
Introducing
synergi™ HST
High Speed Technology
Format
synergi™
Formulated For Polarity
phenomenex®
...breaking with tradition℠

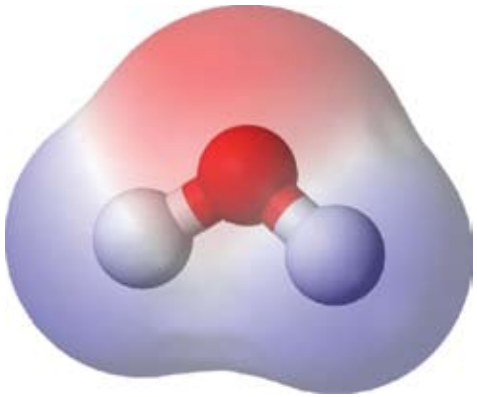
synergi™

SIMPLIFIED

CHEMICAL POLARITY
IT'S A SIMPLE CONCEPT, RIGHT?

Unequally shared electrons between atoms result in a separation of positive and negative electric charge in a molecule. So why is it that resolving compounds across the polarity spectrum gives us so many problems in chromatography? Synergi products are already helping thousands of chromatographers across the world overcome their separation difficulties with non-polar and polar compounds!

This brochure will outline various solution options just right for you!



NON-POLARS

In a purely non-polar sample mixture, important elements of your column stationary phase should center around these phase properties:

1. High Hydrophobicity
2. High Methylene Selectivity
3. High Ligand Density

NON-POLAR/POLAR MIXTURES

Sample mixtures of non-polar and polar compounds usually present the most difficulty. Your column stationary phase should center around these phase properties:

1. Duel-Phase Selectivity
2. High Hydrogen Bonding/Electrostatic Interactions
3. Moderate – High Hydrophobicity

POLARS

In a purely polar sample mixture, important elements of your column stationary phase should center around these phase properties:

1. High Polar Selectivity
2. π-π Interactions for Polar Aromatics
3. Hydrophillic Endcapping

SYNERGI FUSION-RP
C18 Polar Embedded

SYNERGI HYDRO-RP
C18 Polar Endcapped

SYNERGI MAX-RP
C12

SYNERGI 2.5 µm HST
High Speed Technology

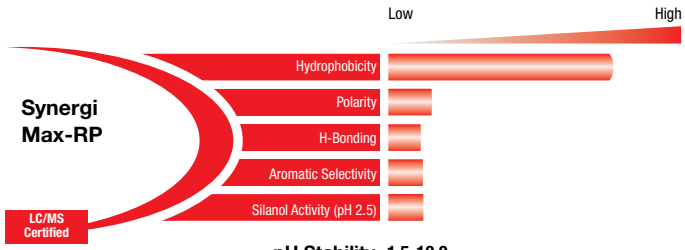
SYNERGI POLAR-RP
Phenyl-Ether

COLUMN SELECTION

COLUMN CHARACTERISTICS FOR SIMPLIFIED SELECTION

SYNERGI MAX-RP
C12 with TMS Endcapping

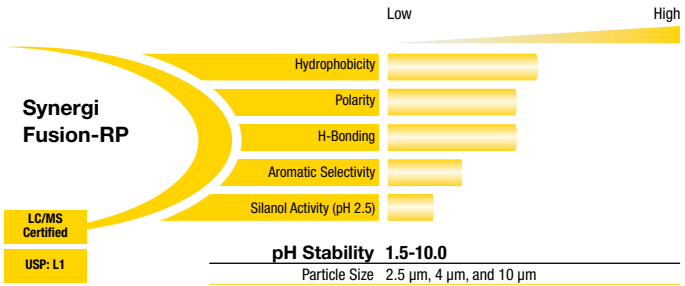
Maximum Reversed Phase Performance for the Synergi Line



pH Stability	**1.5-10.0**
Particle Size	2.5 µm, 4 µm, and 10 µm
Phase	Reversed phase C12
Application	For hydrophobic, non-polar compounds over a wide pH range, with little or no MS phase bleed
Strength	Sharp peak shape for basic compounds at neutral pH

SYNERGI FUSION-RP
Polar Embedded C18

Improved Polar Selectivity with Reduced Run Times

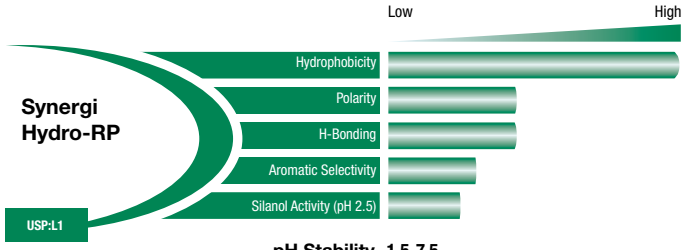


pH Stability	**1.5-10.0**
Particle Size	2.5 µm, 4 µm, and 10 µm
Phase	Polar embedded C18
Application	For a balanced retention of polar, basic compounds and moderate retention of hydrophobics over a broad pH range
Strength	Analysis of polar, basic compounds with little or no MS phase bleed

Each Synergi Phase has a unique "fingerprint" composed of multiple characteristics. By understanding the different selectivities of each phase, you can easily identify the best column for your needs.

SYNERGI HYDRO-RP
Polar Endcapped C18

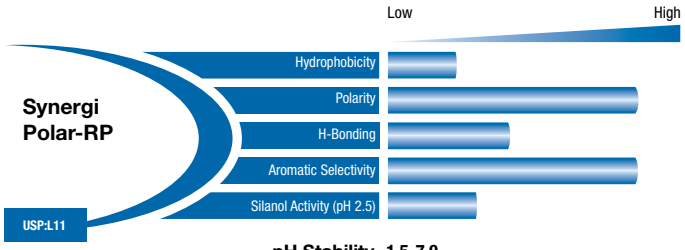
Hydro-phobic/philic Reversed Phase Retention



pH Stability	**1.5-7.5**
Particle Size	2.5 µm, 4 µm, and 10 µm
Phase	C18 with polar endcapping
Application	For extreme retention of non-polar and extremely polar alkyl compounds
Strength	Resolution of highly polar compounds under 100 % aqueous mobile phase conditions

SYNERGI POLAR-RP
Ether-Linked Phenyl

Polar and Aromatic Reversed Phase Selectivity

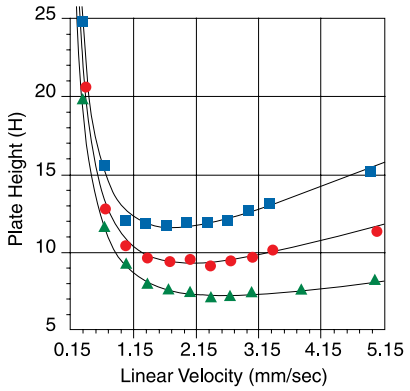


pH Stability	**1.5-7.0**
Particle Size	2.5 µm, 4 µm and 10 µm
Phase	Ether-linked phenyl with polar endcapping
Application	For extreme retention of polar and aromatic compounds
Strength	Improved peak shape for acidic and basic analytes and aromatic selectivity with methanol containing mobile phases

4 µm SILICA – HIGH EFFICIENCY WITH LOW BACKPRESSURE

Synergi utilizes a 4 µm 80 Å silica to provide efficiencies closer to a 3 µm silica, while providing backpressures closer to a 5 µm silica. Ultra-high purity silica (99.99 % metal free) ensures minimal surface metal sites available for chelation and reduces silanol acidity, even under neutral mobile phase conditions. With such a superior silica providing the support for the Synergi phases, it is no wonder why they are used by method developers worldwide.

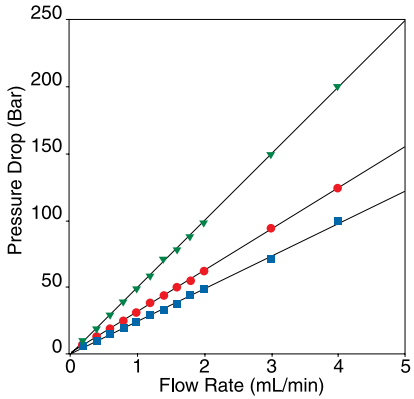
HIGH EFFICIENCY



■ 5 µm C18
● 4 µm Max-RP
▼ 3 µm C18

Columns: Synergi 4 µm Max-RP
Luna® 5 µm C18
Luna® 3 µm C18
Dimensions: 50 x 4.6 mm
Mobile Phase: Water / Acetonitrile (35:65)
Detection: UV @ 254 nm
Injection: 1 µL
Temperature: 30 °C
Sample: Naphthalene (1 µg)

LOW BACKPRESSURES

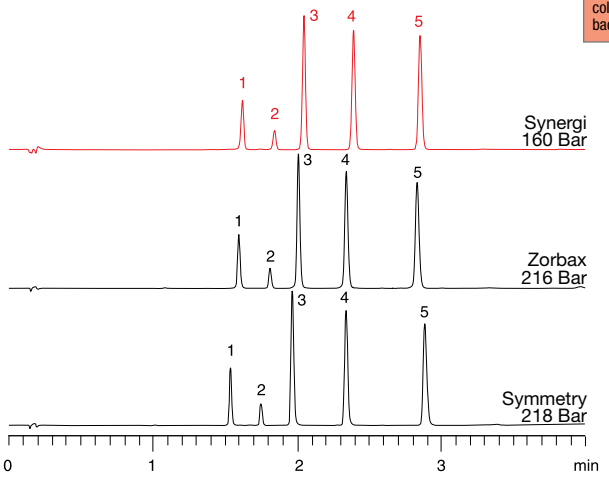


Columns: Synergi 4 µm Max-RP
Luna® 5 µm C18
Luna® 3 µm C18
Dimensions: 50 x 4.6 mm
Mobile Phase: Water / Acetonitrile (35:65)
Detection: UV @ 254 nm
Injection: 1 µL
Temperature: 30 °C
Sample: Naphthalene (1 µg)

LOWER COLUMN BACKPRESSURE COMPARED TO 3.5 µm COMPETITORS

Synergi 4 µm Max-RP Backpressure= 160 Bar — App ID 12480
Zorbax® 3.5 µm SB-C18 Backpressure= 216 Bar — App ID 12520
Symmetry® 3.5 µm C18 Backpressure= 218 Bar — App ID 12521

Lower column backpressure



Columns: Synergi 4 µm Max-RP
Agilent 3.5 µm Zorbax SB-C18
Waters Symmetry 3.5 µm C18
Dimensions: 50 x 4.6 mm
Mobile Phase: A: Water with 0.1 % Formic acid
B: Acetonitrile with 0.1 % Formic acid
Gradient: A/B (95:5) to A/B (5:95) in 4 minutes
Flow Rate: 4 mL/min
Detection: UV @ 254 nm
Injection: 2.5 µL
Temperature: 30 °C
Sample: 1. Dexamethasone (2.5 µg)
2. Hydrocortisone (2.5 µg)
3. 11-α-Hydroxyprogesterone (2.5 µg)
4. 17-α-Hydroxyprogesterone (2.5 µg)
5. Progesterone (2.5 µg)

Synergi Silica Characteristics

Particle Size (µm)	Surface Area (m^2/g)	Pore Size (Å)
4.00	475	80

µm AND 2.5 µm SILICA

SYNERGI 2.5 µm HST
HIGH SPEED TECHNOLOGY

Synergi 2.5 µm HST (High Speed Technology) columns deliver the same, high-performance chromatographic selectivity as the corresponding Synergi 4 µm columns, but with greater advantages when it comes to faster analysis times!

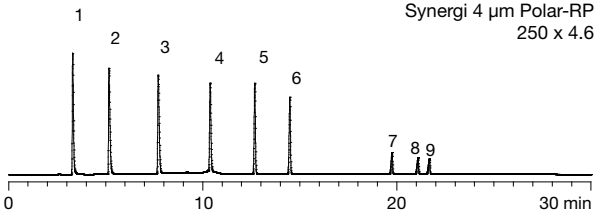
The Synergi 2.5 µm media, combined with optimized shorter dimensions, provides faster separations independent of system pressure capabilities. Synergi 2.5 µm HST columns can be used on your current standard HPLC system and on newer, high-pressure systems to deliver faster chromatographic separations.

Eliminating analysis time as a bottleneck in your lab is now as easy as HST!

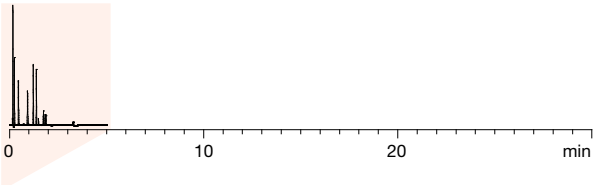
SYNERGI

Synergi 4 µm Polar-RP — App ID 16262

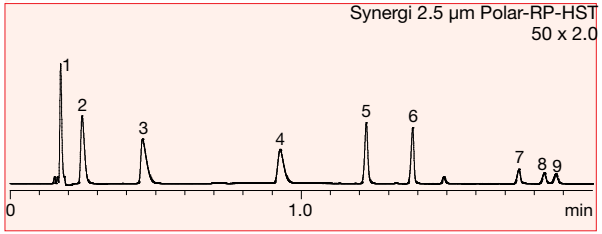
Synergi 2.5 µm Polar-RP-HST — App ID 16263



Column: Synergi 4 µm Polar-RP
Dimensions: 250 x 4.6 mm
Part No.: 00G-4336-E0
Mobile Phase: A: Water
B: Acetonitrile
Gradient: 10 % B hold for 1 min, to 95 % B in 25 min, hold for 10 min, then to 10 % B in 0.1 min
Flow Rate: 1.5 mL/min
Detection: UV @ 270 nm; 9.9 min requilibration
Injection: 5 µL
Temperature: 60 °C



10x Increase in speed



Column: Syngeri 2.5 µm Polar-RP-HST
Dimensions: 50 x 2.0 mm
Part No.: 00B-4371-B0
Mobile Phase: A: Water
B: Acetonitrile
Gradient: 10 % B hold for 0.5 min, to 95 % B in 1.5 min, hold for 1 min, then to 10 % B in 0.1 min (or 1 sec.)
Flow Rate: 1.2 mL/min
Detection: UV @ 270 nm; 1.9 min requilibration
Injection: 1 µL
Temperature: 60 °C
Sample: 20 mg/mL in Acetonitrile
1. Acetone
2. 2-Butanone
3. 2-Pentanone
4. 2-Hexanone
5. 2-Heptanone
6. 2-Octanone
7. 2-Decanone
8. 2- Tridecanone
9. 2-Hexadecanone

Synergi Silica Characteristics

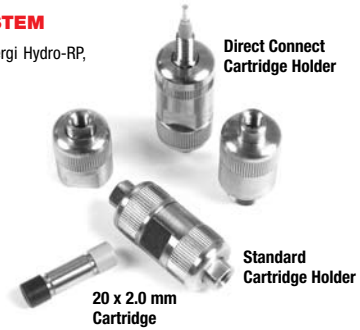
Particle Size (µm)	Surface Area (m^2/g)	Pore Size (Å)
2.5	400	100

MercuryMS
EXCELLENT EFFICIENCY FOR HIGH-THROUGHPUT

MercuryMS™ cartridges are engineered to provide superior performance to meet the demands of today's high-throughput environment. Synergi 2.5 µm silica provides efficiencies required when shortening run times. Utilizing the unique phase characteristics of Synergi Fusion-RP, Max-RP, Hydro-RP, and Polar-RP provides ultimate compound selectivity with up to 60 % reduction in analysis time. Synergi 2.5 µm materials are slurry packed into the MercuryMS™ cartridges, providing resolution & peak shapes equivalent to what was once only found in analytical columns.

