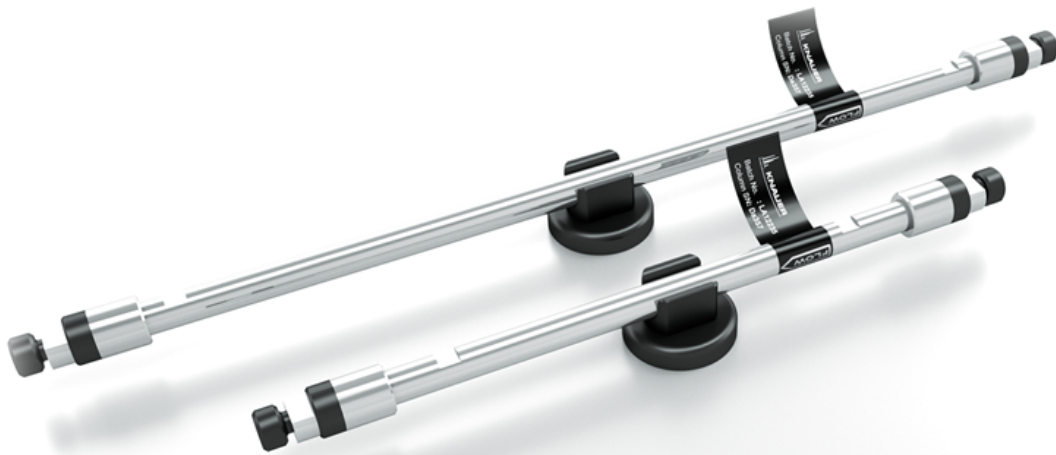


Overview

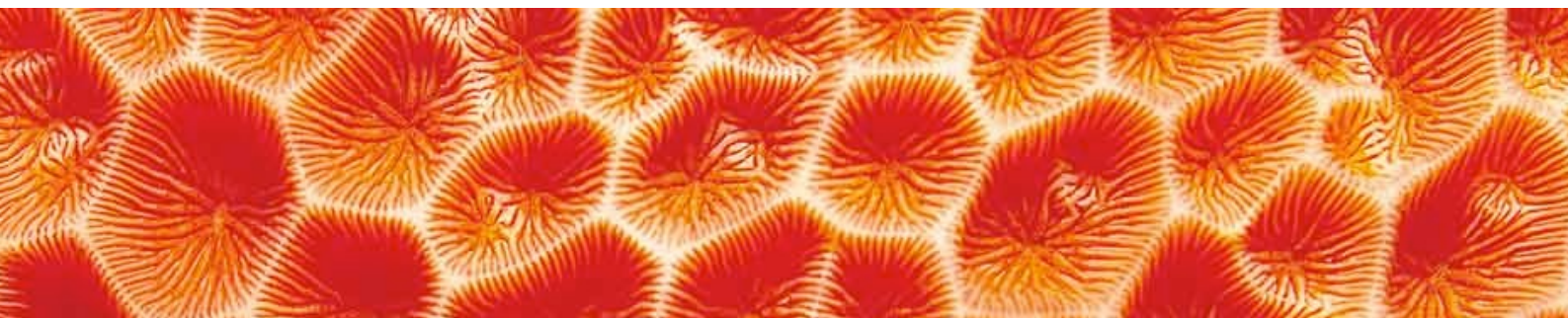
Analytical HPLC and UHPLC columns

Eurospher II for HPLC, HPLC Plus and UHPLC

Eurokat for LC separation of carbohydrates and organic acids



- Handy column hardware -> easy exchange of filters
- Integrated precolumn system -> no loss in separation power
- Wide area of application services -> column- and method guidance

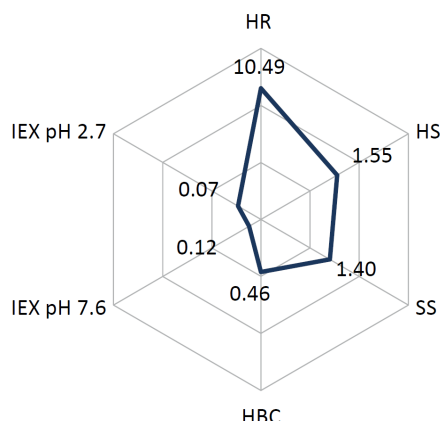


Characterisation of phases based on Tanaka tests

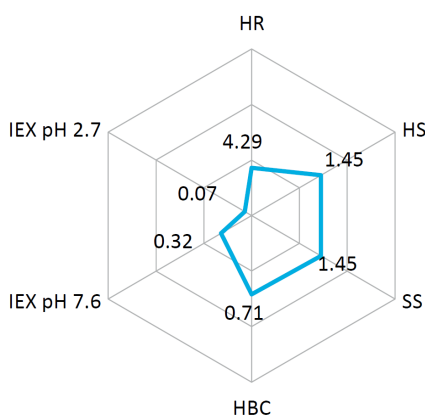


Optimized selectivity – for better separations

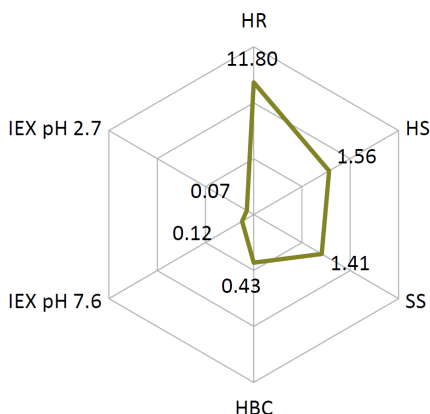
- HR: hydrophobic retention
- HS: hydrophobic selectivity
- SS: steric selectivity
- HBC: hydrogen bonding capacity
- IEX (pH 7,6): ion exchange capacity at pH 7.6
- IEX (pH 2,7): ion exchange capacity at pH 2.7



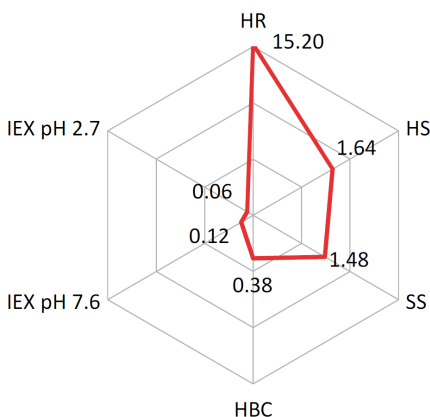
Eurosphere II 100 C18 - USP L1 -
 for acidic, basic and neutral analytes in reversed phase mode (sulphonamides; anabolic steroids; anti-psychotics; beta blocker; Sudan dyes; phenols, preservatives etc.)



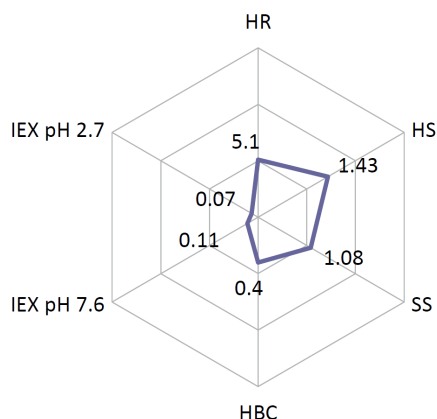
Eurosphere II 100 C18 A - USP L1-
 polar endcapped C18 phase for alternative selectivity; 100% aqueous applications with very polar compounds (basic pharmaceutical ingredients, water soluble vitamins, catecholamines as well as organic acids)



Eurosphere II 100 C18 H - USP L1 -
 recommended alternative for Kromasil 100 C18 columns; for acidic, basic and neutral analytes in reversed phase mode with extended pH range

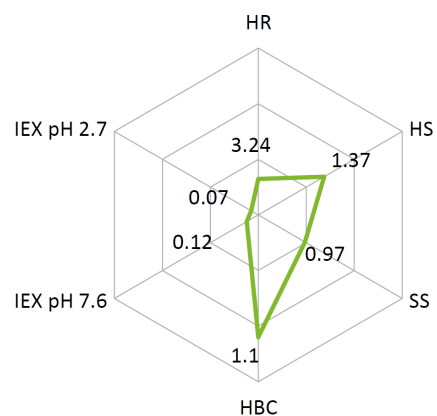


Eurosphere II 100 C18 P - USP L1 -
 alternative selectivity to C18 phase; stationary phase in Eurosphere II C18 family with the highest carbon load; fully endcapped; excellent shape selectivity and pH stability



Eurosphere II 100 C8 - USP L7 -

similar selectivity to C18 phase but less retention due to the lower hydrophobicity; useful for determination of water soluble vitamins, steroids, catecholamines, sedatives etc.



Eurosphere II 100 Phenyl - USP L11 -

alternative selectivity for aromatic and moderately polar analytes or mixtures with varying polarity and aromaticity

HILIC

Eurosphere II 100 HILIC -

especially suited for the separation of hydrophilic, polar and ionic analytes which are only poorly retained on reversed phase columns; behavior is the other way round on Eurosphere II HILIC compared to RP which makes it an ideal tool to enhance chromatographic separations for these molecules

NH₂

Eurosphere II 100 NH₂- USP L8 -

most flexible phase in the Eurosphere II family; can be used in three modes: normal phase, reversed phase and ion chromatography mode (weak anion exchanger); different selectivity to the silica packing; in reversed phase mode mainly used for analysis of carbohydrates

Eurosphere II Family

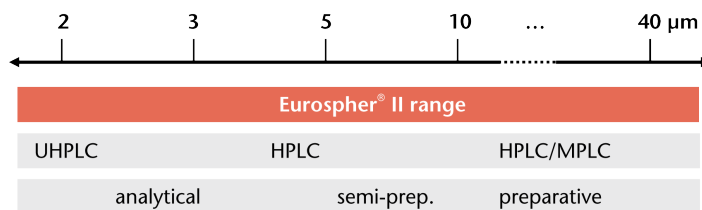


Based on an ultra pure spherical silica gel, Eurosphere II is a high performance column material for analytical, semipreparative and process-scale applications. Eurosphere II features very narrow particle and pore size distributions, as well as outstanding mechanical stability. Eurosphere II silica gel is perfectly suited to take on routine analyses as well as the most ambitious chromatography tasks.

