



CHROMATOGRAPHY

Product Guide

Everything
for your
applications



WHAT IS NEW

ASTRA® BDS and ASTRA® Sugar HPLC columns

New ASTRA® HPLC columns are complementary to our ARION® brand. These columns offer not only a high-endcapped C18, C18-BDS, C8-BDS and Phenyl-Hexyl-HE phases, but also a unique DM phase with dual modification. Another novel phase C18-AQ offers dual chemistry bonding for analyses in aqueous mobile phases.

We extended ASTRA® HPLC columns with polymer based columns for sugar analysis. See page 4.



ARION® HPLC columns and Guard system

We have extended range of ARION® HPLC columns with the PFP phase. New ARION® NH₂ cartridges extend the AGS system. See page 58.



LION™ GC columns

The family of GC column LION™ has grown by two stages. LN-624 Sil MS brings with it a higher temperature limit of 300/320 °C, lower background and longer lifetime. New LN-FAME HT is a highly polar bonded phase with an increased temperature limit up to 280 °C, with the application being focused on the analysis of FAME and their cis/trans isomers. See details on page 78.



SpeExtra™ MSPE columns

MSPE filters enable the quick and effective pretreatment of a sample using different types of membranes with 0.22 micrometer porosity and a suitable sorbent. They are a suitable replacement for 1–3 mL SPE columns, tips filled with sorbent and LL type extraction. With MSPE filters you will save time, use a minimum amount of solvents and perform more sample analyses than with conventional SPE columns. See details on page 88.



MetAmino® sample preparation kit

The MetAmino® kit offers an easy sample preparation method for your LC/MS or GC/MS analysis. It has been developed in the Czech Republic in co-operation with Biology Centre CAS. See page 94.

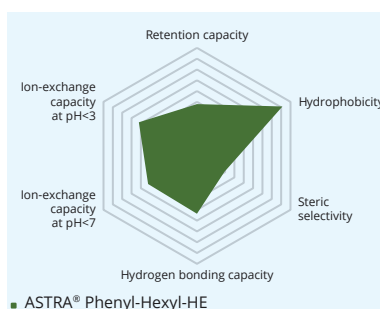
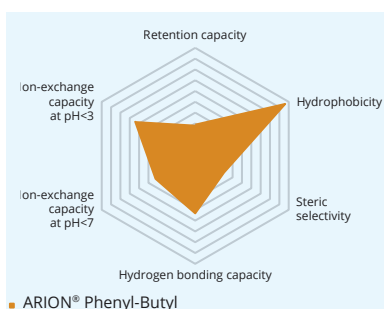
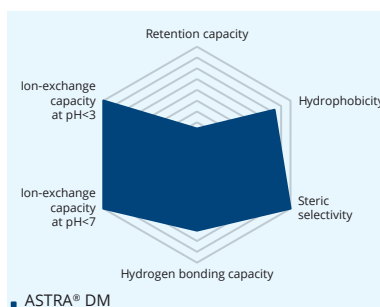
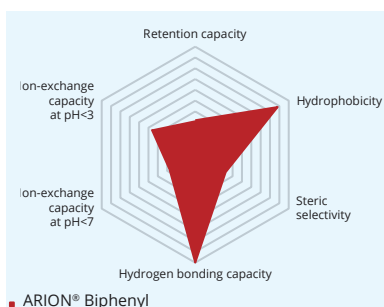
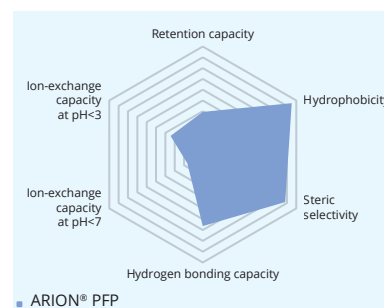
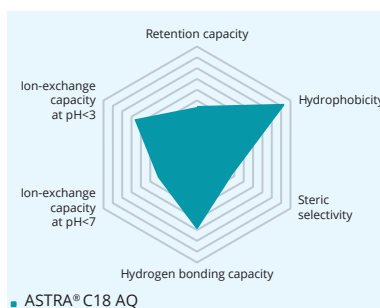
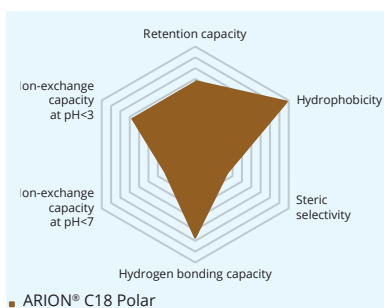
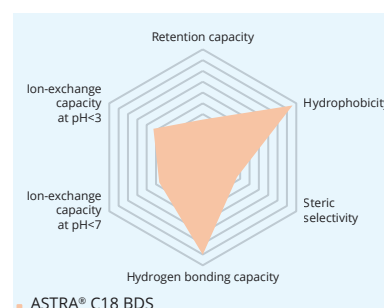
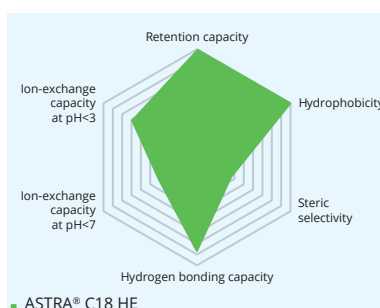
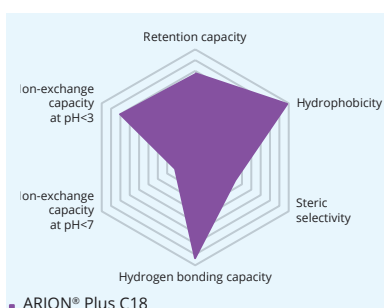


HPLC COLUMN SELECTION

HPLC column selectivity

The selectivity is defined as the capability of stationary phases to separate analytes under certain conditions. The selectivity mainly depends on the structure, metal content and modification of base silica gel, type of chemical bonding or silica gel end-capping. The HPLC column selectivity has been measured according to the Tanaka plots (Tanaka, N. et al., Journal of Chromatographic Science, 27 (1989), 721–728), shown below. This allows users a quick comparison of different phases in order to choose the best possible HPLC columns for their application.

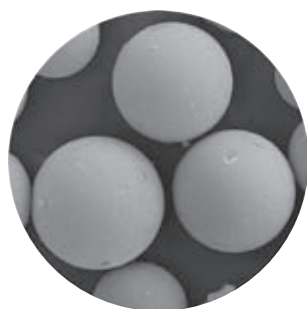
Property	Synonym	Measured parameter
Retention capacity	Hydrophobicity	k' (pentyl benzene)
Hydrophobicity	Methylene selectivity	α (pentyl benzene, butyl benzene)
Steric selectivity	–	α (triphenylene, o-terphenyl)
Hydrogen bonding capacity	Capacity of silanol	α (caffeine, phenol)
Ion-exchange capacity at pH>7	–	α (benzyl amine, phenol)
Ion-exchange capacity at pH<3	–	α (benzyl amine, phenol)





ASTRA® HPLC columns extend our ARION® and CHROMSHELL® product lines. The ASTRA® has been developed in the Czech Republic to offer an alternate to a broad range of general HPLC columns. ASTRA® brings completely new and unique stationary phase with the polar embedded group to offer a complementary selectivity.

- Unique and high endcapped C18 phases.
- 330 m²/g surface area (170 m²/g for BDS phases).
- Multi-modal phase.

