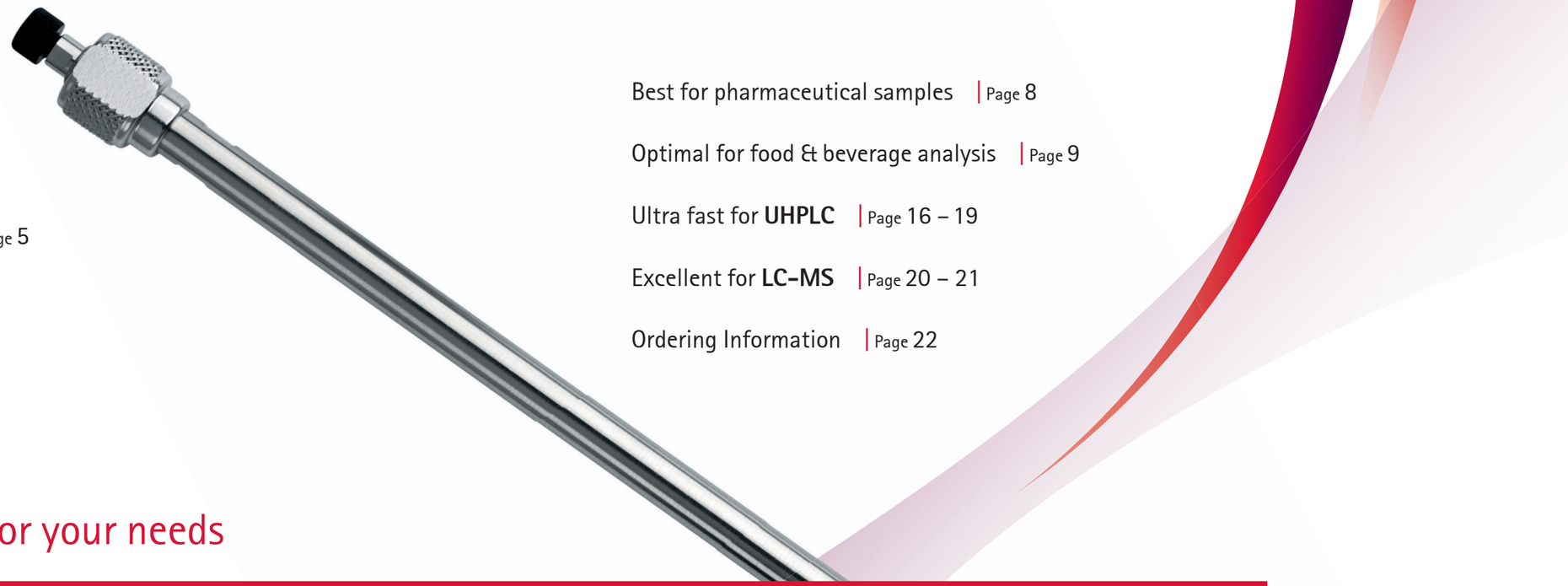
Outstanding performance
Purospher® STAR
HPLC and UHPLC columns

EMD Millipore is a division of
Merck KGaA, Darmstadt, Germany

Purospher® STAR
HPLC and UHPLC columns



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Ultra fast for **UHPLC** | Page 16 – 19

Excellent for **LC-MS** | Page 20 – 21

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Choose the best selectivity for your needs

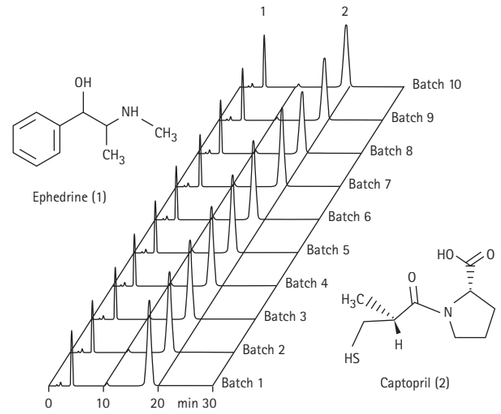
Modification	Particle size	Pore size [Å]	Spec. surface area [m^2/g]	Coverage of the surface [$\mu mol/m^2$]	Carbon load [%]	pH Stability	Use	Page
RP-18 endcapped	5 µm 3 µm 2 µm	120	330	3	17	1.5 – 10.5	Best in class RP-18e column for excellent peak symmetry, performance and pH stability	6 – 9 16 – 18
RP-8 endcapped	5 µm 3 µm 2 µm	120	330	3	10,5	1.5 – 10.5	Less hydrophobic compounds, faster Retention of very hydrophobic compounds	10 – 11 19
Phenyl	5 µm 3 µm 2 µm	120	330	3	12,5	1.5 – 10.5	Enhanced selectivitiy for separation of aromatic compounds due to π-π interactions	12 – 13
NH_2	5 µm	120	330	3	3.5	2 – 7.5	Separation of carbohydrates and polar compounds with normal-phase or HILIC chromatography	14
Si	5 µm	120	330	3	–	2 – 7.5	Separation of polar compounds with normal-phase or HILIC (Si) chromatography	15

Be sure
Robust, reproducible results

Consistent results

The success of any method depends on the quality of the stationary phase. Precise, long-term reproducibility is a key factor in achieving reliable results.

The base silica of Purospher® STAR columns is 99.999 % pure. Furthermore, meticulous care is given to quality control over all aspects of silica structure and chemistry. These factors ensure that the columns will always perform consistently, resulting in method reproducibility you can trust.



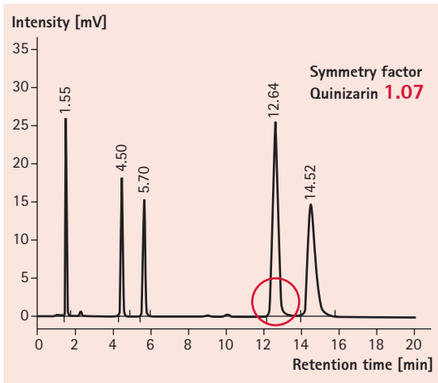
Perfect peak shape

Accurate results rely on two important chromatographic properties of the stationary phase: resolution and peak shape.

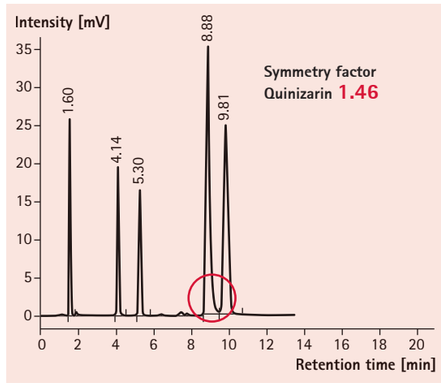
With Purospher® STAR columns, high efficiency and bonded phase surface coverage produce sharp, symmetrical peaks for acidic, basic and chelating compounds.

This makes Purospher® STAR RP-18 endcapped and RP-8 endcapped columns the optimal choice for USP methods as well as for general method development.