Especially for ultrafast UHPLC, Eurosphere II is also available in 2 μm particle size.

Characteristics:

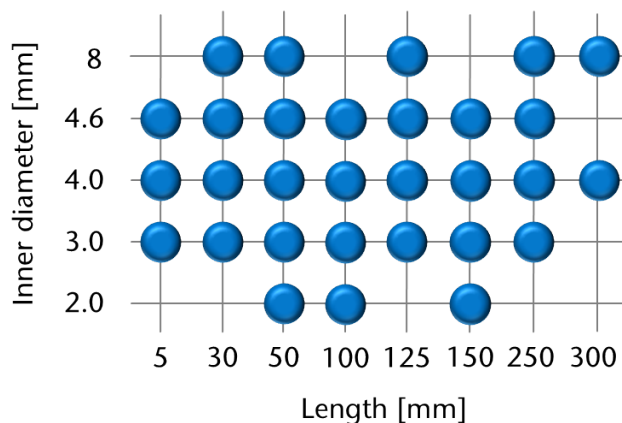
- Eurosphere II 100 HPLC phases are based on ultra pure 3rd generation silica gel
- numerous modifications are available for a broad range of applications
- high resolution LC phase, suited for analytical HPLC and UHPLC as well as for semipreparative and preparative Separations
- high mechanical stability
- narrow particle and pore size distribution
- high batch to batch reproducibility



Physical properties:

Silica gel	ultrapure > 99.99 %
Metal content	< 10 ppm
Particle size	2 μm , 3 μm , 5 μm , 10 μm , (15 μm , 20 – 45 μm upon request)
Particle shape	spherical
Porengröße	100 Å
Specific surface	320 \pm 20 m ² /g
Pore volume	0.8 ml/g
Density	430 g/l

Available column dimensions*:



* preparative column dimensions up to 50 mm ID also available

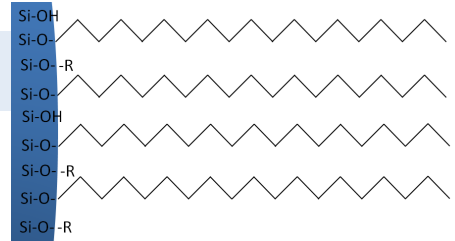
Recommended application areas:

Phase type	non polar	polar	acidic	basic	Chelator	hydroph. retention	shape selectivity	extreme aqueous	pH > 9	LC-MS
C18	excellent	excellent	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent
C18 H	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent	excellent	excellent
C18 P	excellent	good	suitable	excellent	excellent	excellent	excellent	excellent	excellent	excellent
C18 A	excellent	excellent	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent
Phenyl	excellent	suitable	excellent	excellent	excellent	suitable	excellent	excellent	excellent	excellent
C8	excellent	suitable	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent
C8 A	excellent	excellent	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent
C4	excellent	excellent	suitable	good	excellent	suitable	excellent	excellent	excellent	excellent
HILIC	excellent	excellent	excellent	excellent	excellent	excellent	excellent	excellent	excellent	excellent
NH ₂	excellent	good	suitable	suitable	excellent	excellent	excellent	excellent	excellent	excellent
CN	excellent	good	suitable	suitable	excellent	excellent	excellent	excellent	excellent	excellent
Diol	excellent	good	suitable	excellent	excellent	excellent	excellent	excellent	excellent	excellent
Si	excellent	good	excellent	excellent	suitable	excellent	excellent	excellent	excellent	excellent

excellent
 good
 suitable
 not recommended

other column dimensions and particle sizes upon request, please check www.knauer.net

EurospHER II 100 C18 - USP L1 -



Ultra pure, spherical high performance HPLC phase based on silica gel
 Unpolar, monomeric C18 (Octadecyl) modification, endcapped,
 16 % carbon content (~ 50 % endcapping).

Properties:

Separation mechanism: Hydrophobic interaction

Key features:

High-class HPLC phase perfectly suited to take on routine analyses as well as the most ambitious chromatography tasks, classical C18 phase with ca. 50 % endcapping and resulting 16 % carbon content, outstanding mechanical and chemical stability

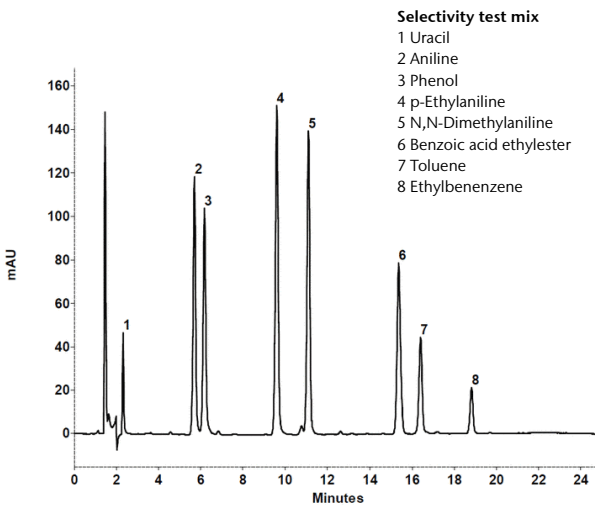
Technical data:

C18 phase based on ultra-pure silica gel (purity > 99 %),
 metal content < 10 ppm, pH-stability 2 - 8, pore size 100 Å, particle size 2 µm, 3 µm, 5 µm, 10 µm (15 µm, 20 – 45 µm on request).

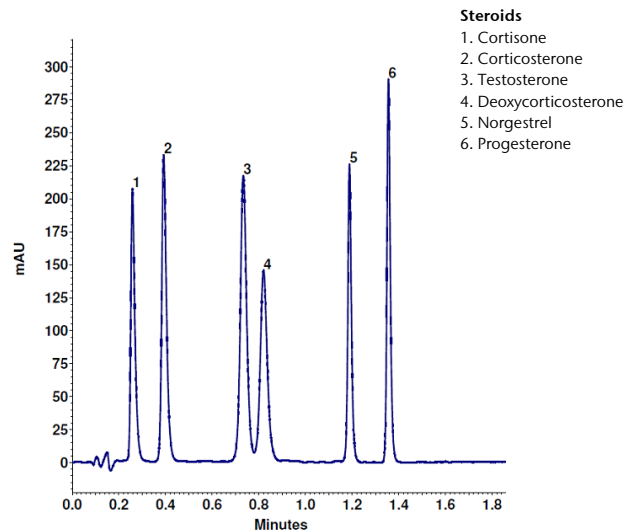
Recommended application areas:

Suitable for acidic, basic and neutral analytes in reversed phase mode, for example sulphonamides; anabolic steroids; anti-psychotics; beta blocker; sudan dyes; phenols and preservatives

EurospHER II 100-5 C18, 150 x 2.0 mm ID
 Article number: 15BE181E2J



EurospHER II 100-2 C18, 50 x 2 mm ID
 Article number: 05BE181E2F



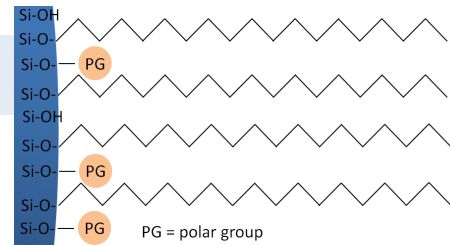
Tip: Never use classical C18 phases with 100 % aqueous mobile phase. The hydrophobic C18 chains will collapse. Only special C18 A or C18 AQ phases have a hydrophilic endcapping style and can be used with pure water.

EurospHER II 100 C18 article numbers								
Columns	2 mm ID		3 mm ID		4 mm ID		4.6 mm ID	
Column length & equipment	2 µm	3 µm	3 µm	5 µm	3 µm	5 µm	3 µm	5 µm
250 mm			25CE181E2G	25CE181E2J	25DE181E2G	25DE181E2J	25EE181E2G	25EE181E2J
with integrated precolumn			25XE181E2G	25XE181E2J	25WE181E2G	25WE181E2J	25VE181E2G	25VE181E2J
150 mm	15BE181E2F	15BE181E2G	15CE181E2G	15CE181E2J	15DE181E2G	15DE181E2J	15EE181E2G	15EE181E2J
with integrated precolumn			15XE181E2G	15XE181E2J	15WE181E2G	15WE181E2J	15VE181E2G	15VE181E2J
100 mm	10BE181E2F	10BE181E2G	10CE181E2G	10CE181E2J	10DE181E2G	10DE181E2J	10EE181E2G	10EE181E2J
with integrated precolumn			10XE181E2G	10XE181E2J	10WE181E2G	10WE181E2J	10VE181E2G	10VE181E2J
50 mm	05BE181E2F	05BE181E2G	05CE181E2G	05CE181E2J	05DE181E2G	05DE181E2J	05EE181E2G	05EE181E2J
5 mm precolumn cartridge			P5CE181E2G	P5CE181E2J	P5DE181E2G	P5DE181E2J	P5DE181E2G	P5DE181E2J
Bulk Media								
Quantity	2 µm	3 µm	5 µm					
10 g	00BE181E2F	00BE181E2G	00BE181E2J					
100 g		00CE181E2G	00CE181E2J					

other column dimensions and particle sizes upon request, please check www.knauer.net

Eurosphere II 100 C18 A - USP L1-

Ultra pure, spherical high performance HPLC phase based on silica gel
 Polar, monomeric C18 (Octadecyl) modification, polar endcapping,
 10 % carbon content (~ 50 % endcapping)



Properties:

Separation mechanism: Hydrophobic and polar interaction

Key features:

C18 A phase with alternative, more polar selectivity, suited for the use with pure aqueous mobile phases, 50 % endcapping and resulting 10 % carbon content, outstanding mechanical and chemical stability, suited for analytical as well as semi preparative and preparative applications

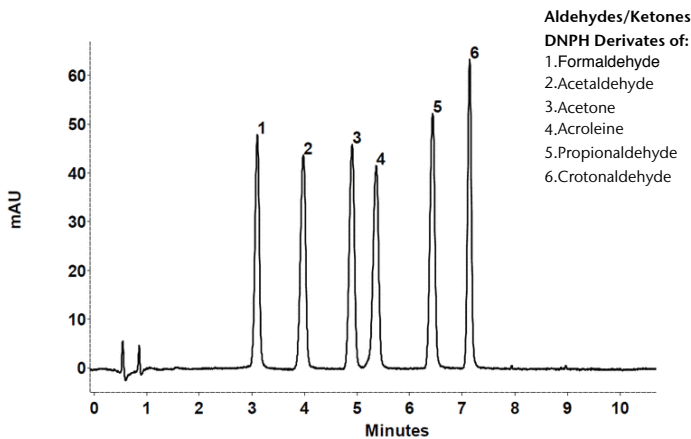
Technical data:

C18 A phase based on ultra-pure silica gel (purity > 99 %), metal content < 10 ppm, pH-stability 2 - 8, pore size 100 Å, particle size 2 µm, 3 µm, 5 µm, 10 µm (15 µm, 20 – 45 µm on request).