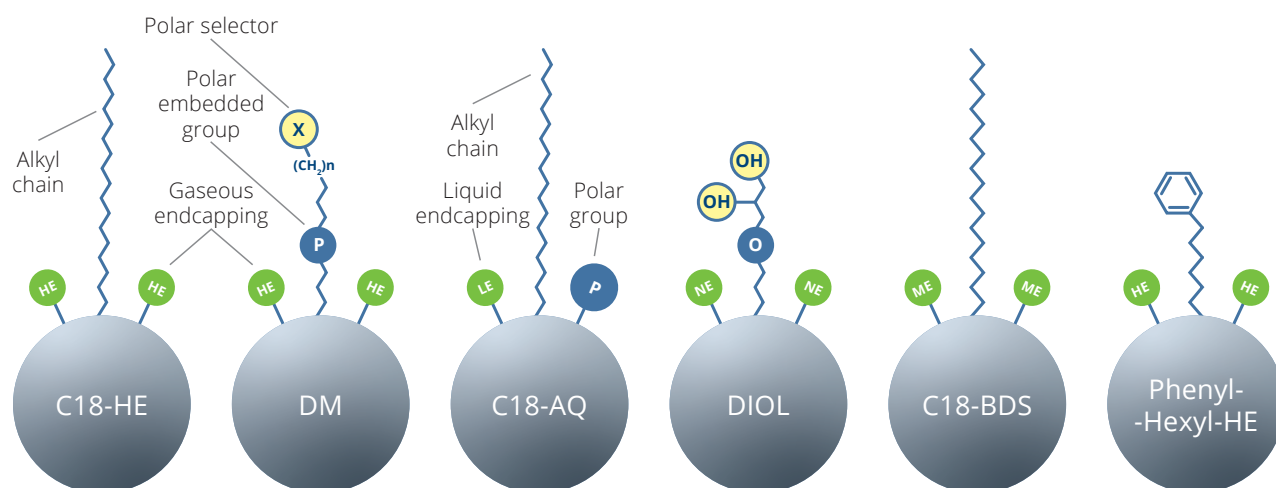


ASTRA® Silicagel

Particle size	5 µm	3 µm	2 µm
Metal content	<10 ppm	<10 ppm	<10 ppm
Mean particle diameter	4.6 ± 1.2 µm	3.0 ± 0.7 µm	2.1 ± 0.4 µm
Proximity to the shape of sphere	0.97 ± 0.04	0.97 ± 0.03	0.97 ± 0.03

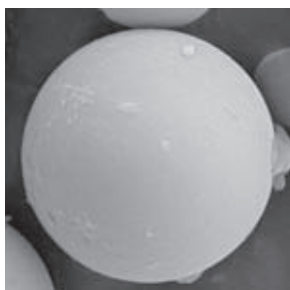
ASTRA® phases	Particle size (µm)	Pore size (Å)	Surface area (m ² /g)	Carbon load	pH stability	Endcapping	100% aqueous mobile phase	USP code
C18-HE	2, 3, 5, 10	100	330	17 %	2 to 9	High	×	L1
C18-AQ	2, 3, 5	100	330	13 %	2 to 9	Mixed	✓	L1
C18-BDS	3, 5	140	170	11 %	2 to 8	Proprietary	×	L1
C8-HE	5	100	330	11 %	2 to 9	High	×	L7
C8-BDS	3, 5	140	170	6 %	2 to 8	Proprietary	×	L7
Phenyl-Hexyl-HE	3, 5	100	330	11 %	2 to 7.5	High	×	L11
DM	3, 5	100	205	12 %	2 to 9	High	×	–
Diol	3, 5	100	330	5 %	2 to 7.5	–	✓	L20

ASTRA® phases	Particle size (µm)	Crosslinking	Max. Flow rate	Max. Pressure (bar)	Max Temperature	USP code
Sugar Ca(S)	9, 10	Proprietary	1.5 mL/min	60	90	L19
Sugar H(S)	9, 10	Proprietary	1.5 mL/min	60	90	L17
Sugar K(S)	10	Proprietary	1.5 mL/min	60	90	–
Sugar Na(S)	10	Proprietary	1.5 mL/min	60	90	L58

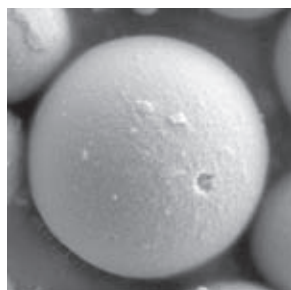


Up close

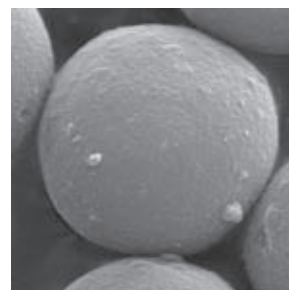
As with all phases developed by Chromservis, ASTRA® HPLC column particles are continuously analysed by SEM. The electron microscope shows the very high quality of ASTRA® 3 and 5µm particles.



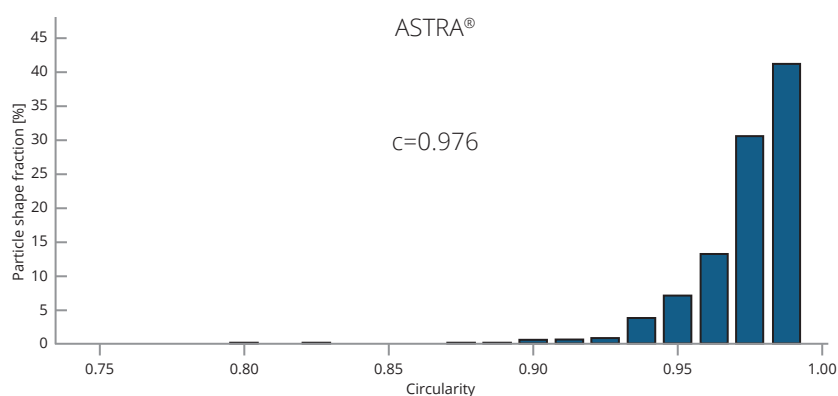
ASTRA® particle 5 µm



ASTRA® particle 3 µm

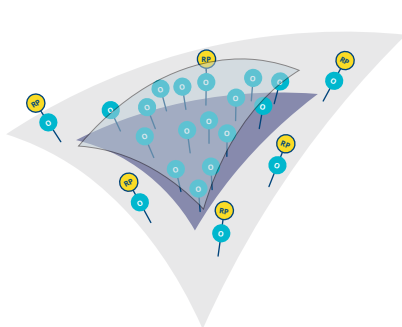


ASTRA® particle 2 µm

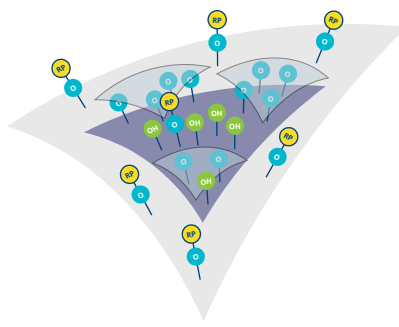


Main particle characteristics:

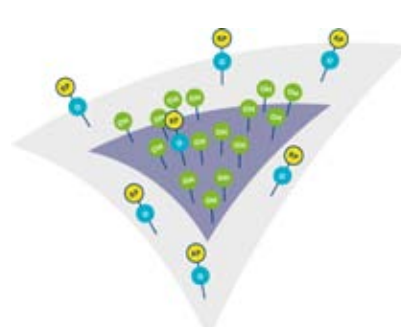
- Close proximity to a sphere.
- Highly effective endcapping.
- No broken particles.
- Robustness to high pressures.
- Lot-to-lot reproducibility.
- Unique modern embedded phases.



