQ, 100 x 4.6mm, 2.6µm PC
TR-2.6AQ-03046	Isosceles AQ, 30 x 4.6mm, 2.6µm PC
TR-2.6AQ-15021	Isosceles AQ, 150 x 2.1mm, 2.6µm PC

*Note. Other dimensions available upon request.

Isosceles AQ Application

Nucleic Acid Bases

Column: **Isosceles AQ**

2.6 μ m 150 x 4.6 mm

Isocratic mobile phase:

10 mM phosphate buffer, pH 7.0

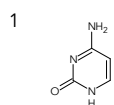
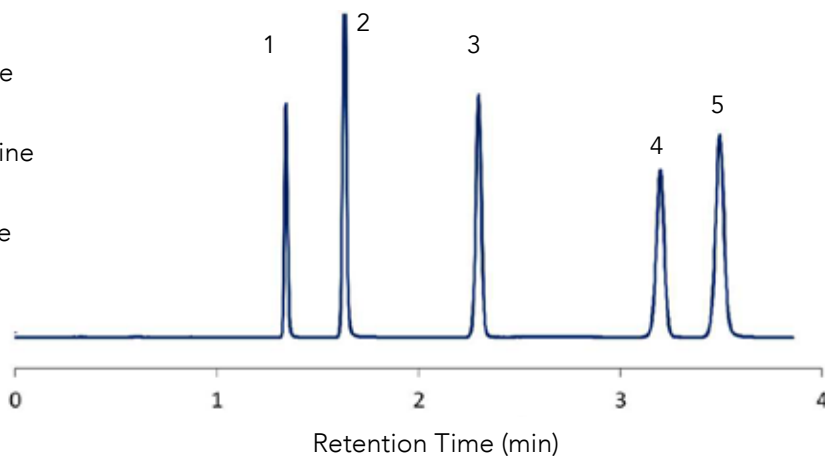
Flow rate: 1.5 ml/min

Temperature: 40 °C

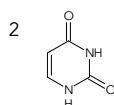
Detection: UV@250nm

Sample:

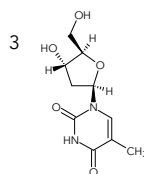
1. Cytosine
2. Uracil
3. Thymidine
4. Uridine
5. Thymine



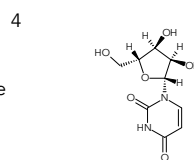
Cytosine



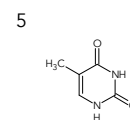
Ura cil



Thymidine



Uridine



Thymine

Water Soluble Vitamins

Column: **Isosceles AQ**

2.6 μ m, 150 x 4.6 mm

Isocratic mobile phase:

40 mM phosphate buffer, pH 6.8

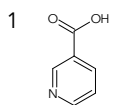
Flow rate: 1.0 mL/min

Temperature: 40 °C

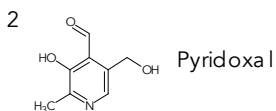
Detection: UV@250 nm

Sample:

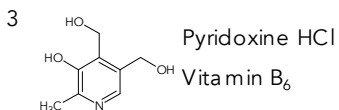
1. Nicotinic acid
2. Pyridoxal
3. Pyridoxine HCl
4. Nicotinamide



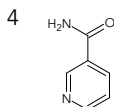
Nicotinic acid



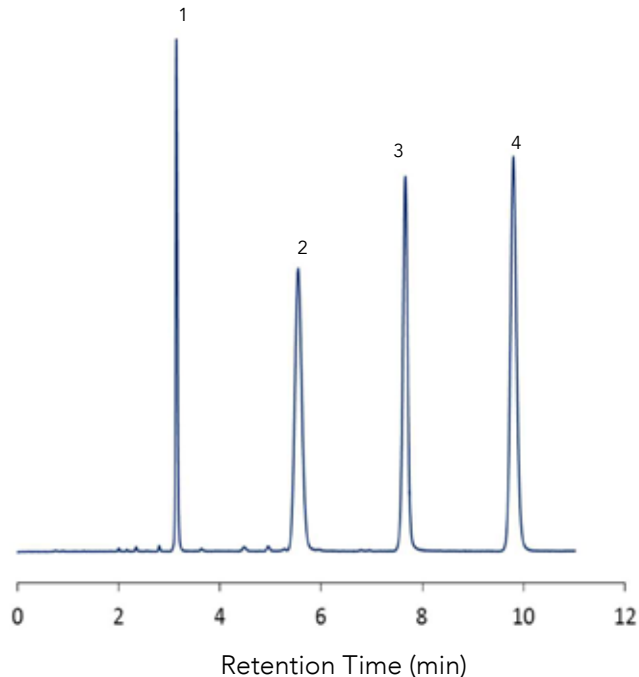
Pyridoxal



Pyridoxine HCl
Vita min B₆

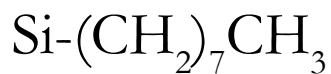


Nicotina mide



Isosceles C8

- USP classification: L7
- Base material: pellicular-core silica
- Particle size: 2.6 µm
- Outer porous shell: 0.5 µm with 95 Å pores
- Carbon load: 5%
- End-capping: proprietary
- pH range: 1.5 to 10



The Isosceles C8 can be used for very hydrophobic compounds that retain strongly on a C18 phase. Isosceles C8 is more polar than Isosceles C18 and would allow a more rapid separation of very hydrophobic compounds with the same selectivity.

Features & Benefits

- Pellicular-core offers comparable resolution and peak capacity to sub-2 µm non-core particles but at 50% lower back pressure under the same mobile phase conditions
- Proprietary end-capping minimizes peak tailing to produce sharp symmetrical peaks for basic compounds
- Ideal for separations where C18 exhibits too much retention
- Good choice for rapid separation of hydrophobic compounds

Isosceles C8, 2.6 µm Ordering Information

Part No.	Description
TR-2.6C8-05021	Isosceles C8, 50 x 2.1mm, 2.6µm PC
TR-2.6C8-05046	Isosceles C8, 50 x 4.6mm, 2.6µm PC
TR-2.6C8-10021	Isosceles C8, 100 x 2.1mm, 2.6µm PC
TR-2.6C8-10046	Isosceles C8, 100 x 4.6mm, 2.6µm PC
TR-2.6C8-03046	Isosceles C8, 30 x 4.6mm, 2.6µm PC
TR-2.6C8-15021	Isosceles C8, 150 x 2.1mm, 2.6µm PC

*Note. Other dimensions available upon request.