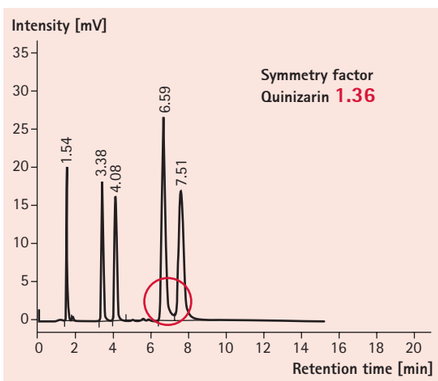
Purospher® STAR RP-18 endcapped



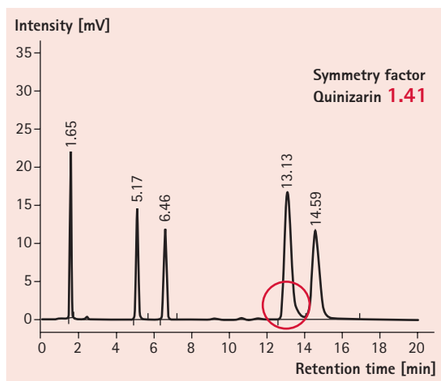
Column L



Column X



Column I



Moblie phase: *Methanol/Buffer pH 7.0 80/20* **Flow rate:** *1.0 mL/min* **Detection:** *UV 254 nm* **Temprature:** *22°C*
Sample: *1. Uracil; 2. Toluene; 3. Ethylbenzene; 4. Quinizarin; 5. Amitryptyline*

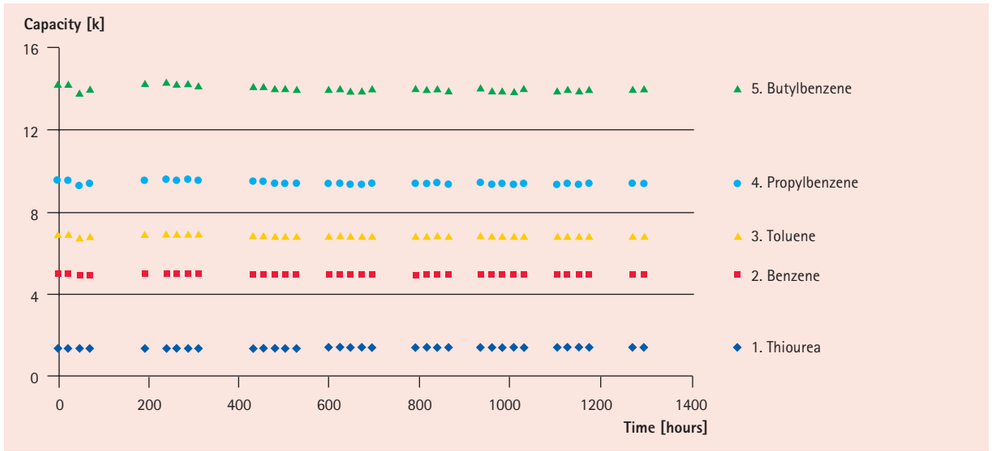
Feel free
Maximum stability for maximum flexibility

Enhanced pH stability

Thanks to their outstanding performance and stability, Purospher® STAR RP-18 endcapped, RP-8 endcapped and Phenyl columns offer maximum flexibility in method development.

Robust methods can be developed over the entire pH range from 1.5 to 10.5. This high pH-stability allows the separation of strongly basic compounds with alkaline eluents.

Long term pH stability

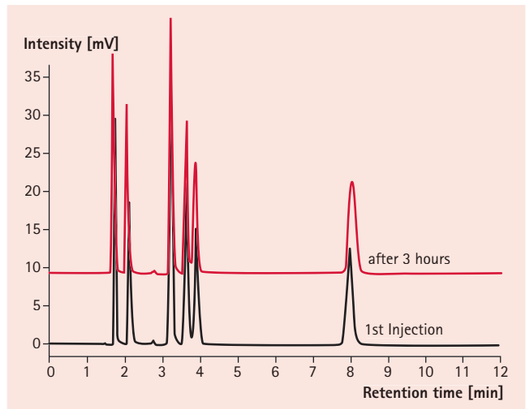


Column: *Purospher® STAR RP-18 endcapped, 5 µm; LiChroCART® 150-4.6*
Mobile phase: *Acetonitrile/Water (0.1 % NH_3 ; [25 %]; 60:40)* **Flow rate:** *1.0 mL/min* **Detection:** *UV 254 nm* **Injection:** *10 µL*

Compatible with aqueous mobile phases

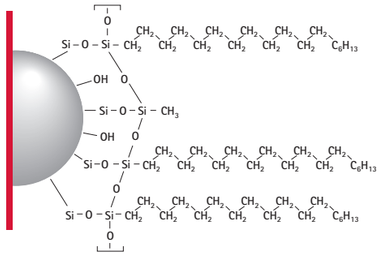
Standard reversed phase columns, particularly RP-18 columns, often suffer from phase collapse when used in combination with highly aqueous mobile phases.

In contrast, Purospher® STAR RP-18 endcapped, RP-8 endcapped and Phenyl columns still perform perfectly with 100 % aqueous mobile phases.



Column: *Purospher® STAR RP-18 endcapped, 5 µm; LiChroCART® 150-4.6*
Mobile phase: *1 % acetic acid*

Use universally
Purospher® STAR RP-18 endcapped



Purospher® STAR RP-18 endcapped HPLC columns are designed for universal use. Acidic, basic, neutral and metal chelating compounds can be easily separated with simple mobile phases – without peak tailing!

The combination of high purity silica, best all-round retention characteristics, excellent pH stability up to pH 10.5, and suitability for up to 100 % aqueous mobile phases, make Purospher® STAR RP-18 endcapped almost universal in its range of applications.

Thanks to its outstanding performance and stability, Purospher® STAR RP-18 endcapped offers complete freedom in method development.

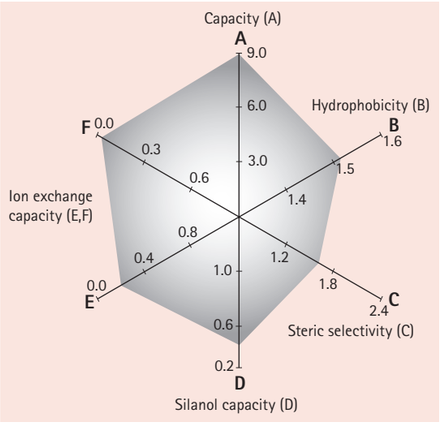
- > **Accurate results** with excellent peak shape for all types of analytes
- > **Outstanding resolution** due to high separation efficiency
- > **Proven reliability** and reproducibility from run to run and batch to batch
- > **Universal compatibility** with best all-round performance acc. to Tanaka
- > **Maximum flexibility** in method development and choice of mobile phase
  - > pH stability from pH 1.5 – 10.5
  - > Suitable for up to 100 % aqueous mobile phases
- > **Highest sensitivity** and suitability for LC-MS applications

One for all
Perfectly balanced selectivity

The Tanaka test summarizes and illustrates the most important parameters required for selectivity when choosing the right HPLC column.

A set of seven substances is used to describe capacity, hydrophobicity, steric selectivity and silanophilic properties. To facilitate the visualization of a sorbent's quality, the values of these parameters are outlined on the six axes of a hexagon. The more symmetrical the hexagon appears and the larger its area, the more balanced the stationary phase is in the sum of its chromatographic properties.

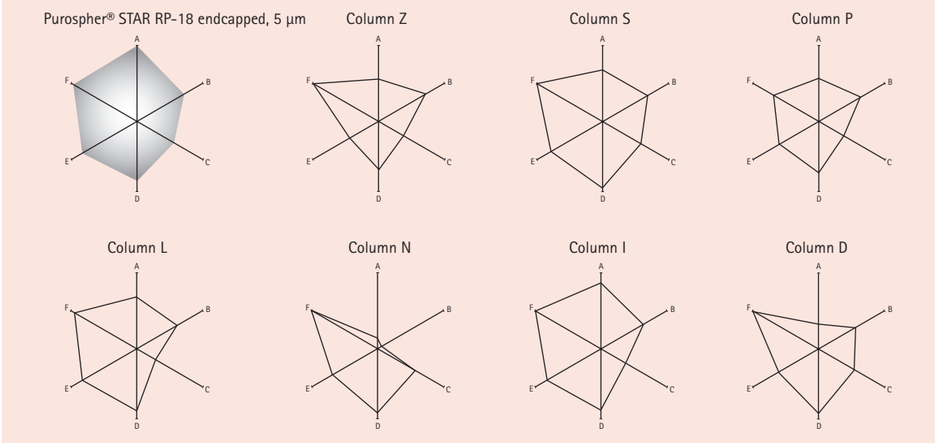
A:	*k'*	*(Pentyl benzene)*	*9.59*
B:	*α*	*(Pentyl-/Butyl benzene)*	*1.51*
C:	*α*	*(Triphenylene/o-Terphenyl)*	*1.63*
D:	*α*	*(Caffeine/Phenol)*	*0.44*
E:	*α*	*(Benzylamine/Phenol; pH 7.6)*	*0.23*
F:	*α*	*(Benzylamine/Phenol; pH 2.7)*	*0.02*



Parameters	Property of the stationary phase	Factors in preparation of the stationary phase
Capacity (A):	number of alkyl chains	silica surface; surface coverage
Hydrophobicity (B):	CH_2 group selectivity	surface coverage
Steric selectivity (C):	differentation according to the shape of compounds	silane functionality; surface coverage
Silanol capacity (D):	content and type of silanol groups	residual silanols endcapping; surface coverage
Ion exchange capacity (E):	at high pH	residual silanols; active sites pH 7
Ion exchange capacity (F):	at low pH	metal impurities

Literature: J. Chromoto. Sci. 27, 125, 1989.