MercuryMS™ CARTRIDGE SYSTEM

Packed with 2.5 µm Synergi Max-RP, Synergi Hydro-RP, Synergi Fusion-RP, and Synergi Polar-RP



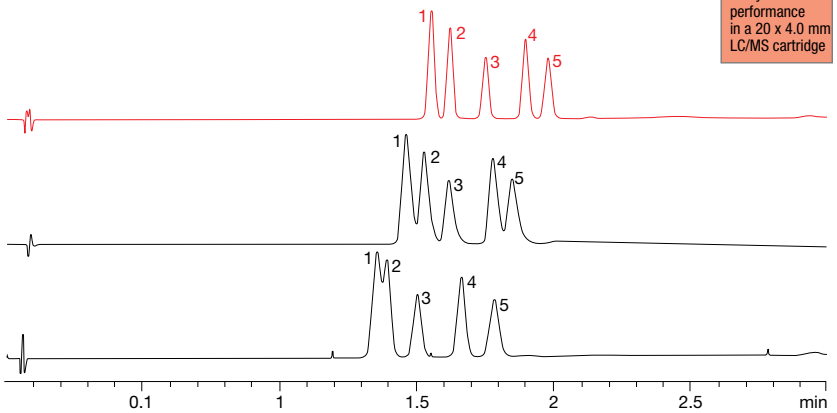
PERFORMANCE COMPARISON OF LC/MS CARTRIDGES

Synergi™ 2.5 µm Max-RP 20 x 4.0 mm MercuryMS — App ID 14229

XTerra® 2.5 µm MS C18 20 x 4.6 mm — App ID 14232

Zorbax® 3.5 µm SB C18 15 x 4.6 mm — App ID 14231

Analytical-like performance in a 20 x 4.0 mm LC/MS cartridge



Cartridges: Synergi 2.5 µm Max-RP
Waters XTerra 2.5 µm C18 MS
Agilent 3.5 µm Zorbax SB-C18
Dimensions: 20 x 4.0 mm MercuryMS™ Cartridge (Synergi Max-RP)
20 x 4.6 mm (XTerra)
15 x 4.6 mm (Zorbax)
Mobile Phase: A: Water with 0.1 % Formic acid
B: Acetonitrile with 0.1 % Formic acid
Gradient: A/B (85:15) to A/B (15:85) in 5 minutes
Flow Rate: 3 mL/min
Detection: UV @ 210 nm (XTerra & Zorbax)
UV @ 254 nm (MercuryMS)
Temperature: 22 °C
Sample: 1. Desmethyldiazepam
2. Oxazepam
3. Lorazepam
4. Temazepam
5. Diazepam (Valium)

synergi™

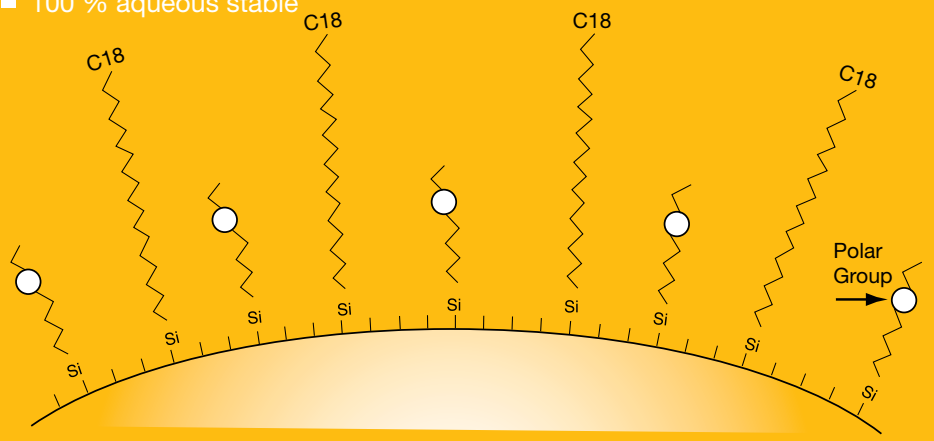
Fusion-RP

Polar Embedded

C18 Column

Improved Polar Selectivity with Reduced Run Times

- Enhanced polar retention under organic conditions
- Low MS bleed
- 100 % aqueous stable



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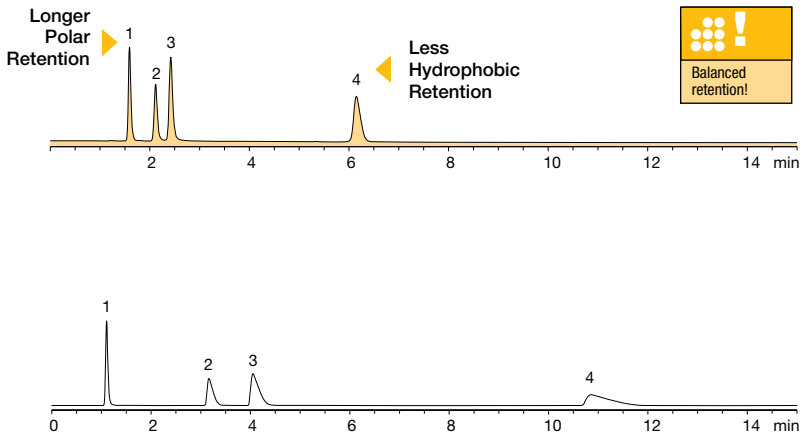
IMPROVED POLAR SELECTIVITY WITH REDUCED RUN TIMES

Synergi Fusion-RP uses a polar embedded and a hydrophobic ligand to achieve improved selectivity. The C18 ligand gives Synergi Fusion-RP good hydrophobic retention and selectivity, while the polar embedded group provides enhanced polar retention. This dual-phase selectivity allows balanced polar, acidic, basic and hydrophobic compound retention and resolution. If you are working with mixtures of compounds with polar and non-polar characteristics, and having difficulties finding that perfect mix of selectivity, then you should try Synergi Fusion-RP.

INCREASED POLAR RETENTION WITH REDUCED HYDROPHOBIC INTERACTION

Synergi 4 µm Fusion-RP App ID 14840

Typical C18



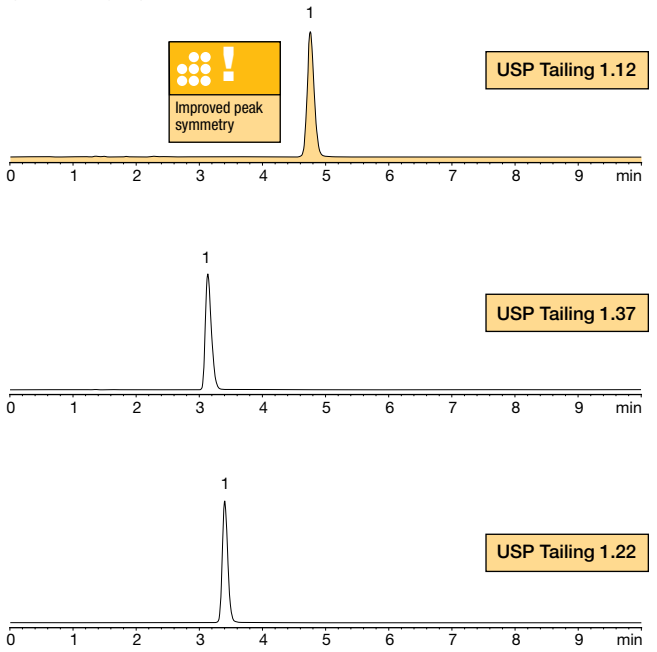
Columns: Synergi 4 µm Fusion-RP
Typical C18
Dimensions: 150 x 4.6 mm
Mobile Phase: 20 mm Potassium Phosphate, pH 2.5 / Acetonitrile (75:25)
Flow Rate: 1.0 mL/min
Detection: UV @ 210 nm
Sample: 1. Maleic acid
2. Chlorpheniramine
3. Triprolidine
4. Diphenhydramine

PEAK SHAPE COMPARISON USING PROPRANOLOL

Synergi 4 µm Fusion-RP App ID 14837

Waters SymmetryShield™ 5 µm C18

Supelco Discovery® 5 µm RP-AmideC16



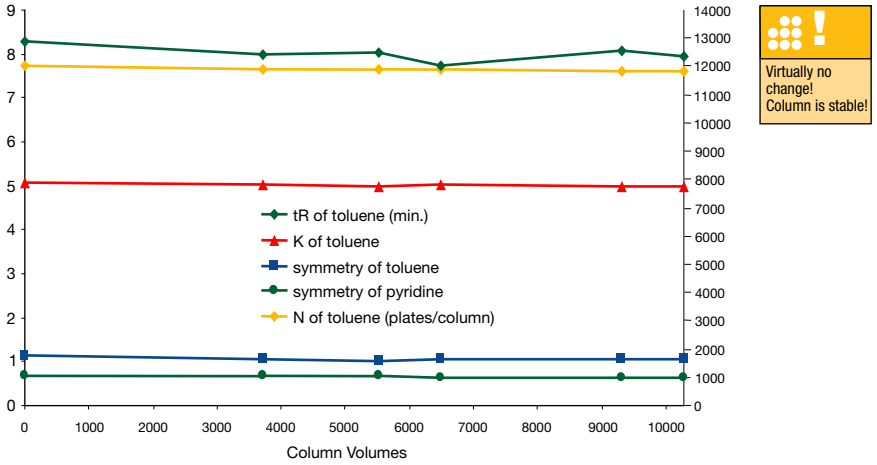
Columns: Synergi 4 µm Fusion-RP
Waters SymmetryShield™ 5 µm C18
Supelco Discovery® 5 µm RP-AmideC16
Dimensions: 150 x 4.6 mm
Mobile Phase: 20 mM Potassium Phosphate, pH 2.5 / Acetonitrile (75:25)
Flow Rate: 1.0 mL/min
Detection: UV @ 230 nm
Sample: 1. Propranolol

synergi™ FUSION-RP

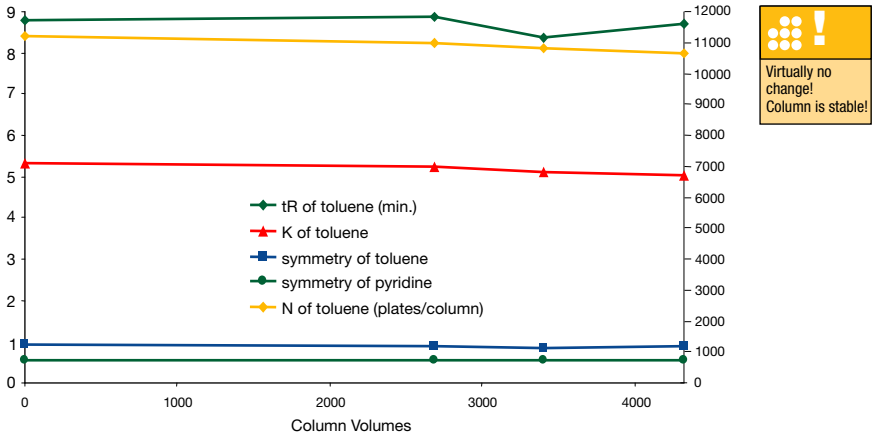
1.5-10 pH STABLE FOR RUGGED METHODS

The ability of Synergi Fusion-RP to operate in an extended pH range of 1.5-10 (under isocratic elution conditions) is the direct result of an exhaustive endcapping procedure, which is highly protective of the silica surface. pH stability is an indication of column ruggedness. pH tested at the extremes (1.5 and 10), for more than 4000 column volumes, the results below clearly show how rugged Synergi Fusion-RP is. Imagine how well this column will work for your application.

pH 10.0 STABILITY TEST



pH 1.5 STABILITY TEST



pH testing was done under isocratic conditions with phosphate buffer. Formic acid and ammonium formate were also used as test buffers.

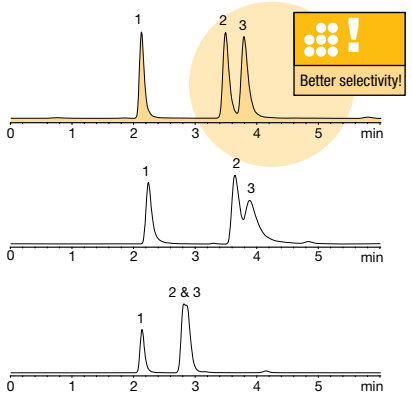
ANTIHISTAMINES

Synergi 4 µm Fusion-RP App ID 14839

Waters SymmetryShield™ 5 µm C18

Supelco Discovery® 5 µm RP-AmideC16

Columns: Synergi 4 µm Fusion-RP
SymmetryShield™ 5 µm C18
Supelco Discovery® 5 µm RP-AmideC16
Dimensions: 150 x 4.6 mm
Mobile Phase: 20 mm Potassium Phosphate, pH 7 / Methanol (70:30)
Flow Rate: 1.0 mL/min
Detection: UV @ 210 nm
Sample: 1. Phenylephrine
2. Phenylpropanolamine
3. Pseudoephedrine

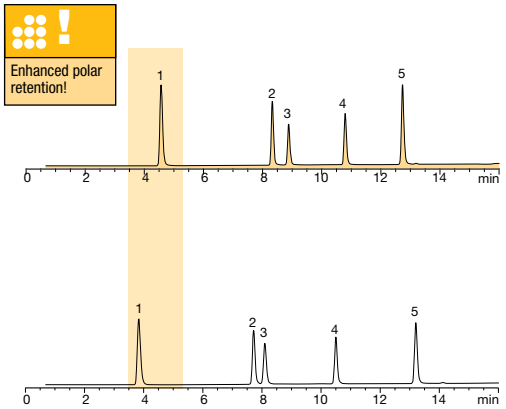


SULFA DRUGS

Synergi 4 µm Fusion-RP App ID 14838

Waters SymmetryShield™ 5 µm C18

Columns: Synergi 4 µm Fusion-RP
SymmetryShield™ 5 µm C18
Dimensions: 150 x 4.6 mm
Mobile Phase: A: 20 mM Potassium Phosphate, pH 2.5
B: Methanol
Gradient: A/B (95:5) for 0.5 min
A/B (20:80) in 15 min
Flow Rate: 1.0 mL/min
Detection: UV @ 254 nm
Sample: 1. Sulfanilamide
2. Sulfathiazole
3. Sulfamerazine
4. Sulfamethoxazole
5. Sulfaquinoxaline



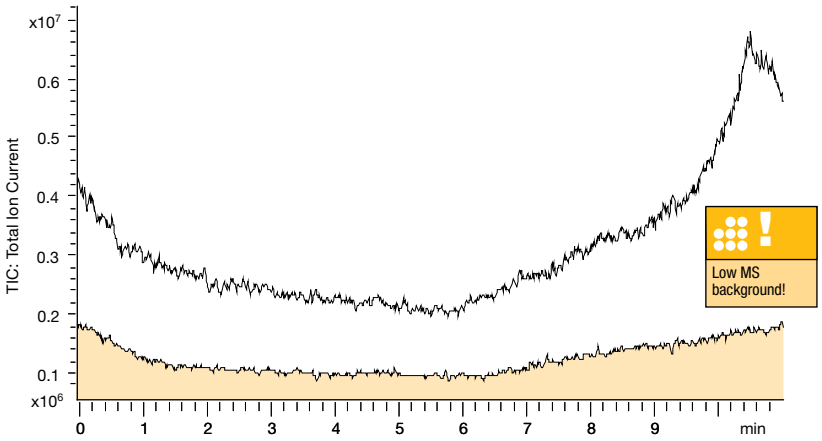
EXTREMELY LOW LC/MS COLUMN BLEED

A careful control of the endcapping process combined with the chemical nature of the polar embedded group results in high phase stability with minimal ligand cleavage. The excellent bleed profile compared to a competitor polar-embedded column in the figure below shows Synergi Fusion-RP is well suited for LC/MS work.