Isosceles C8 Application

Calcium Antagonists

Column: **Isosceles C8**

2.6 μm , 150 x 4.6 mm

Isocratic mobile phase: Methanol:25 mM
phosphate buffer, pH 7.0 (70:30, v/v)

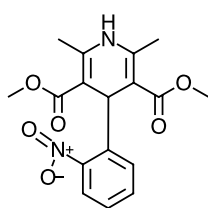
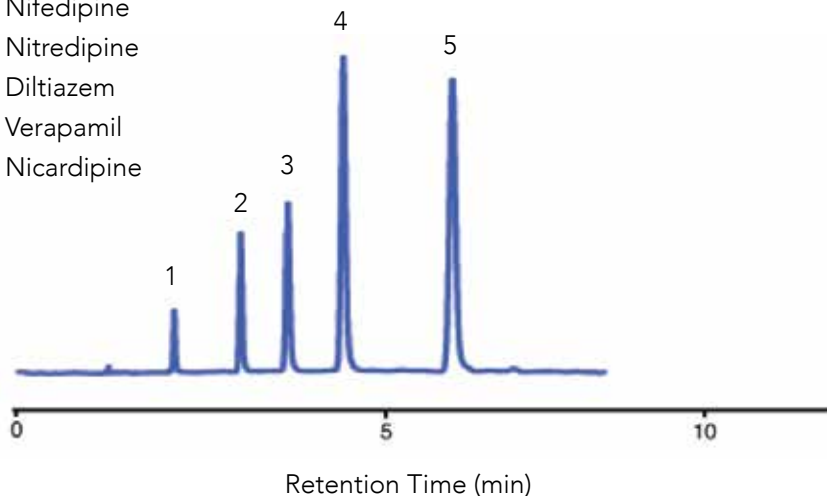
Flow rate: 1.0 mL / min

Temperature: 40 °C

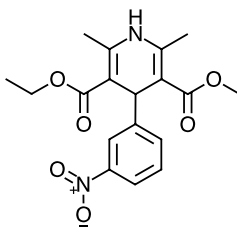
Detection: UV@230 nm

Sample:

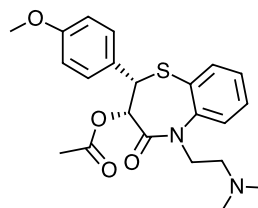
1. Nifedipine
2. Nitredipine
3. Diltiazem
4. Verapamil
5. Nicardipine



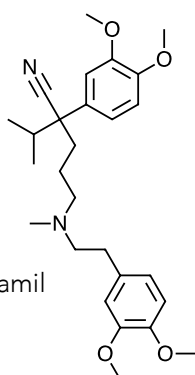
1. Nifedipine



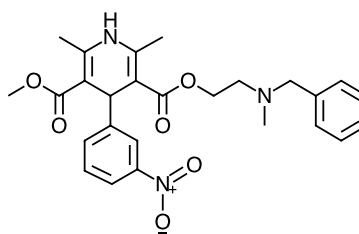
2. Nitredipine



3. Diltiazem



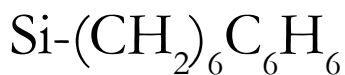
4. Verapamil



5. Nicardipine

Isosceles Phenylhexyl

- USP classification: L11
- Pellicular-core silica
- Particle size: 2.6 μm
- Outer porous shell: 0.5 μm with 95 Å pores
- Carbon load: 5.5%
- End-capping: proprietary
- Recommended pH range: 1.5 to 9



Isosceles Phenylhexyl columns consist of a phenyl group bonded to our pellicular-core silica via a 6-carbon alkyl linker providing complimentary selectivity to solely alkyl-chain bonded phases.

Features & Benefits

- Isosceles Phenylhexyl displays different but complimentary selectivity when compared to conventional C18 phases
- Phenyl functional group provides the stationary phase with unique selectivity arising from analyte interactions with the aromatic ring (π - π interactions) and its delocalized electrons
- Good shape selectivity is seen with compounds with aromatic and heterocyclic rings such as benzodiazepines, opioids, opiates and antipsychotic drugs
- Six-carbon alkyl linker provides stronger retention than standard phenyl phases which use a shorter alkyl linker

Isosceles Phenylhexyl, 2.6 μm Ordering Information

Part No.	Description
TR-2.6PH-05021	Isosceles PH, 50 x 2.1mm, 2.6 μm PC
TR-2.6PH05046	Isosceles PH, 50 x 4.6mm, 2.6 μm PC
TR-2.6PH-10021	Isosceles PH, 100 x 2.1mm, 2.6 μm PC
TR-2.6PH-10046	Isosceles PH, 100 x 4.6mm, 2.6 μm PC
TR-2.6PH-03046	Isosceles PH, 30 x 4.6mm, 2.6 μm PC
TR-2.6PH-15021	Isosceles PH, 150 x 2.1mm, 2.6 μm PC

*Note. Other dimensions available upon request.

Isosceles Phenylhexyl Application

Explosives

Column: Isosceles Phenylhexyl

2.6 μm , 100 x 4.6 mm

Mobile phase:

Acetonitrile:water, (40:60, v/v)

Flow rate: 1.0 mL / min

Temperature: 40 °C

Detection: UV@250 nm

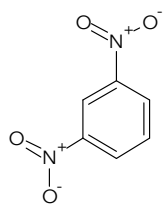
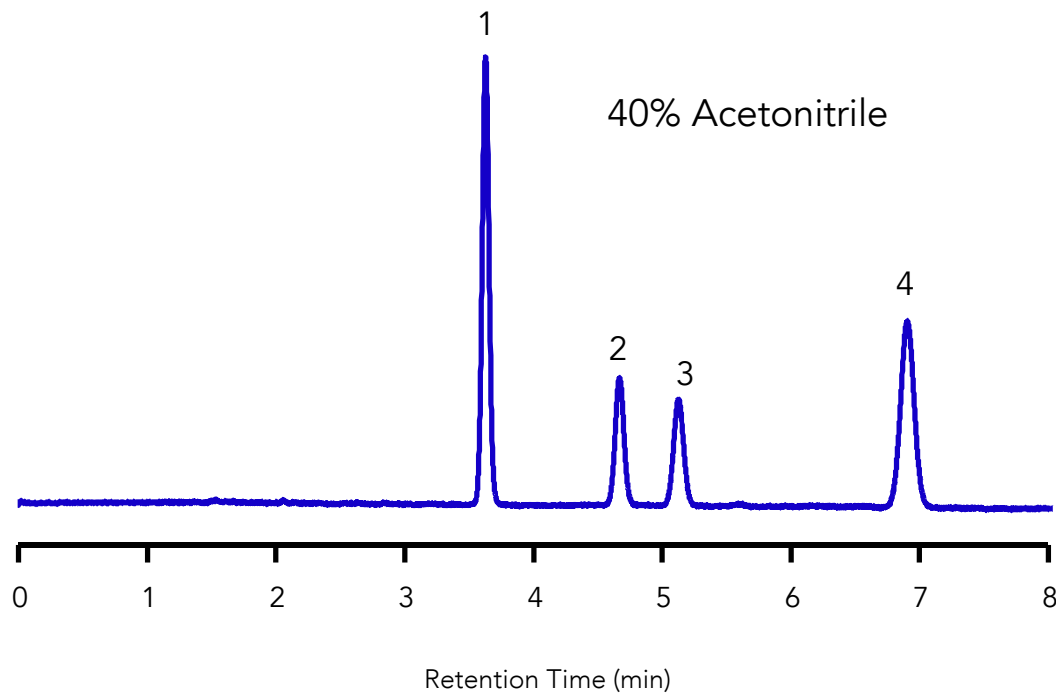
Sample:

1. 1,3-Dinitrobenzene

2. 1,3,5-Trinitrobenzene

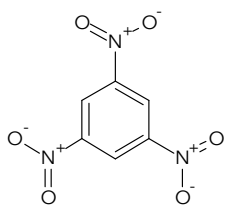
3. 2,4-Dinitrotoluene

4. 2,4,6-Trinitrotoluene



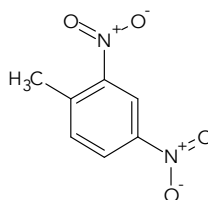
1,3-Dinitrobenzene

2



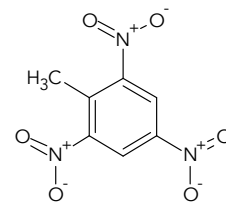
1,3,5-Trinitrobenzene

3



2,4-Dinitrotoluene

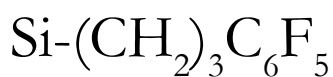
4



2,4,6-Trinitrotoluene

Isosceles PFP

- USP classification: L43
- Pellicular-core silica
- Particle size: 2.6 µm
- Outer porous shell: 0.5 µm with 95 Å pores
- Carbon load: 5%
- Endcapped
- Recommended pH range: 1.5 to 9



Isosceles PFP columns consist of a pentafluorophenyl group bonded to our pellicular-core silica via a propyl alkyl linker and can operate in both HILIC and reversed-phase separation modes.