Purospher® STAR RP-18 endcapped columns demonstrate the best over-all selectivity, making them the optimal choice for successful separation.

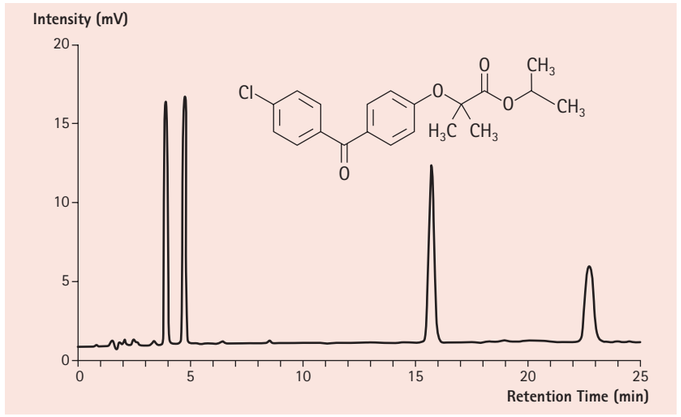


Best for pharmaceutical samples
Purospher® STAR RP-18 endcapped

Analytical methods for pharmaceutical samples have to follow strong regulations.
Purospher® STAR RP-18 endcapped columns are perfectly suitable for this demand and are the best choice for L1 columns listed in the USP (United States Pharmacopeia).

Fenofibrate and related substances

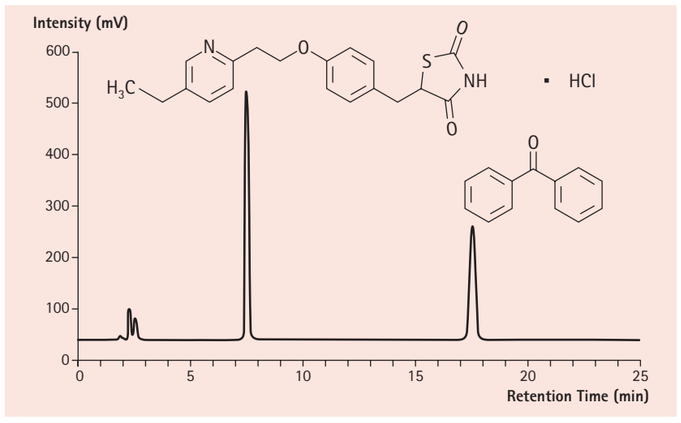
Fenofibrate is a drug of the fibrate class, which is most commonly used to reduce cholesterol levels in patients at risk of cardiovascular disease. In addition to increasing high-density lipoprotein (HDL) levels, Fenofibrate decreases the levels of low-density lipoprotein (LDL), very low-density lipoprotein (VLDL) and triglycerides.



Column:	Purospher® STAR RP-18 endcapped (5 µm) Hibar® RT 250-4.0
Injection:	20 µL
Detection:	UV@286 nm
Cell:	13 µL
Flow Rate:	1.0 mL/min
Mobile Phase (v/v):	Acetonitrile and water acidified with phosphoric acid to a pH of 2.5. Mix water and acetonitrile 30:70.
Temperature:	Ambient
Diluent:	Mobile phase
Sample:	1 ppm of Fenofibrate, Fenofibrate RS A and RS B, and 2 ppm Fenofibrate RS C

Pioglitazone HCl

One of the best selling medications in the U.S., Pioglitazone is a prescription drug of the class thiazolidinedione (TZD) with hypoglycemic (antihyperglycemic, antidiabetic) action.



Column:	Purospher® STAR RP-18 endcapped (5 µm) Hibar® RT 150-4.6
Injection:	20 µL
Detection:	DAD@269 nm
Cell:	13 µL
Flow Rate:	0.7 mL/min
Mobile Phase (v/v):	Acetonitrile, 0.1 M ammonium acetate, and glacial acetic acid (25:25:1)
Temperature:	Ambient
Diluent:	Mobile phase
Sample:	50 µg/mL of Pioglitazone HCl and 13 µg/mL of benzophenone (SST solution)

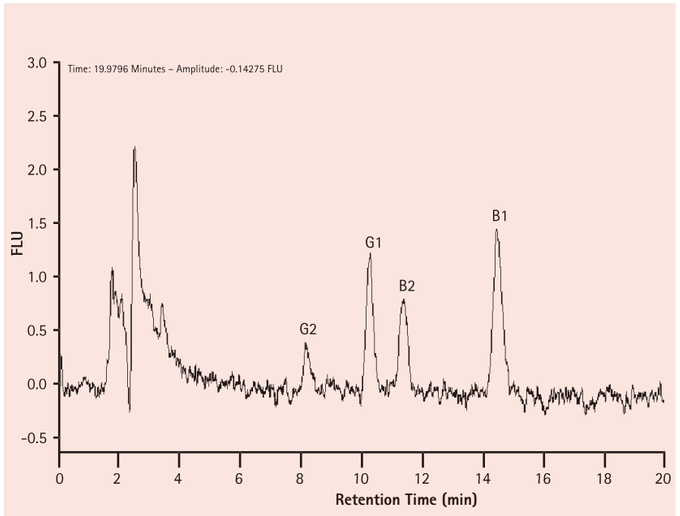
Optimal for food & beverage analysis
Purospher® STAR RP-18 endcapped

In Food and Beverage analysis sensitivity is crucial.
Purospher® STAR RP-18 endcapped columns are the optimal choice for highly sensitive results.

Aflatoxins

Aflatoxins B1, B2, G1 and G2 are the main toxins produced by Aspergillus flavus, A. parasiticus and A. nomius. They can contaminate food products when storage conditions are favorable to fungal growth. The most common aflatoxin contaminations are reported in maize, peanuts, brazil and pistachio nuts, as well as copra and cottonseeds. Aflatoxins are carcinogenic, mutagenic, teratogenic and immunosuppressive to most animal species. The International Agency for Research on Cancer (IARC) has classified all four aflatoxins as group one carcinogens.

Confirmation of the presence of aflatoxins in a sample by HPLC requires derivatization of the aflatoxins B1 and G1. This enhances their natural fluorescence under UV light, facilitating their detection. The use of a Coring Cell for derivatization and a Purospher® STAR RP-18 endcapped column enables extremely sensitive results in the pg/mL range.

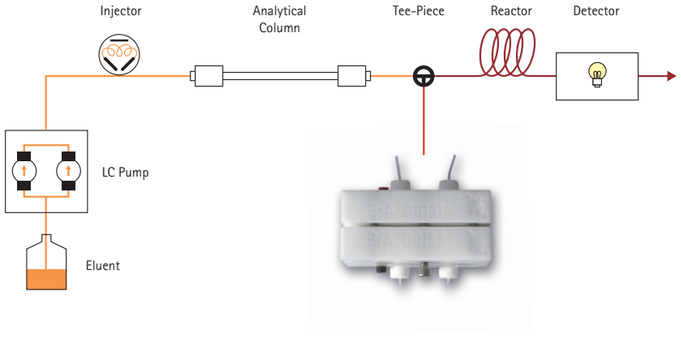


Chromatographic conditions:

Column:	Purospher® STAR RP-18 endcapped (5 µm) LiChroCART® 150-4.6
Pre-column:	LiChroCART® 4-4 Purospher® STAR RP-18 endcapped, 5 µm
Mobile phase:	Water + 183.1 mg KBr/L + 154 µL HNO_3 65 %/L/ Methanol/Acetonitrile 65 % A/17.5 % B/ 17.5 % C (v/v/v), Isocratic
Flow Rate:	1 mL/min
Detection:	Fluorescence EX 365/EM 435
Temperature:	40°C
Injection volume:	100 µL
Sample:	B1 and G1: 10 pg/mL, B2 and G2: 2.5 pg/mL

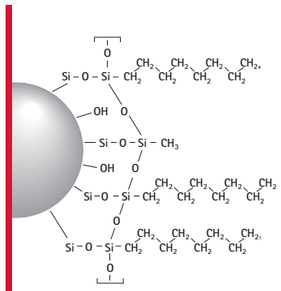
Post column derivatization:

Derivatization coil:	PEEK coil, 1.38 m x 0.25 mm i.d.