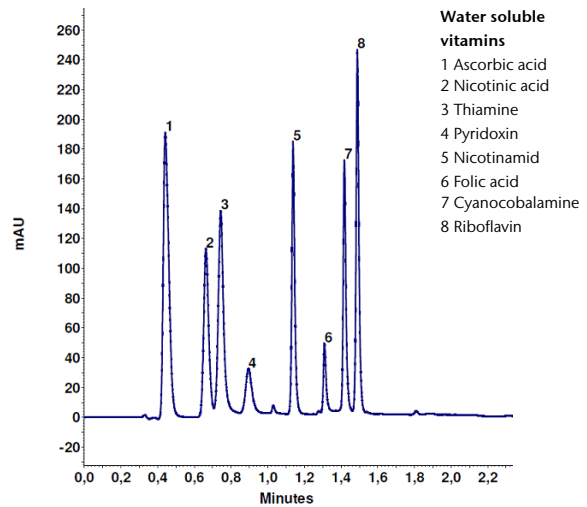
Recommended application areas:

polar endcapped C18 phase for water soluble and polar analytes, 100 % aqueous eluents for analysis of very polar compounds, basic pharmaceutical ingredients, water soluble vitamins, catecholamines as well as organic acids

Eurosphere II 100-3 C18 A, 100 x 3 mm ID
 Article number: 10CE184E2G



Eurosphere II 100-2 C18 A, 100 x 2 mm ID
 Article number: 10BE184E2F



Tip: Caution! Even for short term storage all buffer solutions have to be rinsed from the column to prevent crystallization effects

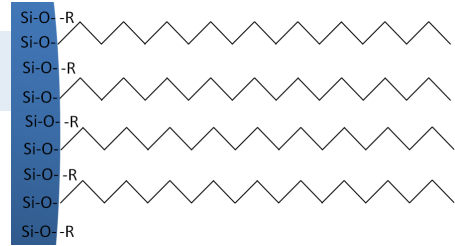
Eurosphere II 100 C18 A article numbers

Columns	2 mm ID		3 mm ID		4 mm ID		4.6 mm ID	
Column length & equipment	2 µm	3 µm	3 µm	5 µm	3 µm	5 µm	3 µm	5 µm
250 mm with integrated precolumn			25CE184E2G	25CE184E2J	25DE184E2G	25DE184E2J	25EE184E2G	25EE184E2J
150 mm with integrated precolumn	15BE184E2F	15BE184E2G	15CE184E2G	15CE184E2J	15DE184E2G	15DE184E2J	15EE184E2G	15EE184E2J
100 mm with integrated precolumn	10BE184E2F	10BE184E2G	10CE184E2G	10CE184E2J	10DE184E2G	10DE184E2J	10EE184E2G	10EE184E2J
50 mm	05BE184E2F	05BE184E2G	05CE184E2G	05CE184E2J	05DE184E2G	05DE184E2J	05EE184E2G	05EE184E2J
5 mm precolumn cartridge			P5CE184E2G	P5CE184E2J	P5DE184E2G	P5DE184E2J	P5DE184E2G	P5DE184E2J
Bulk Media								
Quantity	2 µm	3 µm	5 µm					
10 g	00BE184E2F	00BE184E2G	00BE184E2J					
100 g		00CE184E2G	00CE184E2J					

other column dimensions and particle sizes upon request, please check www.knauer.net

EurospHER II 100 C18 H - USP L1 -

Ultra pure, spherical high performance HPLC phase based on silica gel
 Unpolar, monomeric C18 (Octadecyl) modification, high efficiency endcapping,
 17 % carbon content (~ 99 % endcapping)



Properties

Separation mechanism: Hydrophobic interaction

Key features:

Unpolar C18 phase with high efficiency endcapping and 17 % carbon content, therewith higher pH stability in the range of 1-12, outstanding mechanical and chemical stability, suited for analytical as well as semi preparative and preparative applications

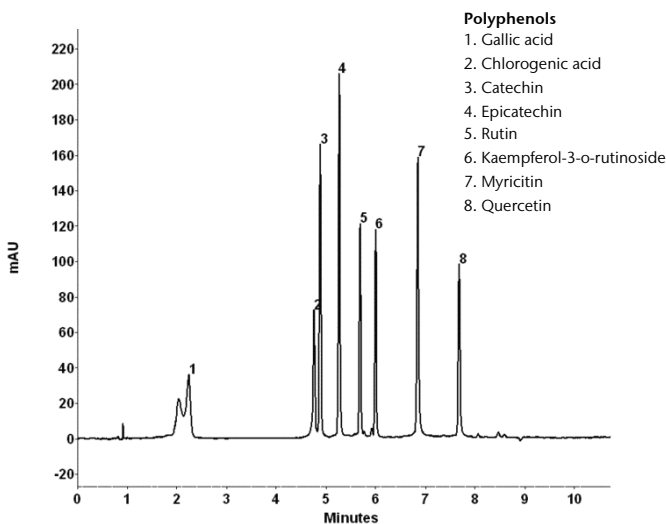
Technical data:

C18 phase based on ultra-pure silica gel (purity > 99 %), metal content < 10 ppm, pH-stability 2 - 8, pore size 100 Å, particle size 2 µm, 3 µm, 5 µm, 10 µm (15 µm, 20 – 45 µm on request).

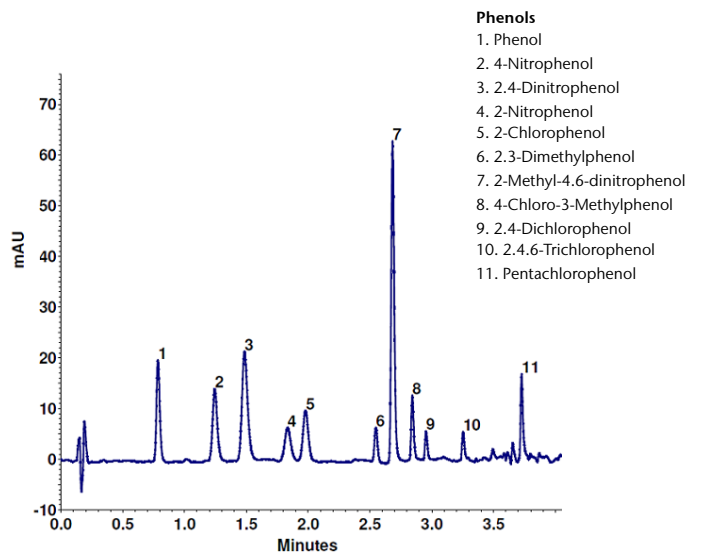
Recommended application areas:

Recommended alternative to Kromasil 100 C18, für acidic, basic and neutral analytes in reversed phase mode with extended pH range

EurospHER II 100-3 C18 H, 150 x 3.0 mm ID
 Article number: 15CE185E2G



EurospHER II 100-2 C18 H, 50 x 2 mm ID
 Article number: 05BE185E2F



Tip: All analytical KNAUER columns can be used in reversed flow direction for example for cleaning

EurospHER II 100 C18 H article numbers

Columns	2 mm ID		3 mm ID		4 mm ID		4.6 mm ID	
Column length & equipment	2 µm	3 µm	3 µm	5 µm	3 µm	5 µm	3 µm	5 µm
250 mm with integrated precolumn			25CE185E2G	25CE185E2J	25DE185E2G	25DE185E2J	25EE185E2G	25EE185E2J
150 mm with integrated precolumn	15BE185E2F	15BE185E2G	15CE185E2G	15CE185E2J	15DE185E2G	15DE185E2J	15EE185E2G	15EE185E2J
100 mm with integrated precolumn	10BE185E2F	10BE185E2G	10CE185E2G	10CE185E2J	10DE185E2G	10DE185E2J	10EE185E2G	10EE185E2J
50 mm	05BE185E2F	05BE185E2G	05CE185E2G	05CE185E2J	05DE185E2G	05DE185E2J	05EE185E2G	05EE185E2J
5 mm precolumn cartridge			P5CE185E2G	P5CE185E2J	P5DE185E2G	P5DE185E2J	P5DE185E2G	P5DE185E2J
Bulk Media								
Quantity	2 µm	3 µm	5 µm					
10 g	00BE185E2F	00BE185E2G	00BE185E2J					
100 g		00CE185E2G	00CE185E2J					

other column dimensions and particle sizes upon request, please check www.knauer.net

Eurosphere II 100 C18 P - USP L1 -

Ultra pure, spherical high performance HPLC phase based on silica gel
 Unpolar, trifunctional C18 (Octadecyl) modification, high efficiency endcapping
 20 % carbon content (~ 99 % endcapping)



Properties

Separation mechanism: Hydrophobic and steric interaction

Key features:

KNAUER's most unpolar C18 phase, polymeric, high efficiency endcapping of 99 % and 20 % carbon content, higher pH stability in the range of 1-12, outstanding mechanical and chemical stability, suited for analytical as well as semi preparative and preparative applications

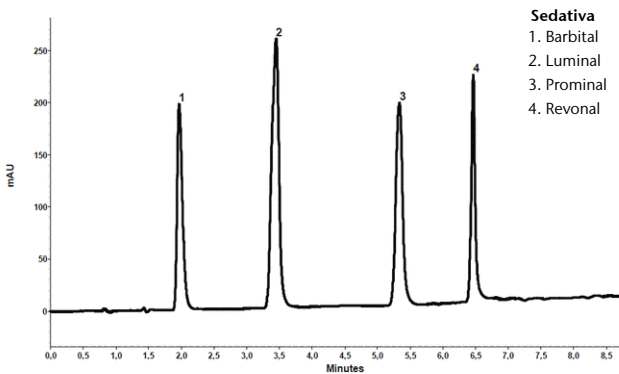
Technical data:

C18 phase based on ultra-pure silica gel (purity > 99 %), metal content < 10 ppm, pH-stability 2 - 8, pore size 100 Å, particle size 2 µm, 3 µm, 5 µm, 10 µm (15 µm, 20 – 45 µm on request).