Features & Benefits

- Two types of retention behavior can be seen on the Isosceles PFP. One usually observes reversed-phase type retention with mobile phases using lower amounts of organic modifier (i.e., acetonitrile < 50%) and HILIC type retention is observed with mobile phases using higher amounts of organic modifier (i.e., acetonitrile > 50%)
- In reversed-phase mode, the Isosceles PFP can provide alternate selectivity compared to conventional C18 phases
- In HILIC mode, the Isosceles PFP can provide alternate selectivity to other HILIC phases including bare silica
- Retention and selectivity is achieved with compounds that can undergo hydrogen-bonding, dipole-dipole interactions, π - π interactions, and hydrophobic interactions

Isosceles PFP, 2.6 µm Ordering Information

Part No.	Description
TR-2.6PFP-05021	Isosceles PFP, 50 x 2.1mm, 2.6µm PC
TR-2.6PFP-05046	Isosceles PFP, 50 x 4.6mm, 2.6µm PC
TR-2.6PFP-10021	Isosceles PFP, 100 x 2.1mm, 2.6µm PC
TR-2.6PFP-10046	Isosceles PFP, 100 x 4.6mm, 2.6µm PC
TR-2.6PFP-03046	Isosceles PFP, 30 x 4.6mm, 2.6µm PC
TR-2.6PFP-15021	Isosceles PFP, 150 x 2.1mm, 2.6µm PC

*Note. Other dimensions available upon request.

Isosceles PFP Application

Isomers (ortho, meta and para) of Xylene (BTEX)

Column: Isosceles PFP

2.6 μm , 150 x 4.6 mm

Isocratic mobile phase: Methanol:water, (70:30, v/v)

Flow rate: 0.7 mL/min

Temperature: 15 $^{\circ}\text{C}$

Detection: UV@250nm

Sample: BTEX

1. Benzene

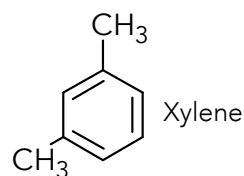
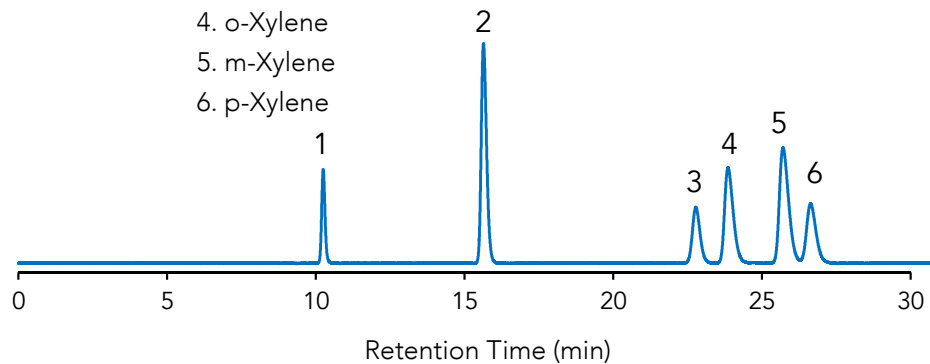
2. Toluene

3. Ethylbenzene

4. o-Xylene

5. m-Xylene

6. p-Xylene



Isomers of Cresol

Column: Isosceles PFP

2.6 μm , 150 x 4.6 mm

Isocratic mobile phase: Methanol:water, (40:60, v/v)

Flow rate: 1.0 mL/min

Temperature: 25 $^{\circ}\text{C}$

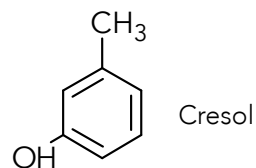
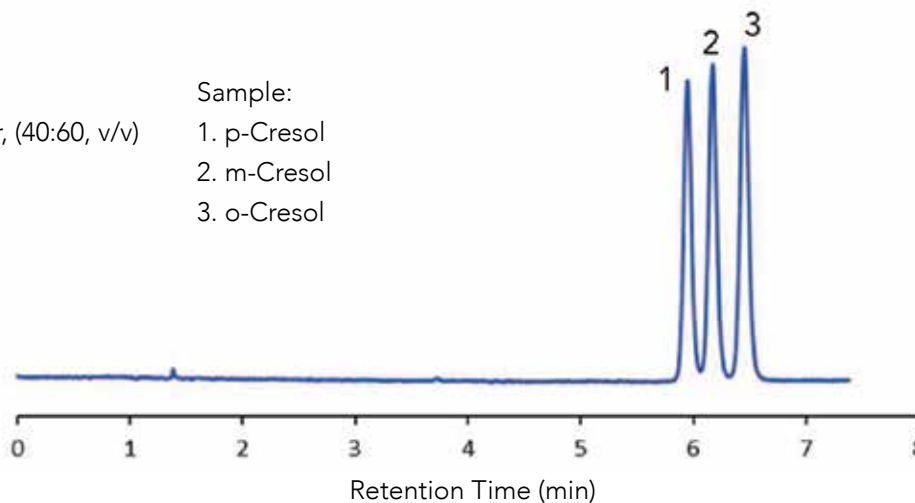
Detection: UV@250nm

Sample:

1. p-Cresol

2. m-Cresol

3. o-Cresol



Isosceles Amide (HILIC)

- USP classification: L68
- Pellicular-core silica
- Particle size: 2.6 μm
- Outer porous shell: 0.5 μm with 95 Å pores
- Carbon load: 3.5%
- End-capping: not endcapped
- Recommended pH range: 2 to 8



Isosceles Amide HILIC consist of a secondary amide bonded to silica through a linker chain and another polar group attached at the carbonyl end.

Features & Benefits

- Isosceles Amide HILIC is recommended as an ideal choice for HILIC because of its ability to retain a wide range of polar compounds
- Isosceles Amide HILIC columns are designed to retain highly polar compounds that are usually not retained under reversed-phase chromatography conditions
- The amide functionality being polar and uncharged is suitable for the retention of polar neutrals (e.g., sugars, oligosaccharides), polar acids (e.g., organic acids) and polar bases (e.g., nucleobases, catecholamines)

Isosceles Amide (HILIC), 2.6 μm Ordering Information

Part No.	Description
TR-2.6AMH-05021	Isosceles AMH, 50 x 2.1mm, 2.6 μm PC
TR-2.6AMH-05046	Isosceles AMH, 50 x 4.6mm, 2.6 μm PC
TR-2.6AMH-10021	Isosceles AMH, 100 x 2.1mm, 2.6 μm PC
TR-2.6AMH-10046	Isosceles AMH, 100 x 4.6mm, 2.6 μm PC
TR-2.6AMH-03046	Isosceles AMH, 30 x 4.6mm, 2.6 μm PC
TR-2.6AMH-15021	Isosceles AMH, 150 x 2.1mm, 2.6 μm PC

*Note. Other dimensions available upon request.