A Coring Cell is an electrochemical cell which generates the derivatising agent, bromine, from potassium bromide present in the mobile phase. The derivatization of aflatoxins occurs rapidly (reaction time is approximately 4 seconds) at ambient temperature. A daily preparation of derivatising reagent (iodine) is not necessary, and a supplementary pump for addition of derivatising reagent is not needed.

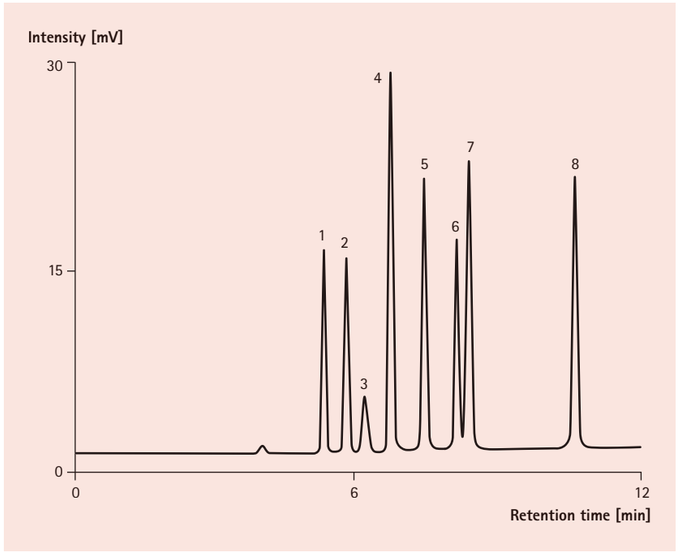
Ideal for less hydrophobic compounds Purospher® STAR RP-8 endcapped



Purospher® STAR RP-8 endcapped columns are suitable for a wide range of applications. As the sorbent is less hydrophobic than Purospher® STAR RP-18 endcapped, analytes will typically elute faster on the C-8 phase. Hence, the column provides enhanced selectivity for positional isomers, and symmetrical peak shapes for strongly basic and less hydrophobic compounds.

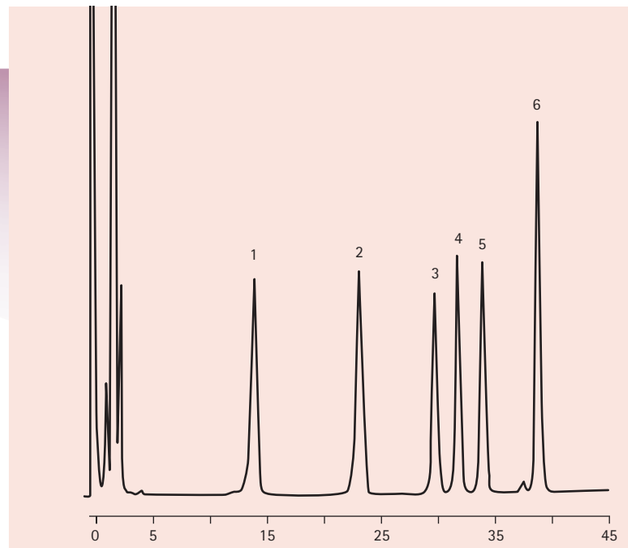
- > **Excellent peak symmetry** for acidic, basic and chelating compounds
- > **Excellent resolution** due to high separation efficiency
- > **Excellent stability** from pH 1.5 to 10.5

Separation of caffeine and related substances
Separation examples Purospher® STAR RP-8 endcapped
Caffeine and derivatives



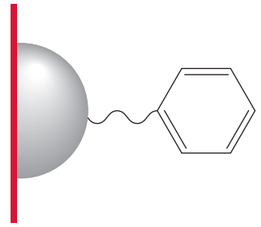
Column:	Purospher® STAR RP-8 endcapped, 5 µm LiChroCART® 125-4
Mobile phase:	Methanol/Ammonia Acetate Buffer pH 3.5 (Gradient)
Flow rate:	1.0 mL/min
Detection:	UV 270 nm
Temperature:	ambient
Injection volume:	10 µL
Sample:	1. 1-Methylxanthine 2. 1.3-Dimethyl uric acid 3. Paracetamol 4. Theobromine 5. 1.7-Dimethyl uric aicd 6. 1.7-Dimethyl xanthine 7. Theophylline 8. Caffeine

Separation of FMOC amino acids



Column:	Purospher® STAR RP-8 endcapped, 3 µm LiChroCART® 55-4 mm		
Mobile phase:	A: 100 mM Acetate buffer pH 5.5 B: Methanol		
Gradient:	Time/min	%A	%B
	0.0	65	35
	15.0	55	45
	25.0	50	50
	40.0	40	60
Flow rate:	1 mL/min		
Detection:	254 nm		
Temperature:	ambient		
Injection volume:	10 µL		
Sample:	1. FMOC-Alanin 2. FMOC-Valin 3. FMOC-Isoleucin 4. FMOC-Norleucin 5. FMOC-Cystein 6. FMOC-Histidin ca. 0.1 mg/mL in Acetone		

Enhanced selectivity for aromatic compounds
Purospher® STAR Phenyl



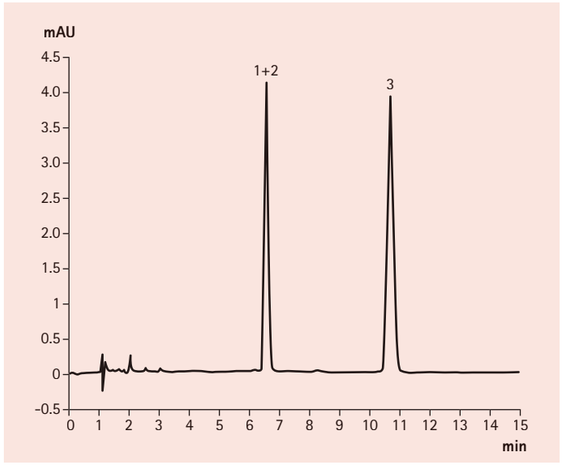
Phenyl HPLC columns are the best alternative to RP-8 or RP-18 columns for the separation of aromatic compounds, and compounds containing aromatic groups. Purospher® STAR Phenyl can retain analytes via several different mechanisms, including π-π interactions between the overlap of the delocalized electrons on the analyte and the stationary phase phenyl group, and via partitioning between the mobile phase and the hydrophobic aryl-alkyl phase.

The new Purospher® STAR Phenyl columns are based on high-purity silica particles, which provide symmetrical peaks for basic compounds, as well as high stability and excellent reproducibility. Furthermore, hydrophobic compounds elute much faster with Purospher® STAR Phenyl columns than with C-18 columns.