LC/MS BLEED PROFILES

Waters SymmetryShield™ 5 µm C18

Synergi 4 µm Fusion-RP



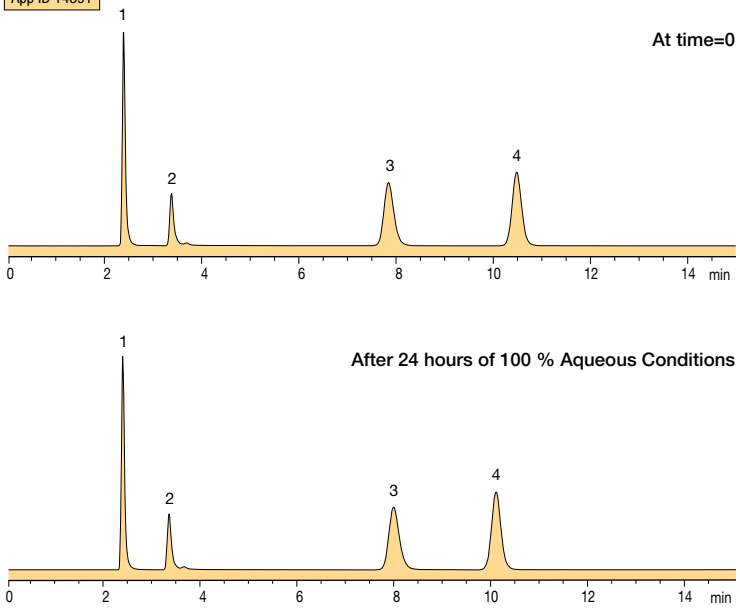
Columns: Synergi 4 µm Fusion-RP
Waters SymmetryShield™ 5 µm C18
Dimensions: 150 x 4.6 mm
Mobile Phase: A: 0.1 % CH_3COOH in Water
B: 0.1 % CH_3COOH in Methanol
Gradient: 95:5 (A/B) linear to 5:95 over 8 min
hold for 5 min
Flow Rate: 0.5 mL/min
Detection: Bruker-Daltonics Esquire 2000 IT
Ion Source: ESI
Scan Rate: 13000 m/z/s
Scan Range: 50-1000

100 % AQUEOUS FOR ADDED METHOD FLEXIBILITY

Use Synergi Fusion-RP for greater polar retention under 100 % aqueous conditions. The polar embedded group allows this phase to be run under 100 % aqueous conditions without loss of retentivity. Unlike typical C18 phases, the pores and the sorbent surface of Synergi Fusion-RP stay wet even after many hours of operation in 100 % aqueous mobile phase. This aqueous stability offers greater flexibility in application development.

AQUEOUS STABILITY

App ID 14891



Column: Synergi 4 µm Fusion-RP
Dimensions: 150 x 4.6 mm
Part No.: 00F-4424-E0
Mobile Phase: 20 mM Potassium phosphate buffer pH 2.5
Flow Rate: 1.0 mL/min
Detection: UV @ 254 nm
Injection: 1 µL
Temperature: 30 °C
Sample: 1. Thiourea
2. Adenine
3. Guanosine-5-monophosphate
4. Thymine

synergi™

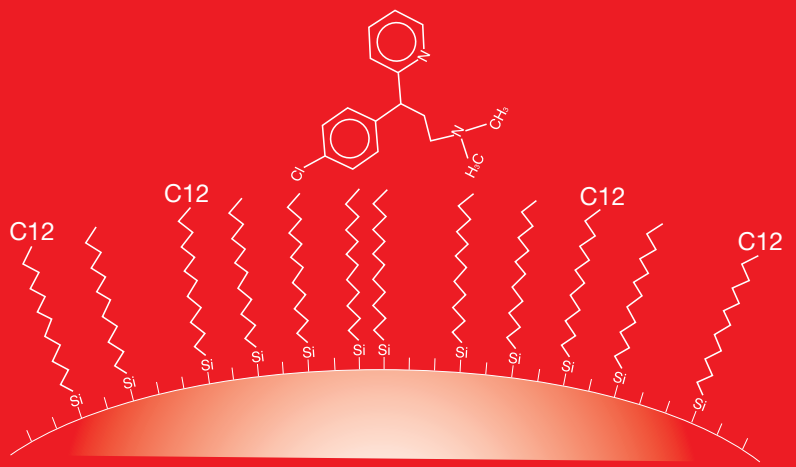
Max-RP

Reversed Phase

C12 Column

Maximum Reversed Phase Performance

- Hydrophobic retention similar to a C18 with improved results
- 25 % more free silanol coverage than most C18 columns
- Sharper peaks for basic and tailing compounds

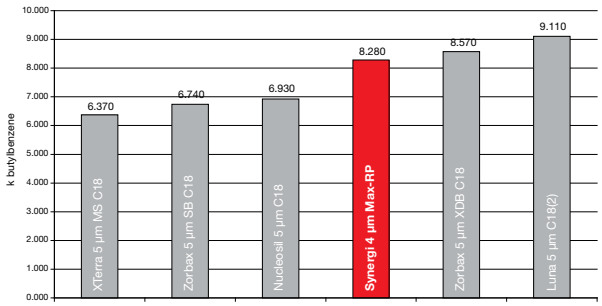


synergi™ MAX-RP

HYDROPHOBIC RETENTION SIMILAR TO A C18 - WITH IMPROVED RESULTS

The bulky nature of C18 ligands results in relatively low coverage of surface silanols which cause peak tailing. Nevertheless, C18 columns have the hydrophobic selectivity chromatographers rely on. To reduce peak tailing and still offer the preferred hydrophobic selectivity, we engineered Synergi Max-RP with a C12 bonded phase. A C12 ligand is sterically less hindered than a C18 and can be bonded to result in 25 % more of the silica surface being covered than a C18, shielding more free silanols from non-specific interaction. When bonded to our high (475 m²/g) surface area silica, Synergi Max-RP gives the hydrophobic retention and methylene selectivity you would expect from a C18 column, but with sharper peaks, less tailing, and improved reproducibility.

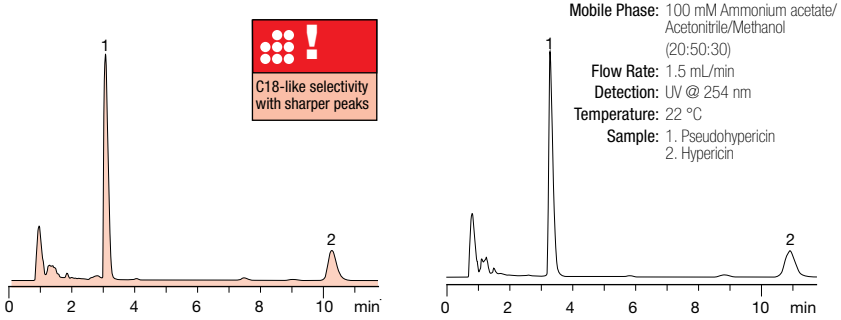
HYDROPHOBIC RETENTION: SYNERGI MAX-RP (C12) PERFORMS LIKE A C18



Columns: XTerra 5 µm MS C18
Zorbax 5 µm SB C18
Nucleosil 5 µm C18
Synergi 4 µm Max-RP
Zorbax 5 µm XDB C18
Luna 5 µm C18(2)
Dimensions: 150 x 4.6 mm
Mobile Phase: Acetonitrile/Water (80:20)
Flow Rate: 1 mL/min
Detection: UV @ 254 nm
Injection: 1 µL
Temperature: Ambient
Sample: Butylbenzene

SYNERGI MAX-RP VS. SYNERGI HYDRO-RP

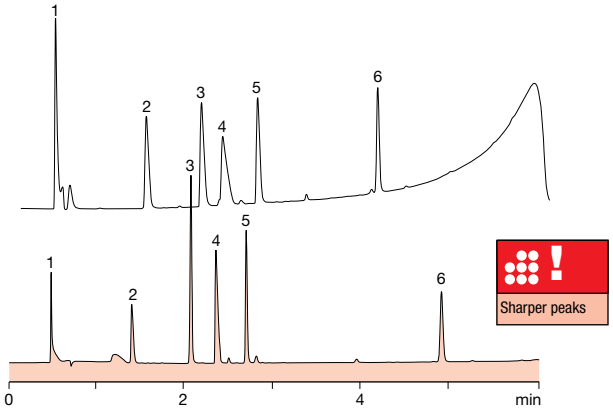
Synergi 4 µm Max-RP App ID 14248
Synergi 4 µm Hydro-RP App ID 14246



Dimensions: 150 x 4.6 mm
Mobile Phase: 100 mM Ammonium acetate/Acetonitrile/Methanol (20:50:30)
Flow Rate: 1.5 mL/min
Detection: UV @ 254 nm
Temperature: 22 °C
Sample: 1. Pseudohypericin
2. Hypericin

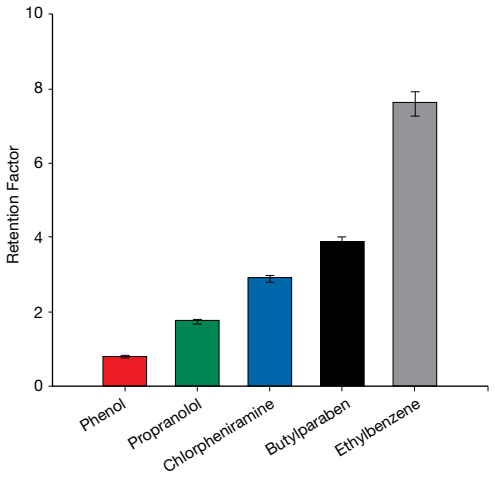
SYNERGI MAX-RP VS. ZORBAX 3.5 µm XDB C18

Zorbax® 3.5 µm XDB C18 App ID 12519
Synergi 4 µm Max-RP App ID 12476



Dimensions: 50 x 4.6 mm
Mobile Phase: A: Water with 0.1 % Formic acid
B: Acetonitrile with 0.1 % Formic acid
Gradient: A/B (95:5) to 100 % B in 5 min
Flow Rate: 1.5 mL/min
Detection: UV @ 254 nm
Injection: 5 µL
Temperature: 30 °C
Sample: 1. Thiourea (0.25 µg)
2. Codeine (1 µg)
3. Chlorpheniramine (2 µg)
4. Propranolol (6 µg)
5. Desipramine (0.5 µg)
6. Ibuprofen (6 µg)

BATCH REPRODUCIBILITY OF SYNERGI MAX-RP



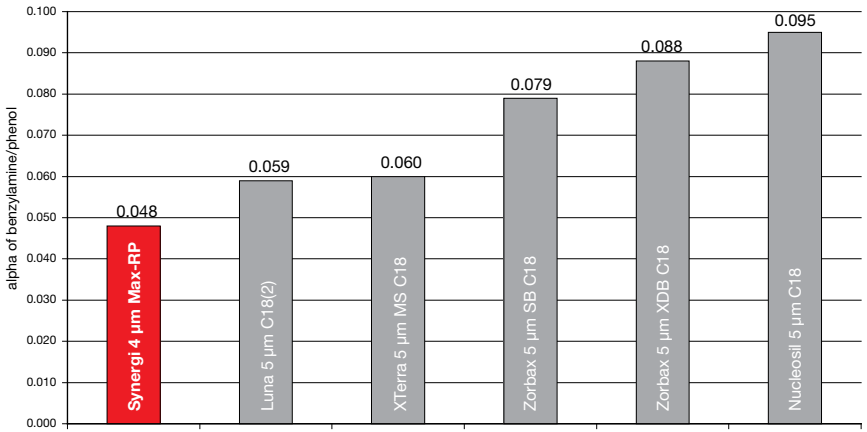
Column: Synergi 4 µm Max-RP
Dimensions: 150 x 4.6 mm
Part No.: 00F-4337-E0
Mobile Phase: Methanol/Acetonitrile/20 mM Potassium phosphate pH 7.0 (40:30:30)
Flow Rate: 1.5 mL/min
Detection: UV @ 254 nm
Injection: 5 µL
Temperature: Ambient
Sample: 1. Phenol (2 µg)
2. Propranolol (15 µg)
3. Chlorpheniramine (1 µg)
4. Butylparaben (0.25 µg)
5. Ethylbenzene (5 µg)

synergi™ MAX-RP

SHARPER PEAKS FOR BASIC COMPOUNDS

Ionic interactions created by free silanols also can contribute to peak tailing. Low pH mobile phases (~2.5) are often employed in order to protonate free silanols. Un-protonated free silanols can lead to poor peak shape for basic drugs. Utilizing a C12 bonded phase, a 25 % greater bonded phase density is achieved compared to typical C18 bonding, covering more free silanols. Benzylamine and phenol are used to probe for active silanol sites at pH 2.5; Synergi Max-RP shows lower silanol activity as compared to other C18 columns.