Isosceles Amide (HILIC) Application

Water Soluble Vitamins

Column: **Isosceles Amide (HILIC)**

2.6 μm , 100 x 4.6 mm,

Isocratic mobile phase:

Acetonitrile: 25 mM phosphate buffer, pH 2.5, (80:20, v/v)

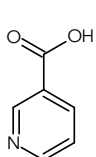
Flow rate: 1.0 mL/min

Detection: UV@250 nm

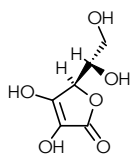
Sample:

1. Nicotinic acid
2. Ascorbic acid
3. Pyridoxine

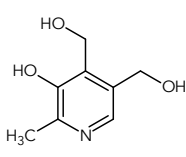
Temperature: 40 $^{\circ}\text{C}$



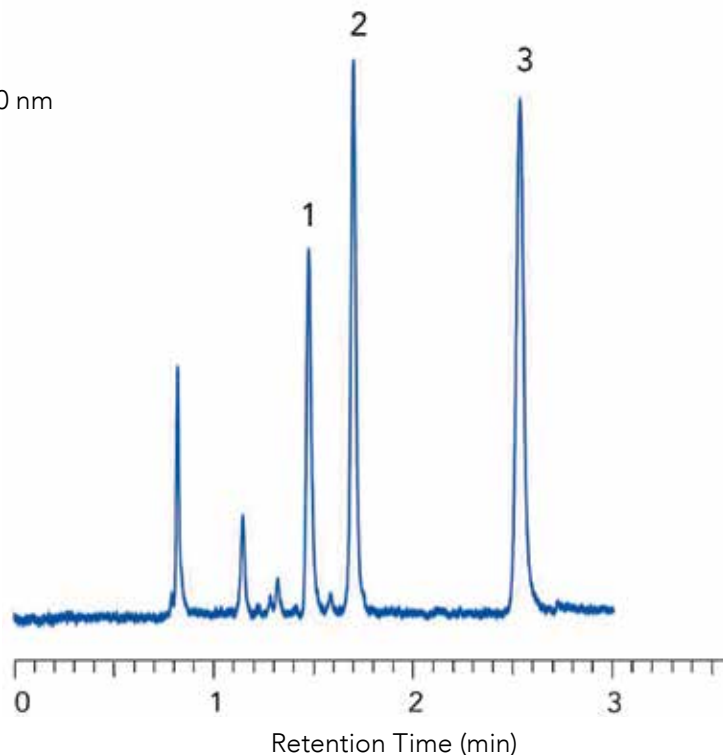
1. Nicotinic acid



2. Ascorbic acid



3. Pyridoxine



Glycosides

Column: **Isosceles Amide (HILIC)**

2.6 μm , 100 x 4.6 mm

Isocratic mobile phase:

Acetonitrile: 25 mM ammonium phosphate buffer, pH 4.9, (80:20, v/v)

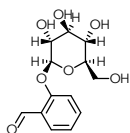
Flow rate: 1.0 mL/min

Temperature: Ambient

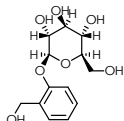
Detection: UV@215 nm

Sample:

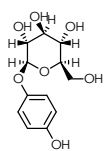
1. Helicin
2. Salitin
3. Arbutin
4. Rutin