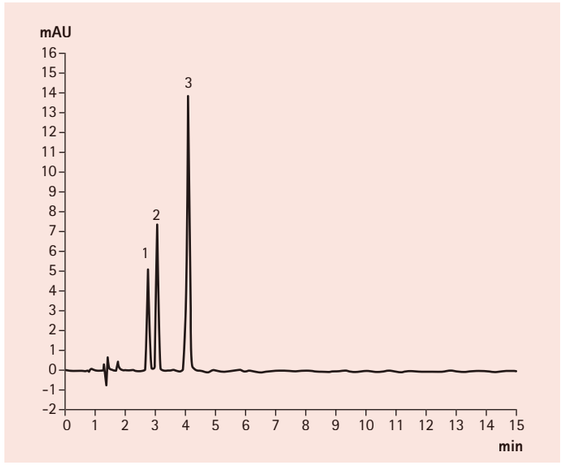
- > **Enhanced selectivity** for aromatic compounds
- > **Low silanol activity**
- > **Excellent pH stability** from 1.5 to 10.5
- > **Suitable for up to 100 % aqueous mobile phases**

Sander & Wise SRM 869b Test

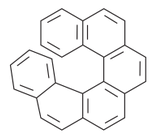
Purospher® STAR RP-18 endcapped, 5 µm



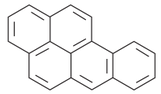
Purospher® STAR Phenyl, 5 µm



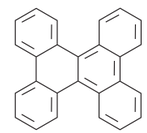
Mobile phase:	Acetonitrile/Water 90/10 (v/v)
Flow rate:	1.3 mL/min
Detection:	UV 254 nm
Injection:	1 µL
Sample:	1. PhPh 2. BaP 3. TBN



PhP (Phenanthro-[3,4-c]-phenanthrene)

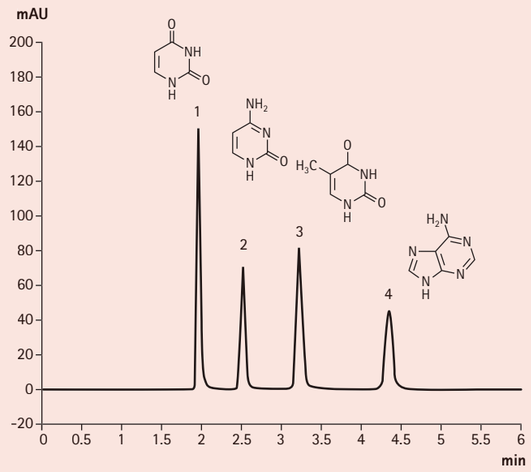


BaP (Benzo[a]pyrene)



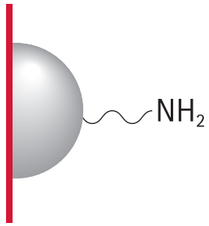
TBN (Tetrabenzonaphtalene)

Separation of nucleobases under aqueous conditions



Column:	Purospher® STAR Phenyl, 5 µm Hibar® RT 150-4.6 mm
Mobile phase:	10 mM Ammonium acetate buffer pH=3.0
Flow rate:	1.3 mL/min
Detection:	270 nm
Temperature:	35°C
Injection:	1 µL
Sample:	1. Uracil 2. Cytosine 3. Thymine 4. Adenine

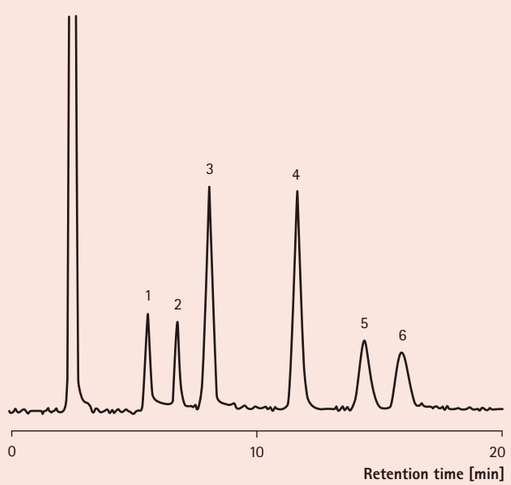
Most efficient separation of carbohydrates Purospher® STAR NH_2



Purospher® STAR NH_2 (Amino) columns are widely used for carbohydrate analysis, with a typical mobile phase consisting of acetonitrile and water. In terms of their polarity, these columns lie between bare silica (normal-phase chromatography) and reversed-phase silica (reversed-phase chromatography). Hence, Purospher® STAR NH_2 can also be used as an ion-exchanger.

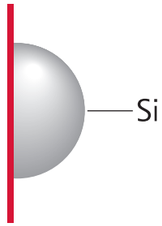
In acidic solutions, the NH_2-groups are protonated (-NH_3 +X-) and therefore display the characteristics of a weak anion exchanger. Medium polarity Purospher® STAR NH_2 columns possess hydrophilic as well as hydrophobic properties, thus can be used under both reversed-phase and normal-phase conditions. However, retention is weaker than on silica or RP-supports.

Carbohydrates



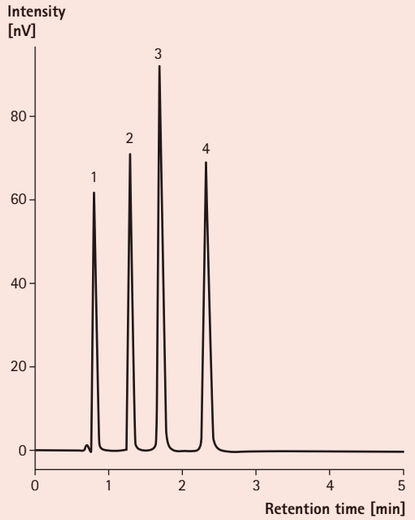
Column:	Purospher® STAR NH_2 (5 µm) LiChroCART® 250-4
Mobile phase:	Acetonitrile/Water 75:25
Flow rate:	1.0 mL/min
Detection:	RI
Temperature:	30°C
Injection volume:	10 µL
Sample:	1. Xylose 2. Fructose 3. Glucose 4. Saccharose 5. Maltose 6. Lactose

High performance in normal-phase separation Purospher® STAR Si



Purospher® STAR Si (Silica) offers highest separation efficiency for normal-phase chromatography of low molecular weight compounds soluble in organic solvents.

Anisols



Column:	Purospher® STAR Si (5 µm) LiChroCART® 125-4
Mobile phase:	Heptane/Dioxane 95/5 (v/v)
Flow rate:	2 mL/min
Detection:	UV 254 nm response fast
Temperature:	Room temperature
Injection volume:	5 µL
Sample	1. Anisol 2. 3-Nitroanisol 3. 4-Nitroanisol 4. 2-Nitroanisol

Ultra-fast separations with ultra-high performance Purospher® STAR UHPLC columns

Fast and ultra-fast separations have become increasingly important due to the need for higher sample throughput and greater productivity. To answer these requirements, UHPLC methods were introduced, which are based on short column length, narrow inner diameter of the column, and small particle size. This combination makes it possible to speed up analysis times by up to tenfold.

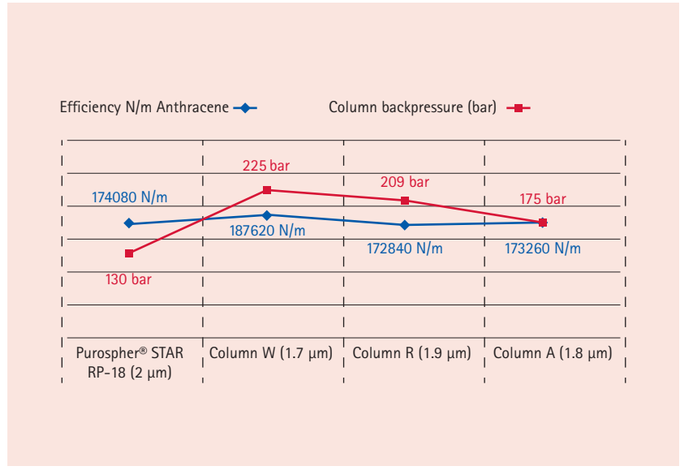
Purospher® STAR UHPLC columns are ideal for ultra-fast applications, where resolution, sensitivity and sample throughput are crucial. This makes them the first choice for high-throughput screening and QC analyses, as well as process monitoring, method development, and LC/MS applications.

- **Perfectly balanced selectivity**
- **Excellent peak symmetry** for accurate results
- **Enhanced separation efficiency** for best resolution
- **Outstanding pH stability** (pH 1.5 – 10.5)
- **High pressure stability**
- **Exceptional suitability** for LC-MS

High resolution at lower column backpressure Purospher® STAR UHPLC columns

Although UHPLC is typically performed with a particle size smaller than 2 µm, EMD Millipore employs 2 µm particles due to two important factors. Firstly, column efficiency and backpressure depend on the particle size of the column material. Secondly, column efficiency is also highly influenced by instrument effects.

