

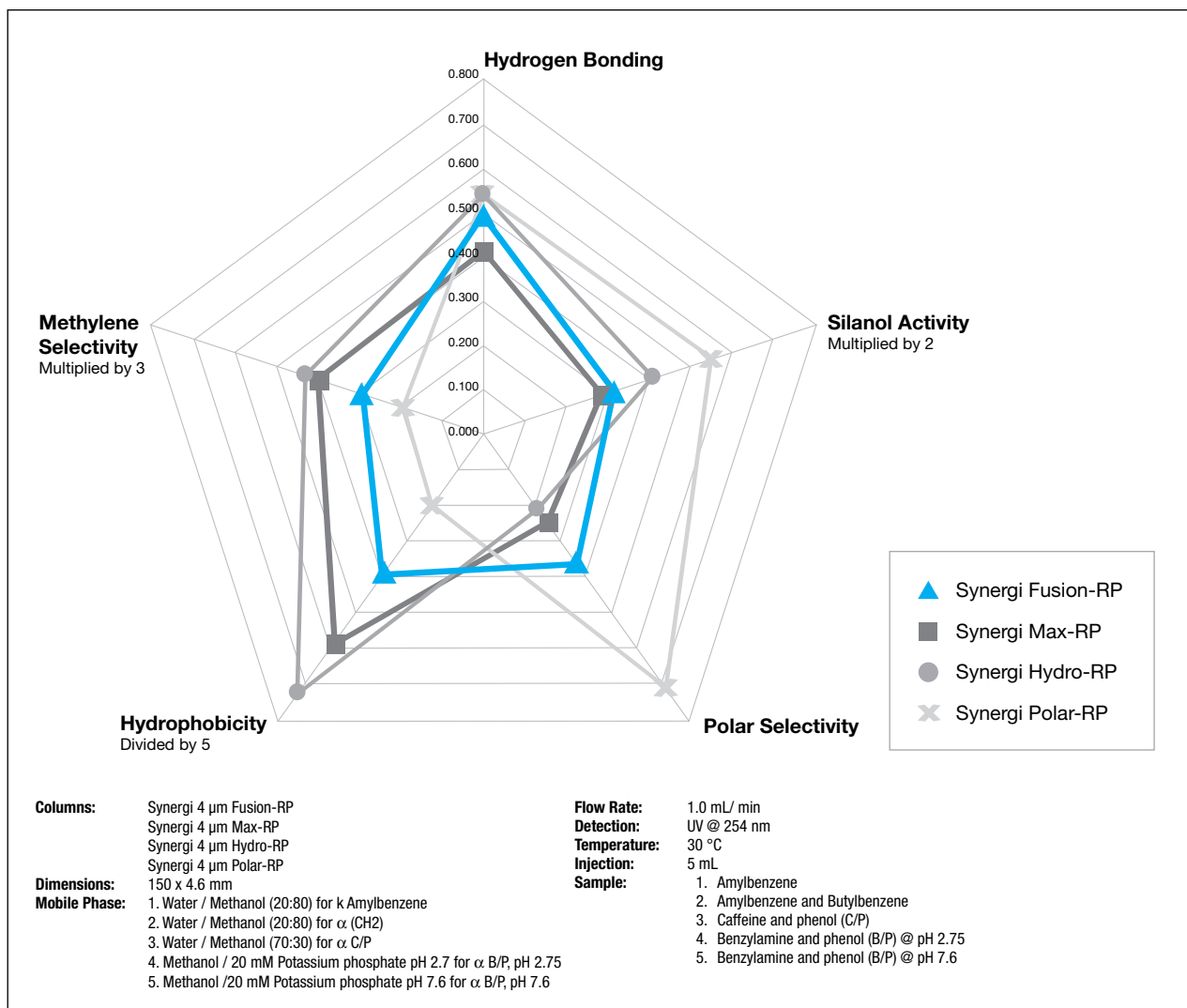
Full Range Selectivity for Reversed Phase Separation

Many different mechanisms of retention are utilized within reversed phase chromatography in order to retain and separate target analytes. Whether your compounds are hydrophobic or polar, Synergi columns provide you with a full range of selectivity, ensuring separation of the most challenging and complex mixtures.

LC Method Development

Column	Phase	Mechanism of Retention
Max-RP	C12	Strong Hydrophobic Interactions
Hydro-RP	C18, Polar Endcapped	Strong Hydrophobic Interactions Slight Polar Interactions
Fusion-RP	C18, Polar Embedded	Balanced Hydrophobic Interactions Moderate Polar Interactions
Polar-RP	Phenyl, Ether-linked	Weak Hydrophobic Interactions Strong Polar Interactions Strong Aromatic Interactions

If Synergi analytical columns do not provide at least an equivalent separation as compared to a competing column of similar particle size, similar phase and dimensions, send in your comparative data within 45 days and keep the Synergi column for FREE.



Synergi is a trademark of Phenomenex, Inc.

Full Range Selectivity for Reversed Phase Separation

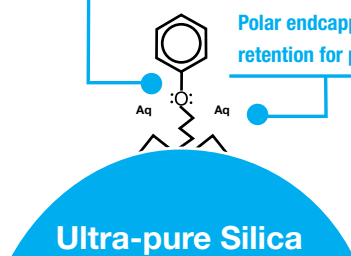
Synergi Polar-RP

Phenyl Ether-Linked

For polar and aromatic mixtures

Ether linkage increases aromaticity of the phenyl group and also provides π - π interactions with conjugated compounds