SILANOL ACTIVITY AT LOW pH: C12 VS. C18 PHASES

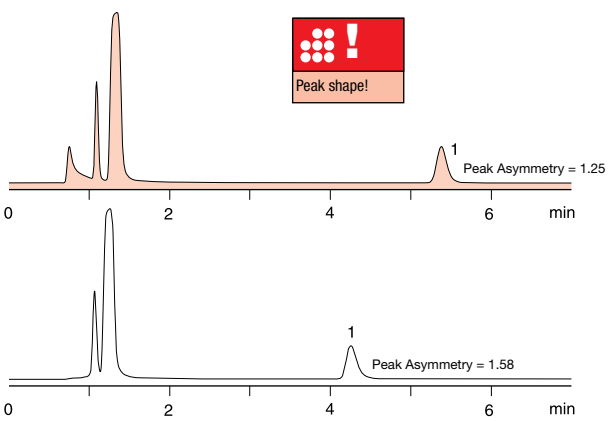


Columns: Synergi 4 µm Max-RP
Luna 5 µm C18(2)
XTerra 5 µm MS C18
Zorbax 5 µm SB C18
Zorbax 5 µm XDB C18
Nucleosil 5 µm C18
Dimensions: 150 x 4.6 mm
Mobile Phase: Methanol/20 mM Potassium phosphate, pH 2.5 (30:70)
Flow Rate: 1 mL/min
Detection: UV @ 254 nm
Injection: 5 µL
Temperature: Ambient
Sample: 1. Benzylamine
2. Phenol

SYNERGI MAX-RP VS. WATERS® XTERRA® MS

Synergi 4 µm Max-RP App ID 10896

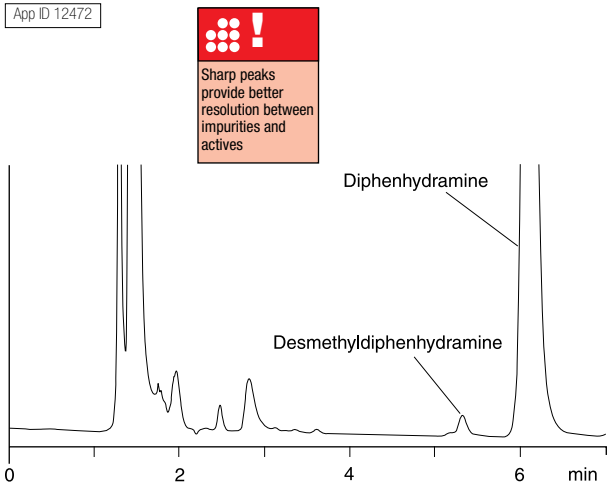
XTerra® MS 5 µm C18



Columns: Synergi 4 µm Max-RP
XTerra MS 5 µm C18
Dimensions: 150 x 4.6 mm
Mobile Phase: 20 mM Potassium phosphate pH 7/Acetonitrile / Methanol (50:25:25)
Flow Rate: 1.5 mL/min
Detection: UV @ 210 nm
Injection: 1 µL
Temperature: 30 °C
Sample: Methanol extract from Chlortrimeton Allergy Pills
1. Chlorpheniramine

BENADRYL®

App ID 12472



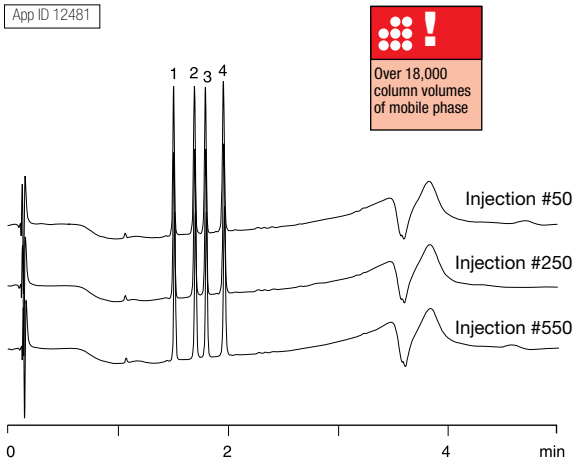
Column: Synergi 4 µm Max-RP
Dimensions: 150 x 4.6 mm
Part No.: 00F-4337-E0
Mobile Phase: 20 mM Potassium phosphate pH 7/ Acetonitrile /Methanol (30:40:30)
Flow Rate: 1.0 mL/min
Detection: UV @ 210 nm
Injection: 10 µL
Temperature: Ambient
Sample: Methanol extract of Benadryl Allergy Chewables (Parke-Davis)
1. Desmethyldiphenhydramine
2. Diphenhydramine

REPRODUCIBLE PERFORMANCE FROM pH 1.5-10

Our bonding and endcapping procedures give Synergi 4 µm Max-RP stability from pH 1.5 (0.1 % TFA) to 10. This robust pH range ensures that there will be little bleed at low pH's due to bonded phase hydrolysis and that a broad range of mobile phase modifiers can be used without damaging the column. It also allows analysts to use high pH's to overcome basic ionization and to overcome sample solubility issues.

STABILITY @ pH 1.5

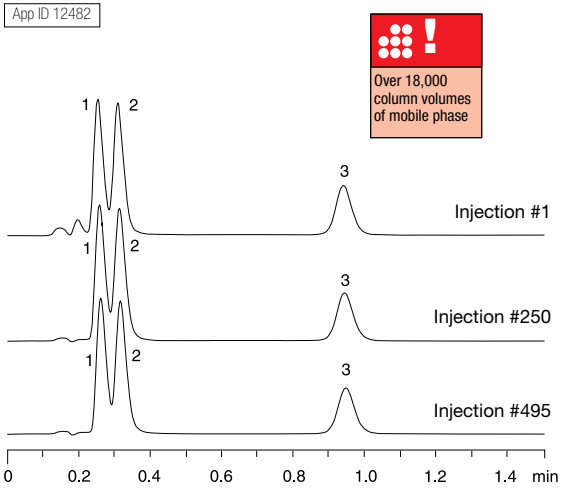
App ID 12481



Column: Synergi 4 µm Max-RP
Dimensions: 30 x 2.0 mm
Part No.: 00A-4337-B0
Mobile Phase: A: Water with 0.1 % TFA
B: Acetonitrile with 0.1 % TFA
Gradient: A/B (95:5) to A/B (5:95) in 3 min
Flow Rate: 1.0 mL/min
Detection: UV @ 254 nm
Injection: 1 µL
Temperature: 30 °C
Sample: Precipitated porcine serum (2:1 Acetonitrile:serum) containing:
1. Oxazepam (50 ng)
2. Temazepam (50 ng)
3. Nordiazepam (50 ng)
4. Diazepam (50 ng)

STABILITY @ pH 10.0

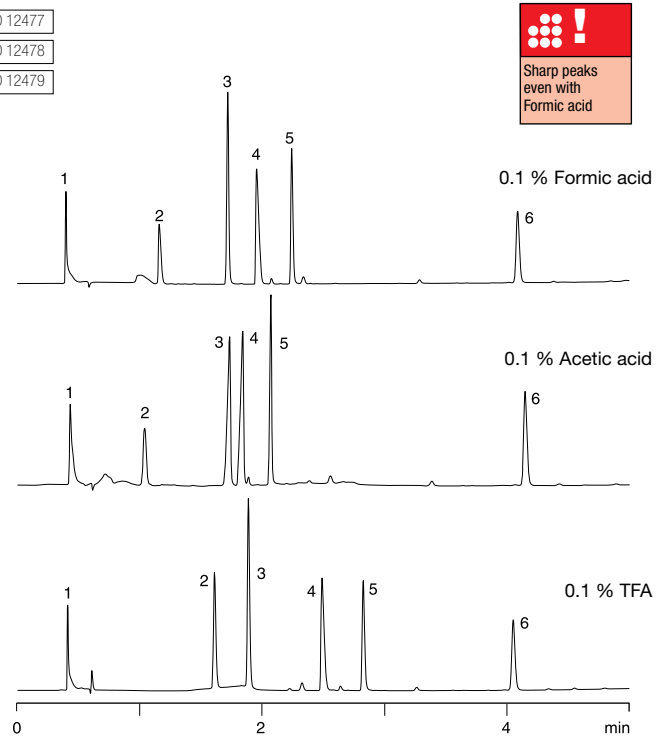
App ID 12482



Column: Synergi 4 µm Max-RP
Dimensions: 30 x 2.0 mm
Part No.: 00A-4337-B0
Mobile Phase: Water with 0.1 % Ammonium hydroxide, pH 10 / Acetonitrile with 0.1 % Ammonium hydroxide, pH 10 (50:50)
Flow Rate: 0.5 mL/min
Detection: UV @ 254 nm
Injection: 5 µL
Temperature: 30 °C
Sample: 1. Pyridine
2. Phenol
3. Toluene

PERFORMANCE IN MS-COMPATIBLE MODIFIERS

App ID 12477
App ID 12478
App ID 12479



Column: Synergi 4 µm Max-RP
Dimensions: 50 x 4.6 mm
Part No.: 00B-4337-E0
Mobile Phase: A: Water with 0.1 % TFA, Formic acid, or Acetic acid
B: Acetonitrile with 0.1 % TFA, Formic acid, or Acetic acid
Gradient: A/B (95:5) to 100 % B in 5 min
Flow Rate: 1.5 mL/min
Detection: UV @ 254 nm
Injection: 5 µL
Temperature: 30 °C
Sample: 1. Thiourea (0.25 µg)
2. Codeine (1 µg)
3. Chlorpheniramine (2 µg)
4. Propranolol (6 µg)
5. Desipramine (0.5 µg)
6. Ibuprofen (6 µg)

synergi™

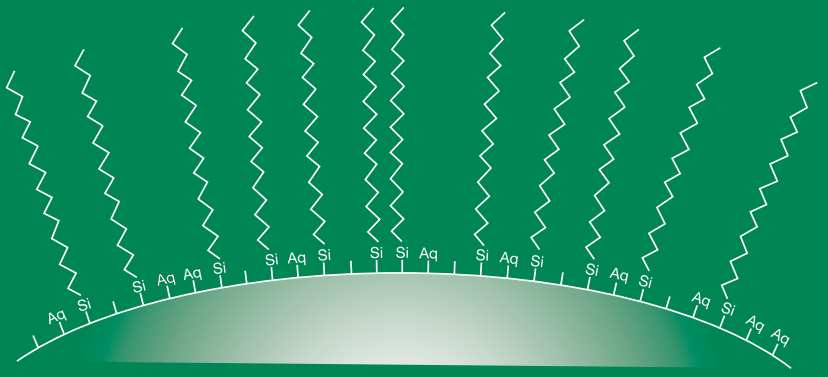
Hydro-RP

Polar Endcapped

C18 Column

Hydro-phobic/philic Reversed Phase Retention

- Extreme retention of hydrophobic compounds
- Stable in 100 % aqueous mobile phase
- Improved polar selectivity



synergi™ HYDRO-RP

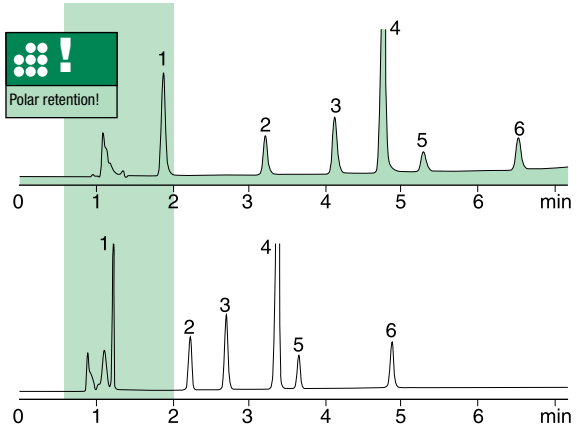
A C18 WITH ENHANCED RETENTION OF POLAR COMPOUNDS UNDER 100 % AQUEOUS CONDITIONS

Extremely polar analytes are not always retained and often do not separate well on conventional C18 columns. Synergi Hydro-RP is a C18 bonded phase endcapped with a unique proprietary polar group to provide extreme retention of both hydrophobic as well as polar compounds under 100 % aqueous conditions. The high (475m²/g) 4 µm silica surface area combined with a dense bonded phase coverage allows for substantial interaction between the sample analyte and the bonded phase. The net result is a very retentive C18 phase well suited to separating extremely polar analytes.

SYNERGI HYDRO-RP VS. ZORBAX XDB

Synergi™ 4 µm Hydro-RP — App ID 14239

Agilent Technologies® Zorbax® 5 µm Eclipse® XDB — App ID 14266

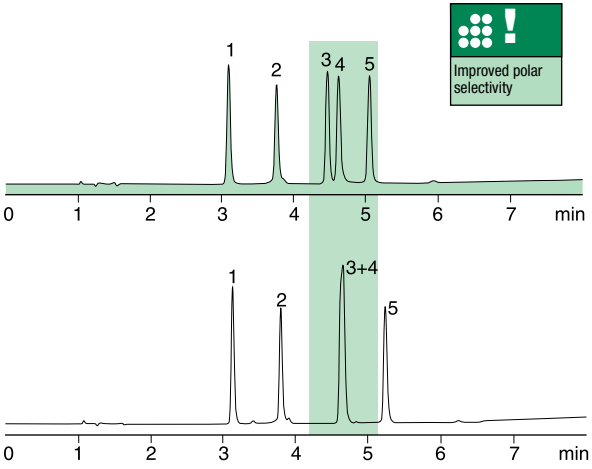


Dimensions: 150 x 4.6 mm
Mobile Phase: A: 10 mM Triethylammonium formate pH 6.0
B: Acetonitrile with 10 mM Triethylammonium formate
Gradient: A/B (85:15) to A/B (35:65) in 15 minutes
Flow Rate: 1.5 mL/min
Temperature: Ambient
Detection: UV @ 230 nm
Injection: 1 µL of beta-blockers mix each at 0.8 µg/µL
Sample:
1. Atenolol
2. Pindolol
3. Nadolol
4. Acebutolol
5. Metoprolol
6. Labetalol