When UHPLC columns with 1.7 µm, 1.8 µm, 1.9 µm and 2 µm particles are compared on the same instrument and under the same conditions, results show no significant difference in efficiency. However, column pressure varies substantially among the different particle size materials. For example, a 1.7 µm particulate material has over 100 bar higher column backpressure, compared to a 2 µm material.

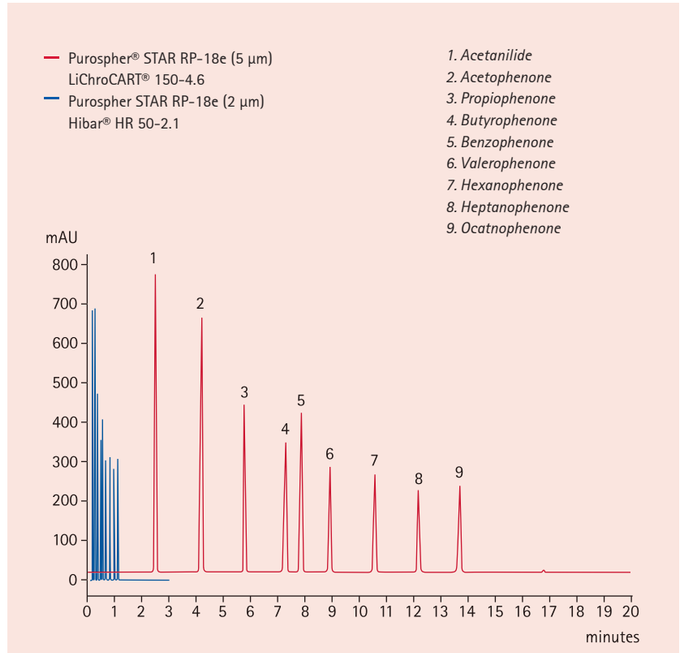


Column dimension: *50-2.1* **Mobile phase:** *Acetonitrile/Water 60/40*
Flow rate: *0.350 mL/min* **Injection:** *0.2 µL*
Sample: *Thiourea; Biphenyl-2-ol; Progesterone; Hexanophenone; Anthracene*

Chromatographic conditions	
Column temperature:	40°C
Eluents:	A. Water, B. Acetonitrile
UV:	247 nm
Injection volume:	10 µL

Red: Purospher® STAR RP-18e (5 µm) LiChroCART® 150-4.6	
Gradient:	0 min 45 % B, from 45 to 95 % B in 15 min, from 15.1 to 20 min reequilibration with 45 % B
Flow rate:	1.0 mL/min
Pressure:	105 bar
Total run time:	20 min

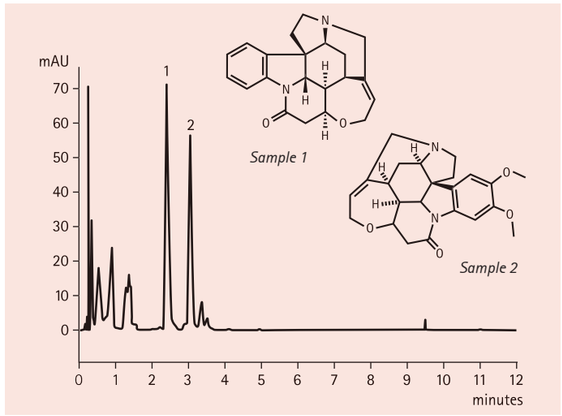
Blue: Purospher STAR RP-18e (2 µm) Hibar® HR 50-2.1	
Gradient:	0 min 45 % B, from 55 to 100 % B in 0.8 min from 0.9 to 2 min reequilibration with 55 % B
Flow rate:	1.1 mL/min
Pressure:	505 bar
Total run time:	2 min



Purospher® STAR UHPLC columns

Purospher® STAR RP-18 endcapped, 2 µm

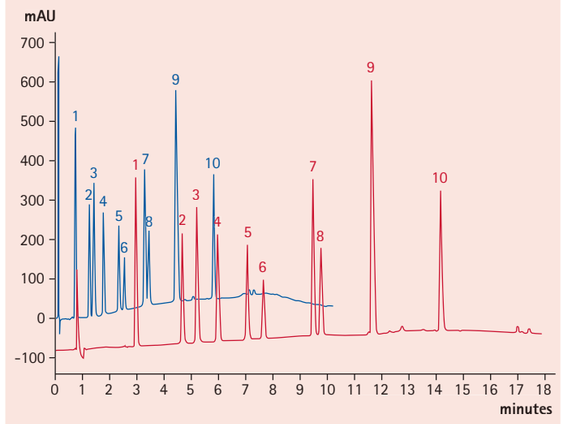
Ultra fast separation of strychnine and brucine



Column:	Purospher® STAR RP-18 endcapped, 2 µm Hibar® HR 50-2.1 mm
Column temperature:	40°C
Eluents:	A. 0.1 % Phosphoric acid, B. Acetonitrile
Flow rate:	0.9 mL/min
Gradient:	from 8 % B to 17 % B in 6 min, 30 % B in 8 min, 8.1-12 min re-equilibration with 8 % B
Wavelenght:	260 nm
Injection volume:	5 µL
Sample:	Strychnos tree seed (1:30 diluted) 1. Strychnine 2. Brucine

Improved separation of Lamotrigine and related compounds

For separation of complex mixtures higher separation efficiencies are needed, provided by the new 100 mm and 150 mm (2.1 mm i.d.) UHPLC columns filled with Purospher® STAR RP-18 endcapped 2 µm particles.



Blue: Purospher® STAR (2 µm), 50-2.1 mm
Red: Purospher® STAR (2 µm), 150-2.1 mm

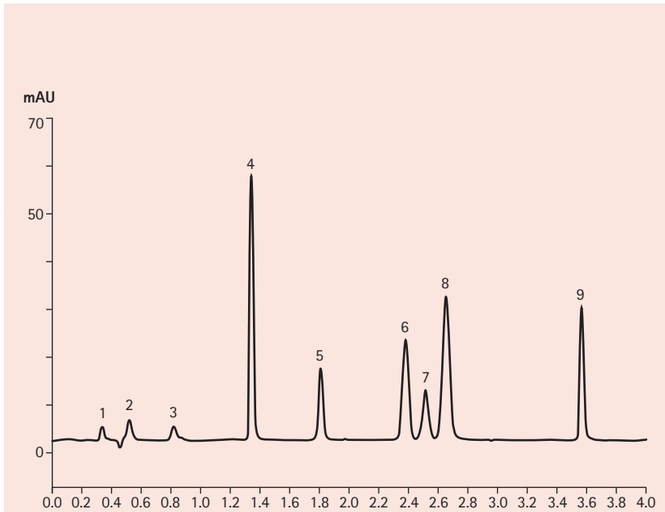
Purospher® STAR RP-18 endcapped 3 µm columns are recommended for difficult samples where clogging and backpressure present an issue.