Polar endcapping provides added retention for polar compounds



Synergi Fusion-RP

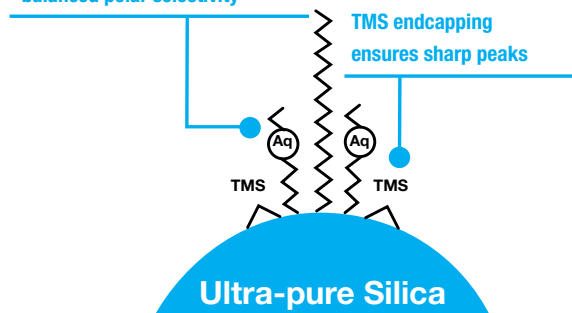
C18

Polar Embedded

Balanced non-polar and polar performance

Embedded polar group complements C18 ligand with balanced polar selectivity

TMS endcapping ensures sharp peaks



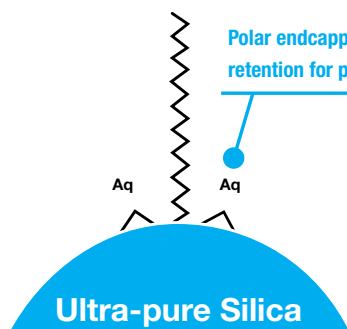
Synergi Hydro-RP

C18

Polar Endcapped

Strong non-polar and polar retention

Polar endcapping provides added retention for polar compounds



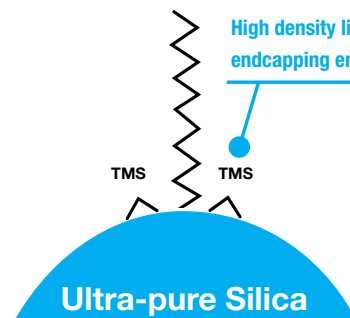
Synergi Max-RP

C12

TMS Endcapped

Excellent for basic compounds at neutral pH

High density ligands and extensive endcapping ensure sharp peaks



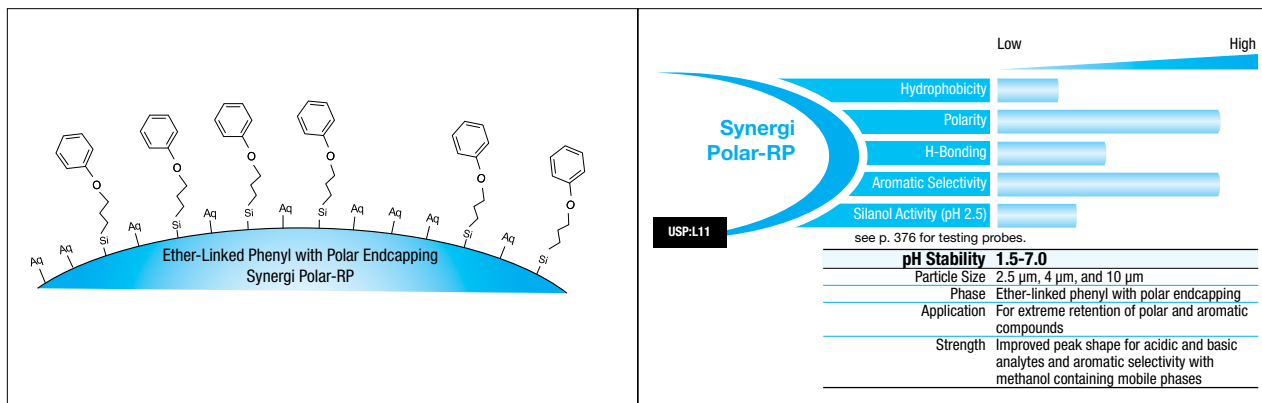
Material Characteristics

Packing Material	Particle Shape/Size (µm)	Pore Size (Å)	Pore Volume (mL/g)	Surface Area (m²/g)	Carbon Load %	Calculated Bonded Phase Coverage (µmole/m²)	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

Synergi Polar-RP

An Ether-linked Phenyl Column with Polar Endcapping

If Synergi analytical columns do not provide at least an equivalent separation as compared to a competing column of similar particle size, similar phase and dimensions, send in your comparative data within 45 days and keep the Synergi column for FREE.



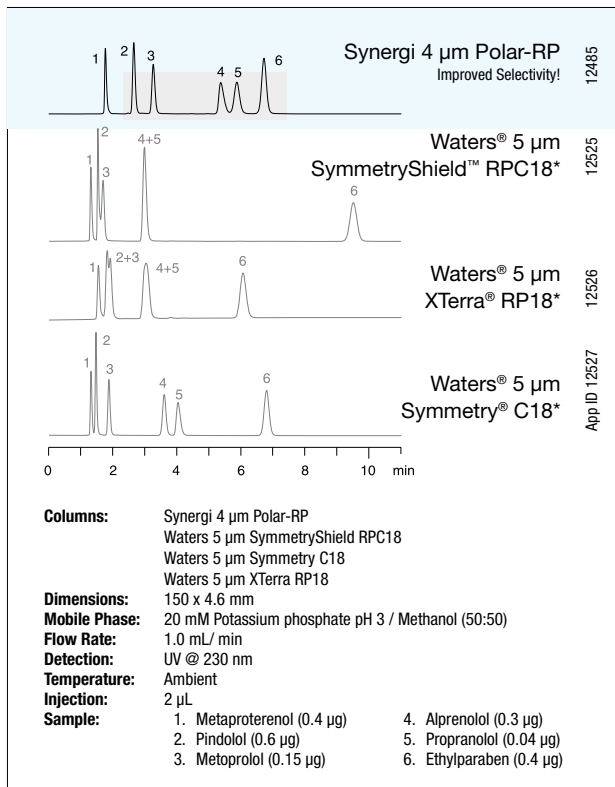
Sample Challenge:

You need greater separation between polar and aromatic compounds with only slight differences chemically or structurally.

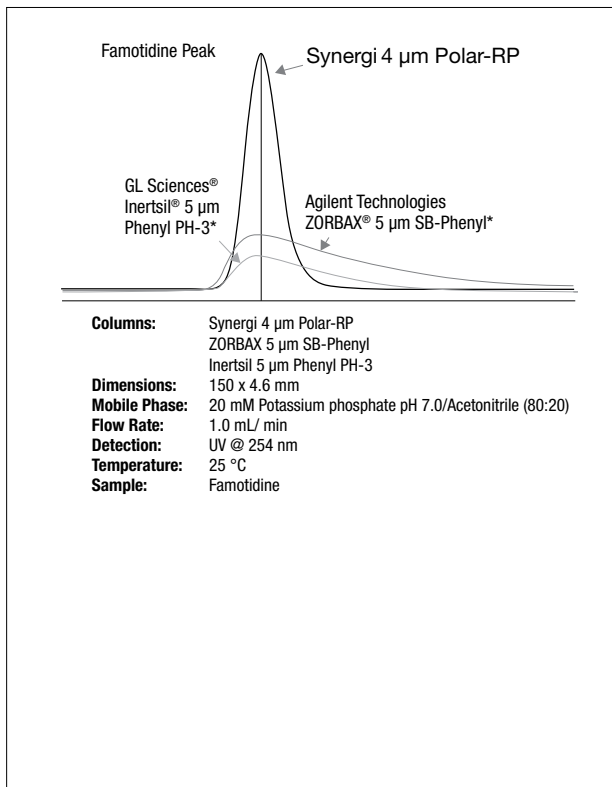
Selectivity Solution:

The slightest variations in polarity and aromaticity are exploited by Synergi Polar-RP in order to achieve the greatest separation between polar and/or aromatic compounds.

Increased resolution of polar compounds with Synergi Polar-RP compared to traditional C18 phases



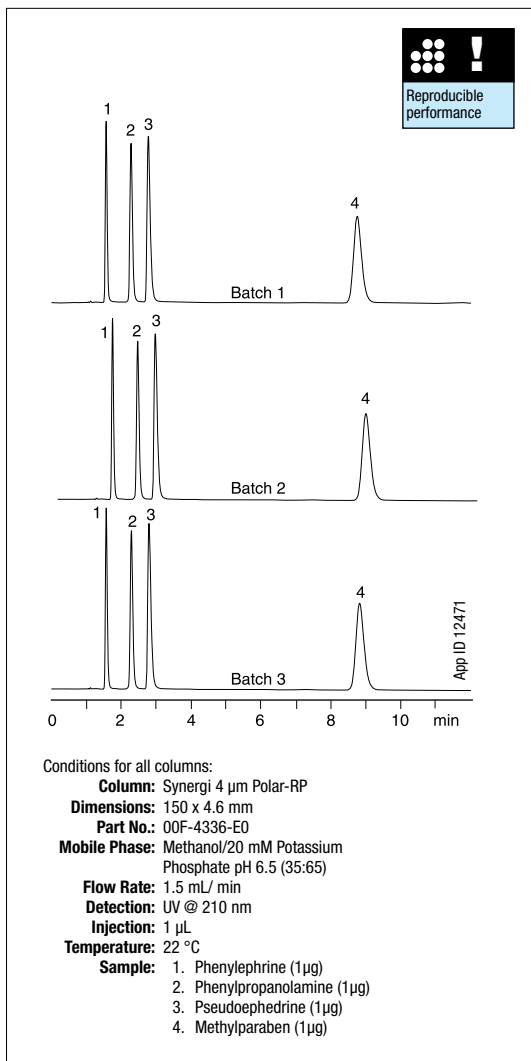
Improve peak symmetry of polar compounds with Synergi Polar-RP compared to other phenyl phases



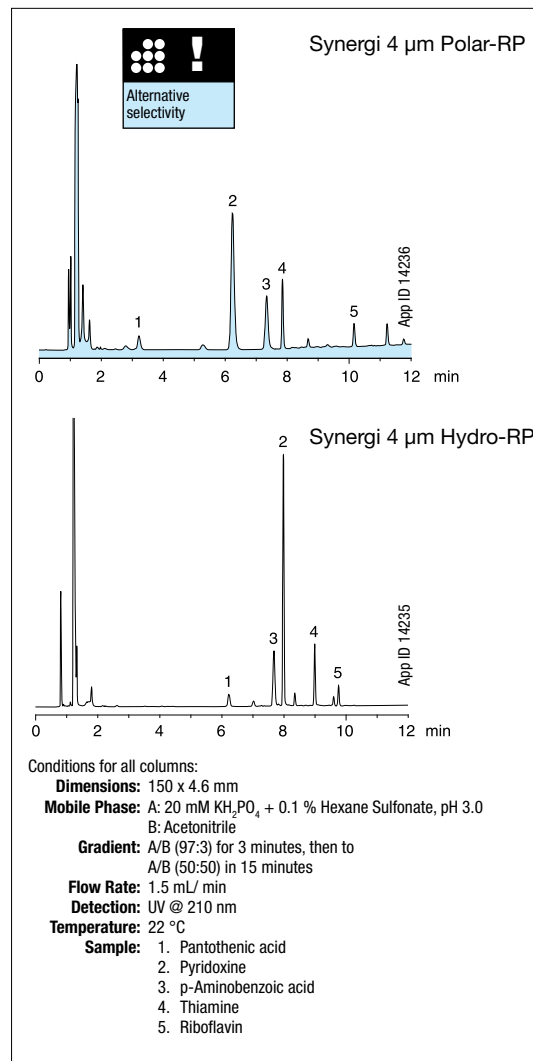
*See p. 264 for disclaimer information. Comparative separations may not be representative of all applications.