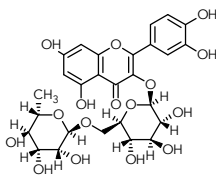
1. Helicin



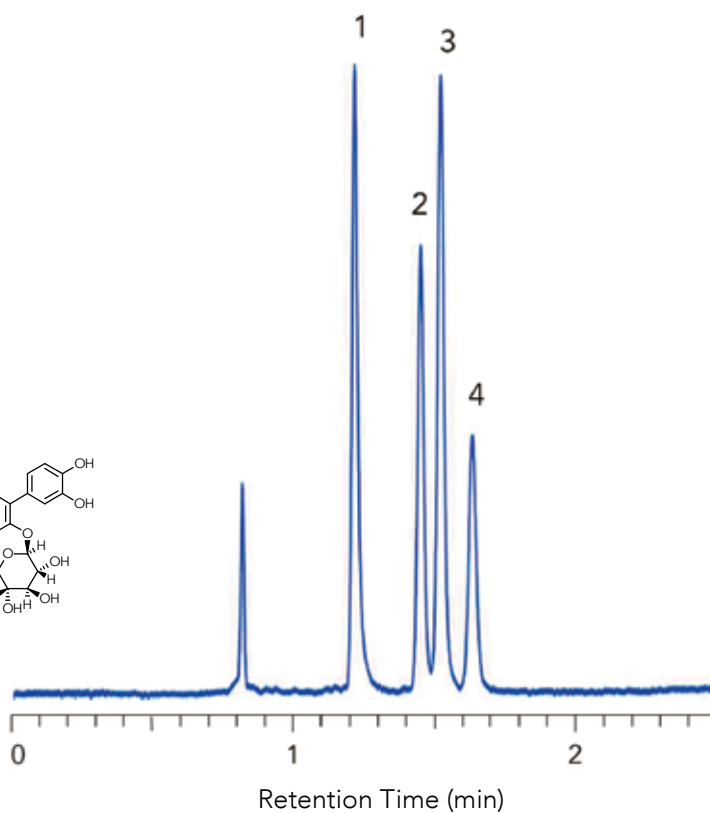
2. Salitin



3. Arbutin



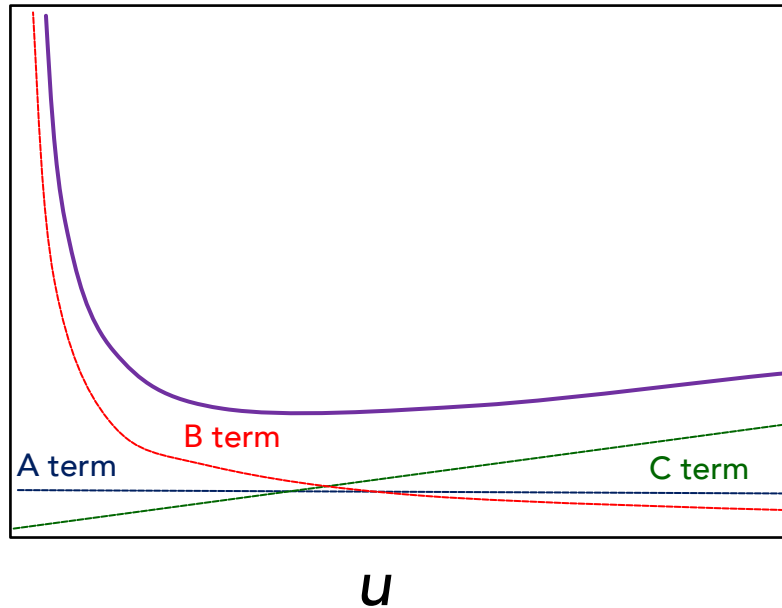
4. Rutin



Technical

Van Deemter Equation

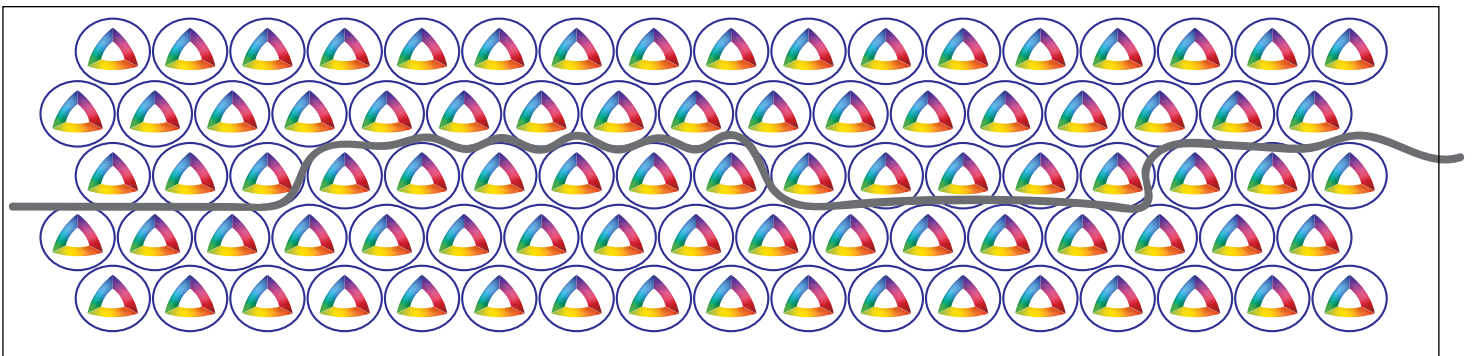
$$H = A + \frac{B}{u} + C * u$$



A term : Eddy diffusion
B term : Longitudinal diffusion
C term : Mass transfer

Ref.: van Deemter J J, Zuiderweg F J & Klinkenberg A. (1956) Chem. Eng. Sci. 5:271-89.

Pellicular core silica showing low back pressure
due to narrow particle size distribution.



Applications - Pharmaceutical

Basic Compounds

Column: **Isosceles PFP**

2.6 μm 150 x 4.6 mm

Isocratic mobile phase:

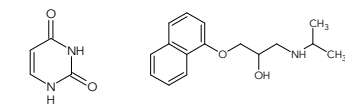
Acetonitrile: 10 mM phosphate buffer, pH 7.0, (80:20, v/v)

Flow rate: 1.8 mL/min

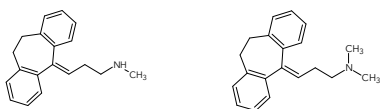
Temperature: 25 °C

Sample:

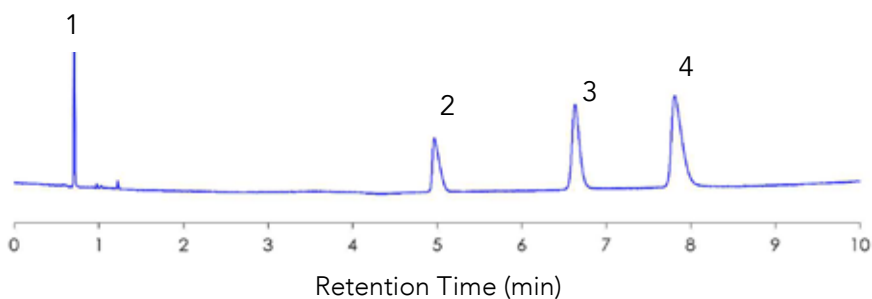
1. Uracil
2. Propranolol
3. Nortriptyline
4. Amitriptyline



1. Uracil 2. Propranolol



3. Nortriptyline 4. Amitriptyline



Beta blockers

Column: **Isosceles C18**

2.6 μm 100 x 4.6 mm

Isocratic mobile phase:

Methanol: 25 mM phosphate buffer, pH 7.0, (50:50, v/v)

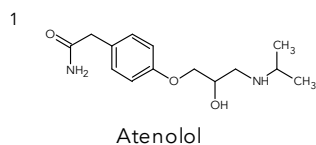
Flow rate: 1.0 mL / min

Temperature: 40 °C

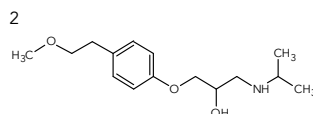
Detection: UV@280 nm

Sample:

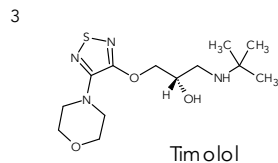
1. Atenolol
2. Metoprolol
3. Timolol
4. Propranolol



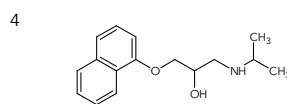
Atenolol



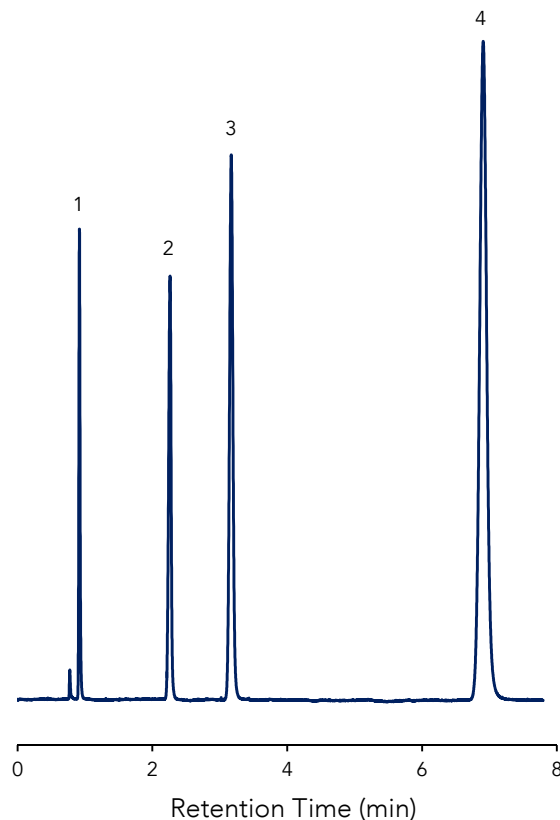
Metoprolol



Timolol



Propranolol



Applications - Food & Agriculture

Separation of Green Tea

Column: Isosceles C18

2.6 μm , 75 x 4.6 mm

Mobile phase:

A. 0.1% phosphoric acid in water, (v/v)

B. Acetonitrile

Gradient:

Time Profile

(min) A B

0 98 2

7.5 75 25

10 75 25

Flow rate: 1.0 mL/min,

Temperature: 25 $^{\circ}\text{C}$

Detection: UV@250 nm

Sample:

1. Gallicocatechin

2. Epigallocatechin

3. Catechin

4. Caffeine

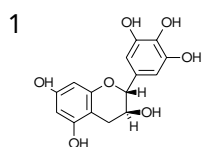
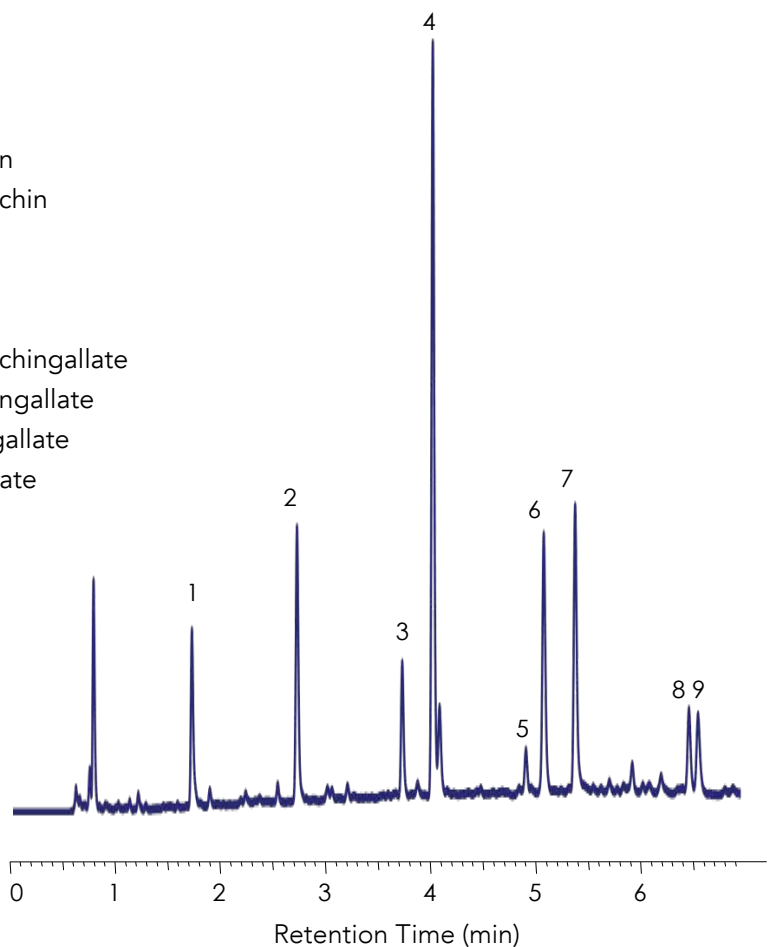
5. Epicatechin

6. Epigallocatechingallate

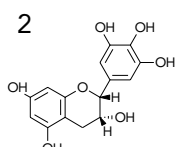
7. Gallicatechingallate

8. Epicatechingallate

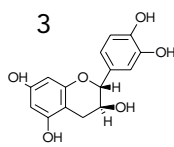
9. Catechingallate



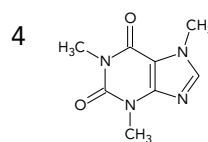
Gallicocatechin



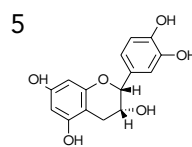
Epigallocatechin



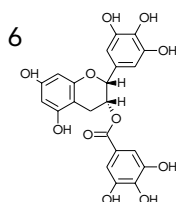
Catechin



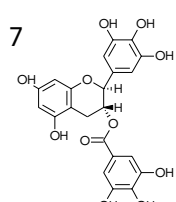
Caffeine



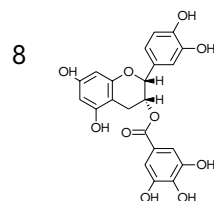
Epicatechin



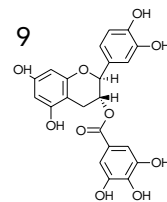
Epigallocatechingallate



Gallicatechingallate



Epicatechingallate



Catechingallate

Applications - Food & Agriculture

Separation of Water Soluble Vitamins

Column: **Isosceles Amide (HILIC)**

2.6 μ m, 100 x 4.6 mm

Isocratic mobile phase:

Acetonitrile: 25 mM phosphate buffer, pH 2.5, (80:20, v/v)

Flow rate: 1.0 mL/min

Temperature: 40 °C

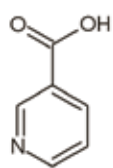
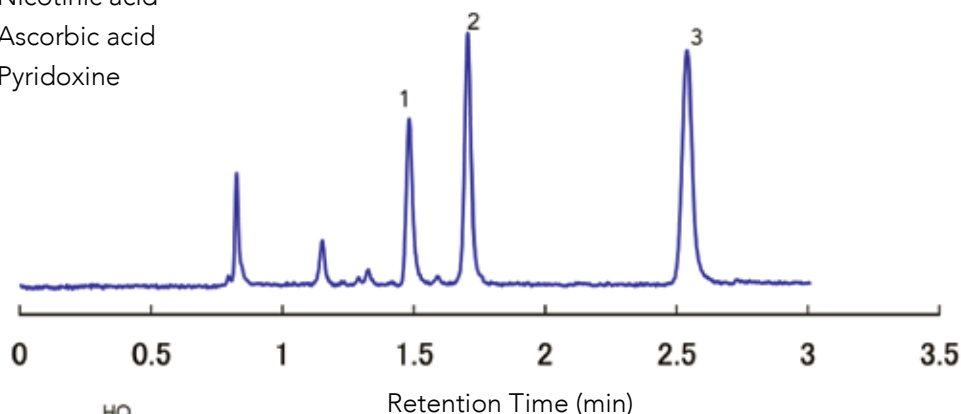
Detection: UV@250 nm,

Sample:

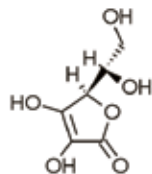
1. Nicotinic acid

2. Ascorbic acid

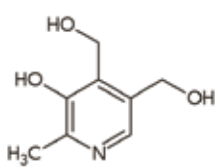
3. Pyridoxine



1. Nicotinic acid



2. Ascorbic acid



3. Pyridoxine

Melamine and Cyanuric Acid

Column: **Isosceles Amide (HILIC)**

2.6 μ m, 100 x 4.6 mm

Isocratic mobile phase:

Acetonitrile: 5 mM phosphate buffer, pH 6.9, (75:25, v/v)

Flow rate: 1.0 mL/min

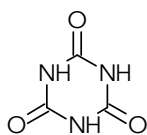
Temperature: 40 °C

Detection: UV@220 nm

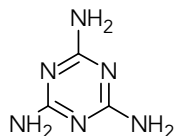
Sample:

1. Cyanuric acid

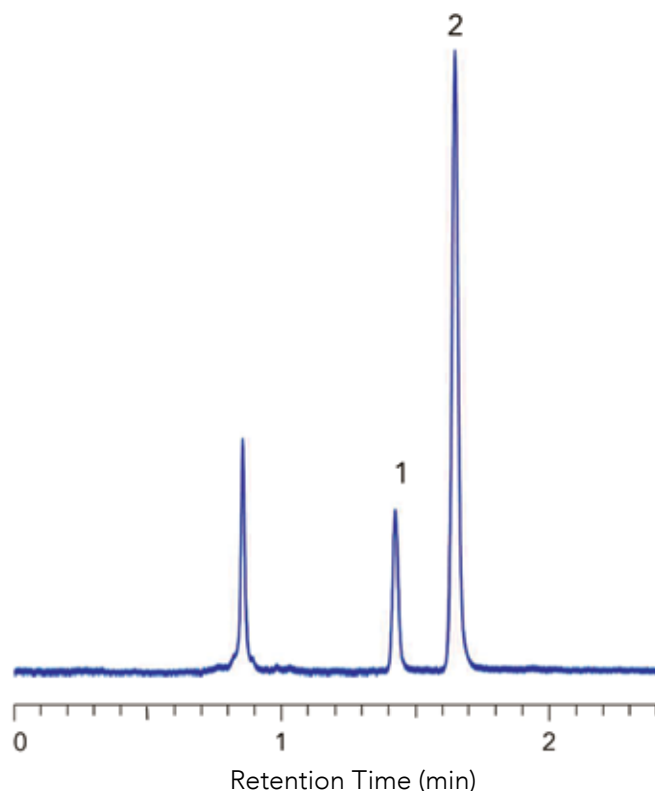
2. Melamine



1. Cyanuric acid



2. Melamine



Applications - Clinical & Bioanalysis

Drug Metabolism Test Mix

Column: **Isosceles C18**

2.6 μm , 50 x 2.1 mm

Mobile Phase:

A: 0.1% formic acid

in water, (v/v)