Recommended application areas:

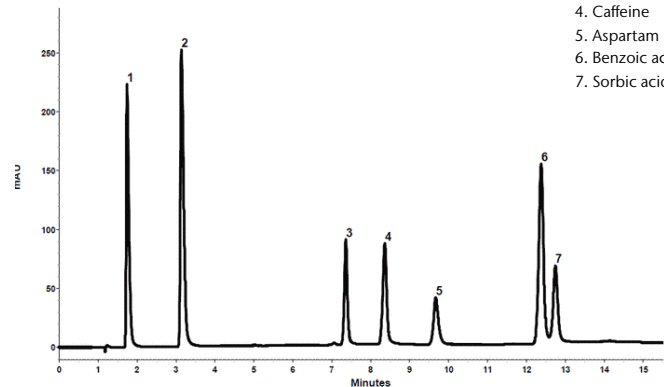
alternative selectivity to standard C18; stationary phase in Eurosphere II C18 family with the highest carbon load; fully endcapped; excellent shape selectivity and pH stability

Eurosphere II 100-3 C18 P, 100 x 3.0 mm ID
Article number: 10CE182E2G



Sedativa
 1. Barbitol
 2. Luminal
 3. Prominal
 4. Revonal

Eurosphere II 100-3 C18 P, 100 x 3.0 mm ID
Article number: 10CE182E2G



Softdrink additives
 1. Acesulfam
 2. Saccharin
 3. Vanilline
 4. Caffeine
 5. Aspartam
 6. Benzoic acid
 7. Sorbic acid



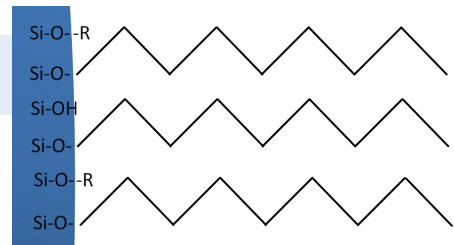
Tip: Not all C18 phases are comparable! When replacing an existing column always have a close look at the characteristics like carbon load, pore size and specific surface area.

Eurosphere II 100 C18 P article numbers								
Columns	2 mm ID		3 mm ID		4 mm ID		4.6 mm ID	
Column length & equipment	2 µm	3 µm	3 µm	5 µm	3 µm	5 µm	3 µm	5 µm
250 mm with integrated precolumn			25CE182E2G	25CE182E2J	25DE182E2G	25DE182E2J	25EE182E2G	25EE182E2J
150 mm with integrated precolumn	15BE182E2F	15BE182E2G	15XE182E2G	15XE182E2J	15WE182E2G	15WE182E2J	15VE182E2G	15VE182E2J
100 mm with integrated precolumn	10BE182E2F	10BE182E2G	10CE182E2G	10CE182E2J	10DE182E2G	10DE182E2J	10EE182E2G	10EE182E2J
50 mm	05BE182E2F	05BE182E2G	05XE182E2G	05XE182E2J	05WE182E2G	05WE182E2J	05VE182E2G	05VE182E2J
5 mm precolumn cartridge			P5CE182E2G	P5CE182E2J	P5DE182E2G	P5DE182E2J	P5DE182E2G	P5DE182E2J
Bulk Media								
Quantity	2 µm	3 µm	5 µm					
10 g	00BE182E2F	00BE182E2G	00BE182E2J					
100 g		00CE182E2G	00CE182E2J					

other column dimensions and particle sizes upon request, please check www.knauer.net

Eurosphere II 100 C8 - USP L7 -

Ultra pure, spherical high performance HPLC phase based on silica gel
 Monomeric C8 (Octyl) modification, standard endcapping
 10 % carbon content (~ 50 % endcapping)



Properties

Separation mechanism: Hydrophobic interaction (lower compared to C18 phases)

Key features:

Classical C8 phase, standard 50 % endcapping and 10 % carbon load, outstanding mechanical and chemical stability, suited for analytical as well as semi preparative and preparative applications

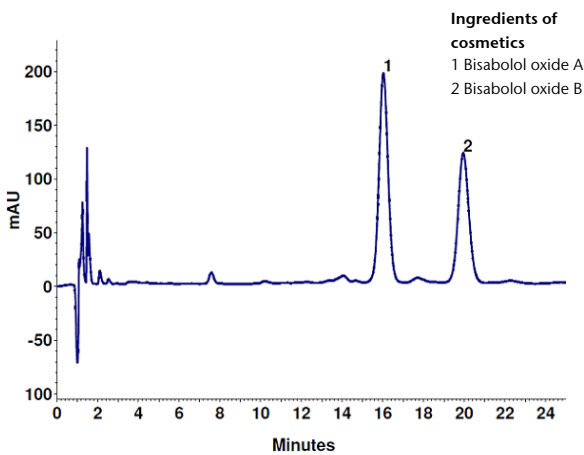
Technical data:

C8 phase based on ultra-pure silica gel (purity > 99 %), metal content < 10 ppm, pH-stability 2 - 8, pore size 100 Å, particle size 2 µm, 3 µm, 5 µm, 10 µm (15 µm, 20 – 45 µm on request).

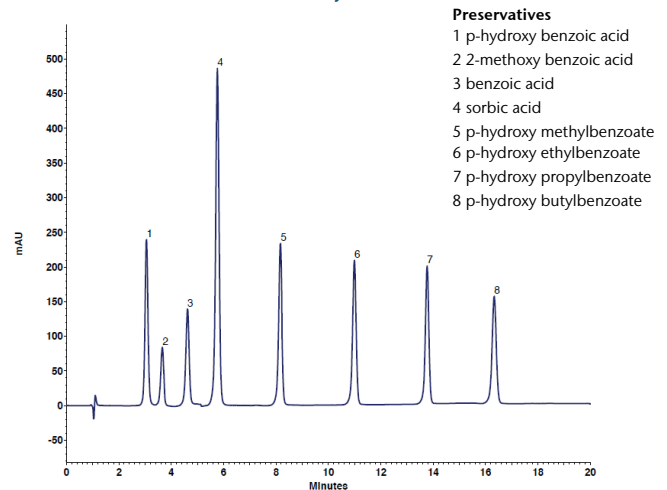
Recommended application areas:

Similar selectivity to C18 phase but less retention due to the lower hydrophobicity; useful for determination of water soluble vitamins, steroids, catecholamines, sedatives etc.

Eurosphere II 100-5 C8, 150 x 4.6 mm ID
 Article number: 15EE081E2J



Eurosphere 100-5 C8, 125 x 4.0 mm ID
 Article number: 12DE081ESJ



Tip: Column lifetime can be extended by using moderate conditions like temperatures not higher than 45 °C, backpressure below the maximum pressure and a good sample preparation.

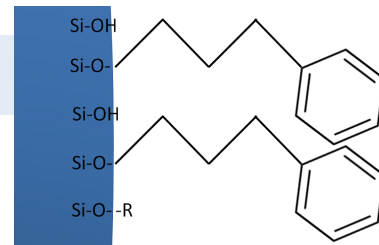
Eurosphere II 100 C8 article numbers

Columns	2 mm ID		3 mm ID		4 mm ID		4.6 mm ID	
Column length & equipment	2 µm	3 µm	3 µm	5 µm	3 µm	5 µm	3 µm	5 µm
250 mm			25CE081E2G	25CE081E2J	25DE081E2G	25DE081E2J	25EE081E2G	25EE081E2J
with integrated precolumn			25XE081E2G	25XE081E2J	25WE081E2G	25WE081E2J	25VE081E2G	25VE081E2J
150 mm	15BE081E2F	15BE081E2G	15CE081E2G	15CE081E2J	15DE081E2G	15DE081E2J	15EE081E2G	15EE081E2J
with integrated precolumn			15XE081E2G	15XE081E2J	15WE081E2G	15WE081E2J	15VE081E2G	15VE081E2J
100 mm	10BE081E2F	10BE081E2G	10CE081E2G	10CE081E2J	10DE081E2G	10DE081E2J	10EE081E2G	10EE081E2J
with integrated precolumn			10XE081E2G	10XE081E2J	10WE081E2G	10WE081E2J	10VE081E2G	10VE081E2J
50 mm	05BE081E2F	05BE081E2G	05CE081E2G	05CE081E2J	05DE081E2G	05DE081E2J	05EE081E2G	05EE081E2J
5 mm precolumn cartridge			P5CE081E2G	P5CE081E2J	P5DE081E2G	P5DE081E2J	P5DE081E2G	P5DE081E2J
Bulk Media								
Quantity	2 µm	3 µm	5 µm					
10 g	00BE081E2F	00BE081E2G	00BE081E2J					
100 g		00CE081E2G	00CE081E2J					

other column dimensions and particle sizes upon request, please check www.knauer.net

Eurospher II 100 Phenyl - USP L11 -

Ultra pure, spherical high performance HPLC phase based on silica gel
Phenyl modification (Phenylpropyl),
12 % carbon content



Properties

Separation mechanism: Pi-Pi Interactions

Key features:

Classical phenyl phase with 12 % carbon load, outstanding mechanical and chemical stability, suited for analytical as well as semi preparative and preparative applications

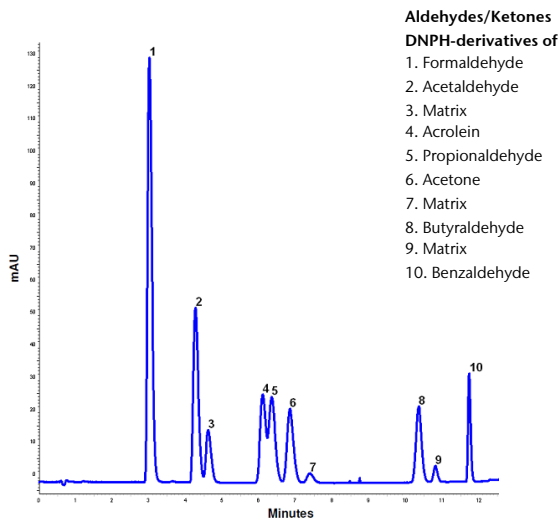
Technical Data:

Phenyl phase based on ultra-pure silica gel (purity > 99 %), metal content < 10 ppm, pH-stability 2 - 8, pore size 100 Å, particle size 2 µm, 3 µm, 5 µm, 10 µm (15 µm, 20 – 45 µm on request).