Synergi Polar-RP (cont'd)

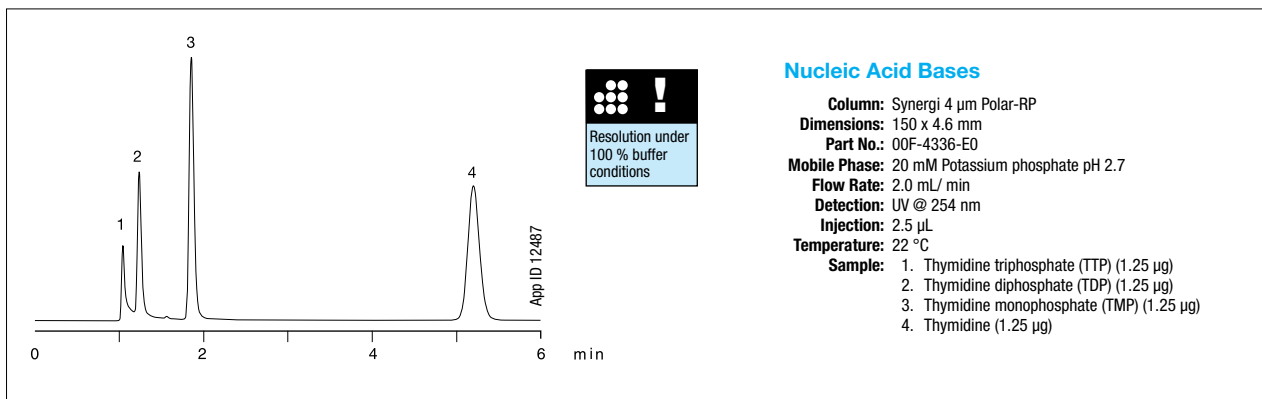
Synergi Polar-RP is highly reproducible



The selectivity of Synergi Polar-RP can provide differences in peak elution order for confirmation or better separation



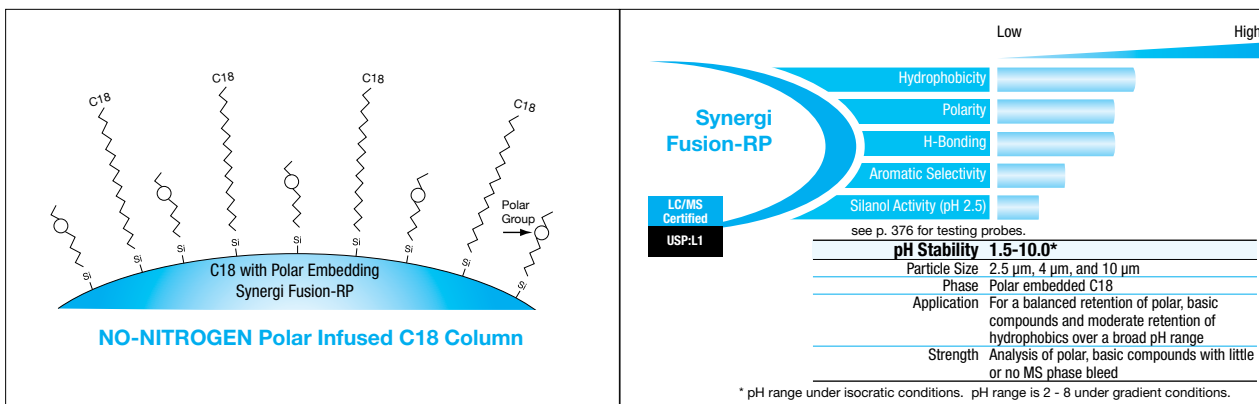
100 % buffer mobile phase stability allows for separation of extremely polar compounds, like nucleic acid bases, on Synergi Polar-RP



Synergi Fusion-RP

A Polar Embedded C18 Column

If Synergi analytical columns do not provide at least an equivalent separation as compared to a competing column of similar particle size, similar phase and dimensions, send in your comparative data within 45 days and keep the Synergi column for FREE.



Sample Challenge:

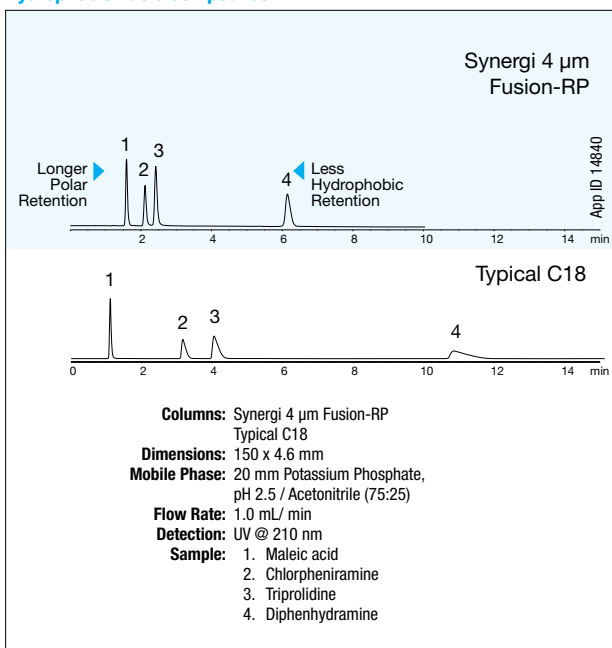
You need greater separation of compounds that exhibit moderately polar and hydrophobic characteristics.

Selectivity Solution:

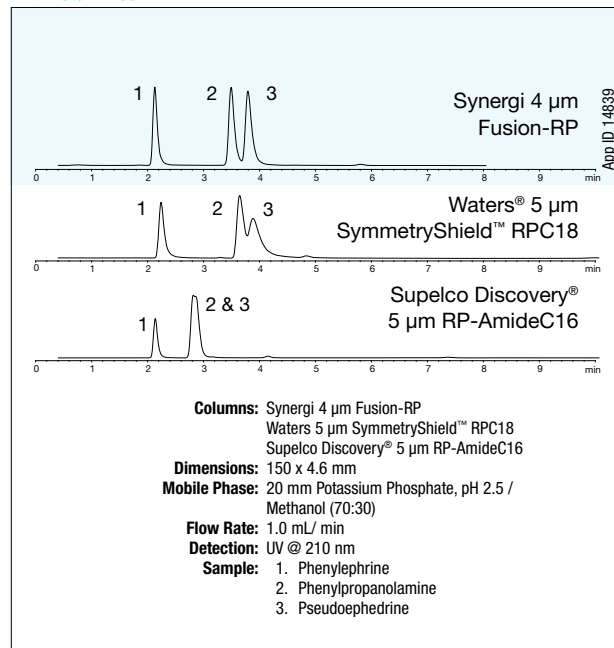
Offering a balanced combination of hydrophobic and polar selectivity, Synergi Fusion-RP will allow you to separate compounds exhibiting polar and hydrophobic characteristics.