High endcapping



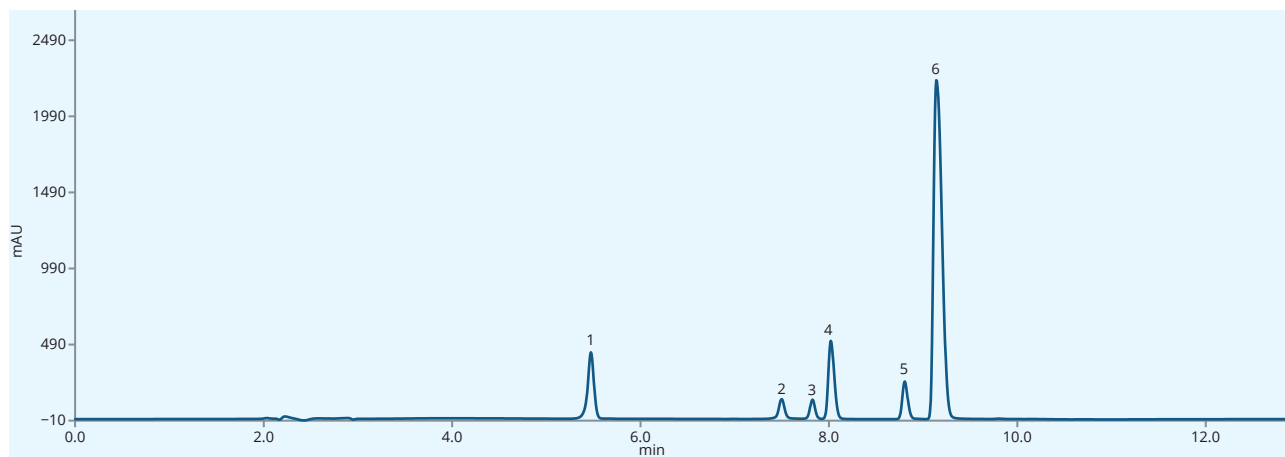
Low endcapping



Non endcapped

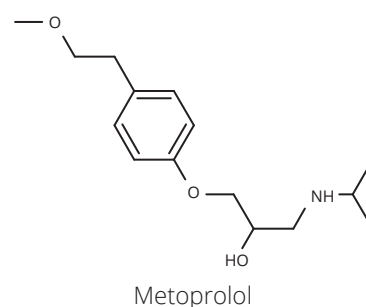
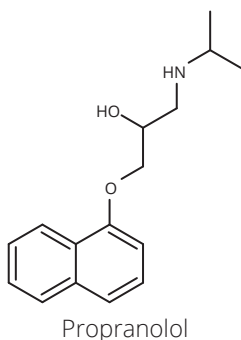
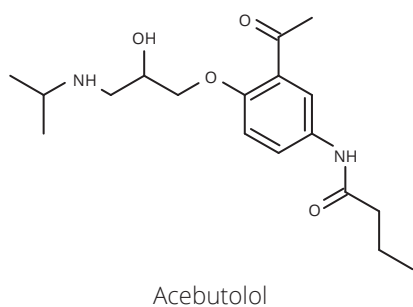
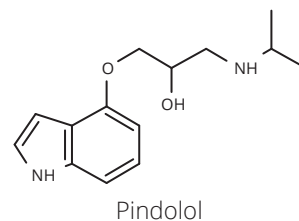
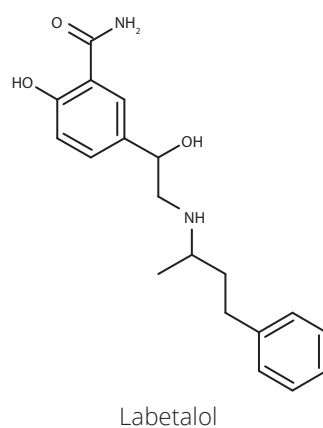
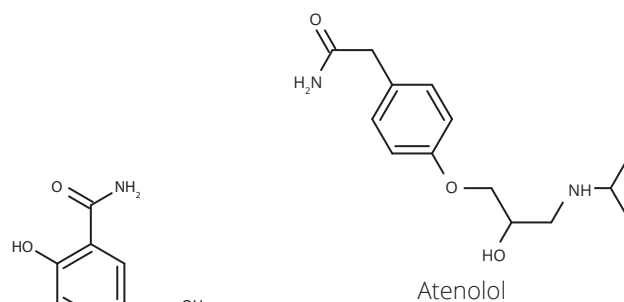
Beta Blockers

Beta Blockers are also known as beta-adrenergic blocking agents. They are used as a medication that reduces blood pressure.



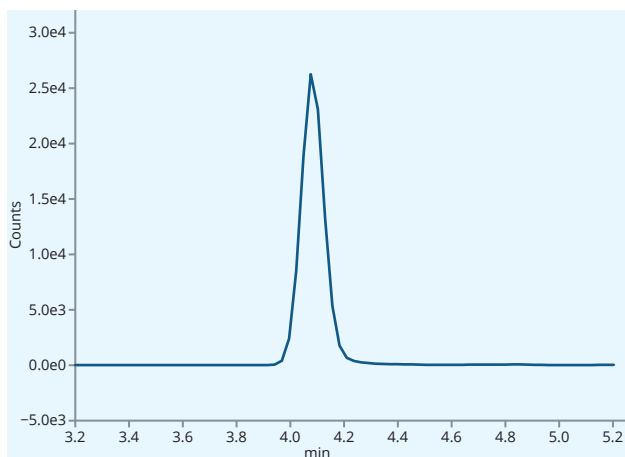
Standard mixture on ASTRA® C18-HE column

Columns	ASTRA® C18-HE, 5 µm			
Dimensions	150 mm × 4.6 mm			
Part numbers	AST-5732-LK46			
Mobile phase	A: Phosphate buffer 20mM, pH 2.5 B: ACN			
Gradient elution	Time	A (%)	B (%)	Flow rate (mL/L)
	0	95	5	0.75
	3	85	15	1.00
	8	50	50	1.00
	12	95	5	1.00
	13	95	5	0.75
Flow rate	See gradient table (mL/L)			
Temperature	25 °C			
Detection	UV @250 nm			
Analytes	1. Atenolol, CAS No. 29122-68-7 2. Pindolol, CAS No. 13523-86-9 3. Acebutolol, CAS No. 37517-30-9 4. Metoprolol, CAS No. 37350-58-6 5. Labetalol, CAS No. 36894-69-6 6. Propranolol, CAS No. 525-66-6			

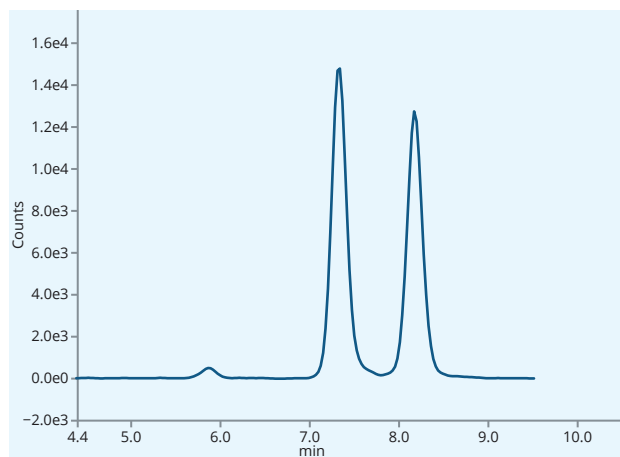


API glucuronide by LC/MS

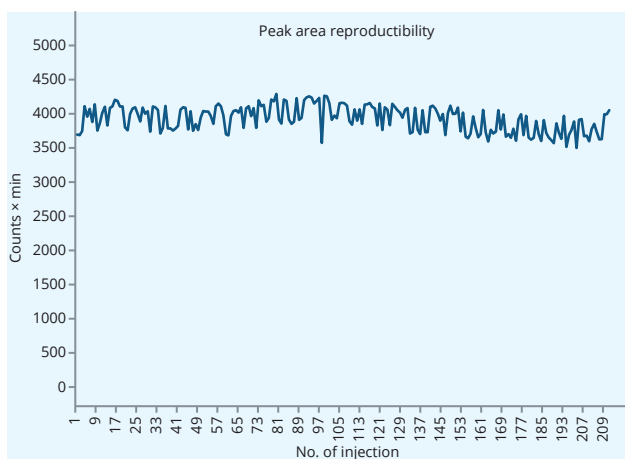
This application shows high ASTRA[®] HPLC column stability in the pharmacokinetic assay. API is used in hypolipidemic therapy adjusting cholesterol levels in the human body.



Scan 1 – API glucuronide



Scan 2 – API isomers



Plasma sample on ASTRA[®] C18-HE column

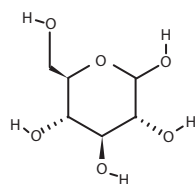
Column	ASTRA [®] C18-HE, 5 µm
Dimensions	150 mm × 4.6 mm
Part number	AST-5732-LK46
Mobile phase	MeOH : ACN : Water : 0.1% NH ₄ OH 25/50/20/5 (v/v/v/v) Isocratic elution
Flow rate	0.45 mL/min
Temperature	Ambient
Injection volume	15 µL
Detection	MS/MS
Mode	ESI, Negative 2500 eV
MS Temperature	350 °C (capillary), 380 °C (vaporizer)
Collision gas	Argon
Instrument	TSQ Quantiva (Thermo Fisher Scientific)
Analytes	1. API (proprietary)

Compound name	Q1 (m/z)	Q2 (m/z)	Collision cell pressure	Collision energy
API Glucuronide D4	588	275	2 mTorr	29 eV
API D	412	275	2 mTorr	29 eV

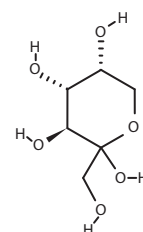
Sugars in infusion solutions

Sugars solutions in the form of infusions can be used to treat low blood sugar and water loss and as part of parenteral nutrition to optimise fluid, energy and nitrogen balance. As active ingredients of finished dosage forms, sugars should be controlled according to the strict requirements of pharmaceutical guidelines. In this application there are the results of the control of several solutions containing glucose, fructose and mannitol using Astra® Sugar Ca(S) column.