SYNERGI HYDRO-RP VS. SYNERGI MAX-RP

Synergi™ 4 µm Hydro-RP — App ID 14251

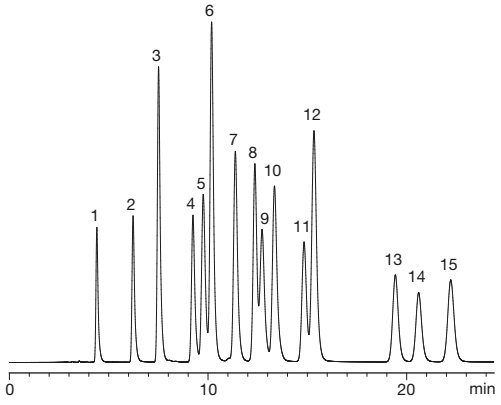
Synergi™ 4 µm Max-RP — App ID 14253



Dimensions: 150 x 4.6 mm
Mobile Phase: A: 20 mM Potassium dihydrogen phosphate
B: Acetonitrile
Gradient: A/B (95:5) to A/B (65:35) in 15 minutes
Flow Rate: 1.5 mL/min
Temperature: 22 °C
Detection: UV @ 210 nm
Sample:
1. Morphine
2. Hydromorphone
3. Codeine
4. Nalorphine
5. Oxycodone

EXPLOSIVES MIX: EPA METHOD 8330

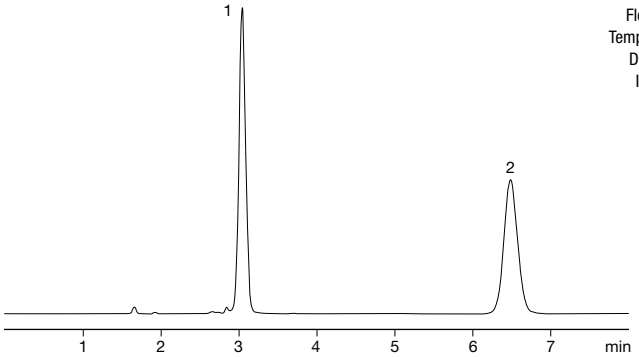
App ID 14768



Column: Synergi 4 µm Hydro-RP
Dimensions: 250 x 4.6 mm
Part No.: 00G-4375-E0
Mobile Phase: Water/Methanol/Acetonitrile (51:45:4)
Flow Rate: 0.8 mL/min
Temperature: 35 °C
Detection: UV @ 254 nm
Sample:
1. HMX
2. RDX
3. 1,3,5-Trinitrobenzene
4. 1,2-Dinitrobenzene (Int Std)
5. Tetryl
6. 1,3-Dintrobenzene
7. Nitrobenzene
8. 2,4,6-Trinitrotoluene
9. 4-Amino-2,6-dinitrotoluene
10. 2-Amino-4,6-dinitrotoluene
11. 2,6-Dinitrotoluene
12. 2,4-Dinitrotoluene
13. 2-Nitrotoluene
14. 4-Nitrotoluene
15. 3-Nitrotoluene

REDUCED AND OXIDIZED GLUTATHIONE

App ID 14240



Column: Synergi 4 µm Hydro-RP
Dimensions: 150 x 4.6 mm
Part No.: 00F-4375-E0
Mobile Phase: 20 mM Potassium phosphate, pH 2.7/Acetonitrile (99:1)
Flow Rate: 1.0 mL/min
Temperature: 22 °C
Detection: UV @ 210 nm
Injection: 1 µL of glutathione oxidized and reduced at 1 mg/mL each in buffer
Sample:
1. Glutathione Reduced (G-SH)
2. Glutathione Oxidized (G-S-S-G)

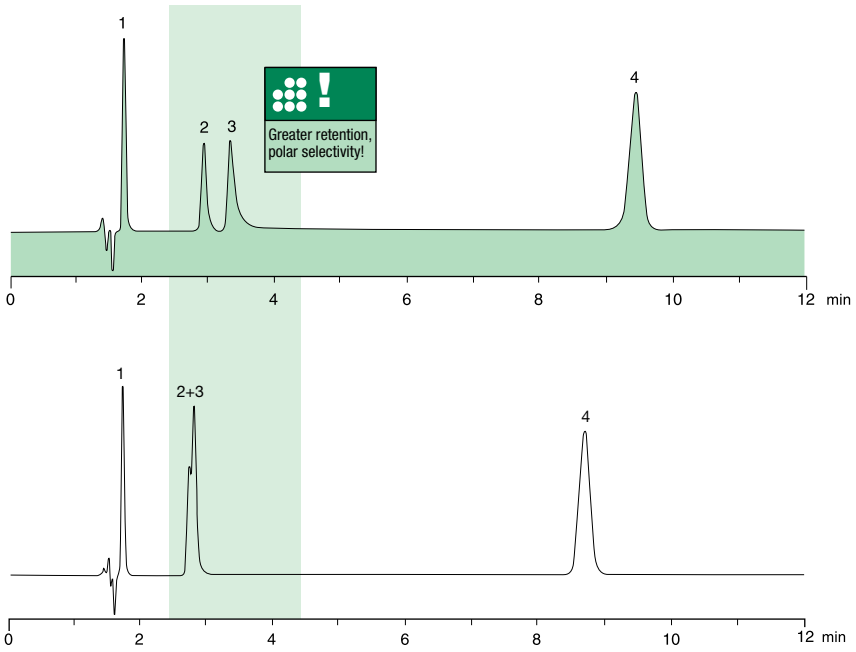
synergi™ HYDRO-RP

EXTREME RETENTION OF HYDROPHOBIC COMPOUNDS

Synergi Hydro-RP shows significantly higher hydrophobic retention when compared to other C18 phases. Greater hydrophobicity is useful for many applications because higher percentage organic mobile phase can be used resulting in shorter run and re-equilibration times. For LC/MS applications this enhanced hydrophobicity results in analytes eluting at higher percentage organic mobile phase, resulting in improved sensitivity. Dense bonding and endcapping make Synergi Hydro-RP compatible with a variety of MS-compatible mobile phase modifiers such as formic acid, TEAA, and acetic acid. Through a combination of greater retention, excellent efficiency, and stability to MS-compatible buffers, Synergi Hydro-RP is ideal for LC/MS applications.

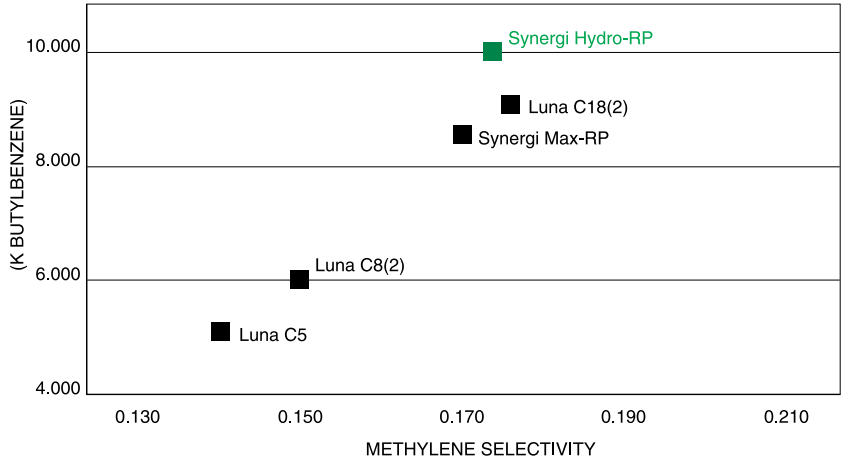
SYNERGI HYDRO-RP VS. LUNA® C18(2)

Synergi 4 µm Hydro-RP 80Å — App ID 14424
Luna® 5 µm C18(2) 100Å — App ID 14425



Dimensions: 150 x 4.6 mm
Mobile Phase: 20 mM Potassium phosphate, pH 7.0 /Methanol (60:40)
Flow Rate: 1 mL/min
Temperature: 22 °C
Detection: UV @ 210 nm
Sample: 1. Phenylephrine
2. Phenylpropanolamine
3. Pseudoepherine
4. Methylparaben

HYDROPHOBIC RETENTIVITY COMPARED



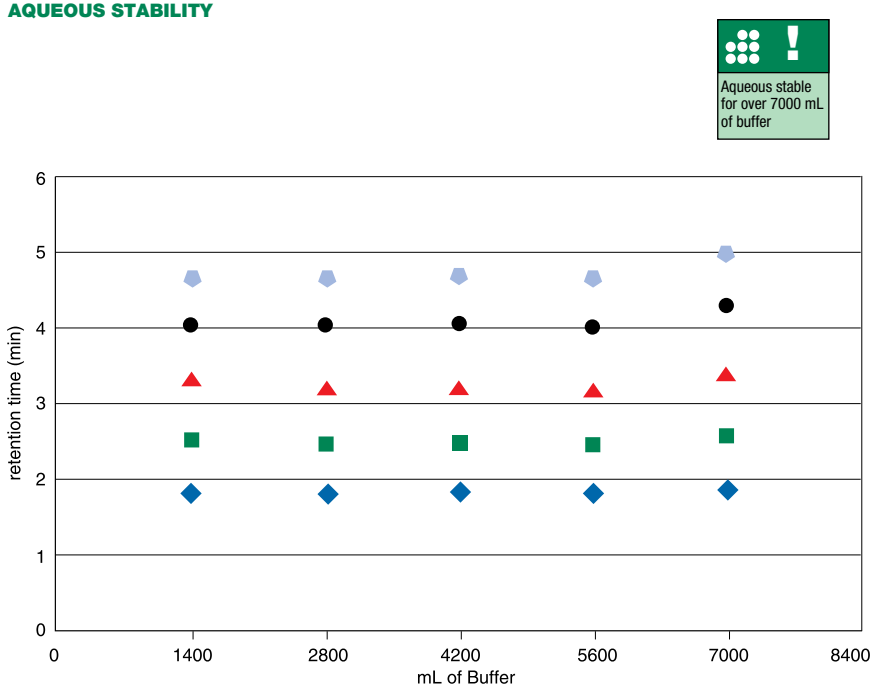
Dimensions: 150 x 4.6 mm
Mobile Phase: Acetonitrile/20 mM Potassium phosphate pH 7.0 (65:35)
Flow Rate: 1.5 mL/min
Temperature: Ambient
Sample: 1. Butylbenzene
2. Amylbenzene

The chart was obtained by plotting hydrophobic retention (k for butylbenzene vs. methylene selectivity (log k for amylbenzene vs the number of methyl groups) under the stated conditions. A column with high hydrophobicity will better resolve two analytes which subtly differ in their overall hydrophobicity than a column with lower hydrophobic selectivity.

STABLE IN 100 % AQUEOUS MOBILE PHASE

Running a 100 % aqueous mobile phase on a C18 column can provide improved retention of extremely polar compounds. However, conventional C18 phases are poorly wetted by highly aqueous mobile phases causing the C18 ligands to mat down on the surface of the silica and, over time, retention is completely lost. Organic acids and catecholamines are often difficult to separate analyze as their polarity hinders interaction with conventional C18 ligands, but this is easily accomplished using Synergi Hydro-RP under 100 % aqueous conditions. Synergi Hydro-RP utilizes this versatility for method development while providing superior column ruggedness.

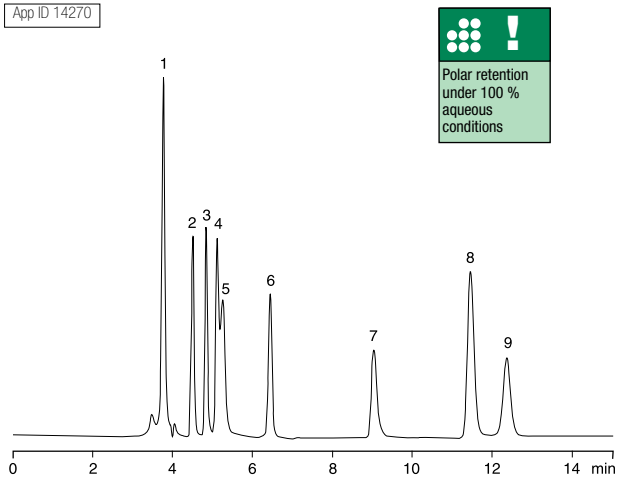
AQUEOUS STABILITY



Column: Synergi 4 µm Hydro-RP
Dimensions: 150 x 4.6 mm
Part No.: 00F-4375-E0
Mobile Phase: 20 mM Potassium phosphate, pH 2.5
Flow Rate: 1.0 mL/min
Temperature: 35 °C
Detection: UV @ 210 nm
Injection: 5 µL
Sample: 1. Norepinephrine (0.8 mg/mL)
2. Epinephrine (0.5 mg/mL)
3. Normetanephrine (0.6 mg/mL)
4. Dopamine (0.4 mg/mL)
5. L-DOPA (0.3 mg/mL)

ORGANIC ACIDS

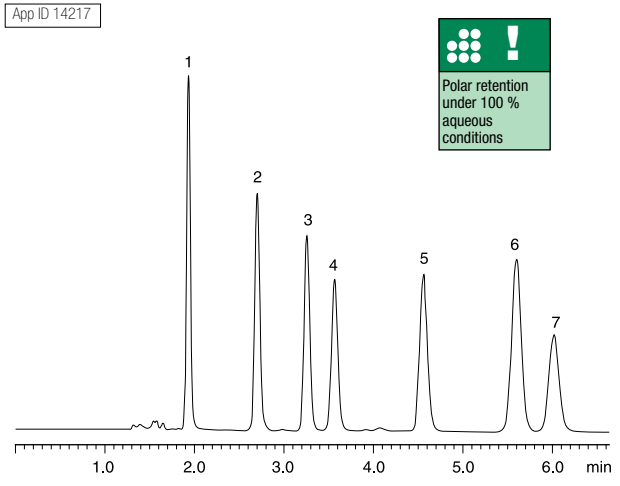
App ID 14270



Column: Synergi 4 µm Hydro-RP
Dimensions: 250 x 4.6 mm
Part No.: 00G-4375-E0
Mobile Phase: 20 mM Potassium phosphate, pH 2.9
Flow Rate: 0.7 mL/min
Temperature: 22 °C
Detection: UV @ 220 nm
Sample: 1. Oxalic acid
2. Tartaric acid
3. Glycolic acid
4. Formic acid
5. Pyruvic acid
6. Malonic acid
7. Acetic acid
8. Maleic acid
9. Citric acid

CATECHOLAMINES

App ID 14217



Column: Synergi 4 µm Hydro-RP
Dimensions: 150 x 4.6 mm
Part No.: 00F-4375-E0
Mobile Phase: 20 mM Potassium phosphate, pH 2.5
Flow Rate: 1 mL/min
Temperature: 22 °C
Detection: UV @ 210 nm
Sample: 1. Norepinephrine
2. Epinephrine
3. 6-Hydroxydopamine
4. Normetanephrine
5. Dopamine
6. L-DOPA
7. Epinine

synergi™

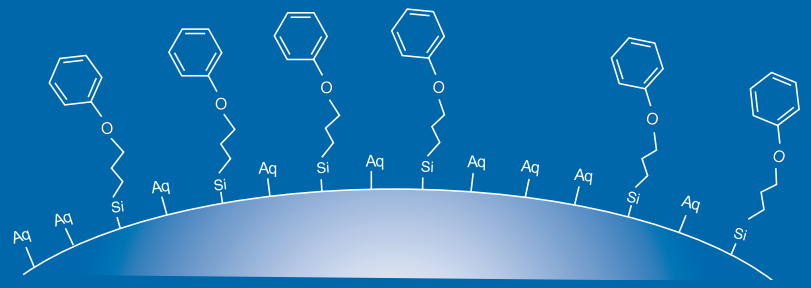
Polar-RP

Ether-Linked

Phenyl Column

Polar and Aromatic Reversed Phase Selectivity

- Increased retention of highly polar and aromatic compounds
- Stable in 100 % buffer mobile phases
- Highly reproducible



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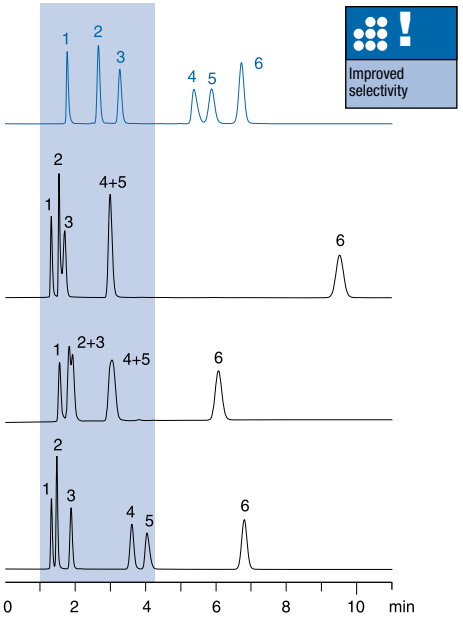
synergi™ POLAR-RP

ENHANCED SELECTIVITY FOR POLAR AROMATICS

Synergi Polar-RP is an ether-linked phenyl phase with proprietary hydrophilic endcapping designed specifically to maximize retention and selectivity for polar and aromatic analytes. Aromatic selectivity can be further enhanced by the addition of methanol to the mobile phase. Methanol facilitates the π-π interactions between the aromatic rings of the analyte and the phenyl functional group of Synergi Polar-RP. This feature allows for improved polar retention that complements the more conventional C18 column chemistries, as well as provides improved peak shape and an alternative selectivity compared to other polar phases.