Balanced Polar and Hydrophobic Retention Allows for Superior Selectivity

Hydrophobic Basic Compounds



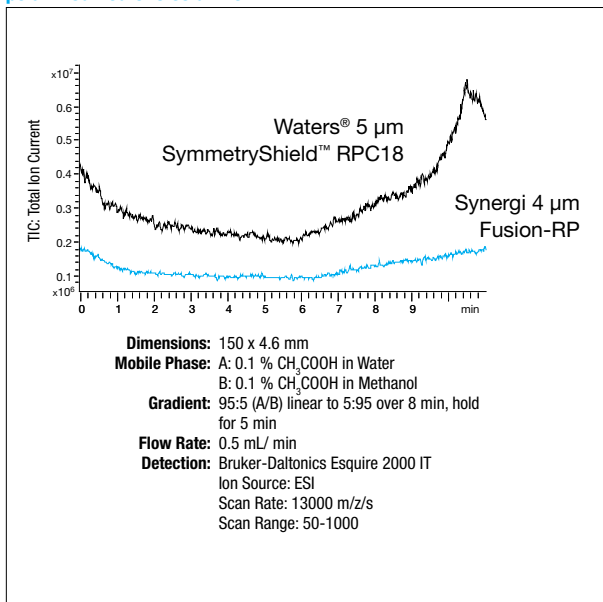
Antihistamines



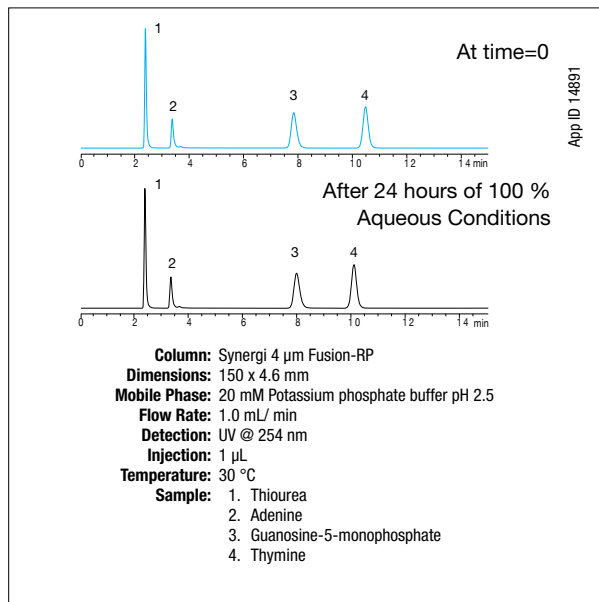
*See p. 264 for disclaimer information. Comparative separations may not be representative of all applications.

Synergi Fusion-RP (cont'd)

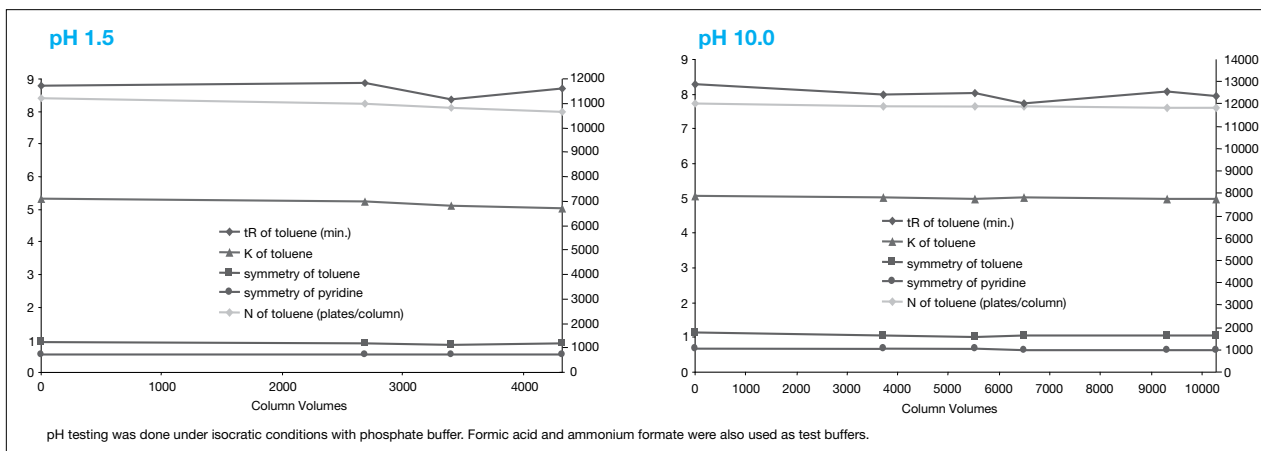
Synergi Fusion-RP has negligible MS bleed compared to other polar modified C18 columns



100 % aqueous stable for added method flexibility



Achieve reproducibility and long column lifetimes even at pH extremes with Synergi Fusion-RP



*Comparative separations may not be representative of all applications.
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 Synergi is a trademark of Phenomenex, Inc.

Discovery is a registered trademark of Sigma-Aldrich® Biotechnology. Phenomenex has no affiliation with Sigma-Aldrich®. Columns used for comparison studies were manufactured by and purchased from Sigma-Aldrich®.

Nucleosil is a registered trademark of Macherey Nagel. Phenomenex has no affiliation with Macherey Nagel. Columns used for comparison studies were manufactured by and purchased from Macherey Nagel.

Inertsil is a registered trademark of GL Sciences Inc.. Phenomenex has no affiliation with GL Sciences Inc.. Columns used for comparison studies were manufactured by and purchased from GL Sciences Inc..

SymmetryShield is a trademark of Waters Corp. XTerra and Symmetry are registered trademarks of Waters Corp. Phenomenex has no affiliation with Waters Corp. Columns used for comparison studies were manufactured by and purchased from Waters Corp.

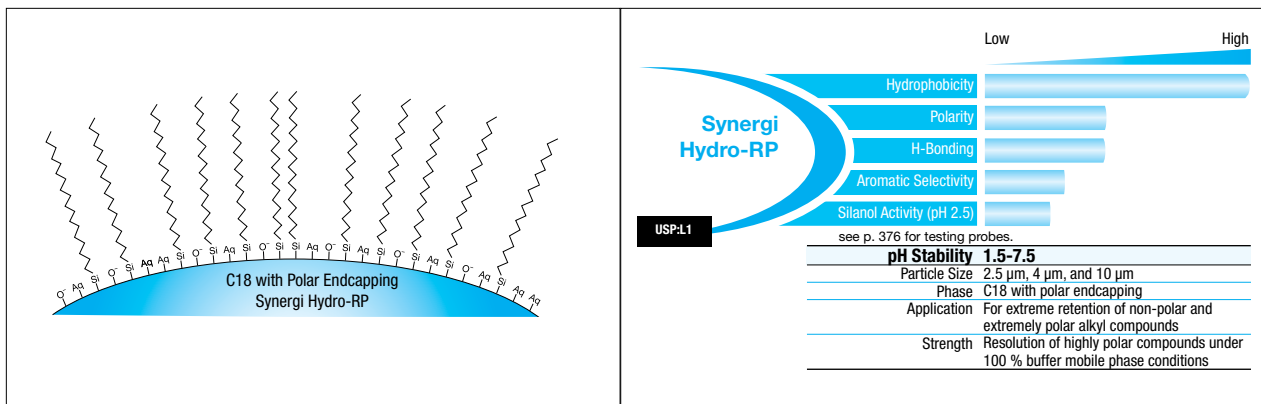
ZORBAX SB and ZORBAX Eclipse XDB are registered trademarks of Agilent Technologies. Columns used for comparison studies were manufactured by and purchased from Agilent Technologies.



Synergi Hydro-RP

A Polar Endcapped C18 Column

If Synergi analytical columns do not provide at least an equivalent separation as compared to a competing column of similar particle size, similar phase and dimensions, send in your comparative data within 45 days and keep the Synergi column for FREE.