B: acetonitrile

Flow rate: 0.3 mL/min

Gradient:

Time Profile

(min) A B

0 95 5

10 35 65

10.1 95 5

13.1 95 5

Temperature: 30 $^{\circ}\text{C}$

Detection: LC-ESI-MRM

Sample:

1. Atenolol

2. Acebutolol

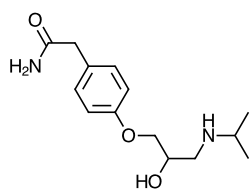
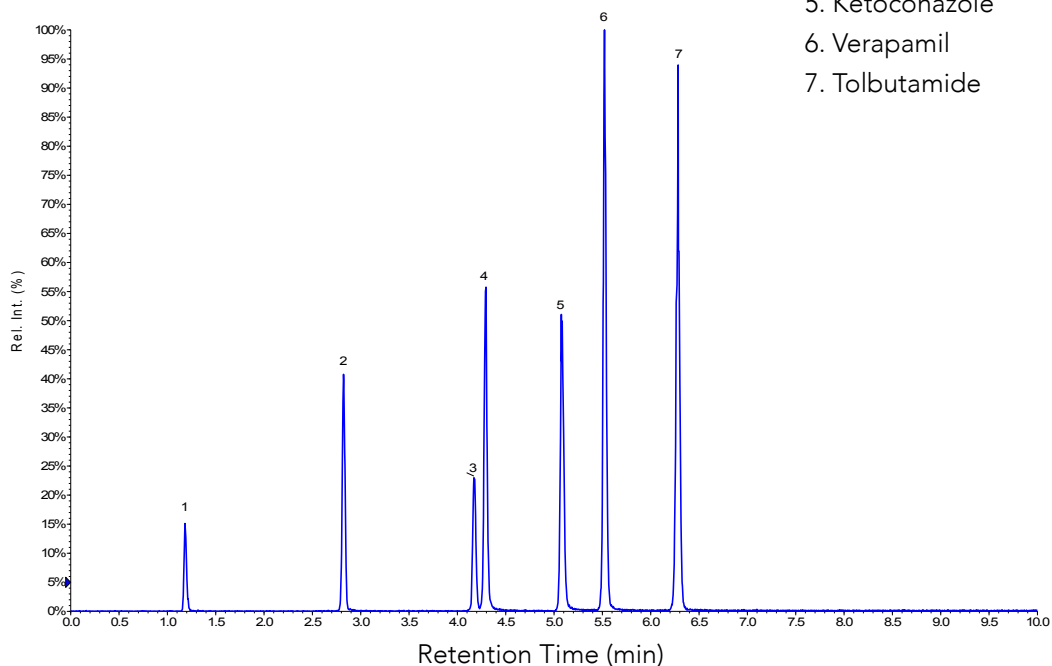
3. Propranolol

4. Dextromethorphan

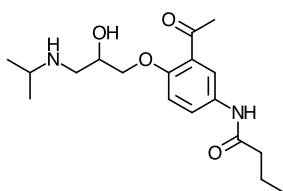
5. Ketoconazole

6. Verapamil

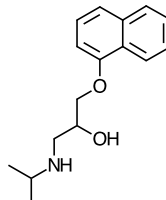
7. Tolbutamide



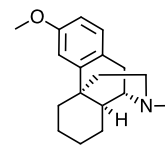
1. Atenolol



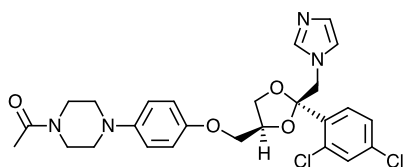
2. Acebutolol



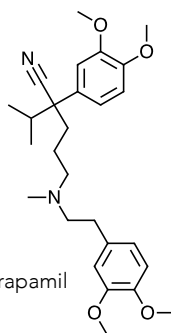
3. Propranolol



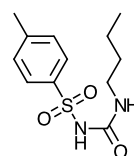
4. Dextromethorphan



5. Ketoconazole



6. Verapamil



7. Tolbutamide

Applications - Environmental

Explosives

Column: **Isosceles Phenylhexyl**

2.6 μm , 100 x 4.6 mm

Mobile phase:

Acetonitrile: water, (40:60, v/v)

Flow rate: 1.0 mL / min

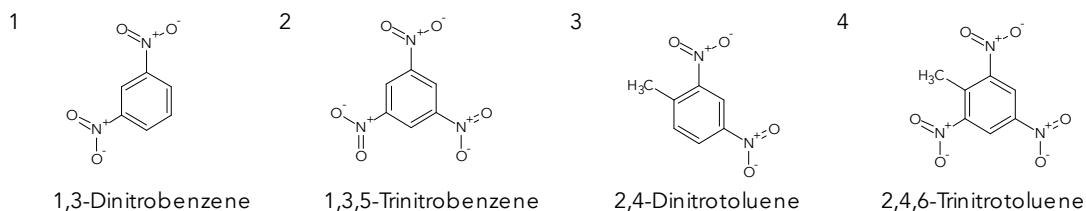
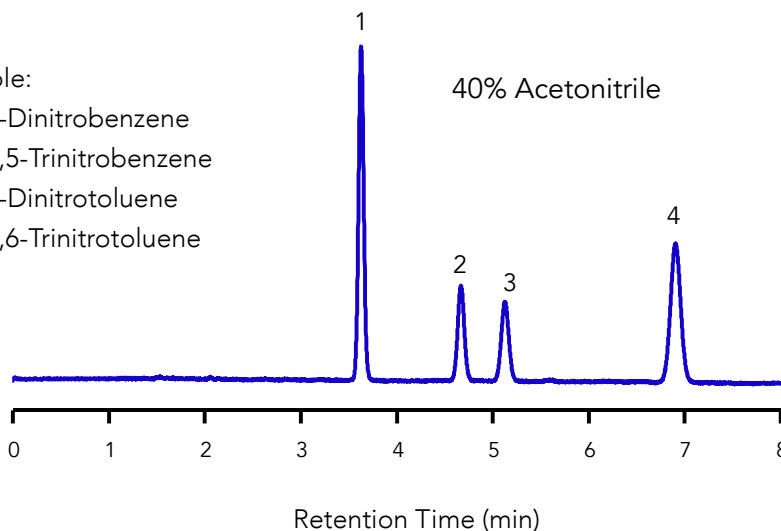
Temperature: 40 °C

Detection: UV@250 nm

Sample:

1. 1,3-Dinitrobenzene
2. 1,3,5-Trinitrobenzene
3. 2,4-Dinitrotoluene
4. 2,4,6-Trinitrotoluene

40% Acetonitrile



Isomers (ortho, meta and para) of Xylene

Column: **Isosceles PFP**

2.6 μm 150 x 4.6 mm

Isocratic mobile phase: Methanol:water, (70:30, v/v)

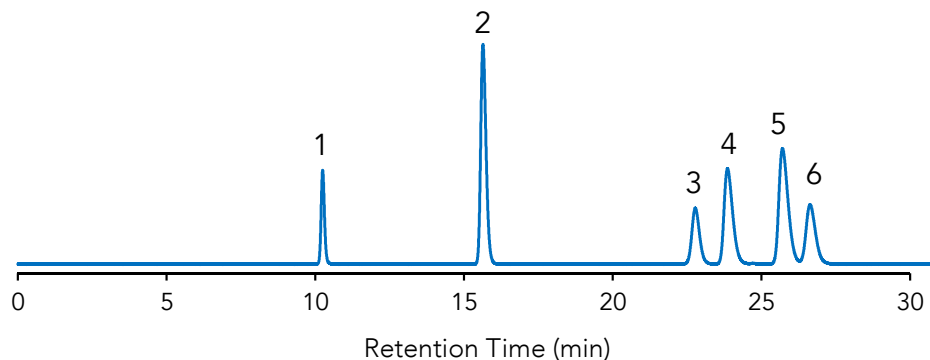
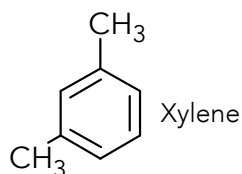
Flow rate: 0.7 mL/min