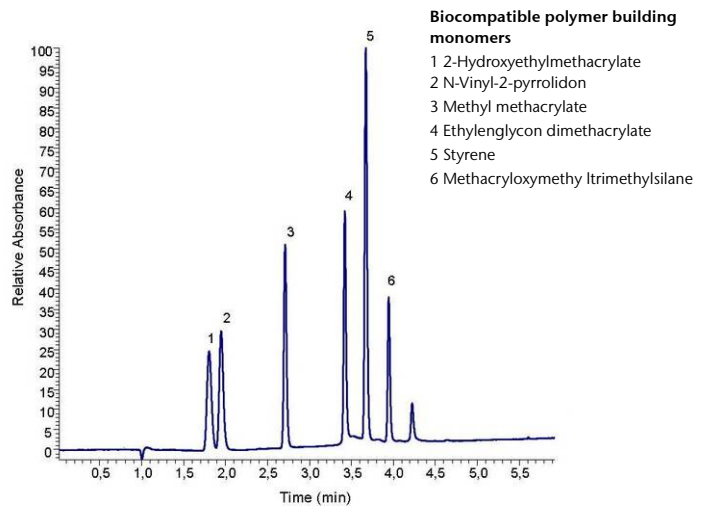
Recommended application areas:

Alternative selectivity for aromatic and moderately pi-pi interaction polar analytes or mixtures with varying polarity and aromaticity

Eurospher II 100-2 Phenyl, 100 x 2 mm ID Article number: 10BE050E2F



Eurospher II 100-2 Phenyl, 100 x 2 mm ID Article number: 10BE050E2F



Tip: For UHPLC columns like Eurospher II 2 µm particle size, samples and eluents should be filtered through a 0.2 µm instead of a 0.45 µm membrane filter. Frits at column in- and outlet have smaller pores than classical HPLC columns and block more easily.

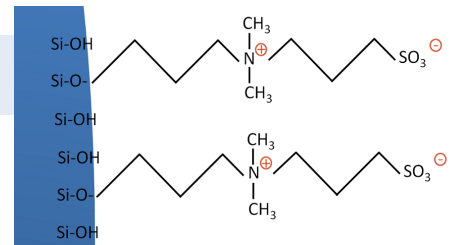
Eurospher II 100 Phenyl article numbers

Columns	2 mm ID		3 mm ID		4 mm ID		4.6 mm ID	
Column length & equipment	2 µm	3 µm	3 µm	5 µm	3 µm	5 µm	3 µm	5 µm
250 mm with integrated precolumn			25CE050E2G	25CE050E2J	25DE050E2G	25DE050E2J	25EE050E2G	25EE050E2J
150 mm with integrated precolumn	15BE050E2F	15BE050E2G	15CE050E2G	15CE050E2J	15DE050E2G	15DE050E2J	15EE050E2G	15EE050E2J
100 mm with integrated precolumn	10BE050E2F	10BE050E2G	10CE050E2G	10CE050E2J	10DE050E2G	10DE050E2J	10EE050E2G	10EE050E2J
50 mm	05BE050E2F	05BE050E2G	05CE050E2G	05CE050E2J	05DE050E2G	05DE050E2J	05EE050E2G	05EE050E2J
5 mm precolumn cartridge			P5CE050E2G	P5CE050E2J	P5DE050E2G	P5DE050E2J	P5DE050E2G	P5DE050E2J
Bulk Media								
Quantity	2 µm	3 µm	5 µm					
10 g	00BE050E2F	00BE050E2G	00BE050E2J					
100 g		00CE050E2G	00CE050E2J					

other column dimensions and particle sizes upon request, please check www.knauer.net

Eurospher II 100 HILIC

Ultra pure, spherical high performance HPLC phase based on silica gel
 Zwitterionic modification: Ammonium – sulfonic acid,
 7 % carbon content



Properties

Separation mechanism: Hydrophilic and weak electrostatic interactions

Key features:

Modern HILIC phase with zwitterionic modification on the basis of ammonium- sulfonic acid, outstanding mechanical and chemical stability

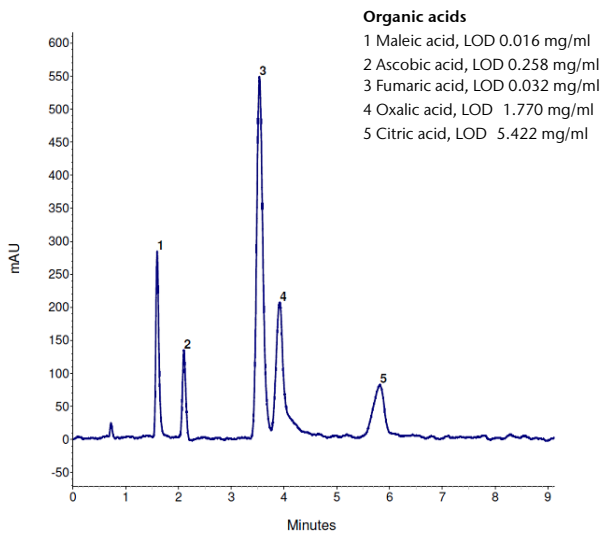
Technical Data:

HILIC phase based on ultra-pure silica gel (purity > 99 %), metal content < 10 ppm, pH-stability 2 - 8, pore size 100 Å, particle size 3 µm and 5 µm

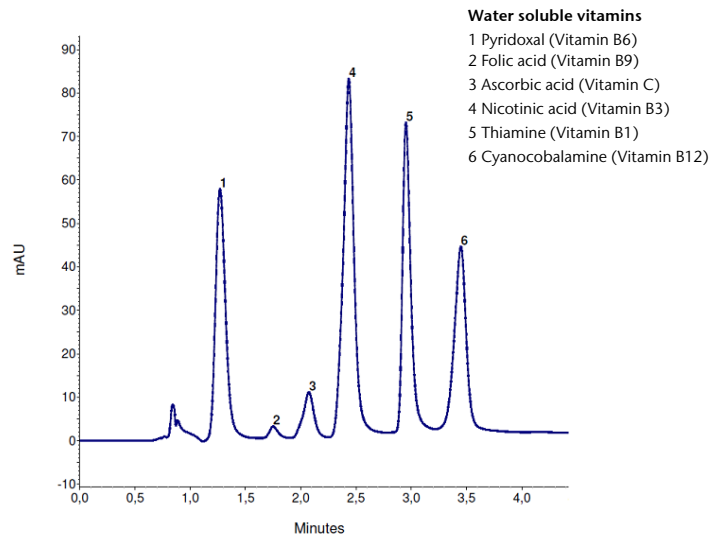
Recommended application areas:

Especially suited for the separation of hydrophilic, polar and ionic analytes which are poorly retained on reversed phase columns; behavior is the other way round on Eurospher II HILIC compared to RP which makes it an ideal tool to enhance chromatographic separations for these molecules

Eurospher II 100-5 HILIC, 150 x 3 mm ID
 Article number: 15CE120E2J



Eurospher II 100-5 HILIC, 150 x 3 mm ID
 Article number: 15CE120E2J



Tip: HILIC applications are well-suited for coupling with MS detection. The high organic content of the applied mobile phases are qualified well for evaporation in the MS's ionization source.

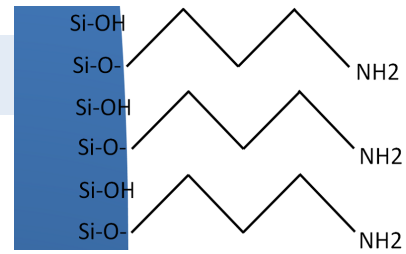
Eurospher II 100 HILIC article numbers

Columns	3 mm ID		4 mm ID		4.6 mm ID	
	3 µm	5 µm	3 µm	5 µm	3 µm	5 µm
250 mm	25CE120E2G	25CE120E2J	25DE120E2G	25DE120E2J	25EE120E2G	25EE120E2J
with integrated precolumn	25XE120E2G	25XE120E2J	25WE120E2G	25WE120E2J	25VE120E2G	25VE120E2J
150 mm	15CE120E2G	15CE120E2J	15DE120E2G	15DE120E2J	15EE120E2G	15EE120E2J
with integrated precolumn	15XE120E2G	15XE120E2J	15WE120E2G	15WE120E2J	15VE120E2G	15VE120E2J
100 mm	10CE120E2G	10CE120E2J	10DE120E2G	10DE120E2J	10EE120E2G	10EE120E2J
with integrated precolumn	10XE120E2G	10XE120E2J	10WE120E2G	10WE120E2J	10VE120E2G	10VE120E2J
50 mm	05CE120E2G	05CE120E2J	05DE120E2G	05DE120E2J	05EE120E2G	05EE120E2J
5 mm precolumn cartridge	P5CE120E2G	P5CE120E2J	P5DE120E2G	P5DE120E2J	P5DE120E2G	P5DE120E2J

other column dimensions and particle sizes upon request, please check www.knauer.net