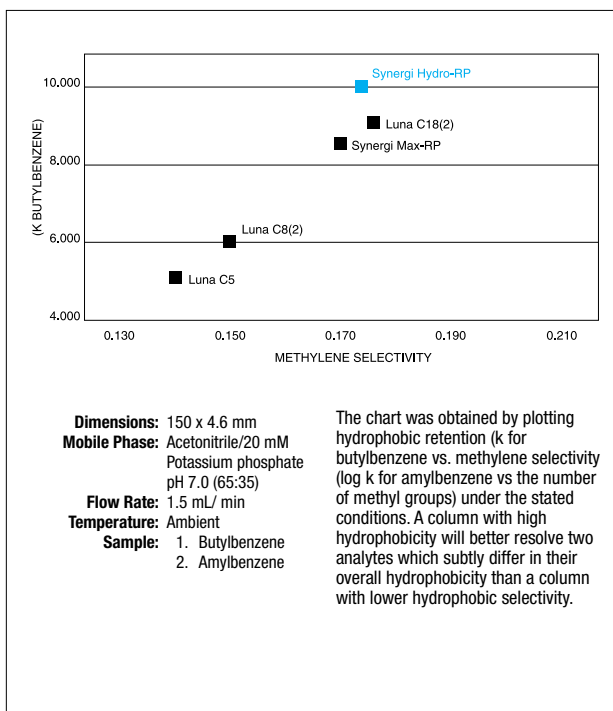
Sample Challenge:

Your sample contains multiple analytes with only slight variations in hydrophobicity.

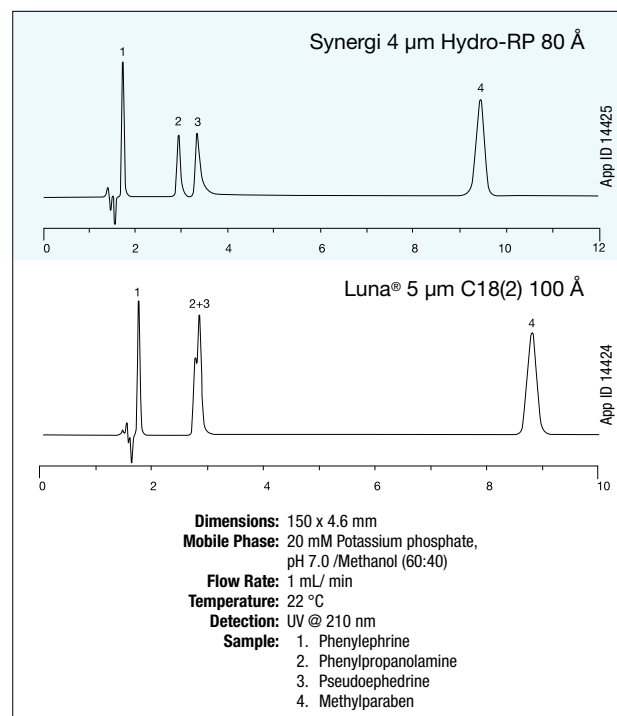
Selectivity Solution:

The extreme hydrophobic selectivity offered by Synergi Hydro-RP is needed to amplify the small differences in selectivity and get the greatest separation.

Extreme hydrophobic retention relative to other hydrophobic selectivity phases

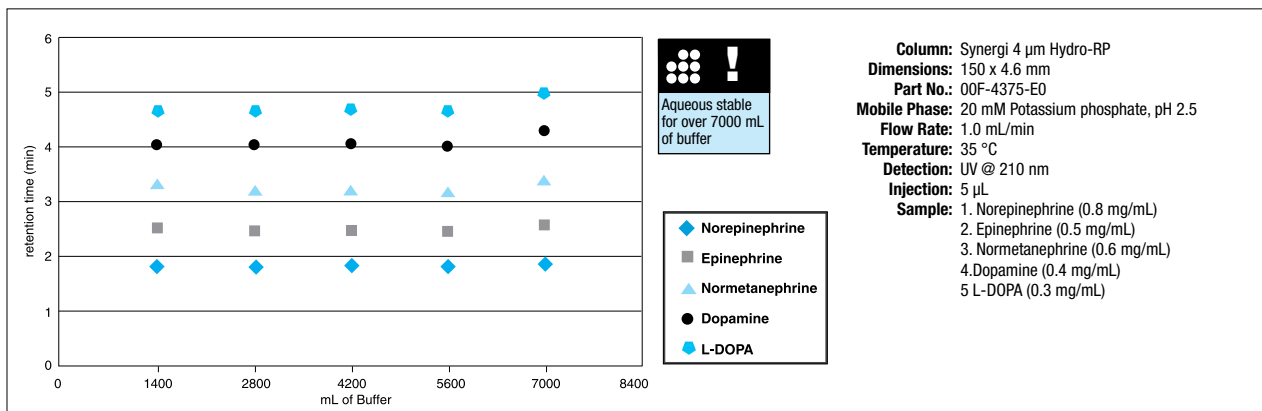


Additional polar selectivity provides separation where traditional C18 columns cannot

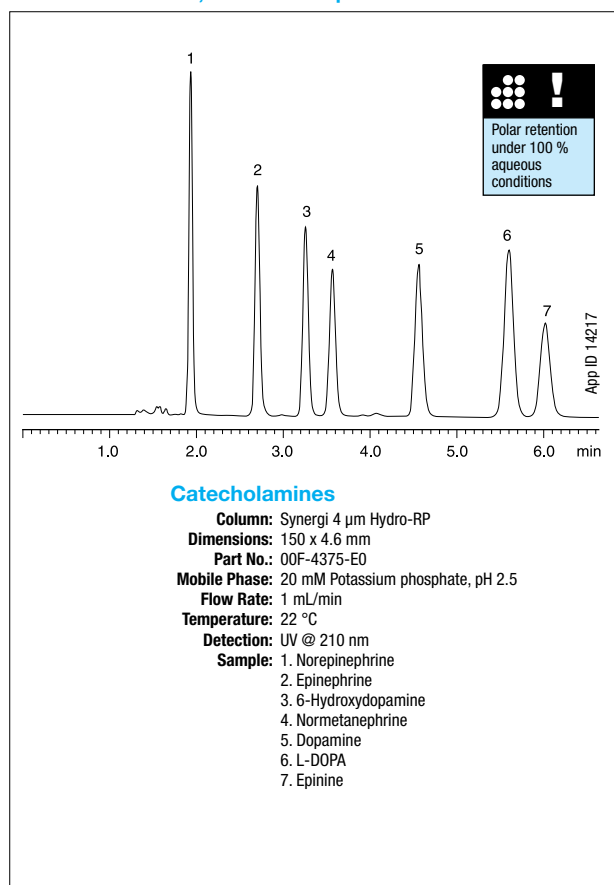
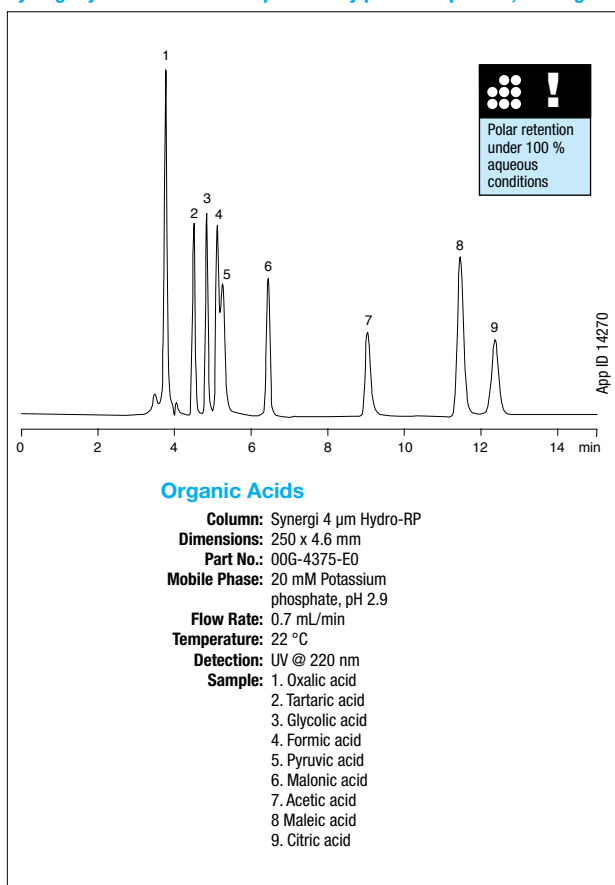