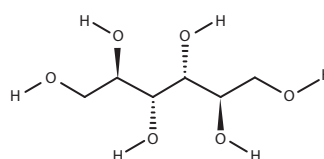
Column	ASTRA® Sugar Ca(S), 10 µm
Dimensions	300 mm × 8.0 mm
Part number	AST-5906-VN80
Mobile phase	100% H ₂ O
Flow rate	0.8 mL/min
Temperature	80 °C
Injection volume	20 µL
Detection	RID @55 °C
Analytes	1. Glucose 2. Fructose 3. Mannitol



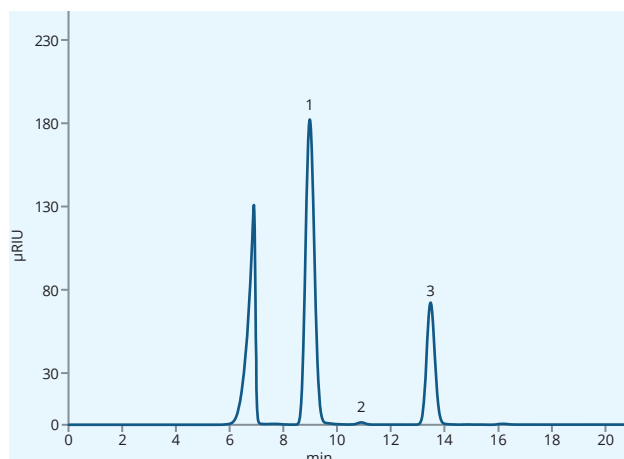
Glucose



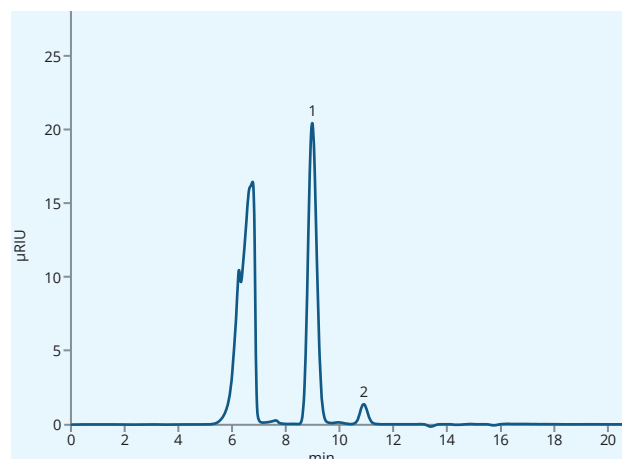
Fructose



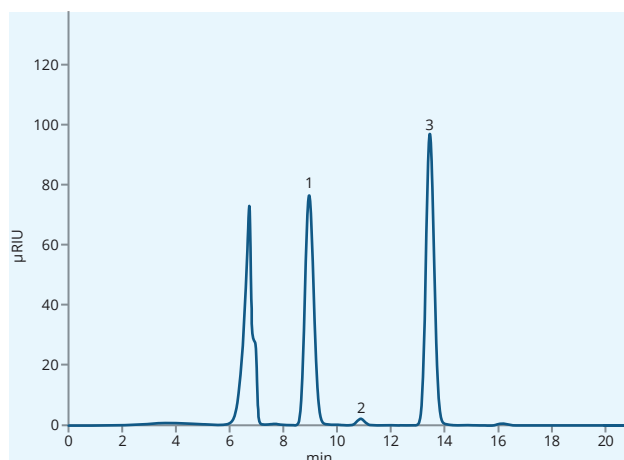
Mannitol



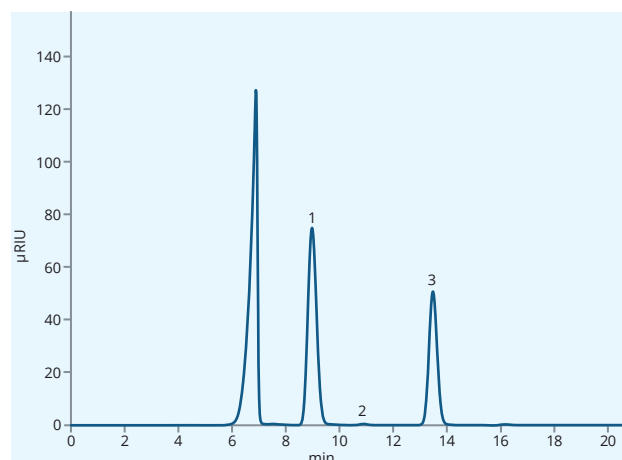
Test solution 1 on ASTRA® Sugar Ca(S) column



Test solution 2 on ASTRA® Sugar Ca(S) column



Test solution 3 on ASTRA® Sugar Ca(S) column

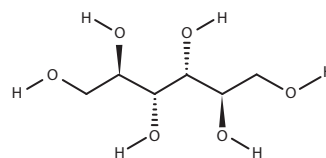


Test solution 4 on ASTRA® Sugar Ca(S) column

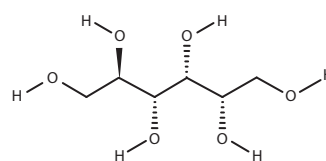
Sorbitol analysis according to Ph. Eur.

Sorbitol is a sugar alcohol commonly used as a sweetener and stabilizer in a wide range of pharmaceutical formulations. This application shows a method of control of sorbitol according to **Ph. Eur. Monograph 07/2019:0436**. Astra[®] Sugar Ca(S) column provides a perfect resolution factor and peak symmetry under the conditions of the pharmacopoeial method.

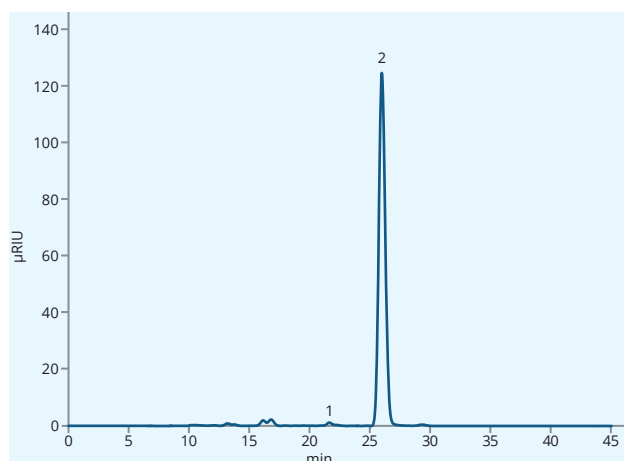
Column	ASTRA [®] Sugar Ca(S), 9 µm
Dimensions	300 mm × 8.0 mm
Part number	AST-5906-WN80
Mobile phase	100% H ₂ O
Flow rate	0.5 mL/min and 0.75 mL/min
Temperature	80 °C
Injection volume	20 µL
Detection	RID @55 °C
Analytes	1. Mannitol 2. Sorbitol