Eurospher II 100 NH2- USP L8 -

Ultra pure, spherical high performance HPLC phase based on silica gel
 Amino modification (Aminopropyl),
 4 % carbon content (without endcapping)



Properties

Separation mechanism: Hydrophilic and ionic interactions

Key features:

Multi mode column for RP, NP, HILIC and IC, Aminopropyl modification without endcapping, outstanding mechanical and chemical stability

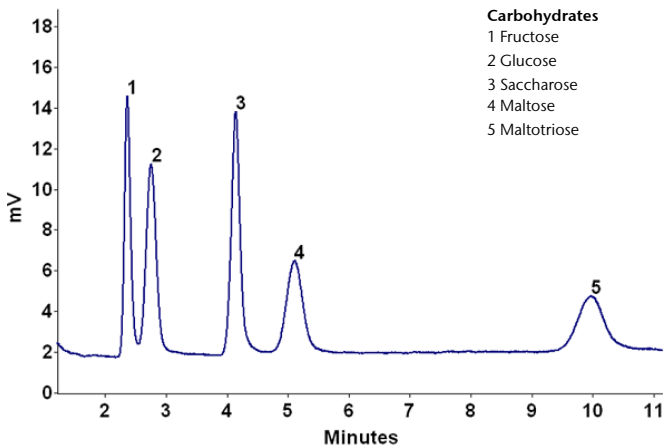
Technical Data:

Amino phase based on ultra-pure silica gel (purity > 99 %), metal content < 10 ppm, pH-stability 2 - 8, pore size 100 Å, particle size 2 µm, 3 µm, 5 µm, 10 µm (15 µm, 20 – 45 µm on request).

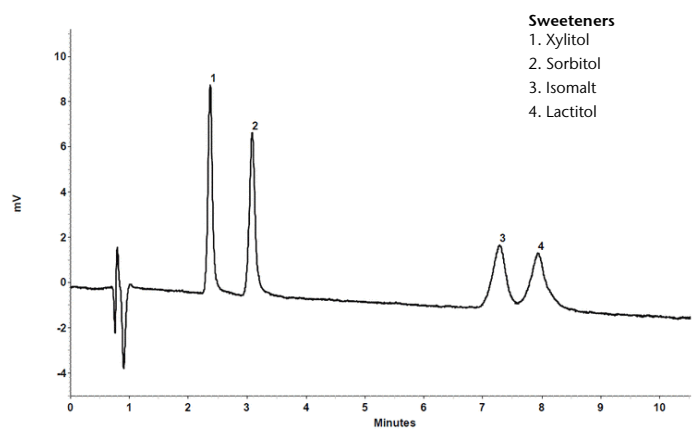
Recommended application areas:

Most flexible phase in the Eurospher II family; can be used in three modes: normal phase, reversed phase and ion chromatography mode (weak anion exchanger); different selectivity to the silica packing; in reversed phase mode mainly used for analysis of carbohydrates

Eurospher II 100-3 NH2, 100 x 3.0 mm ID
 Article number: 10CE190E2G



Eurospher II 100-3 NH2, 100 x 3.0 mm ID
 Article number: 10CE190E2G



Tip: A precolumn can help to protect your analytical column. Especially when working with highly matrix afflicted samples it is highly recommended to use precolumns.

Eurospher II 100 NH2 article numbers								
Columns	2 mm ID		3 mm ID		4 mm ID		4.6 mm ID	
Column length & equipment	3 µm		3 µm	5 µm	3 µm	5 µm	3 µm	5 µm
250 mm			25CE190E2G	25CE190E2J	25DE190E2G	25DE190E2J	25EE190E2G	25EE190E2J
with integrated precolumn			25XE190E2G	25XE190E2J	25WE190E2G	25WE190E2J	25VE190E2G	25VE190E2J
150 mm	15BE190E2G		15CE190E2G	15CE190E2J	15DE190E2G	15DE190E2J	15EE190E2G	15EE190E2J
with integrated precolumn			15XE190E2G	15XE190E2J	15WE190E2G	15WE190E2J	15VE190E2G	15VE190E2J
100 mm	10BE190E2G		10CE190E2G	10CE190E2J	10DE190E2G	10DE190E2J	10EE190E2G	10EE190E2J
with integrated precolumn			10XE190E2G	10XE190E2J	10WE190E2G	10WE190E2J	10VE190E2G	10VE190E2J
50 mm	05BE190E2G		05CE190E2G	05CE190E2J	05DE190E2G	05DE190E2J	05EE190E2G	05EE190E2J
5 mm precolumn cartridge			P5CE190E2G	P5CE190E2J	P5DE190E2G	P5DE190E2J	P5DE190E2G	P5DE190E2J
Bulk Media								
Quantity	3 µm		5 µm					
10 g	00BE190E2G		00BE190E2J					
100 g	00CE190E2G		00CE190E2J					

other column dimensions and particle sizes upon request, please check www.knauer.net

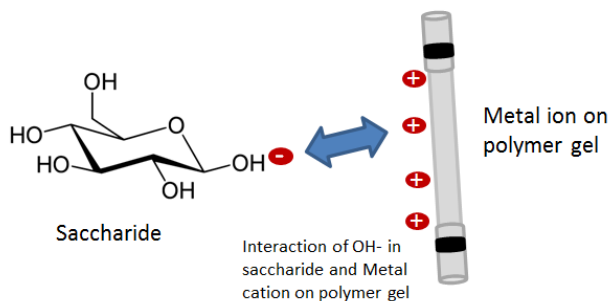
High performance polymer phase for the analysis of organic acids, carbohydrates and alcohols.
Available in the ionic forms H, Ca, Pb, Na und Ag.

Characteristics

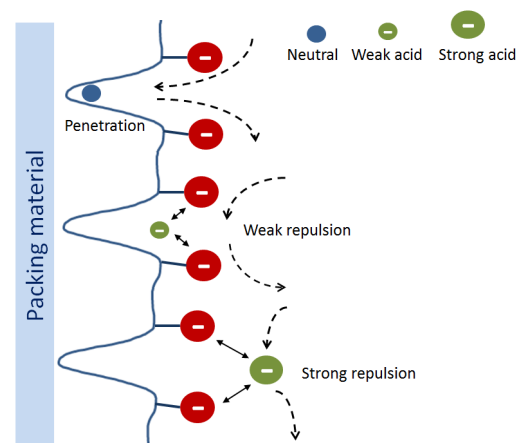
Eurokat high performance polymer phases were especially developed for the separation of organic acids, carbohydrates, alcohols and even complex mixtures of these compounds.

Eurokat is a sulfonated cross-linked styrene-divinylbenzene copolymer available in several ionic forms (H, Ca, Pb and Ag). This particular cation exchanger is characterized by an outstanding density of functional groups, making it the ideal choice for your ion exclusion, size exclusion and ligand exchange chromatography.

Principle of ligand exchange mechanism



Principle of ion exclusion mechanism



Stability

Eurokat polymer columns are extremely stable over the whole pH range. This is one striking advantage compared with silica-based phases which have a limited lifetime at pH extremes, especially in the higher pH range. Most importantly, Eurokat phases show extraordinary column lifetime stability and are not affected by aqueous solvents.

Choice of chromatographic conditions

The Eurokat stationary phase is designed to be applicable to a wide range of diverse chromatographic conditions. All Eurokat columns can be used at temperatures up to 90 °C with no organic solvents. The best separation of sugars can be achieved using between 60 to 90 °C. To extend separation performance, it is possible to connect up to three columns of Eurokat in series. Eurokat columns require no organic solvents and thus are environmentally friendly.

Physical properties:

Particle size	10 µm, 25-56 µm
Cross-linkage	ca. 8 % (H-Form) ca. 6 % (Ca, Pb, Na, Ag-Form) higher cross linkage means smaller pore size
Max. pressure	up to 100 bar
Max. temperature	up to 90 °C

Application areas:

- Carbohydrates and organic acids in softdrinks and fruit juices
- Sugar substitutes
- Food preservatives
- Dairy products
- Urine analytic (Uric acid, Hippuric acid)
- Monitoring of fermentation processes

Eurokat H - USP L17 -

organic solvent
free operation

Polymer phase for the determination of organic acids, carbohydrates and alcohols
H-form, 8 % cross linkage, USP L17.

Properties

Cation exchanger, extremely long lasting lifetime when correctly handled, best results with aqueous eluents and small amounts of anorganic acids, recommended eluent 0,01 N sulfuric acid, usage of up to 10 % organic content in the mobile phase is possible

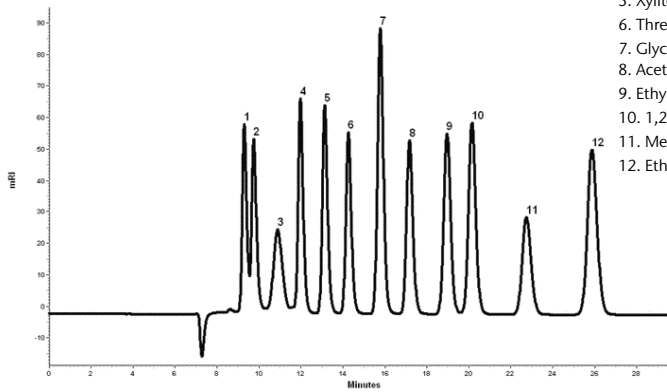
Technical Data:

Sulfonated cross-linked styrenedivinylbenzene copolymer with 8 % cross linkage in the ionic form H, available in 10 µm particle size, pressure stable up to maximum 100 bar.

Recommended application areas:

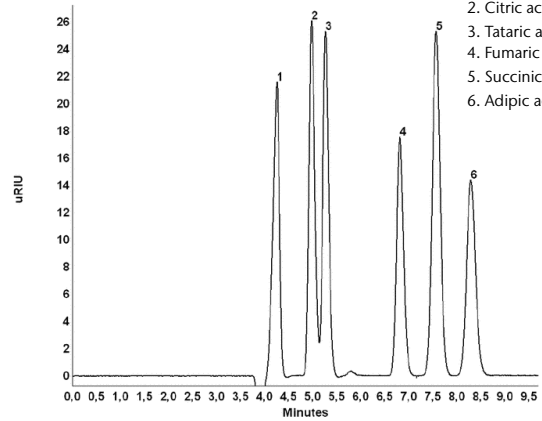
Eurokat H is especially designed for the analysis of organic acids and even complex mixtures of acids, sugars and alcohols as well as sugar alcohols.