Synergi Hydro-RP (cont'd)

Synergi Hydro-RP is stable in 100 % aqueous mobile phase, providing improved retention of extremely polar compounds



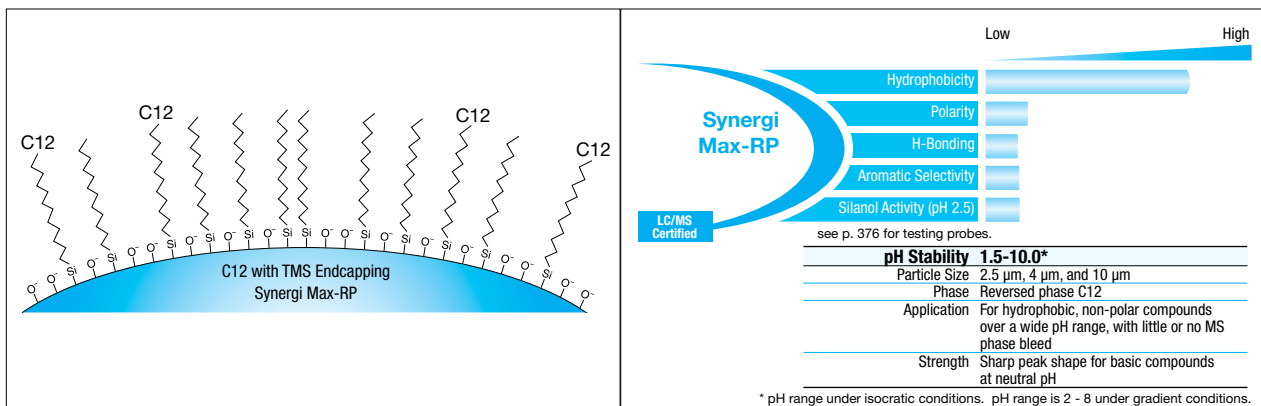
Synergi Hydro-RP is able to separate very polar compounds, like organic acids and catecholamines, under 100 % aqueous conditions



Synergi Max-RP

A Reversed Phase C12 Column

If Synergi analytical columns do not provide at least an equivalent separation as compared to a competing column of similar particle size, similar phase and dimensions, send in your comparative data within 45 days and keep the Synergi column for FREE.



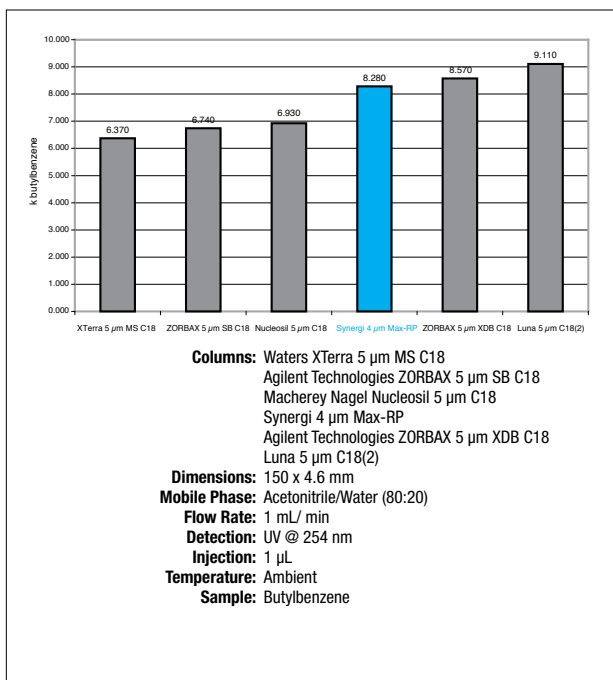
Sample Challenge:

You need to retain compounds based on hydrophobic selectivity exclusively, but cannot accomplish peak separation with C18 column.

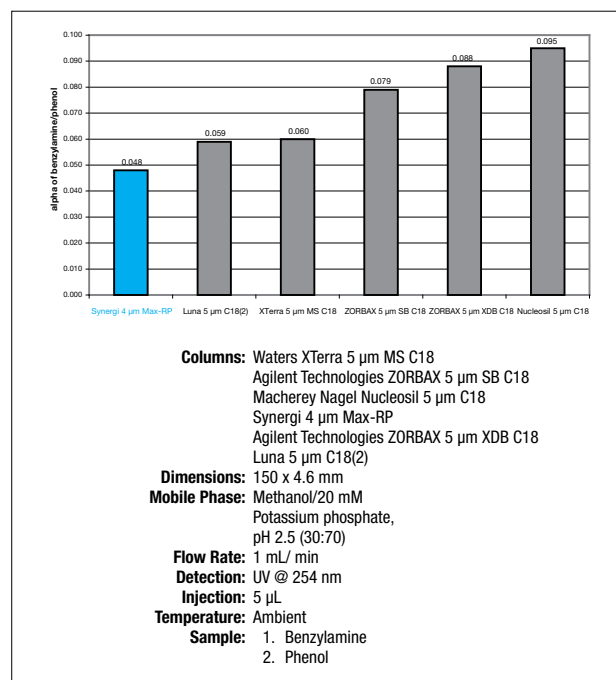
Selectivity Solution:

The C12 ligands on Synergi Max-RP give a hydrophobic selectivity that may separate peaks where C18 columns cannot.

Hydrophobic Retention: Synergi Max-RP (C12) Performs Like a C18*



Silanol Activity at Low pH: C12 vs. C18 Phases

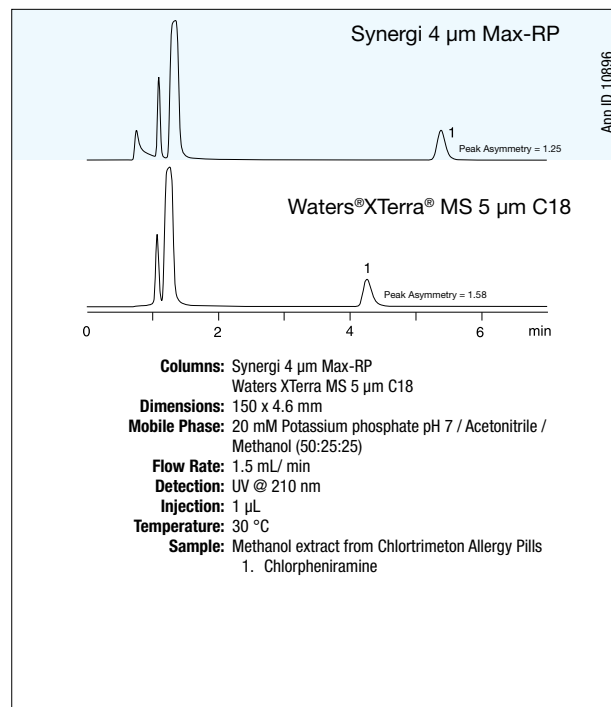
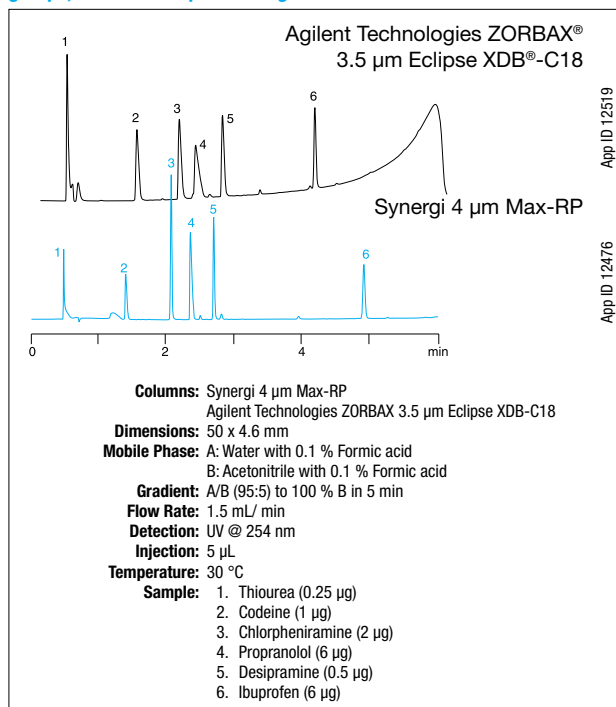


*See p. 264 for disclaimer information. Comparative separations may not be representative of all applications.