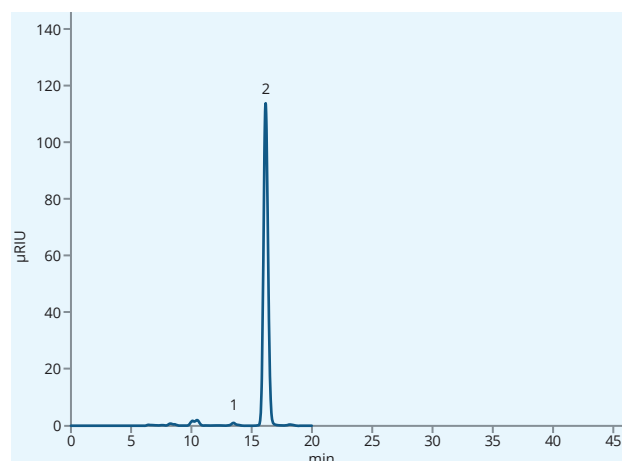
Mannitol



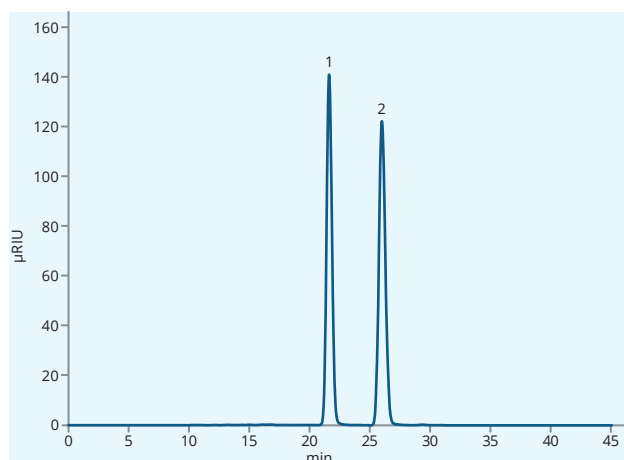
Sorbitol



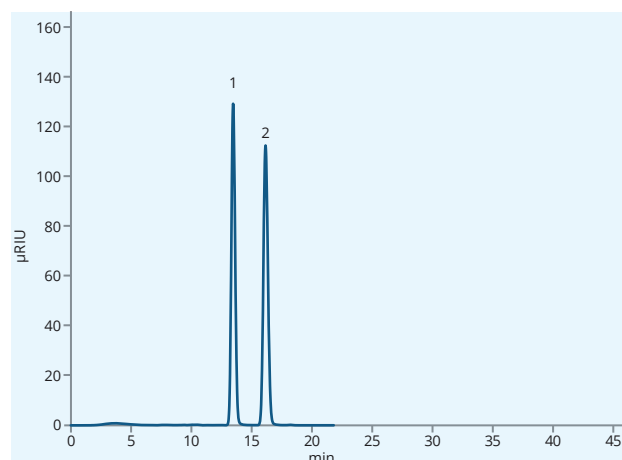
Test solution on ASTRA[®] Sugar Ca(S) column (0.5 mL/min)



Test solution on ASTRA[®] Sugar Ca(S) column (0.75 mL/min)



Reference solution (b) on ASTRA[®] Sugar Ca(S) column (0.5 mL/min)



Reference solution (b) on ASTRA[®] Sugar Ca(S) column (0.75 mL/min)

Analysis of long-chain PFASs in biological sample matrix

PFASs are a group of synthetic organofluorine chemical compounds used in the production of fluoropolymer coatings and products such as furniture, adhesives, personal care products, food packaging, mobile phone screens, etc. Many PFASs pose health and environmental concerns because they are classified as persistent organic pollutants. The long-chain PFASs are due to higher bioaccumulative potential frequently detected in living organisms. This application shows a robust method of extraction and determination of the PFAS compounds in fish biota samples, which can be a relevant exposure pathway for humans.

MSPE with 15 mg of C18 stationary phase and nylon frits was used to analyze 14 PFAS compounds in fish tissue samples. The MSPE sample preparation approach was compared with the reference extraction method without SPE based on Grabicova et al. 2018 [1]. Both sets of samples were fortified to 1 ng/g of PFAS. The MSPE method enhances the response of most of the analytes between 80–130 % (Fig. 1). Although sample preparation is more demanding than the reference method, the MSPE offers relevant signal improvement.

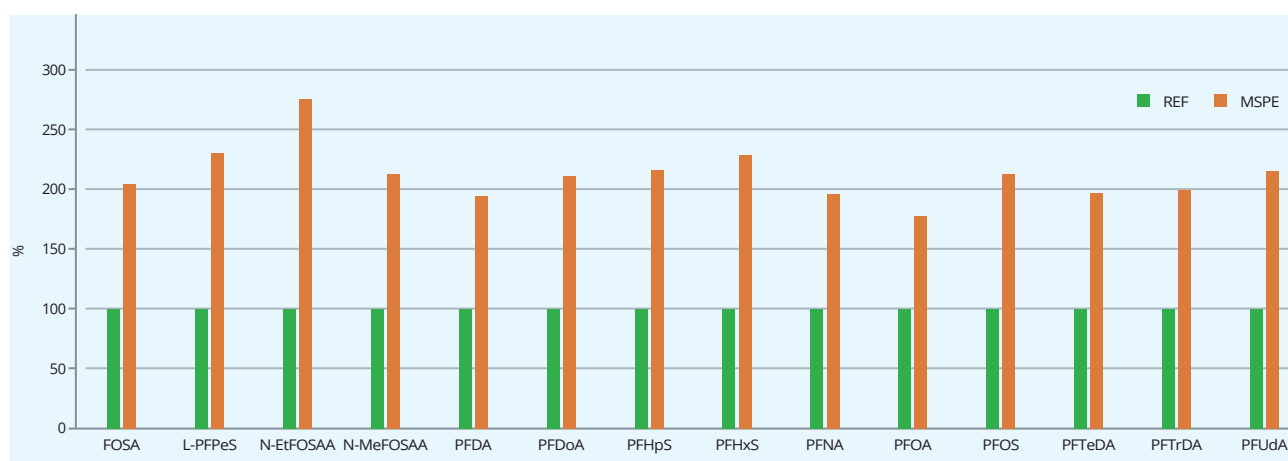
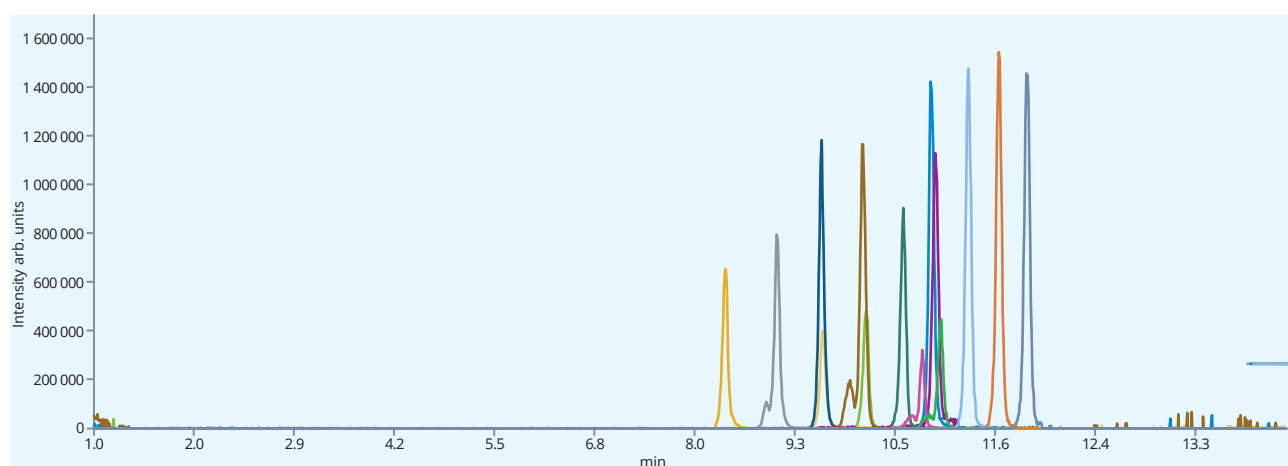


Fig 1. MSPE method relative signal improvement in comparison to the reference extraction method without SPE



Mixture of PFASs on ASTRA® column

References

[1] Grabicova K, Vojs Staňová A, Koba Ucin O, Borika A, Randak T, Grabic R. Development of a robust extraction procedure for the HPLC-ESI-HRPS determination of multi-residual pharmaceuticals in biota samples. *Anal Chim Acta*. 2018 Aug 31;1022:53-60. doi: 10.1016/j.aca.2018.04.011. Epub 2018 Apr 18. PMID: 29729738.

This application was developed in cooperation with the Faculty of Fisheries and Protection of Waters, Research Institute of Fish Culture and Hydrobiology, Laboratory of Environmental Chemistry and Biochemistry.



Analysis of long-chain PFASs in biological sample matrix

MSPE Method

MSPE Column	Micro Spin SpeExtra™ MSPE C18 column with 0.22 µm Nylon membrane, 15 mg (p/n MSP-5876- AA07)
Homogenization	TissueLyser II, Qiagen, Germany, 1800 min ⁻¹ for 10 min
Extraction	ACN + 0.1% FA
Centrifugation	Mini spin, Eppendorf, Germany; 4000 rpm for 2 min
Reconstitution	DDW + 0.1% FA
Dissolution	Ultrasonic bath 5 min
MSPE Activation	DDW + MeOH (50:50)
MSPE Equilibration	DDW + 0.1% FA
MSPE Extraction of analytes	500 µL of sample
MSPE Elution of analytes	200 µL ACN + 0.1% FA

We strongly recommend to use PFAS suitable vials and caps (e.g. CHS silicone/PP septa and PP caps).