Eurokat H 10 µm, 300 x 8 mm ID Article number: 30GX340EKN



1. Isomalt
2. Lactite
3. Gluconic acid
4. Mannite
5. Xylite
6. Threitol
7. Glycerine
8. Acetic acid
9. Ethylene glycol
10. 1,2- Propandiol
11. Methanol
12. Ethanol

Eurokat H 10 µm, 300 x 8 mm ID Article number: 30GX340EKN



1. Oxalic acid
2. Citric acid
3. Tartaric acid
4. Fumaric acid
5. Succinic acid
6. Adipic acid



Tip: Eurokat columns are characterized by an extremely long lifetime if handled properly. Especially pressure shocks and organic solvent contents of more than 10 % in the mobile phase should be avoided absolutely.

Eurokat H article numbers		
Columns	VertexPlus 4 mm ID	VertexPlus 8 mm ID
Column length	10 µm	10 µm
300 mm	30DX340EKN	30GX340EKN
120 mm		11GX340EKN
30 mm precolumn	03DX340EKN	03GX340EKN
Bulk media		
Quantity	10 µm	
10 g		
100 g	00CX340EKN	

Eurokat Pb & Ca- USP L 34 / USP L19 -

organic solvent
free operation

Polymer phase for the determination of mono- and disaccharides
Pb (USP L34) or Ca (USP L19) form, 6 % cross linkage

Properties

Cation exchanger, extremely long lasting lifetime when correctly handled, best results with aqueous eluents, recommended eluent is pure deionized water, usage of up to 10 % organic content in the mobile phase is possible

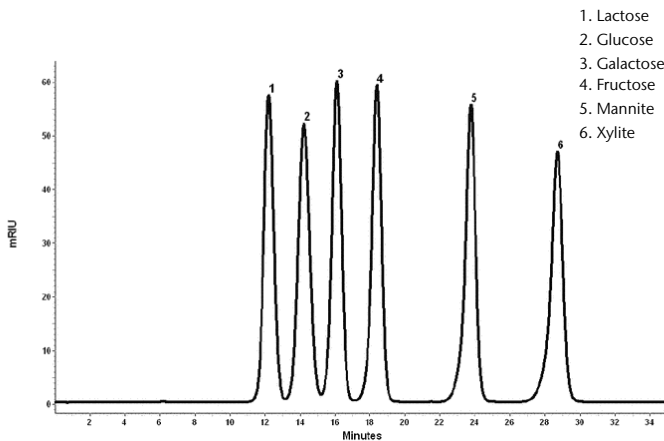
Technical Data:

Sulfonated cross-linked styrenedivinylbenzene copolymer with 6 % cross linkage in the ionic form Pb or Ca, available in 10 µm particle size, pressure stable up to maximum 100 bar.

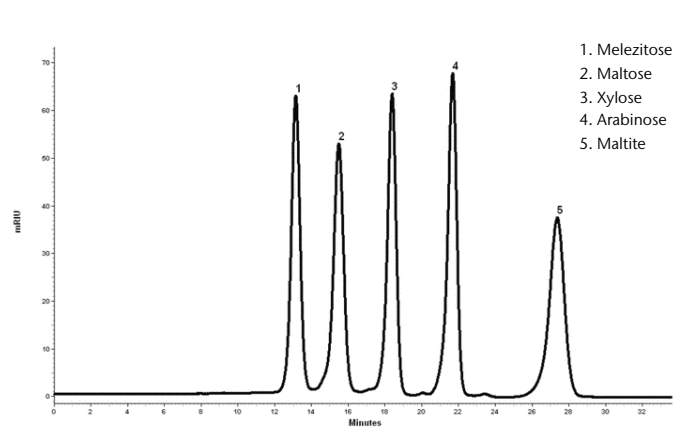
Recommended application areas:

Especially designed for the analysis of small carbohydrates up to DP 4.

Eurokat Ca, 300 x 8 mm ID
Article number: 30GX360EKN



Eurokat Pb, 300 x 8 mm ID
Article number: 30GX350EKN



Tipp: Eurokat columns are used at high temperatures. During equilibration it is very important to have an eye on the backpressure and to start with very low flow rates and increase them only slowly and stepwise after the column has adapted to the temperature.

Eurokat Ca article numbers		
Columns	VertexPlus 4 mm ID	VertexPlus 8 mm ID
Column length	10 µm	10 µm
300 mm	30DX360EKN	30GX360EKN
120 mm		11GX360EKN
30 mm precolumn	03DX360EKN	03GX360EKN
Bulk media		
Quantity	10 µm	
10 g		
100 g	00CX360EKN	

Eurokat Pb article numbers		
Columns	VertexPlus 4 mm ID	VertexPlus 8 mm ID
Column length	10 µm	10 µm
300 mm	30DX350EKN	30GX350EKN
120 mm		11GX350EKN
30 mm precolumn	03DX350EKN	03GX350EKN
Bulk media		
Quantity	10 µm	
10 g		
100 g	00CX350EKN	

Polymer phase for the determination of sugar oligomers
Ag or Na form, 6 % cross linkage.

Properties

Cation exchanger, extremely long lasting lifetime when correctly handled, best results with aqueous eluents, recommended eluent is pure deionized water, usage of up to 10 % organic content in the mobile phase is possible

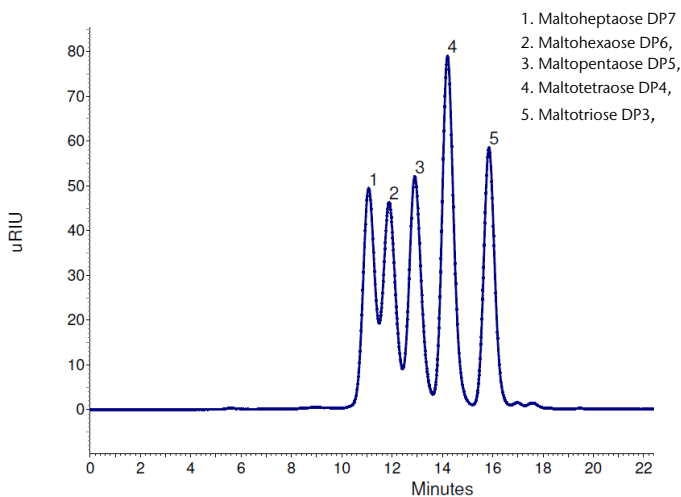
Technical Data:

Sulfonated cross-linked styrenedivinylbenzene copolymer with 6 % cross linkage in the ionic form Ag or Na, available in 10 µm particle size, pressure stable up to maximum 100 bar.

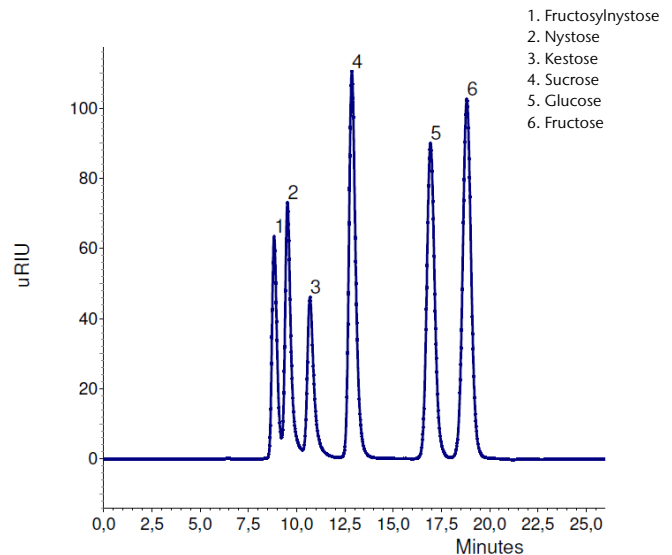
Recommended application areas:

Especially designed for the analysis of sugar oligomers, separates carbohydrates up to DP 8.

Eurokat Ag, 300 x 8 mm ID
Article number: 30GX380EKN



Eurokat Na, 300 x 8 mm ID
Article number: 30GX210EKN



Tip: Eurokat columns are typically used with 100% aqueous eluents. For storage, please avoid microbial growth by storing Eurokat columns at 4 °C.

Eurokat Ag article numbers		
Columns	VertexPlus 4 mm ID	VertexPlus 8 mm ID
Column length	10 µm	10 µm
300 mm	30DX380EKN	30GX380EKN
120 mm		11GX380EKN
30 mm precolumn	03DX380EKN	03GX380EKN
Bulk media		
Quantity	10 µm	
10 g		
100 g	00CX380EKN	

Eurokat Na article numbers		
Columns	VertexPlus 4 mm ID	VertexPlus 8 mm ID
Column length	10 µm	10 µm
300 mm	30DX210EKN	30GX210EKN
120 mm		11GX210EKN
30 mm precolumn	03DX210EKN	03GX210EKN
Bulk media		
Quantity	10 µm	
10 g		
100 g	00CX210EKN	



Equilibration, regeneration and storage of silica gel based columns like Eurosphere II

Proper storage of silica based HPLC columns

Silica based columns should be stored in an aprotic solvent. The best solvent for storage of RP packings (C18, C8, C4, C1, C30, CN and Phenyl) is acetonitrile/water (50:50 v/v). The water content should not be greater than 50%. The best solvent for storage of NP packings (Silica, Diol, Nitro, Cyano and Amino) is hexan/isopropanol 90:10 (v/v). The best solvent for storage of columns used in HILIC mode (HILIC, Amino, and Silica) is acetonitrile/water (90:10 v/v) or acetonitrile/5 mM ammonium acetate, pH 5,3 (90:10 v/v). Acetonitrile content should always be greater than 90 %.