Column:	Purospher® STAR RP-18 endcapped, 2 µm Hibar® HR 50-2.1 mm and Hibar® HR 150-2.1 mm
Column temperature:	40°C
Eluents:	A. Buffer (14 mL Triethylamine in 1 liter water, adjusted to pH 1.9 with perchloric acid) B. Acetonitrile
Flow rate:	0.38 mL/min
Pressure:	530 bar
Gradient:	0 min 17 % Acetonitrile, from 17 – 34 % B in 16 min, reequilibration with 17 % B from 16.1 up to 25 min
Injection volume:	2 µL
Sample:	Lamotrigine and related compound standard:

1. 2-Chloro-Lamotrigine
2. 3-Chloro-Lamotrigine
3. 4-Chloro-Lamotrigine
4. 2,5-Dichloro-Lamotrigine
5. Lamotrigine
6. 2,4-Dichloro-Lamotrigine
7. 3,5-Dichloro-Lamotrigine
8. 3,4-Dichloro-Lamotrigine
9. 2,3,5-Trichloro-Lamotrigine
10. Lamotrigine – open form

Purospher® STAR RP-8 endcapped

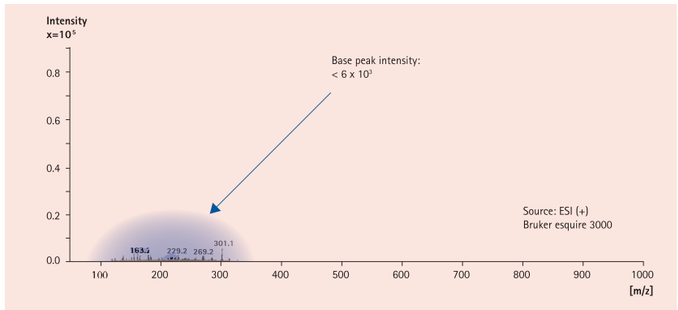
Separation of Carboxylic acids



Column:	Purospher® STAR RP-8 endcapped, 2 µm Hibar® HR 50-2.1 mm		
Mobile phase:	A: Acetonitrile B: 20 mM sodium phosphate buffer pH=2.5		
Gradient:	Time/min	%A	%B
	0.0	2	98
	0.15	18	82
	2.15	18	82
	2.3	32	68
	4	32	68
Flow rate:	600 µL/min		
Pressure:	287 bar		
Detection:	220 nm		
Injection volume:	0.2 µL		
Sample:	1. Malic acid		0.94 mg/mL
	2. Succinic acid		1.06 mg/mL
	3. Glutaric acid		1.25 mg/mL
	4. 3,4-Dihydroxy-cinnamic acid		0.12 mg/mL
	5. 4-Hydroxy-cinnamic acid		0.04 mg/mL
	6. Sorbic acid		0.20 mg/mL
	7. Benzoic acid		0.05 mg/mL
	8. 2-Hydroxybenzoic acid		0.24 mg/mL
	9. Cinnamic acid		0.06 mg/mL

Excellent for LC-MS
Purospher® STAR HPLC and UHPLC columns

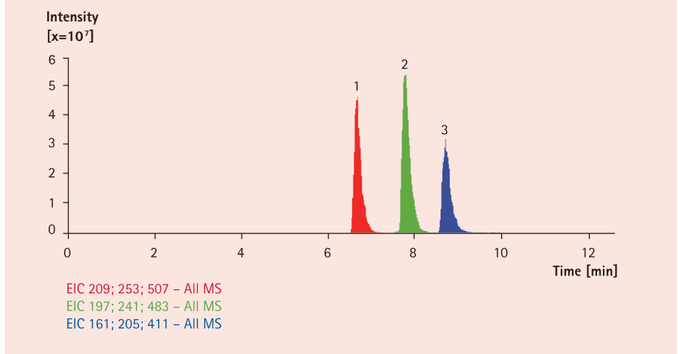
Mass spectrometric (MS) detection is rapidly growing in popularity thanks to its ease of use, better compatibility with liquid chromatography, and cost-efficiency. It enables positive analyte identification, and the possibility to discriminate between co-eluting peaks in specific ion monitoring modes.

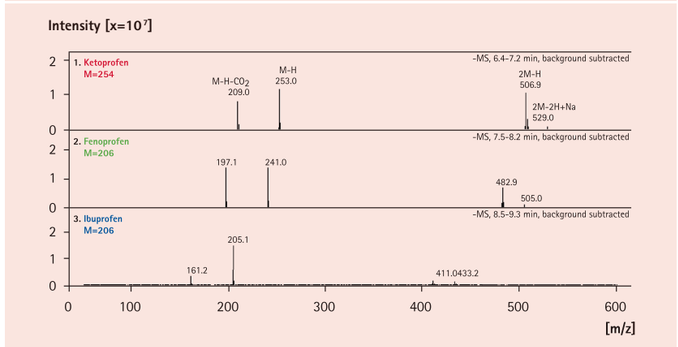


In order to obtain sensitive results with LC-MS, it is essential to avoid trace impurities in the column and solvents.

Purospher® STAR HPLC and UHPLC columns are highly suitably for LC-MS. To ensure low and stable background signals, it is recommended to wash columns with an eluent of isopropanol and 0.1 % formic acid.

Extracted ion chromatograms of profens in negative ion mode separated on Purospher® STAR RP-18 endcapped





Ketoprofen, Fenoprofen and Ibuprofen (100 ng) give ghost-peak-free MS spectra using LiChrosolv® Acetonitrile hypergrade and Purospher® STAR RP-18 endcapped columns.

Chromatographic conditions

Column:	Purospher® STAR RP-18 endcapped, 3 µm LiChroCART® 55-2	
Mobile phase A:	0.1 % Acetic acid in Acetonitrile	
Mobile phase B:	0.1 % Acetic acid in Water	
Gradient:	From 25 % A to 50 % A in 3 min, then isocratic	
Flow Rate:	300 µL, without split	
Detection:	UV 220 nm, Ion Trap MS	
Temperature:	ambient	
Injection volume:	1 µL	
Sample:	1. Ketoprofen	0.1 µg/µL
	2. Fenoprofen	0.1 µg/µL
	3. Ibuprofen	0.1 µg/µL

MS conditions

Ionization:	ESI(-)
Nebulizer:	36 psi
Dry gas:	8.5 L/min
Dry temperature:	330°C
Smart mode optimization:	Target mass 205
Ion charge control:	Target 50,000, max 50 ms
Scan mode:	Standard/Normal
Scan range:	50 – 600 m/z

Best choice for UHPLC-MS
Purospher® STAR UHPLC columns

Purospher® STAR RP-18 endcapped columns fulfill all requirements for fast, modern UHPLC-MS analysis. Identification and quantification of Buprenorphine and its metabolites can be done in just a few minutes. The analysis time for Buprenorphine is 1.4 minutes.

Quantification of Buprenorphine and Norbuprenorphine with UHPLC-MS/MS

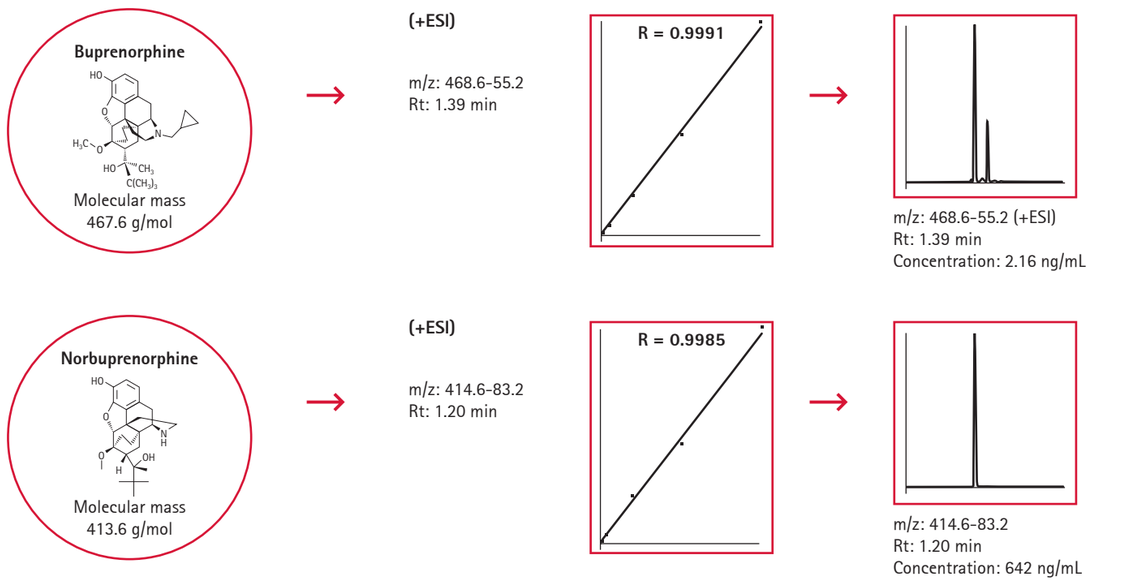
Buprenorphine is a synthetic derivative of the alkaloid thebaine and has partial agonistic properties at the opiate receptor. It is used for pain treatment and aversion therapy for heroin dependence.