Temperature: 15 °C

Detection: UV@250nm

Sample: BTEX

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



Care and Use of Isosceles UHPLC, LC, HPLC Columns

Please read this information carefully before using this column. All Isosceles columns are individually manufactured and tested to meet stringent specification criteria. The following measures will enhance its performance and lifetime

Column Installation

System Compatibility: Isosceles columns are compatible with UHPLC and HPLC instrumentation offered by all leading manufacturers. Isosceles UHPLC columns may be used on HPLC systems, provided that system pressure limits are not exceeded.

System Dead Volume: Reduce dead volume in the system to a minimum by using connection tubing with an internal diameter of 0.010" (0.25mm) or less for analytical columns. Connections between injector, column and detector should be kept as short as possible.

Column Connection: The direction of flow is marked on the column. For optimum performance, the tubing connecting the column to injector and detector must abut the internal shoulder of the fitting. For HPLC columns, the use of PEEK fingertight fittings (p/n# UPF 120X, 10 pack) are recommended. For UHPLC columns at pressures up to 15,000psi (1000bar), the use of UHPLC reusable fittings (p/n# UPUH-196, 10 pack) are recommended.

Mechanical Damage: Protect the column from mechanical shock. Dropping a column can impair its performance.

Equilibration: The storage solvent in a new column is the mobile phase used to evaluate the column, unless otherwise specified on the chromatogram. Initially, care should be taken not to pass any material through the column that may precipitate in the storage solvent. Ensure that the column is fully equilibrated with the mobile phase prior to starting analysis. Normal-phase, HILIC or ion exchange pellicular-core columns usually require more conditioning than reverse-phase columns.

Guard Cartridges: For HPLC columns, guard cartridges are recommended to prevent both inlet frit blockage and irreversible sample adsorption onto the top of the column. Guard cartridges are available for all Isosceles columns – for further guidance on the recommended guard cartridge for this column, contact our Technical Support Department.

Precolumn Filters: As an alternative to guard cartridges, precolumn filters may be used to protect the column inlet frit from blockage. Due to their ultra low dispersion design, column performance and retention remain unaffected. For analytical (2.1 – 4.6mm id) HPLC columns packed with particles $\geq 5\mu\text{m}$, the use of $2\mu\text{m}$ precolumn filters (p/n# AS-850-1051-10, 10 pack) are recommended. For analytical 2.1 – 4.6mm id) HPLC columns packed with particles $\geq 3\mu\text{m}$, the use of $0.5\mu\text{m}$ precolumn filters (p/n# AS-850-1050-10, 10 pack) are recommended. For UHPLC columns at pressures up to 14,500psi (1000bar), UHPLC precolumn filters (p/n# AS-850-1010-10, 10 pack) are recommended.

Performance Testing: It is recommended that the performance of columns is tested on arrival and periodically during use. Performance parameters are defined below.

Efficiency:

$N_{0.5} = 5.54 (t_r / W_{0.5})^2$ – (measured at 50% peak height)

$N_{0.1} = 18.55 (t_r / W_{0.1})^2$ – (measured at 50% peak height)

Asymmetry:

$As_1 = N_{0.1} / N_{0.5}$ – (for a perfect Gaussian peak $As_1 = 1.00$)

$As_2 = B/A$ – (calculated at 10% peak height – for a symmetrical peak

$As_2 = 1.00$, for a fronted peak $As_2 < 1.00$ and for a tailed peak

$As_2 > 1.00$ and for a tailed peak $As_2 > 1.00$)

Operational Guidelines

Solvents: Use only UHPLC/HPLC grade solvents and freshly prepared aqueous buffer solutions to minimize bacterial growth. A slip-on pump inlet filter will remove extraneous particles. For maximum column lifetime, filter the mobile phase using a $0.2\mu\text{m}$ filter.

Mobile Phase pH: The recommended mobile phase pH for silica columns is generally between 2.0 and 7.5. However, use of a pH between 3.5 and 6.5 will ensure maximum column life. For further guidance on the pH range of the silica contained within this column, contact our Technical Support Department.

Sample: For maximum column lifetime, always use freshly prepared sample and filter using a $0.2\mu\text{m}$ filter.

Vials: Premium quality CleanVials™ are recommended for use with Isosceles columns. Please contact our Technical Support Department for further information and to request your free trial samples.



Pressure: Exposure to rapid changes in pressure may reduce column lifetime. For HPLC columns, exposure to pressures $>4000\text{psi}$ (275bar) may reduce column lifetime. For UHPLC columns, exposure to pressures $>14500\text{psi}$ (1000bar) and/or high linear flows (equivalent to $>0.6\text{ml/min}$ for 2.1mm id) may reduce column lifetime.

Temperature: For Isosceles HPLC and UHPLC columns, temperatures $>60^\circ\text{C}$ may reduce column lifetime, dependent upon bonded phase and mobile phase conditions selected. For further guidance on the maximum recommended temperature of this column under your chosen conditions, contact our Technical Support Department.

Storage: Wash out any buffer (ensure that precipitation does not occur) and flush onto the storage solvent defined overleaf. Replace the end-stops to prevent the packing bed drying out and store in a cool area.

Column Cleaning: Over a period of time, columns may still become contaminated by strongly adsorbed sample components. This may be indicated by a deterioration in column performance and/or an increase in back pressure. In such instances, specific cleaning protocols may be used in an attempt to regenerate column performance and further extend the lifetime of the column. For further guidance on the recommended cleaning protocol for this column, contact our Technical Support Department.

Column Warranty: All columns are warranted to meet the specifications stated on the Test Chromatogram. Removal of an end fitting to replace a frit or top-up the packing material should be regarded as a last resort to prolonging column lifetime. Removal of the column end fittings will automatically invalidate the column warranty.

Safety and Disposal: This column contains amorphous silica which may be hazardous to health if column is unpacked and the silica allowed to dry. The silica presents no hazard whilst contained within the column. When the column has reached the end of its useful life, dispose of it in a similar manner to the samples that have been injected onto it. Alternatively, contact our Technical Support Department for details of our column disposal program.

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Chrom4 Philosophy

In April 2010, a group of independent distributors met to discuss the dynamic shift in the chromatography consumables market.

The group concluded that mergers and acquisitions in the chromatography consumables industry have limited the offerings available to the laboratory scientist.

These users of chromatography consumables and buyers of companies from small to large are faced with limited offerings, meaning less choice and less competitive pricing.

Aiming to provide more options and let local independent distributors operate on a more level playing field, the idea of a buying group was born.

This buying group would enable these local distributors, who are specialized experts in chromatography, to compete with world-class quality products, yet maintaining a strong relationship with the customer.

The realization of this idea is Chrom4.

Global companies, who purchase for many worldwide locations can benefit from our distributors by receiving group pricing and maintain the same quality with uniform pricing for all their locations.

Distributed for Chrom4 by:



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www.md-scientific.dk - +45 7027 8565

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