Caution! Even for short-term storage, flush out all buffer solution from the column to prevent algal growth. Make sure that all buffers are washed out of the column before exchanging aqueous mobile phases by organic solvents. Buffer salts are not soluble in acetonitrile and can block capillary tubing and the column.

Equilibration

The equilibration time of a column depends on the column dimensions. In general, a column is equilibrated after 20 column volumes are flushed through it. The equilibration times for the most important column dimensions are summarized in the following table. You can reduce the equilibration time by simply increasing the flow rate. However, make sure to flush the column with at least 10-20 column volumes to make sure the column is equilibrated.

Eurosphere II columns with 2 µm particle size, UHPLC:

Column dimension (Length x ID)	Column volume [ml]	Flow rate [ml/min]	Equilibration time [min]
50 x 2 mm	0.11	0.5	3
100 x 2 mm	0.21	0.5	6

Eurosphere II columns, classical HPLC:

Column dimension (Length x ID)	Column volume [ml]	Flow rate [ml/min]	Equilibration time [min]
250 x 4.6 mm	2.82	1.0	28
150 x 4.6 mm	1.69	1.0	17
100 x 4.6 mm	1.13	1.0	12
50 x 4.6 mm	0.56	1.0	6
250 x 4.0 mm	2.14	1.0	22
150 x 4.0 mm	1.28	1.0	13
125 x 4.0 mm	1.07	1.0	11
250 x 3.0 mm	1.20	0.6	20
150 x 3.0 mm	0.72	0.6	12
100 x 3.0 mm	0.48	0.6	8
50 x 3.0 mm	0.24	0.6	4
250 x 2.0 mm	0.53	0.25	21
150 x 2.0 mm	0.32	0.25	13
100 x 2.0 mm	0.21	0.25	9
50 x 2.0 mm	0.11	0.25	5



Equilibration, regeneration and storage of silica gel based columns like Eurospher II

Regeneration of a column

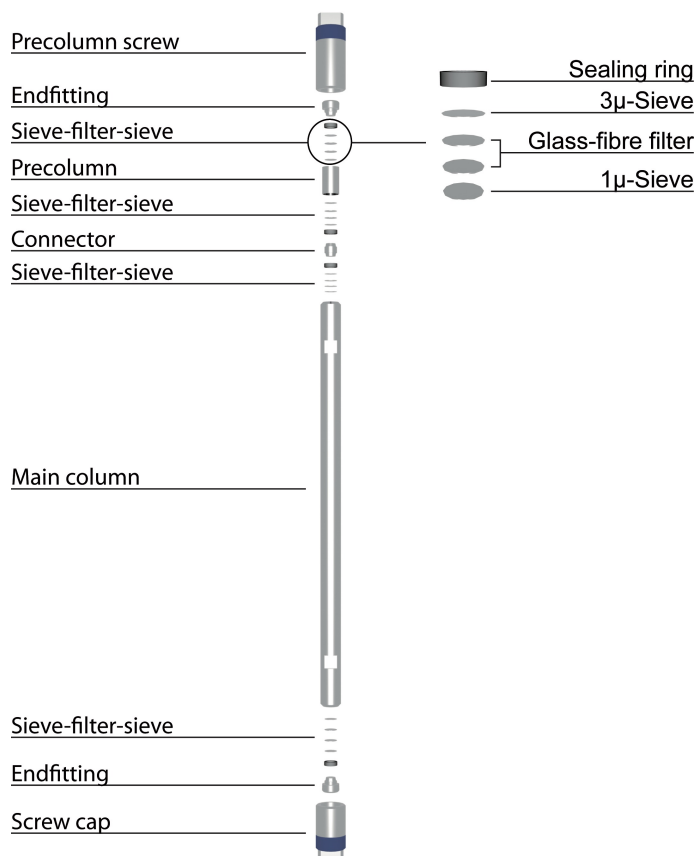
We recommend regenerating a column if a change in peak form, retention time, resolution or an increase in backpressure is observed. If the system pressure begins to rise, remove the column and check the system to find whether the pressure increase is being caused by the system or the column.

Pressure increase caused by system: flush system, exchange eluent filters, frits and/or blocked capillaries.

Pressure increase caused by column: backflush the column carefully to remove particle buildup from the inlet frit (connect the column outlet to the pump/injector and flush).

Do not connect the column to the detector.

Buildup of KNAUER VERTEX PLUS columns with 3.0 to 4.6 mm ID



If the column still has a high backpressure, flush the column according to the following regeneration scheme:

Regeneration scheme for RP columns (C18, C8, C4, C1, C30, CN and Phenyl stationary phases)	Regeneration scheme for NP columns (Silica, Diol, Nitro, Cyano and Amino stationary phases)	Regeneration scheme for columns used in HILIC mode (HILIC and Silica stationary phases)
20 column volumes water	20 column volumes heptane	20 column volumes water
20 column volumes acetonitrile	5 column volumes isopropanol	30 column volumes 0.5 M ammonium acetate
5 column volumes isopropanol	20 column volumes acetonitrile	30 column volumes water
20 column volumes heptane	20 column volumes water	20 column volumes acetonitrile/water (50:50 v/v)
5 column volumes isopropanol	20 column volumes acetonitrile	20 column volumes acetonitrile
20 column volumes acetonitrile	5 column volumes isopropanol	20 column volumes acetonitrile/water (50:50 v/v)
	20 column volumes heptane	

After the regeneration procedure, re-equilibrate the column with the mobile phase before analyses.



Eurokat® Column Care and Regeneration

Column maintenance tips

- The maximum pressure limit during operating should not be exceeded 90 bar. The maximum pressure for the column material is 100 bar.
- Forceful mechanical handling (bumps, shocks) as well as sudden temperature changes should be strictly avoided to conserve the homogeneity of the packed column bed.
- Water used in preparation of the mobile phase should be either fresh double-distilled or HPLC-grade.
- All reagents used in sample preparation (solvents, reference compounds, etc.) should be of p.a. grade. Particulate matter and precipitates must be removed from the sample by filtration before injection.
- Changes in column temperature should only be undertaken under continuous eluent flow. As a principle, drastic temperature changes should always be carried out in gradual steps.
- The optimal temperature range for the analysis of carbohydrates is between 60 and 90°C.
- During heating process from room temperature keep the flow low at 0.1 ml/min for 4 mm and 0.2 ml/min for 8 mm columns until 60 °C.
- Flow rate changes should also only be carried out stepwise.
- Optimal flow rates are typically between 0.1 – 0.2 ml/min for 4 mm diameter columns and 0.4 – 0.8 ml/min for 8 mm diameter columns.
- If the column is not to be used for a longer period, the inlet and outlet should be sealed with appropriate blind fittings to prevent the polymer material from drying out. For longer term storage, the column should be kept at 8°C to avert bacterial growth.

Column Regeneration Procedure

- Eurokat columns can be regenerated in their corresponding ionic form. Regeneration of the polymer resin is important to maintaining the selectivity and lifetime of the column material. If metal ions or organic components are present in the sample, these materials may settle on the resin material or even react with the polymer, resulting in a gradual loss of column performance. Through periodic cleaning of the column, lifetime and performance can be significantly prolonged. To clean the resin, Eurokat Pb, Ca, Na and Ag columns should be flushed for at least 4 hours (preferably overnight) with double-distilled water at a flow rate of 0.2 ml/min (8 mm ID column) in the reverse direction at 60-75 °C. Eurokat H columns can be cleaned in a similar manner but require 0.01 N sulfuric acid.
- The column should then be rinsed for an additional hour with the same cleaning eluent in the normal flow direction at 75-85 °C. Maintaining this flow direction and temperature, Eurokat Pb, Ca, Na and Ag columns should then be purged with a mixture of 10 % acetonitrile and 90 % water. Eurokat H columns should be purged with 10 % acetonitrile and 90 % 0.01 N sulfuric acid.

After this cleaning process, the columns are to be regenerated as follows:

- Eurokat Pb: purge with 0.25 mol/l lead nitrate at 75-85 °C at a flow rate of 0.2 ml/min (8 mm ID column) for about 4-6 hours
 - Eurokat Ca: purge with 0.25 mol/l calcium nitrate at 75-85 °C at a flow rate of 0.2 ml/min (8 mm ID column) for about 4-6 hours
 - Eurokat Na: purge with 0.25 mol/l sodium chloride or 0.1 mol/l sodium hydroxide at 75-85 °C at a flow rate of 0.2 ml/min (8 mm ID column) for about 4-6 hours
 - Eurokat Ag: purge with 0.25 mol/l silver nitrate at 75-85 °C at a flow rate of 0.2 ml/min (8 mm ID column) for about 4-6 hours
 - Eurokat H: purge with 0.05 mol/l sulfuric acid at 75-85 °C at a flow rate of 0.2 ml/min (8 mm ID column) for 4-6 hours
- Once this procedure has been completed, the desired flow rate may be resumed gradually. The column is now ready for further analyses and can be put back into normal use once having gradually reached the working temperature.

Column using tips

In general it is recommended that a precolumn (30 x 8 mm or 30 x 4 mm) be used. In order to eliminate undissolved particles or precipitates, the sample should be filtered through a 0.45 µm filter unit. Particulate matter in the eluent is removed by installing a column inlet filter between the injector and the column. To avoid contaminating the detector's measurement cell, neither the cleaning solution nor the regenerant should pass through the measurement cell.

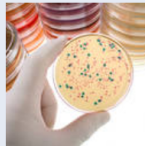
Wide range of applications and columns on www.knauer.net

Application downloads

Find here a variety of HPLC and UHPLC applications with detailed information on chromatographic conditions as PDF downloads.



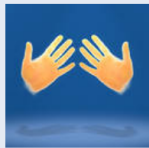
Bio science applications



Chemical analysis



Chiral separations



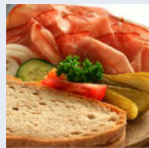
Clinical applications



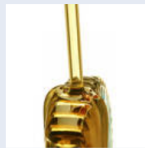
Environmental applications



Food applications



Petrochemical applications



Pharma applications



Preparative applications



Application development



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