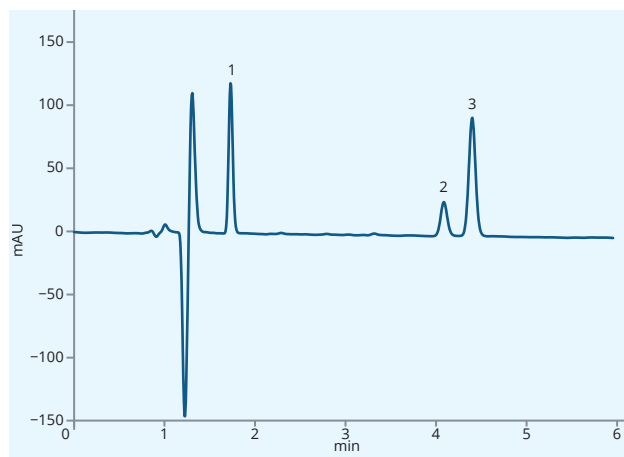
MSPE column

LC-HRMS Method

Column	ASTRA® C18-HE, 3 µm			
Dimensions	75 mm × 2.1 mm			
Part number	AST-5732-IH21			
Mobile phase	A: DDW + 10mM Ammonium Acetate B: Methanol + 10mM Ammonium Acetate			
Gradient elution	Time	A (%)	B (%)	Flow rate (µL/min)
	0	90	10	350
	0.5	90	10	350
	6	40	60	350
	11	0	100	400
	14	0	100	400
	14.01	90	10	350
	16	90	10	350
Temperature	23 °C			
Injection volume	10 µL			
Detection	Full scan (resolving power 120 000, m/z 200), negative mode			
Analytes	1. L-PFPeS (perfluoropentanesulfonic acid) 2. PFHxS (perfluorohexanesulfonic acid) 3. PFOA (perfluorooctanoic acid) 4. PFHpS (perfluoroheptanesulfonic acid) 5. PFNA (perfluorononanoic acid) 6. FOSA (perfluorooctanesulfonamide) 7. PFOS (perfluorooctanesulfonic acid) 8. PFDA (perfluorodecanoic acid) 9. PFUdA (perfluoroundecanoic acid) 10. N-MeFOSAA (2-(N-methylperfluorooctanesulfonamido)acetic acid) 11. N-EtFOSAA (N-Ethyl-N-[(heptadecafluorooctyl)sulphonyl]glycine) 12. PFDoA (perfluorododecanoic acid) 13. PFTrDA (perfluorotridecanoic acid) 14. PFTeDA (perfluorotetradecanoic acid)			

Stevia glycosides

Stevia rebaudiana Bertoni is a plant used for its sweet taste. It contains glycosides, which are used as sweeteners in the food industry.

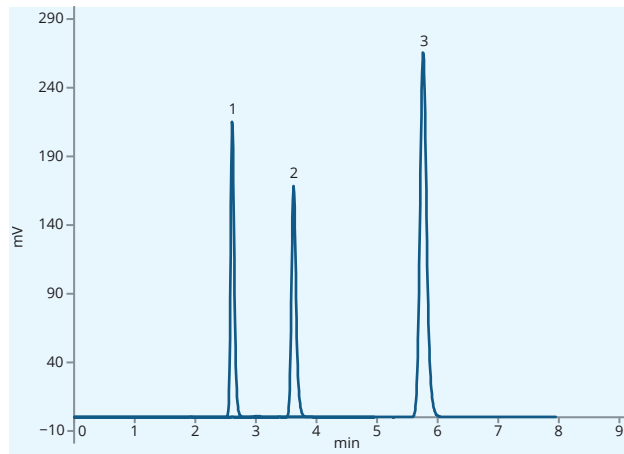


Standard on ASTRA® C18-HE

Column	ASTRA® C18-HE, 3 µm
Dimensions	150 mm × 4.6 mm
Part number	AST-5732-IK46
Mobile phase	Acetonitrile + 0.1% formic acid : water (32 : 68 v/v) Isocratic elution
Flow rate	1.6 mL/min
Temperature	65 °C
Detection	UV @210 nm
Analytes	1. Rebaudioside D 2. Rebaudioside A 3. Stevioside

Amines

This application shows nice symmetry of various amines on ASTRA® C18-BDS.



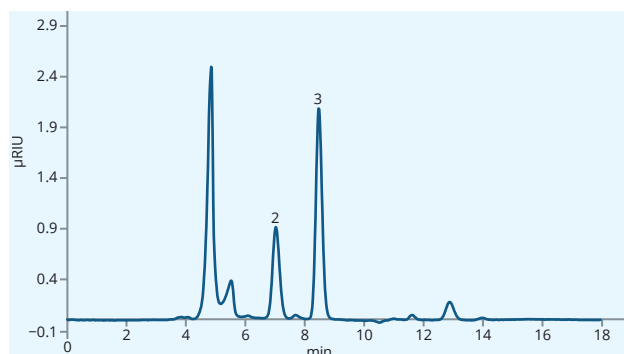
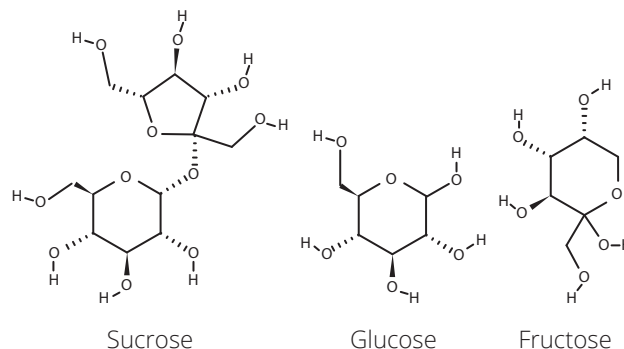
Standard on ASTRA® C18-BDS

Column	ASTRA® C18-BDS 5 µm
Dimensions	150 mm × 4.6 mm
Part number	AST-5875-LK46
Mobile phase	Water:ACN (45:55)
Flow rate	1.0 mL/min
Temperature	25 °C
Injection volume	1 µL
Detection	DAD @254 nm
Analytes	1. Aniline 2. 4-Ethylaniline 3. N,N-dimethylaniline

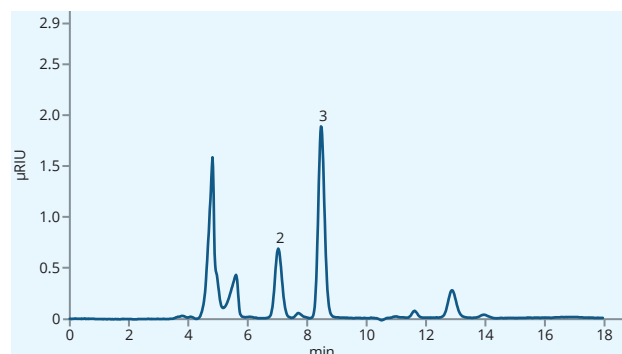
Sugars control in tomatoes and ketchups

A taste of tomato products depends on content of the main food sugars, such as sucrose, glucose and fructose. Sugars are analysed continuously during the products manufacturing at the different steps of a process. The content of sugars in tomatoes is highly dependent on the geographical origin, ripeness and transportation conditions. This application highlights the analysis of food sugars in several kinds of tomatoes and ketchups using ASTRA[®] Sugar Ca column.

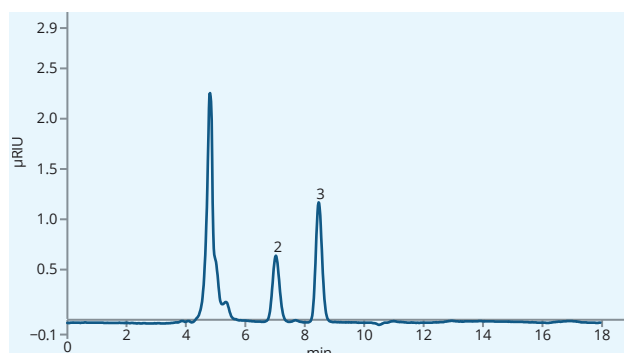
Column	ASTRA [®] Sugar Ca(S), 10 µm
Dimensions	300 mm × 8 mm
Part number	AST-5906-VN80
Mobile phase	100% H ₂ O
Flow rate	1.0 mL/min
Temperature	80 °C
Injection volume	3 µL
Detection	RID (55 °C)
Analytes	1. Sucrose 2. Glucose 3. Fructose