Synergi Max-RP (cont'd)

Sharper Peaks

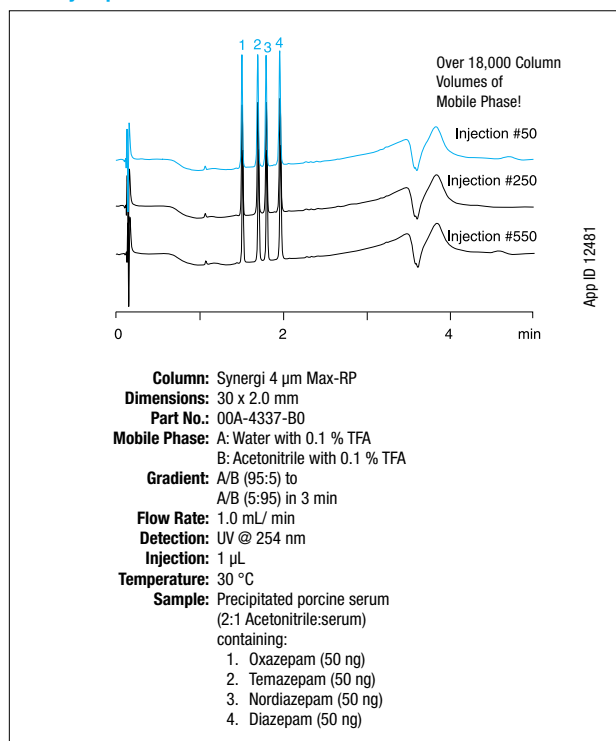
The Synergi Max-RP C12 ligands are densely bound to silica surface, significantly decreasing the number of active silanol groups, which cause peak tailing



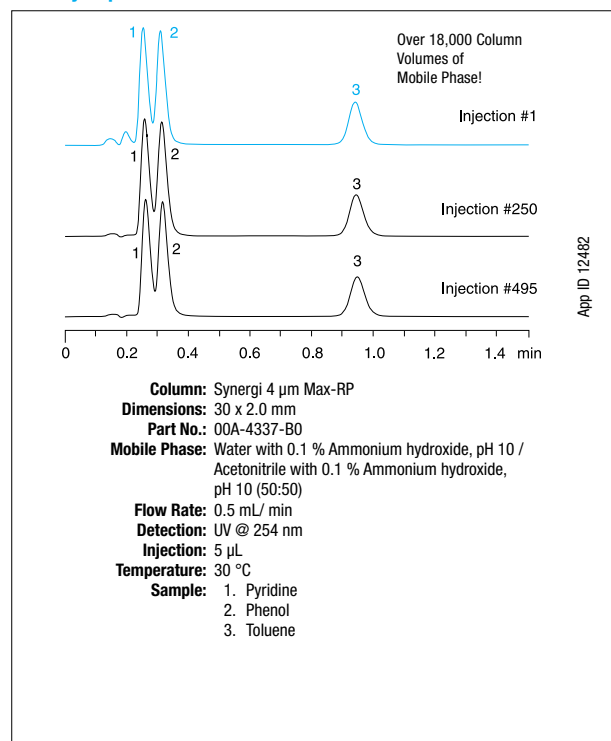
*See p. 264 for disclaimer information. Comparative separations may not be representative of all applications.

Achieve Reproducibility and Long Column Lifetimes Even at pH Extremes with Synergi Max-RP

Stability @ pH 1.5



Stability @ pH 10.0



Fast LC Solutions

Ordering Information

2.5 µm High Speed Technology (HST) Columns (mm)						
Phases	30 x 2.0	50 x 2.0	100 x 2.0	50 x 3.0	100 x 3.0	50 x 4.6
Max-RP	00A-4372-B0	00B-4372-B0	00D-4372-B0	00B-4372-Y0	00D-4372-Y0	00B-4372-E0
Hydro-RP	00A-4387-B0	00B-4387-B0	00D-4387-B0	00B-4387-Y0	00D-4387-Y0	00B-4387-E0
Polar-RP	00A-4371-B0	00B-4371-B0	00D-4371-B0	00B-4371-Y0	00D-4371-Y0	00B-4371-E0
Fusion-RP	00A-4423-B0	00B-4423-B0	00D-4423-B0	00B-4423-Y0	00D-4423-Y0	00B-4423-E0



For information about HST Columns, contact your Phenomenex technical consultant or local distributor.

Ordering Information

2.5 µm MercuryMS LC/MS Cartridges (mm)					Columns (mm)	
Phases	10 x 2.0	10 x 4.0	20 x 2.0	20 x 4.0	20 x 2.0	20 x 4.0
Max-RP	00N-4372-B0-CE	00N-4372-D0-CE	00M-4372-B0-CE	00M-4372-D0-CE	00M-4372-B0	00M-4372-D0
Hydro-RP	00N-4387-B0-CE	00N-4387-D0-CE	00M-4387-B0-CE	00M-4387-D0-CE	00M-4387-B0	00M-4387-D0
Polar-RP	—	00N-4371-D0-CE	00M-4371-B0-CE	00M-4371-D0-CE	00M-4371-B0	00M-4371-D0
Fusion-RP	00N-4423-B0-CE	00N-4423-D0-CE	00M-4423-B0-CE	00M-4423-D0-CE	00M-4423-B0	00M-4423-D0

Mercury MS™ Cartridge Holders



Direct-Connect Holder



Standard Holder

Ordering Information

Direct-Connect Cartridge Holders

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

Standard Cartridge Holders

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

Capillary Columns

Ordering Information

4 µm Synergi Capillary Columns (mm)							4 µm Synergi Capillary Guard Columns (mm)		
Phases	50 x 0.30	150 x 0.30	250 x 0.30	50 x 0.50	150 x 0.50	250 x 0.50	Phases	20 x 0.30	20 x 0.50
Max-RP	00B-4337-AC	00F-4337-AC	—	—	00F-4337-AF	00G-4337-AF	Max-RP	03M-4337-AC	03M-4375-AF
Hydro-RP	00B-4375-AC	00F-4375-AC	00G-4375-AC	00B-4375-AF	00F-4375-AF	00G-4375-AF	Hydro-RP	03M-4375-AC	03M-4375-AF
Fusion-RP	00B-4424-AC	00F-4424-AC	—	00B-4424-AF	00F-4424-AF	00G-4424-AF	Fusion-RP	03M-4424-AC	—

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Mercury MS™ Screening Kits

These convenient screening kits allow quick, easy and economical evaluation of multiple phases. Each kit contains one cartridge of each available phase and a standard holder. Available in either 3 µm or 5 µm Luna with 2.5 µm Synergi.