INCREASED RESOLUTION OF POLAR COMPOUNDS

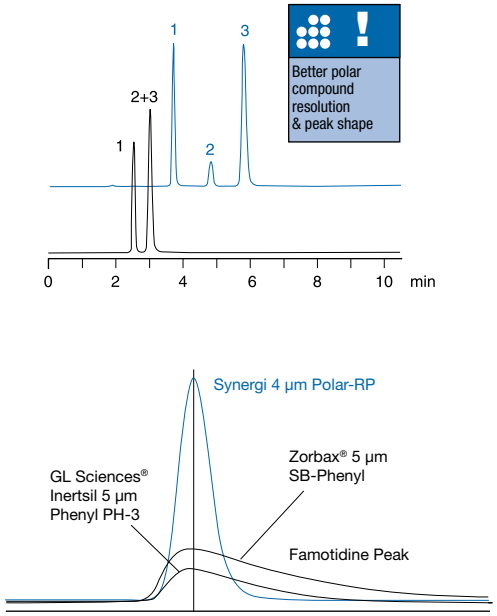
Synergi 4 µm Polar-RP	App ID 12485
Waters® 5 µm SymmetryShield™ C18	App ID 12525
Waters® 5 µm XTerra® RP18	App ID 12526
Waters® 5 µm Symmetry® C18	App ID 12527



Dimensions: 150 x 4.6 mm
Mobile Phase: 20 mM Potassium phosphate pH 3 / Methanol (50:50)
Flow Rate: 1.0 mL/min
Detection: UV @ 230 nm
Injection: 2 µL
Temperature: 22 °C
Sample:
1. Metaproterenol (0.4 µg)
2. Pindolol (0.6 µg)
3. Metoprolol (0.15 µg)
4. Alprenolol (0.3 µg)
5. Propranolol (0.04 µg)
6. Ethylparaben (0.4 µg)

IMPROVED RESOLUTION AND PEAK SHAPE

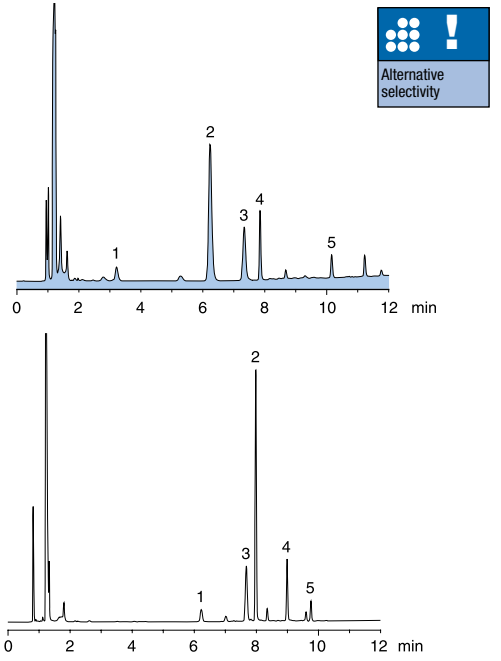
Synergi 4 µm Polar-RP	App ID 10905
Waters 5 µm XTerra® RP18	App ID 10906



Columns: Synergi 4 µm Polar-RP
Waters 5 µm XTerra RP18
Agilent 5 µm Zorbax SB-Phenyl
G.L. Sciences 5 µm Inertsil Phenyl PH-3
Dimensions: 150 x 4.6 mm
Mobile Phase: 20 mM Potassium phosphate pH 7.0/Acetonitrile (80:20)
Flow Rate: 1 mL/min
Detection: UV @ 254 nm
Temperature: 25 °C
Sample:
1. Famotidine
2. Cimetidine
3. Ranitidine

SYNERGI POLAR-RP VS. SYNERGI HYDRO-RP

Synergi 4 µm Polar-RP	App ID 14236
Synergi 4 µm Hydro-RP	App ID 14235



Dimensions: 150 x 4.6 mm
Mobile Phase: A: 20 mM KH_2PO_4 + 0.1 % Hexane Sulfonate, pH 3.0
B: Acetonitrile
Gradient: A/B (97:3) for 3 minutes, then to A/B (50:50) in 15 minutes
Flow Rate: 1.5 mL/min
Detection: UV @ 210 nm
Temperature: 22 °C
Sample:
1. Pantothenic acid
2. Pyridoxine
3. p-Aminobenzoic acid
4. Thiamine
5. Riboflavin

synergi™ POLAR-RP

100 % BUFFER MOBILE PHASE STABILITY

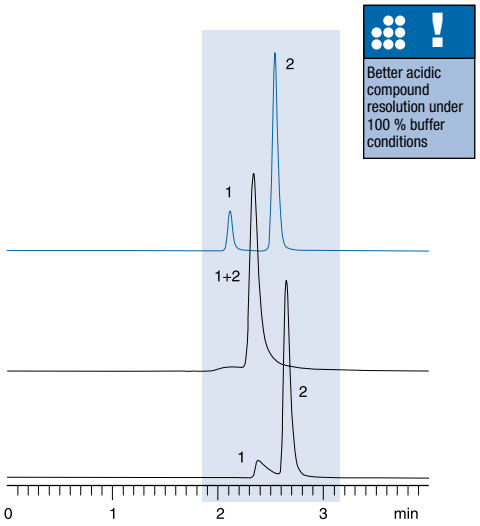
The ether-linkage on the Synergi 4 µm Polar-RP phase contributes to not only sharp peak shape for acidic and basic analytes, but also ensures stability under highly aqueous mobile phase conditions. Very polar analytes, like formic acid, are typically poorly retained on alkyl-bonded phases. However, using a 100 % buffer mobile phase, the formic acid impurity is easily resolved from acetic acid. Other polar-embedded phases typically use a nitrogen-containing amide linkage or carbamate group; this can interfere with the resolution of highly acidic polar compounds. Since Synergi Polar-RP uses an ether-linkage as the polar embedded group, the result is improved peak shape and resolution of the highly acidic polar compound, formic acid.

FORMIC AND ACETIC ACIDS

Synergi™ 4 µm Polar-RP App ID 10904

Waters® 5 µm XTerra® RP18

Supelco™ 5 µm Discovery® RP-AmideC16

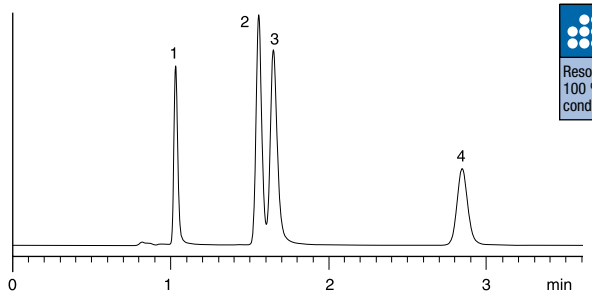


Better acidic compound resolution under 100 % buffer conditions

Dimensions: 150 x 4.6 mm
Mobile Phase: 20 mM Potassium phosphate pH 2.5/ Methanol (97:3)
Flow Rate: 1.0 mL/min
Detection: UV @ 220 nm
Temperature: 25 °C
Sample: 1. Formic acid
2. Acetic acid

NUCLEIC ACID BASES

App ID 12486

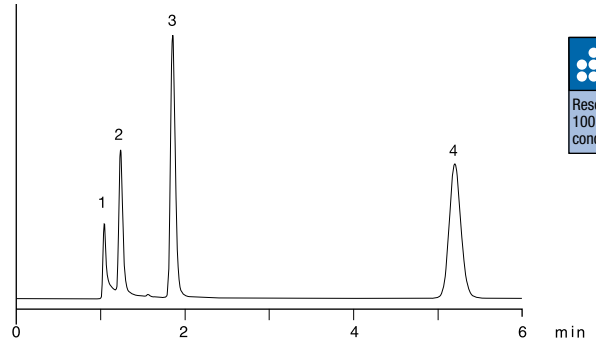


Resolution under 100 % buffer conditions

Column: Synergi 4 µm Polar-RP
Dimensions: 150 x 4.6 mm
Part No.: 00F-4336-E0
Mobile Phase: 20 mM Potassium phosphate pH 2.7
Flow Rate: 2.0 mL/min
Detection: UV @ 254 nm
Injection: 5 µL
Temperature: 22 °C
Sample: 1. Cytosine (0.125 µg)
2. Uracil (0.125 µg)
3. Adenine (0.125 µg)
4. Thymine (0.125 µg)

THYMIDINE NUCLEOTIDES

App ID 12487



Resolution under 100 % buffer conditions

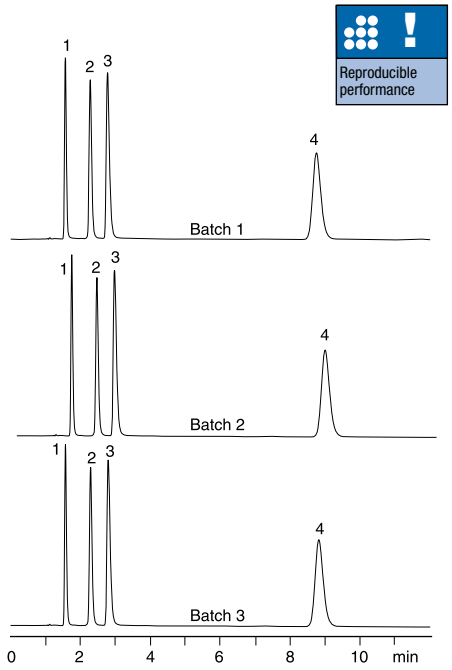
Column: Synergi 4 µm Polar-RP
Dimensions: 150 x 4.6 mm
Part No.: 00F-4336-E0
Mobile Phase: 20 mM Potassium phosphate pH 2.7
Flow Rate: 2.0 mL/min
Detection: UV @ 254 nm
Injection: 2.5 µL
Temperature: 22 °C
Sample: 1. Thymidine triphosphate (TTP) (1.25 µg)
2. Thymidine diphosphate (TDP) (1.25 µg)
3. Thymidine monophosphate (TMP) (1.25 µg)
4. Thymidine (1.25 µg)

A REPRODUCIBLE & STABLE POLAR COLUMN

Synergi Polar-RP is highly reproducible. As indicated by the chromatograms from three separate batches of bonded stationary phase, Synergi Polar-RP exhibits almost no variation between batches. In addition, the ether-linkage is extremely resistant to hydrolysis, even at pH 1.5, thus enabling separations even under relatively harsh 0.1 % TFA running conditions for thousands of column volumes. At the other end of the pH spectrum, Synergi Polar-RP is stable to a pH of 7.0

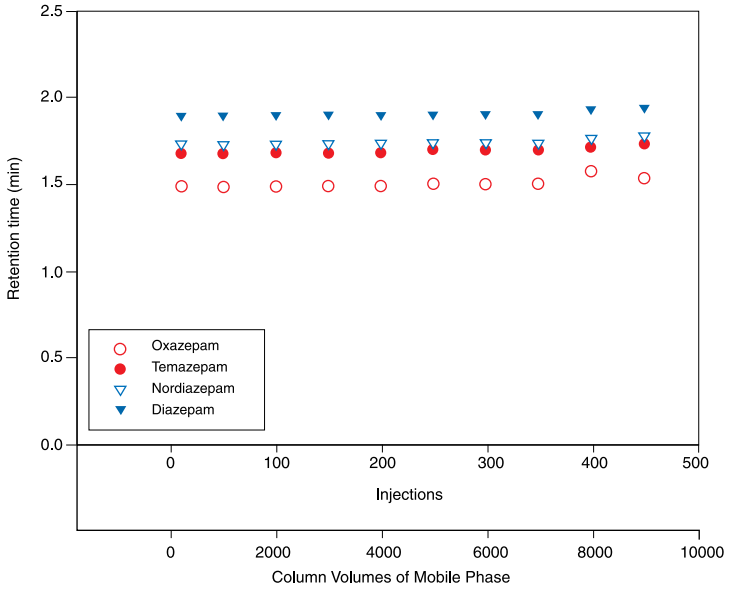
BATCH REPRODUCIBLITY

App ID 12471



Column: Synergi 4 µm Polar-RP
Dimensions: 150 x 4.6 mm
Part No.: 00F-4336-E0
Mobile Phase: Methanol/20 mM Potassium phosphate pH 6.5 (35:65)
Flow Rate: 1.5 mL/min
Detection: UV @ 210 nm
Injection: 1 µL
Temperature: 22 °C
Sample: 1. Phenylephrine (1 µg)
2. Phenylpropanolamine (1 µg)
3. Pseudoephedrine (1 µg)
4. Methylparaben (1 µg)