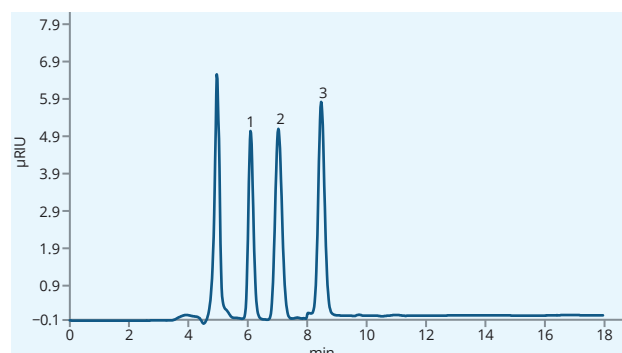
Sugars profile in small red tomatoes



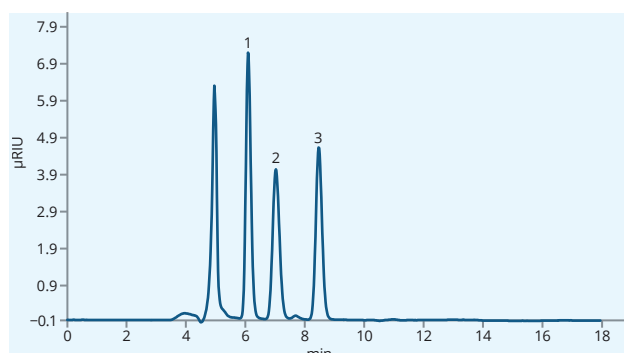
Sugars profile in big red tomatoes



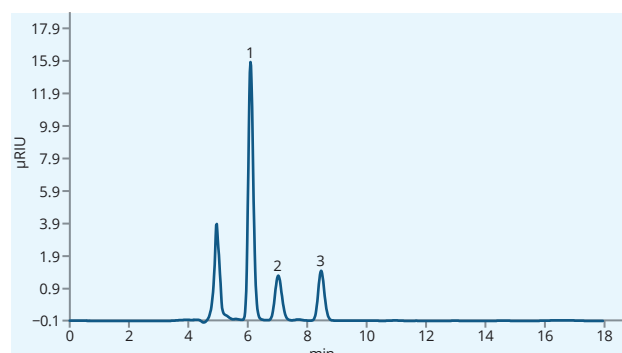
Sugars profile in small orange tomatoes



Sugars profile in ketchup Hame spicy



Sugars profile in ketchup Hame sweet



Sugars profile in ketchup Hellmann's delicate

Ordering information

Analytical columns

2 µm ASTRA® all dimensions in mm						AGS Guard System
Phase	30 × 2.1	50 × 2.1	75 × 2.1	100 × 2.1	150 × 2.1	2.1 mm Cartridges
C18-HE	On request	AST-5732-TG21	On request	AST-5732-TI21	AST-5732-TK21	AGS-5731-RB2*
C18-AQ	On request	On request	On request	AST-5832-TI21	AST-5832-TK21	AGS-5731-RB2*

3 µm ASTRA® all dimensions in mm					AGS Guard System
Phase	50 × 2.1	75 × 2.1	100 × 2.1	150 × 2.1	2.1 mm Cartridges
C18-HE	On request	AST-5732-IH21	AST-5732-II21	AST-5732-IK21	AGS-5731-RC2*
C18-AQ	On request	AST-5832-IH21	AST-5832-II21	AST-5832-IK21	AGS-5731-RC2*
C18-BDS	On request	On request	On request	AST-5875-IK21	AGS-5731-RC2*
Phenyl-Hexyl HE	On request	On request	AST-5891-II21	AST-5891-IK21	AGS-5731-RC2*
DM	On request	On request	AST-5810-II21	AST-5810-IK21	AGS-5731-RC2*
Diol	On request	On request	AST-5858-II21	AST-5858-IK21	On request
Si	On request	On request	On request	AST-5905-IK21	On request

3 µm ASTRA® all dimensions in mm				AGS Guard System
Phase	50 × 3.0	100 × 3.0	150 × 3.0	2.1 mm Cartridges
C18-HE	AST-5732-IG30	AST-5732-II30	AST-5732-IK30	AGS-5731-RC2*
C18-AQ	AST-5832-IG30	AST-5832-II30	AST-5832-IK30	AGS-5731-RC2*
C18-BDS	On request	On request	AST-5875-IK30	AGS-5731-RC2*
Phenyl-Hexyl HE	On request	AST-5891-II30	On request	AGS-5731-RC2*
DM	On request	AST-5810-II30	AST-5810-IK30	AGS-5731-RC2*
Diol	On request	On request	AST-5858-IK30	On request

3 µm ASTRA® all dimensions in mm					AGS Guard System
Phase	50 × 4.6	100 × 4.6	150 × 4.6	250 × 4.6	4.0 mm Cartridges
C18-HE	AST-5732-IG46	AST-5732-II46	AST-5732-IK46	AST-5732-IM46	AGS-5731-RC4*
C18-AQ	On request	AST-5832-II46	AST-5832-IK46	AST-5832-IM46	AGS-5731-RC4*
C18-BDS	On request	AST-5875-II46	AST-5875-IK46	On request	AGS-5731-RC4*
C8-HE	On request	On request	AST-5896-IK46	On request	AGS-5731-RC4*
Phenyl-Hexyl HE	On request	On request	AST-5891-IK46	On request	AGS-5731-RC4*
DM	On request	AST-5810-II46	AST-5810-IK46	On request	AGS-5731-RC4*
Diol	On request	On request	AST-5858-IK46	AST-5858-IM46	On request

5 µm ASTRA® all dimensions in mm						AGS Guard System
Phase	30 × 2.1	50 × 2.1	50 × 3.0	100 × 3.0	150 × 3.0	2.1 mm Cartridges
C18-HE	AST-5732-LD21	AST-5732-LG21	AST-5732-LG30	AST-5732-LI30	AST-5732-LK30	AGS-5731-RD2*
C18-AQ	AST-5832-LD21	AST-5832-LG21	On request	AST-5832-LI30	AST-5832-LK30	AGS-5731-RD2*
C18-BDS	On request	On request	On request	AST-5875-LI30	AST-5875-LK30	AGS-5731-RD2*
C8-BDS	On request	On request	On request	AST-5895-LI30	On request	AGS-5731-RD2*
Phenyl-Hexyl HE	On request	On request	On request	On request	On request	AGS-5731-RD2*
DM	On request	AST-5810-LG21	On request	AST-5810-LI30	AST-5810-LK30	AGS-5731-RD2*
Diol	On request	On request	On request	AST-5858-LI30	On request	On request

* AGS Guard System cartridges require AGS Holder (p/n AGS-5731-000). The holder is supplied with a stainless steel ferrule. Use AGS-5731-RD2 for 2.1 mm ID columns. For applications up to 400 bar, the PEEK ferrule is recommended for use (p/n AGS-5731-Y00).

Ordering information

Analytical columns

5 µm ASTRA® all dimensions in mm		AGS Guard System
Phase	250 × 4.0	4.0 mm Cartridges
C18-HE	On request	AGS-5790-RD4*
C18-AQ	On request	AGS-5790-RD4*
C18-BDS	AST-5875-LM40	AGS-5790-RD4*
C8-HE	AST-5896-LM40	AGS-5790-RD4*
C8-BDS	AST-5895-LM40	AGS-5790-RD4*
Phenyl-Hexyl HE	On request	AGS-5790-RD4*
DM	On request	AGS-5790-RD4*
Diol	On request	On request
Si	AST-5905-LM40	AGS-5731-ND4*

5 µm ASTRA® all dimensions in mm						AGS Guard System
Phase	30 × 4.6	50 × 4.6	100 × 4.6	150 × 4.6	250 × 4.6	4.0 mm Cartridges
C18-HE	AST-5732-LD46	On request	AST-5732-LI46	AST-5732-LK46	AST-5732-LM46	AGS-5790-RD4*
C18-AQ	On request	On request	AST-5832-LI46	AST-5832-LK46	AST-5832-LM46	AGS-5790-RD4*
C18-BDS	On request	On request	AST-5875-LI46	AST-5875-LK46	AST-5875-LM46	AGS-5790-RD4*
C8-HE	On request	On request	On request	AST-5896-LK46	AST-5896-LM46	AGS-5790-RD4*
C8-BDS	On request	On request	On request	AST-5895-LK46	AST-5895-LM46	AGS-5790-RD4*
Phenyl-Hexyl HE	On request	On request	AST-5891-LI46	AST-5891-LK46	AST-5891-LM46	AGS-5790-RD4*
DM	On request	On request	AST-5810-LI46	AST-5810-LK46	AST-5810-LM46	AGS-5790-RD4*
Diol	On request	On request	On request	AST-5858-LK46	AST-5858-LM46	On request
Si	On request	On request	On request	On request	AST-5905-LM46	AGS-5731-ND4*

* AGS Guard System cartridges require AGS Holder (p/n AGS-5731-000). The holder is supplied with a stainless steel ferrule. Use AGS-5731-RD2 for 2.1 mm ID columns. For applications up to 400 bar, the PEEK ferrule is recommended for use (p/n AGS-5731-Y00).