Ordering Information

Screening Kits

	20 x 2.0 mm Kit	20 x 4.0 mm Kit
Kit A includes 1 ea of:	KH0-7333	KH0-7334
Luna 3 µm C18(2) Cartridge		
Luna 3 µm C8(2) Cartridge		
Synergi 2.5 µm Max-RP Cartridge		
Synergi 2.5 µm Hydro-RP Cartridge		
20 mm Standard Cartridge Holder		
Kit B includes 1 ea of:	KH0-7335	KH0-7336
Luna 5 µm C18(2) Cartridge		
Luna 5 µm C8(2) Cartridge		
Synergi 2.5 µm Max-RP Cartridge		
Synergi 2.5 µm Hydro-RP Cartridge		
20 mm Standard Cartridge Holder		



For Fused Silica Capillary Adapter, see p. 349

HPLC Columns

Ordering Information

4 µm Microbore and Minibore Columns (mm)							SecurityGuard™ Cartridges (mm)	
Phases	50 x 1.0	150 x 1.0	250 x 1.0	30 x 2.0	50 x 2.0	75 x 2.0	150 x 2.0	250 x 2.0
Max-RP	00B-4337-A0	00F-4337-A0	—	00A-4337-B0	00B-4337-B0	00C-4337-B0	00F-4337-B0	00G-4337-B0
Hydro-RP	00B-4375-A0	00F-4375-A0	00G-4375-A0	00A-4375-B0	00B-4375-B0	00C-4375-B0	00F-4375-B0	00G-4375-B0
Polar-RP	00B-4336-A0	00F-4336-A0	—	00A-4336-B0	00B-4336-B0	00C-4336-B0	00F-4336-B0	00G-4336-B0
Fusion-RP	00B-4424-A0	00F-4424-A0	—	00A-4424-B0	00B-4424-B0	00C-4424-B0	00F-4424-B0	00G-4424-B0

for ID: 2.0-3.0 mm

4 µm Narrow Bore Columns (mm)					SecurityGuard™ Cartridges (mm)	
Phases	30 x 3.0	50 x 3.0	150 x 3.0	250 x 3.0	4 x 2.0*	
Max-RP	00A-4337-Y0	00B-4337-Y0	00F-4337-Y0	00G-4337-Y0	/10pk	AJO-6073
Hydro-RP	00A-4375-Y0	00B-4375-Y0	00F-4375-Y0	00G-4375-Y0		AJO-7510
Polar-RP	00A-4336-Y0	00B-4336-Y0	00F-4336-Y0	00G-4336-Y0		AJO-6075
Fusion-RP	00A-4424-Y0	00B-4424-Y0	00F-4424-Y0	00G-4424-Y0		AJO-7556

for ID: 2.0-3.0 mm

4 µm Analytical Columns (mm)						SecurityGuard™ Cartridges (mm)	
Phases	30 x 4.6	50 x 4.6	75 x 4.6	150 x 4.6	250 x 4.6	4 x 3.0*	
Max-RP	00A-4337-E0	00B-4337-E0	00C-4337-E0	00F-4337-E0	00G-4337-E0	/10pk	AJO-6074
Hydro-RP	00A-4375-E0	00B-4375-E0	00C-4375-E0	00F-4375-E0	00G-4375-E0		AJO-7511
Polar-RP	00A-4336-E0	00B-4336-E0	00C-4336-E0	00F-4336-E0	00G-4336-E0		AJO-6076
Fusion-RP	00A-4424-E0	00B-4424-E0	00C-4424-E0	00F-4424-E0	00G-4424-E0		AJO-7557

for ID: 3.2-8.0 mm

Preparative Columns

Ordering Information

Axia™ Packed Preparative Columns (mm)					SecurityGuard™ Cartridges (mm)
Phases	50 x 21.2	100 x 21.2	150 x 21.2	250 x 21.2	15 x 21.2**
4 µm					/ea
Max-RP	00B-4337-P0-AX	00D-4337-P0-AX	00F-4337-P0-AX	00G-4337-P0-AX	AJO-7842
Hydro-RP	00B-4375-P0-AX	00D-4375-P0-AX	00F-4375-P0-AX	00G-4375-P0-AX	AJO-7843
Polar-RP	00B-4336-P0-AX	00D-4336-P0-AX	00F-4336-P0-AX	00G-4336-P0-AX	AJO-7845
Fusion-RP	00B-4424-P0-AX	00D-4424-P0-AX	00F-4424-P0-AX	00G-4424-P0-AX	AJO-7844
10 µm					/ea
Max-RP	—	00D-4350-P0-AX	Inquire	00G-4350-P0-AX	AJO-7842
Hydro-RP	—	—	Inquire	00G-4376-P0-AX	AJO-7843
Polar-RP	—	—	Inquire	00G-4351-P0-AX	AJO-7845
Fusion-RP	—	—	Inquire	00G-4425-P0-AX	AJO-7844

for ID: 18-29 mm

Axia™ Packed Preparative Columns (mm) continued					SecurityGuard™ Cartridges (mm)
Phases	50 x 30	75 x 30	100 x 30	250 x 30	15 x 30.0*
4 µm					/ea
Max-RP	00B-4337-U0-AX	00C-4337-U0-AX	00D-4337-U0-AX	00G-4337-U0-AX	AJO-8304
Hydro-RP	00B-4375-U0-AX	00C-4375-U0-AX	00D-4375-U0-AX	00G-4375-U0-AX	AJO-8305
Polar-RP	00B-4336-U0-AX	00C-4336-U0-AX	00D-4336-U0-AX	00G-4336-U0-AX	AJO-8307
Fusion-RP	—	—	00D-4424-U0-AX	00G-4424-U0-AX	AJO-8306
10 µm					/ea
Max-RP	00B-4350-U0-AX	—	00D-4350-U0-AX	00G-4350-U0-AX	AJO-8304
Hydro-RP	00B-4376-U0-AX	—	—	00G-4376-U0-AX	AJO-8305
Polar-RP	00B-4351-U0-AX	—	00D-4351-U0-AX	00G-4351-U0-AX	AJO-8307
Fusion-RP	—	—	00D-4425-U0-AX	00G-4425-U0-AX	AJO-8306

for ID: 30-49 mm

Pilot Scale Columns and Bulk Material

Ordering Information

10 µm Analytical and Semi-Prep Columns (mm)				SecurityGuard™ Cartridges (mm)
Phases	250 x 4.6	250 x 10	4 x 3.0*	10 x 10*
Max-RP	00G-4350-E0	00G-4350-N0	/10pk	/3pk
Hydro-RP	00G-4376-E0	00G-4376-N0	AJO-6074	AJO-7275
Polar-RP	00G-4351-E0	00G-4351-N0	AJO-7511	AJO-7512
Fusion-RP	00G-4425-E0	00G-4425-N0	AJO-6076	AJO-7276
			AJO-7557	AJO-7558

for ID: 3.2-8.0 mm

9-16 mm

10 µm Bulk Packings			
Phases	100 g	1 kg	5 kg
Max-RP	04G-4350	04K-4350	04L-4350
Hydro-RP	04G-4376	04K-4376	04L-4376
Polar-RP	04G-4351	04K-4351	04L-4351
Fusion-RP	04G-4425	04K-4425	04L-4425

Larger quantities of bulk media available upon request.

Ordering Information

4 µm Semi-Prep Columns (mm)		SecurityGuard™ Cartridges (mm)
Phases	250 x 10	10 x 10*
Max-RP	00G-4337-N0	/3pk
Hydro-RP	00G-4375-N0	AJO-7512
Polar-RP	00G-4336-N0	AJO-7276
Fusion-RP	00G-4424-N0	AJO-7558

for ID: 9-16 mm

*SecurityGuard™ Analytical Cartridges require holder, Part No.: KJO-4282
 *SemiPrep SecurityGuard™ Cartridges require holder, Part No.: AJO-7220
 **PREP SecurityGuard™ Cartridges require holder, Part No.: AJO-8223
 *PREP SecurityGuard™ Cartridges require holder, Part No.: AJO-8277



For more dimensions and phases of Axia packed preparative columns, see pp. 310-311, or contact your Phenomenex Technical Consultant

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!