AQUEOUS STABILITY



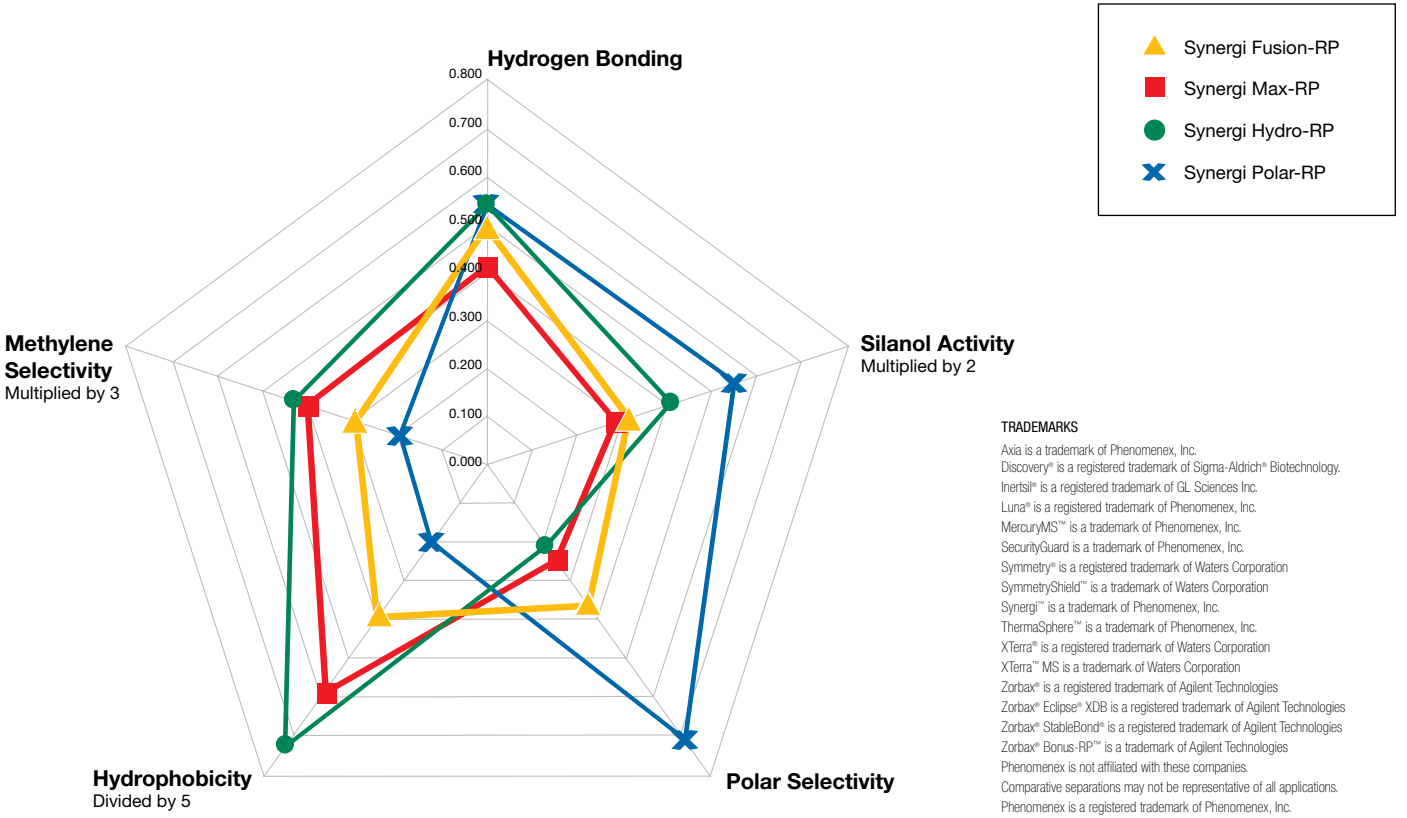
Column: Synergi 4 µm Polar-RP
Dimensions: 30 x 2.0 mm
Part No.: 00A-4336-B0
Mobile Phase: A: Water with 0.1 % TFA
B: Acetonitrile with 0.1 % TFA
Gradient: A/B (95:5) to A/B (5:95) in 3 min
Flow Rate: 1.0 mL/min
Detection: UV @ 254 nm
Injection: 1 µL
Temperature: 30 °C
Sample: Precipitated porcine serum (2:1 Acetonitrile: serum) containing:
1. Oxazepam (50 ng)
2. Temazepam (50 ng)
3. Nordiazepam (50 ng)
4. Diazepam (50 ng)

synergi™ SPECIFICATIONS

HPLC COLUMN TECHNICAL SPECIFICATIONS

Material Characteristics

Packing Material	Particle Shape/Size (µm)	Pore Size (Å)	Pore Volume (mL/g)	Surface Area (m^2/g)	Carbon Load %	Calculated Bonded Phase Coverage (µmole/m^2)	End Capping
Synergi Max-RP	Spher. 2.5	100	—	400	17	—	TMS
Synergi Hydro-RP	Spher. 2.5	100	—	400	19	—	Hydrophilic
Synergi Polar-RP	Spher. 2.5	100	—	400	11	—	Hydrophilic
Synergi Fusion-RP	Spher. 2.5	100	—	400	12	—	TMS
Synergi Max-RP	Spher. 4, 10	80	1.05	475	17	3.21	TMS
Synergi Hydro-RP	Spher. 4, 10	80	1.05	475	19	2.45	Hydrophilic
Synergi Polar-RP	Spher. 4, 10	80	1.05	475	11	3.15	Hydrophilic
Synergi Fusion-RP	Spher. 4, 10	80	1.05	475	12	N/A	TMS



Columns: Synergi 4 µm Fusion-RP
Synergi 4 µm Max-RP
Synergi 4 µm Hydro-RP
Synergi 4 µm Polar-RP

Dimensions: 150 x 4.6 mm

Mobile Phase:
1. Water / Methanol (20:80) for k Amylbenzene
2. Water / Methanol (20:80) for α (CH_2)
3. Water / Methanol (70:30) for α C/P
4. Methanol / 20 mM Potassium phosphate pH 2.7 for α B/P, pH 2.75.
5. Methanol /20 mM Potassium phosphate pH 7.6 for α B/P, pH 7.6

Flow Rate: 1.0 mL/min

Detection: UV @ 254 nm

Injection: 5 mL

Temperature: 30 °C

Sample:
1. Amylbenzene
2. Amylbenzene and Butylbenzene
3. Caffeine and phenol (C/P)
4. Benzylamine and phenol (B/P) @ pH 2.75
5. Benzylamine and phenol (B/P) @ pH 7.6

synergi™ COLUMN SELECTOR

SIMPLIFY AND AUTOMATE ALL YOUR METHOD DEVELOPMENT AND VALIDATION WORK

Holds up to 6 Analytical or Semi-Prep Columns

BENEFITS

- **Develop, optimize and validate methods faster**
- **Save time and significantly boost productivity**
- **Speed and automate routine validation studies**

FREE

Synergi Analytical LC Column of ≤ 4.6 mm ID with a 6-Column Selector Purchase

TECHNICAL SPECIFICATIONS

- HPLC system communication protocols via contact closures, pulse and level logic, BCD, RS-232
- A single rear mounted "D" connector
- Spring loaded clips that firmly hold columns from 2-25 mm ID and 5-35 cm length
- Digital valve positioning with fast actuation to minimize dispersion
- Front-mounted switching valve with easy-to-access fittings
- Valve architecture eliminates upswept dead volumes
- Numeric display indicating selected column
- Removable, magnetic cover providing environmental isolation and ambient temperature stabilitization
- Pressure rated at 35 MPa/345 bar/5000 psi.

Power Line Cords (specify Part No., included at no charge)	
Australia and New Zealand	AV0-6088
Italy	AV0-6089
Japan	AV0-6090
North America	AV0-6091
Schuko (most of Europe)	AV0-6092
Switzerland	AV0-6093
United Kingdom	AV0-6094

ORDERING INFORMATION

Order No.	Description	Price
AV0-6080	Synergi 6-Column Selector, Stainless Steel, 4 Line BCD Control and RS-232 communication, Universal power supply 100-240 VAC, 50-60 Hz	
AV0-7136	Synergi Column Selector Installation Kit	
AV0-7039	Synergi Valve Repair Kit for 6-Column Selector	

Warranty: All Synergi Column Selectors are warranted for one year parts and labor.

1. Call your technical representative for more information on individual systems and your specific requirements.
2. All units supplied with 10-32 threaded PEEK nuts and ferrules for all ports, 3.5 m (12 ft) of 1/16 inch OD PEEK tubing, power line cord (please specify) and RS-232 interface cable.
   The selectors are stainless steel and include 4 line BCD control, with port for RS-232 communication, Universal power supply 100-240 VAC, 50-60 Hz. Serial cable and software not included. In order to control the Column Selector via the ChemStation software, Agilent 1100 Systems require the additional purchase (from Phenomenex or Agilent) of a BCD Board (Agilent P/N G1351-68701) and External Contact Cable (Agilent P/N G1103-61611).

synergi™ HST
High Speed Technology

HST COLUMNS

- High efficiency of sub-2 µm columns
- Ultra-high performance results on your current HPLC
- Easy method transfer

With NEW High Speed Technology (HST), a balance of speed and efficiency allows you to decrease analysis time while maintaining efficiency and resolution. Synergi HST utilizes the same high quality Synergi media trusted around the world for excellent reproducibility, loadability and scalability. Also, Synergi HST can be used with both your current standard HPLC and newer high performance systems, so there is no need for time-consuming method re-validation!

HIGH EFFICIENCY AT FAST FLOW RATES

At fast linear velocities, HST Technology maintains high efficiencies allowing for increased speed without compromising performance. In the Van Deemter plot below, the 2.5 µm particle shows the lowest reduced plate height (highest efficiency) at the faster flow rates.

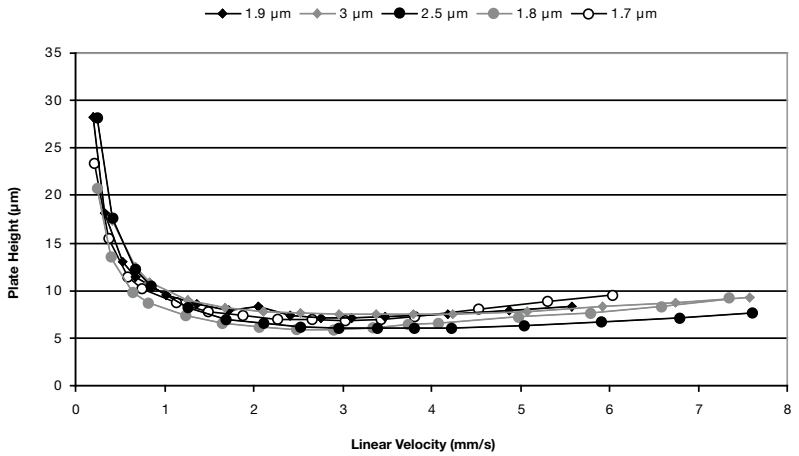
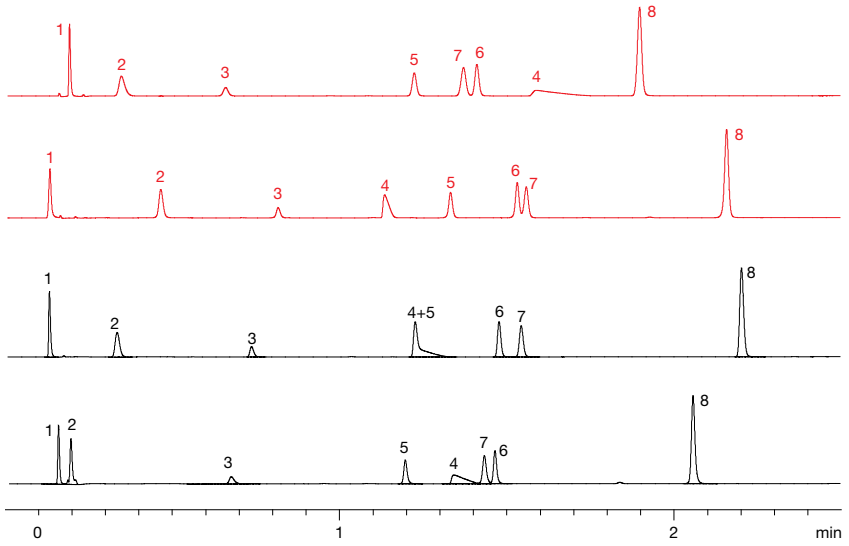


Plate height vs. linear velocity % for 50 x 2.0 mm columns packed with various packing materials. Mobile phases were adjusted between 60-65 % acetonitrile in water in order to match retention factors for naphthalene. Injection volumes of 0.2 µL were used and detection was performed at 254 nm.