Buprenorphine

MS instrument:	Sciex API4000
UHPLC Column:	Purospher® STAR RP-18 endcapped, 2 µm Hibar® HR 50-2.1 mm
Mobile phase A:	0.1 % formic acid in Milli-Q water
Mobile phase B:	0.1 % formic acid in acetonitrile
Flow Rate:	0.7 mL/min
Mobile phase start:	90/10 A/B
Column back pressure at start:	230 bar

Gradient

Time [min]	Mobile Phase A [%]	Mobile Phase B [%]	Flow rate [mL/min]
0.00	90	10	0.7
0.25	90	10	0.7
2.00	10	90	0.7
2.10	90	10	0.7
3.00	90	10	0.7



Ordering Information

Purospher® STAR in stainless steel LiChroCART® cartridges

LiChroCART® cartridge 2 mm i.d.

Modification	Particle size	30-2	55-2	100-2	125-2	150-2	250-2
RP-18 endcapped	3 µm	1.50238.0001**	1.50241.0001**	-	-	-	-
RP-18 endcapped Set*	3 µm	1.50237.0001*	1.50240.0001*	-	-	-	-
RP-18 endcapped	5 µm	1.50229.7185	1.50234.7185	1.50623.0001	1.50255.0001	1.50624.0001	150256.0001
RP-8 endcapped	3 µm	1.50229.7220	1.50234.7220	-	-	-	
RP-8 endcapped	5 µm	-	-	-	1.50274.0001	-	1.50275.0001

LiChroCART® cartridge 3 mm i.d.

Modification	Particle size	30-3	55-3	100-3	125-3	150-3	250-3
RP-18 endcapped	3 µm	1.50233.7184	1.50236.7184	-	-	-	-
RP-18 endcapped	5 µm	1.50233.7185	1.50236.7185	1.50625.0001	1.50253.0001	1.50626.0001	1.50254.0001
RP-8 endcapped	5 µm	-	-	-	1.50038.0001	-	1.50237.0001

LiChroCART® cartridge 4 mm i.d.

Modification	Particle size	4-4 (10 guard columns)	30-4	55-4	75-4	125-4	250-4
RP-18 endcapped	3 µm	-	1.50225.0001**	1.50231.0001**	1.51460.0001	-	-
RP-18 endcapped Set*	3 µm	-	1.50239.0001*	1.50242.0001*	-	-	-
RP-18 endcapped	5 µm	1.50250.0001	1.50302.7185	1.50228.7185	-	1.50251.0001	1.50252.0001
RP-8 endcapped	5 µm	1.50270.0001	-	-	-	1.50271.0001	1.50272.0001
NH_2	5 µm	1.50267.0001	-	-	-	1.50244.0001	1.50245.0001
Si	5 µm	1.50249.0001	-	-	-	1.50268.0001	1.50269.0001

LiChroCART® cartridge 4.6 mm i.d.

Modification	Particle size	4-4 (10 guard columns)	100-4.6	150-4.6	250-4.6
RP-18 endcapped	3 µm	-	1.51448.7184	-	-
RP-18 endcapped	5 µm	1.50250.0001	1.50627.0001	1.50358.0001	1.50359.0001
RP-8 endcapped	5 µm	1.50270.0001	-	1.50031.0001	1.50032.0001
Phenyl	5 µm	-	-	1.51922.0001	1.51921.0001
NH_2	5 µm	1.50267.0001	-	1.50247.0001	1.50248.0001
Si	5 µm	1.50249.0001	-	1.50356.0001	1.50357.0001

LiChroCART® cartridge 10 mm i.d.

Modification	Particle size	10-10 (guard column)	75-10	100-10	125-10	150-10	250-10
RP-18 endcapped	5 µm	1.50178.7185	1.51449.7185	1.51445.7185	1.51443.7185	1.51444.7185	1.50257.0001
RP-8 endcapped	5 µm	-	-	-	-	-	1.50276.0001

* *One set contains: 1 LiChroCART® cartridge and one holder*

** *3 cartridges in one pack*

The LiChroCART® columns (75, 125, 150 and 250 mm length) in the list above (2, 3, 4 and 4.6 mm i.d.) require part number 1.51486.0001 manu-CART® cartridge column holder, which can be used to hold one cartridge column with or without a 4-4 mm guard column. LiChroCART® columns 250-10 mm require part number 1.51419.0001 manu-CART® 10. The short LiChroCART® columns (30 and 55 mm length) can be ordered as a set including the corresponding cartridge holder and one cartridge, or as a pack of 3 cartridges without cartridge holder. The separate part numbers for the cartridge are as follows: 1.50227.0001 LiChroCART® cartridge holder for 30 mm cartridge and 1.50226.0001 LiChroCART® cartridge holder for 55 mm cartridge.

Purospher® STAR in Hibar® RT columns

Hibar® RT column 2 mm i.d.

Modification	Particle size	50-2	100-2	125-2	150-2	250-2
RP-18 endcapped	5 µm	1.50593.0001	1.50595.0001	1.50596.0001	1.50597.0001	1.50598.0001

Hibar® RT column 3 mm i.d.

Modification	Particle size	50-3	100-3	125-3	150-3	250-3
RP-18 endcapped	3 µm	1.50393.0001	1.50398.0001	1.50413.0001	1.50414.0001	1.50427.0001
RP-18 endcapped	5 µm	1.50607.0001	1.50612.0001	1.50615.0001	1.50617.0001	1.50620.0001
RP-8 endcapped	3 µm	-	-	-	1.50750.0001***	-
RP-8 endcapped	5 µm	-	-	-	1.50644.0001***	-
Phenyl	3 µm	-	-	-	1.50631.0001***	-
Phenyl	5 µm	-	-	-	1.51920.0001	-

Hibar® RT column 4 mm i.d.

Modification	Particle size	50-4	125-4	250-4
RP-18 endcapped	3 µm	1.50428.0001	1.50431.0001	1.50468.0001
RP-18 endcapped	5 µm	1.50621.0001	1.50036.0001	1.50037.0001
RP-8 endcapped	5 µm	-	1.50033.0001	1.50035.0001

Hibar® RT column 4.6 mm i.d.

Modification	Particle size	100-4.6	125-4.6	150-4.6	250-4.6
RP-18 endcapped	3 µm	1.50469.0001	-	1.50470.0001	1.50471.0001
RP-18 endcapped	5 µm	1.50622.0001	1.51914.0001	1.51455.0001	1.51456.0001
RP-8 endcapped	5 µm	1.51917.0001	1.51916.0001	1.51453.0001	1.51454.0001
Phenyl	5 µm	-	-	1.51919.0001	1.51918.0001
NH_2	5 µm	-	-	-	1.51913.0001
Si	5 µm	-	-	-	1.51911.0001

Hibar® RT column 10 mm i.d.

Modification	Particle size	250-10
RP-18 endcapped	5 µm	1.51915.0001
Si	5 µm	1.51912.0001

The Hibar® RT columns are complete with endfittings. When using a guard column with a Hibar® RT column, we recommend part number 1.51487.0001 guard column cartridge holder for 4-4 mm guard column cartridges LiChroCART®.

Purospher® STAR in Hibar® HR UHPLC columns 2.1 mm i.d.

Modification	Particle size	30-2.1	50-2.1	100-2.1	150-2.1	250-2.1
RP-18 endcapped	2 µm	1.50645.0001	1.50646.0001	1.50648.0001	1.50649.0001	–
RP-18 endcapped	3 µm	1.50650.0001	1.50651.0001	1.50653.0001	1.50654.0001	1.50655.0001
RP-8 endcapped	2 µm	-	1.50630.0001	1.50629.0001	-	–
RP-8 endcapped	3 µm	-	1.50674.0001***	1.50675.0001***	-	
Phenyl	2 µm	-	1.51013.0001	1.51014.0001	-	–
Phenyl	3 µm	-	1.50672.0001***	1.50673.0001***	-	-

The Hibar® HR UHPLC columns are designed for use in UHPLC instruments. The pressure stability is set at 600 bar.

*** *available from 11/2013*

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