SYNERGI

Synergi 2.5 µm Polar-RP-HST	App ID 16264
Synergi 2.5 µm Fusion-RP-HST	App ID 16265
Zorbax Eclipse XBD C18 1.8 µm	App ID 16266
Hypersil Gold C18 1.9 µm	App ID 16267



Columns: Synergi 2.5 µm Polar-RP-HST, 50 x 2.0 mm
Synergi 2.5 µm Fusion-RP-HST, 50 x 2.0 mm
Zorbax Eclipse XBD C18 1.8 µm 50 x 2.1 mm
Hypersil Gold C18 1.9 µm, 50 x 2.1 mm
Mobile Phase: A: 0.1 % Formic Acid in Water
B: 0.1 % Formic Acid in Acetonitrile
Gradient: A:B (95:5) to (5:95) in 2.9 minutes
Flow Rate: 1.1 mL/min
Detection: UV @ 254 nm
Injection: 1 µL
Temperature: 50 °C

Sample:
1. Pyridine (0.22 mg/mL)
2. Acetaminophen (0.20 mg/mL)
3. Benzyl Alcohol (0.32 mg/mL)
4. Nortriptyline (0.5 mg/mL)
5. 3-Methyl-4-Nitrobenzoic Acid (0.25 mg/mL)
6. 4-Chlrorcinnamic Acid (0.20 mg/mL)
7. 3-Hydroxy-3-Methylbenzaldehyde (0.25 mg/mL)
8. Hexanophenone (1.2 mg/mL)

PACKED PREPARATIVE TECHNOLOGY WITH SYNERGI MEDIA

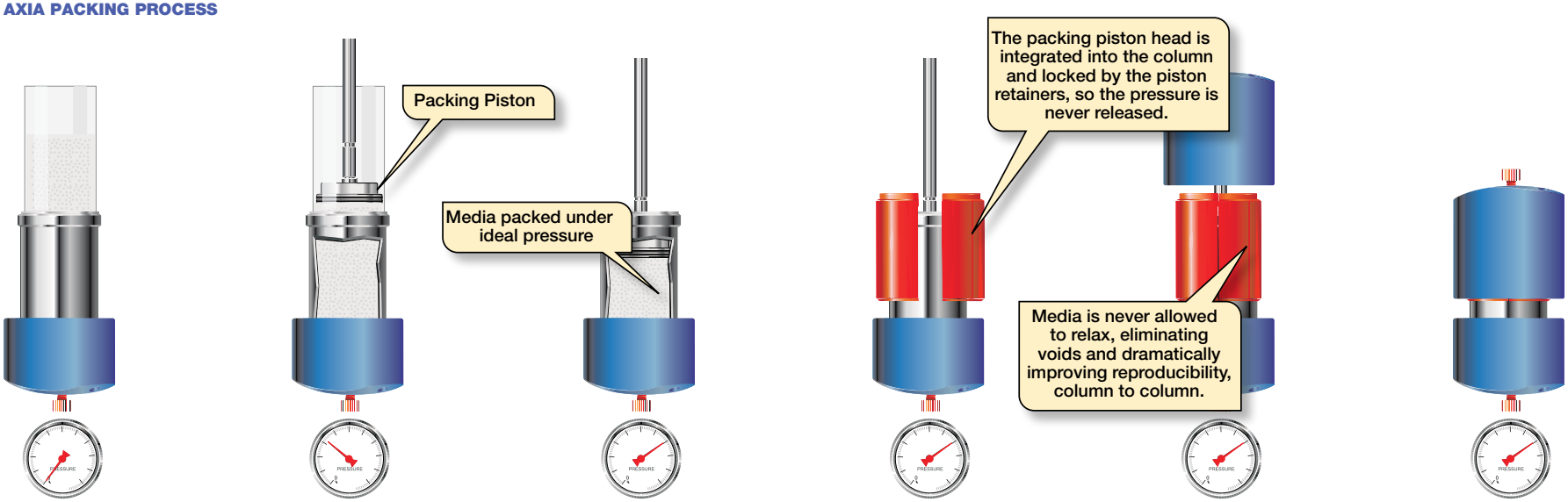
HYDRAULIC PISTON COMPRESSION

An advanced column packing and hardware design, Axia™ incorporates patent-pending Hydraulic Piston Compression technology to eliminate bed collapse as a source of failure in short preparative columns. Ideal bed density is custom calculated and automated for each support, chemistry, and column size. Computer control of the entire process assures both proper bed density and uniformity. Using a single, controlled hydraulic compression, the piston assembly is locked in place without allowing the media to decompress or "relax," thus maintaining media and column bed integrity. Recompression of the bed is not required, as it is for other packing methodologies.

The result is an improved, repeatable packing process, giving preparative chromatographers:

- Extended column lifetime
- Column-to-column reproducibility
- Higher efficiency
- Improved peak shape
- Increased loadability
- Stability under high flow rates

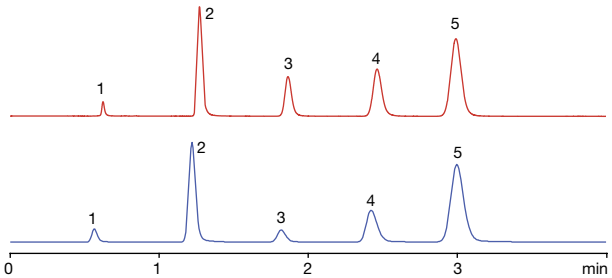
AXIA PACKING PROCESS



HIGH EFFICIENCY IN A PREPARATIVE COLUMN

Synergi 4 µm Hydro-RP 4.6 mm ID — App ID 15932

Axia Packed 30 mm ID — App ID 15931



Columns: Synergi 4 µm Hydro-RP
Dimensions: 75 x 4.6 mm
75 x 30 mm Axia Packed
Part No.: 00C-4375-E0
00C-4375-U0-AX
HPLC System: Agilent 1100 (4.6 mm ID)
Gilson Preparative System (30 mm ID)
Mobile Phase: Water/Acetonitrile (35:65)
Flow Rate: 1.0 mL/min (4.6 mm ID)
43 mL/min (30 mm ID)

Detection: UV @ 254 nm
Temperature: Ambient
Sample:
1. Uracil
2. Acetophenone
3. Benzene
4. Toluene
5. Naphthalene

REQUEST YOUR SCOUT COLUMN TODAY!

synergi™ ORDERING INFORMATION

COLUMNS

2.5 µm High Speed Technology (HST) Columns (mm)

Phase	30 x 2.0	50 x 2.0	100 x 2.0	50 x 3.0	100 x 3.0	50 x 4.6
Synergi Fusion-RP	00A-4423-B0	00B-4423-B0	00D-4423-B0	00B-4423-Y0	00D-4423-Y0	00B-4423-E0
Synergi Max-RP	00A-4372-B0	00B-4372-B0	00D-4372-B0	00B-4372-Y0	00D-4372-Y0	00B-4372-E0
Synergi Hydro-RP	00A-4387-B0	00B-4387-B0	00D-4387-B0	00B-4387-Y0	00D-4387-Y0	00B-4387-E0
Synergi Polar-RP	00A-4371-B0	00B-4371-B0	00D-4371-B0	00B-4371-Y0	00D-4371-Y0	00B-4371-E0

2.5 µm MercuryMS LC/MS Cartridges* (mm)

2.5 µm	Phase	10 x 2.0	10 x 4.0	20 x 2.0	20 x 4.0
Synergi	Fusion-RP	00N-4423-B0-CE	00N-4423-D0-CE	00M-4423-B0-CE	00M-4423-D0-CE
Synergi	Max-RP	00N-4372-B0-CE	00N-4372-D0-CE	00M-4372-B0-CE	00M-4372-D0-CE
Synergi	Hydro-RP	00N-4387-B0-CE	00N-4387-D0-CE	00M-4387-B0-CE	00M-4387-D0-CE
Synergi	Polar-RP	00N-4371-B0-CE	00N-4371-D0-CE	00M-4371-B0-CE	00M-4371-D0-CE

Requires MercuryMS cartridge holder

4 µm Capillary Columns (mm)

	50 x 0.30	150 x 0.30	250 x 0.30	50 x 0.50	150 x 0.50	250 x 0.50
Max-RP	00B-4337-AC	00F-4337-AC	00G-4337-AC	00B-4337-AF	00F-4337-AF	00G-4337-AF
Hydro-RP	00B-4375-AC	00F-4375-AC	00G-4375-AC	00B-4375-AF	00F-4375-AF	00G-4375-AF

4 µm Microbore Columns (mm)

	50 x 1.0	150 x 1.0	250 x 1.0
Fusion-RP	00B-4424-A0	00F-4424-A0	00G-4424-A0
Max-RP	00B-4337-A0	00F-4337-A0	00G-4337-A0
Hydro-RP	00B-4375-A0	00F-4375-A0	00G-4375-A0
Polar-RP	00B-4336-A0	00F-4336-A0	00G-4336-A0

4 µm Minibore Columns (mm)

SecurityGuard™ Cartridges

	30 x 2.0	50 x 2.0	75 x 2.0	150 x 2.0	250 x 2.0	4 x 2.0 mm* /10pk
Fusion-RP	00A-4424-B0	00B-4424-B0	00C-4424-B0	00F-4424-B0	00G-4424-B0	AJ0-7556
Max-RP	00A-4337-B0	00B-4337-B0	00C-4337-B0	00F-4337-B0	00G-4337-B0	AJ0-6073
Hydro-RP	00A-4375-B0	00B-4375-B0	00C-4375-B0	00F-4375-B0	00G-4375-B0	AJ0-7510
Polar-RP	00A-4336-B0	00B-4336-B0	00C-4336-B0	00F-4336-B0	00G-4336-B0	AJ0-6075

for ID: 2.0-3.0 mm

4 µm Narrow Bore Columns (mm)

SecurityGuard™ Cartridges

	30 x 3.0	50 x 3.0	75 x 3.0	150 x 3.0	250 x 3.0	4 x 2.0 mm* /10pk
Fusion-RP	00A-4424-Y0	00B-4424-Y0	00C-4424-Y0	00F-4424-Y0	00G-4424-Y0	AJ0-7556
Max-RP	00A-4337-Y0	00B-4337-Y0	00C-4337-Y0	00F-4337-Y0	00G-4337-Y0	AJ0-6073
Hydro-RP	00A-4375-Y0	00B-4375-Y0	00C-4375-Y0	00F-4375-Y0	00G-4375-Y0	AJ0-7510
Polar-RP	00A-4336-Y0	00B-4336-Y0	00C-4336-Y0	00F-4336-Y0	00G-4336-Y0	AJ0-6075

for ID: 2.0-3.0 mm

4 µm Analytical Columns (mm)

SecurityGuard™ Cartridges

	30 x 4.6	50 x 4.6	75 x 4.6	150 x 4.6	250 x 4.6	4 x 3.0 mm* /10pk
Fusion-RP	00A-4424-E0	00B-4424-E0	00C-4424-E0	00F-4424-E0	00G-4424-E0	AJ0-7557
Max-RP	00A-4337-E0	00B-4337-E0	00C-4337-E0	00F-4337-E0	00G-4337-E0	AJ0-6074
Hydro-RP	00A-4375-E0	00B-4375-E0	00C-4375-E0	00F-4375-E0	00G-4375-E0	AJ0-7511
Polar-RP	00A-4336-E0	00B-4336-E0	00C-4336-E0	00F-4336-E0	00G-4336-E0	AJ0-6076

for ID: 3.2-8.0 mm

MercuryMS™ LC/MS CARTRIDGES PACKED WITH 2.5 µm SYNERGI

The direct-connect holder is designed to interface with your MS, detector or automated switching valve to maximize system efficiency.

Direct-Connect Cartridge Holders

Part No.	Description	Price
CH0-7187	10 mm direct-connect holder	
CH0-7188	20 mm direct-connect holder	

Direct-Connect Cartridge Holders

Part No.	Description	Price
CH0-5846	10 mm standard holder	
CH0-5845	20 mm standard holder	

guarantee

If you are not completely satisfied with Synergi after using for 45 days, KEEP THE COLUMN FOR FREE

synergi™ ORDERING INFORMATION

PREP / PROCESS AND BULK

4 µm Semi-Prep and Preparative Columns (mm)

	250 x 10	250 x 15	50 x 21.2	150 x 21.2	250 x 21.2	250 x 30	SecurityGuard™ Cartridges 10 x 10 mm** /3pk	SecurityGuard™ Cartridges 15 x 21.2 mm† /ea
Fusion-RP	00G-4424-N0	00G-4424-AK	00B-4424-P0	00F-4424-P0	00G-4424-P0	00G-4424-U0	AJ0-7558	AJ0-7844
Max-RP	00G-4337-N0	00G-4337-AK	00B-4337-P0	00F-4337-P0	00G-4337-P0	00G-4337-U0	AJ0-7275	AJ0-7842
Hydro-RP	00G-4375-N0	00G-4375-AK	00B-4375-P0	00D-4375-P0	00G-4375-P0	00G-4375-U0	AJ0-7512	AJ0-7843
Polar-RP	00G-4336-N0	00G-4336-AK	00B-4336-P0	00F-4336-P0	00G-4336-P0	00G-4336-U0	AJ0-7276	AJ0-7845
							for ID: 9-16 mm	18-30 mm

10 µm Analytical, Semi-Prep, Preparative and Pilot Scale Columns (mm)

	250 x 4.6	250 x 10	250 x 15	250 x 21.2	250 x 30	250 x 50	SecurityGuard™ Cartridges 10 x 10mm** /3pk	SecurityGuard™ Cartridges 15 x 21.2 mm† /ea
Fusion-RP	00G-4425-E0	00G-4425-N0	00G-4425-AK	00G-4425-P0	00G-4425-U0	00G-4425-V0	AJ0-7558	AJ0-7844
Max-RP	00G-4350-E0	00G-4350-N0	00G-4350-AK	00G-4350-P0	00G-4350-U0	00G-4350-V0	AJ0-7275	AJ0-7842
Hydro-RP	00G-4376-E0	00G-4376-N0	00G-4376-AK	00G-4376-P0	00G-4376-U0	00G-4376-V0	AJ0-7512	AJ0-7843
Polar-RP	00G-4351-E0	00G-4351-N0	00G-4351-AK	00G-4351-P0	00G-4351-U0	00G-4351-V0	AJ0-7276	AJ0-7845
							for ID: 9-16 mm	18-30 mm

Axia Packed Columns (mm)

	50 x 21.2	100 x 21.2	50 x 30	75 x 30	100 x 30
4 µm					
Max-RP	00B-4337-P0-AX	00D-4337-P0-AX	00B-4337-U0-AX	00C-4337-U0-AX	00D-4337-U0-AX
Hydro-RP	00B-4375-P0-AX	00D-4375-U0-AX	00B-4375-U0-AX	00C-4375-U0-AX	00D-4375-U0-AX
Polar-RP	00B-4336-P0-AX	00D-4336-P0-AX	00B-4336-U0-AX	00C-4336-U0-AX	00D-4336-U0-AX
10 µm					
Max-RP	—	00D-4350-P0-AX	00B-4350-U0-AX	—	00D-4350-U0-AX
Hydro-RP	—	—	00B-4376-U0-AX	—	—
Polar-RP	—	—	00B-4351-U0-AX	—	—

10 µm Bulk Packings

	100 g	1k g	5k g
Fusion-RP	04G-4425	04K-4425	04L-4425
Max-RP	04G-4350	04K-4350	04L-4350
Hydro-RP	04G-4376	04K-4376	04L-4376
Polar-RP	04G-4351	04K-4351	04L-4351

Larger quantities of bulk media available upon request.

**SecurityGuard™ Analytical Cartridges require holder, Part No.: KJ0-4282*

***Semi-prep SecurityGuard™ Cartridges require holder, Part No.: AJ0-7220*

†PREP SecurityGuard™ Cartridges require holder, Part No.: AJ0-8223

SYNERGI BULK MEDIA

Beyond our largest preparative column dimensions, Synergi phases are available in bulk quantities for HPLC purification at the process, pilot, and commercial scale. These medias offer a complementary selectivity to the standard C18, C8, or Silica phases traditionally employed in larger scale HPLC. Additionally, due to the diverse chemical properties of each of the Synergi phases, dramatic differences in chromatographic parameters such as retention time, selectivity, and resolution are often observed.

For those challenging purifications where chromatography still makes the most sense, the Synergi family offers an excellent alternative to evaluate!

Get your Synergi preparative scout column(s) and evaluate these phases today!

www.phenomenex.com
Phenomenex products are available worldwide. For the distributor in your country, contact Phenomenex USA, International Department by telephone, fax or e-mail: international@phenomenex.com.

phenomenex®
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