9 µm ASTRA® all dimensions in mm		Guard column
Phase	300 × 8.0	30 × 8.0
Sugar Ca (S)	AST-5906-WN80	AGS-5906-IFC
Sugar H (S)	On request	AGS-5906-JFC

10 µm ASTRA® all dimensions in mm		Guard column
Phase	300 × 8.0	30 × 8.0
Sugar Ca (S)	AST-5906-VN80	AGS-5906-IFC
Sugar H (S)	AST-5927-VN80	AGS-5906-JFC
Sugar K (S)	On request	On request
Sugar Na (S)	On request	On request

10 µm ASTRA® all dimensions in mm		
Phase	30 × 2.1	250 × 4.6
C18-HE	AST-5832-PD21	AST-5732-PM46
C18-AQ	On request	

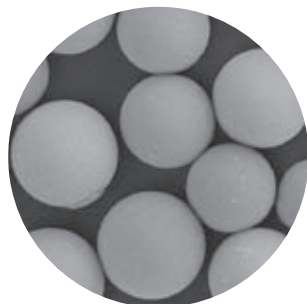


ASTRA® Sugar guard column



As ARION® is one of the latest objects found in space, so it is also the best workhorse for your applications. Explore our new line of ARION® HPLC columns. What innovations does this column bring to you?

- Strict quality control of alkaline and metal content during the silica gel production.
- Narrow particle size and pore size distribution.
- Unique production process ensuring high lot-to-lot reproducibility.
- Good stability at higher temperatures.



ARION® Silicagel

Particle size	5 µm	2.2 µm
Metal content	<10 ppm	<10 ppm
Temperature stability	100 °C*	100 °C*
Mean particle diameter	5.3 ± 0.9 µm	2.5 ± 0.5 µm
Proximity to the shape of a sphere	0.96 ± 0.04	0.97 ± 0.03

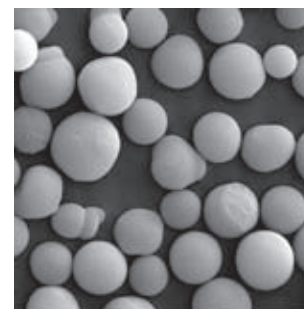
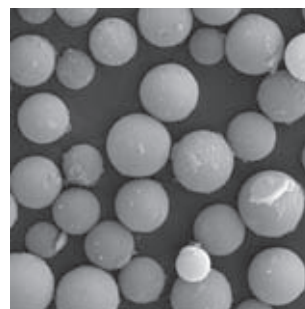
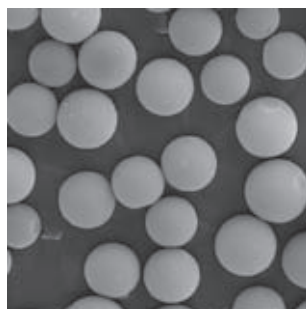
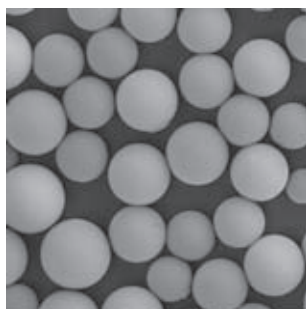
* Depends on mobile phase used and silica bonding.

ARION® phases	Particle size (µm)	Pore size (Å)	Surface area (m ² /g)	Carbon load	pH stability	Endcapping	100% aqueous mobile phase	USP code
Plus C18	1.7, 2.2, 3, 5, 10, 15	100	420	18 %	1.0 to 10	Multi-step	×	L1
Polar C18*	2.2, 3, 5, 10, 15	120	325	16 %	1.5 to 7	Multi-step	✓	L1
C8	3, 5	120	325	11 %	2.0 to 7	Single-step	×	L7
Biphenyl	3, 5	100	325	12 %	2.0 to 7.5	Proprietary	✓	L11
Phenyl-Butyl	2.2, 3, 5	100	300	12 %	1.5 to 7.5	Single-step	×	L11
PFP	5	100	420	14 %	1.5 to 7.5	Single-step	✓	L43
NH ₂	2.2, 3, 5	120	325	5 %	2.0 to 6.5	Proprietary	×	L8
CN	3, 5, 10	120	325	8 %	2.0 to 7	Single-step	×	L10
HILIC Plus	2.2, 3, 5	100	420	–	1.5 to 7	Proprietary	✓	L3
Si	2.2, 3, 5, 10	100	420	–	1.5 to 7	–	×	L3
SAX	5	120	325	–	1.0 to 7.5	–	×	L14
SCX	5	120	325	–	1.0 to 7.5	–	×	L9

* Unique selectivity for Amino Acid and small molecules.

What does ARION® quality look like?

ARION® particles have a very tight distribution and the closest proximity to the shape of a spherical particle ($c=0.9618 \pm 0.0353$). This ensures high separation power and separation reproducibility.



ARION®

Competitor L

Competitor X

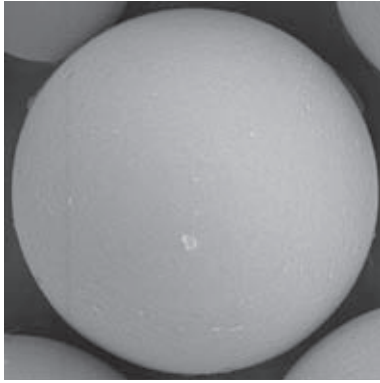
Competitor E

SEM HV analysis 20.0 kV, view field 30 µm (by independent laboratory)

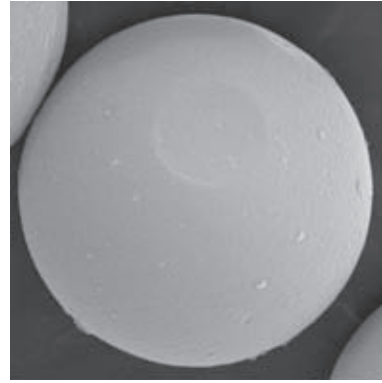
The ARION® medium does not include broken or “potato-shaped” particles. The silica spherical shape is unique; both surface uniformity and surface smoothness enable better packing into HPLC columns and therefore paramount chromatography resolution and reproducibility.

Up close

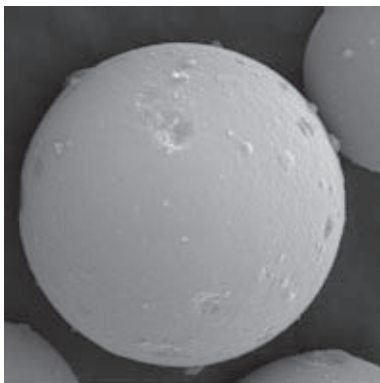
The 5-micron electron microscope field clearly shows the highest quality of ARION® 5µm particles.



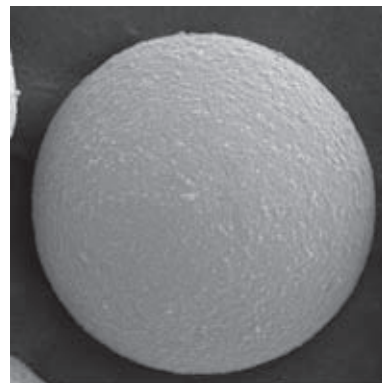
ARION® particle 5 µm



Competitor L particle 5 µm



Competitor X particle 5 µm

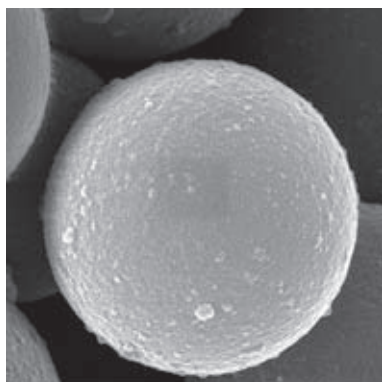


Competitor E particle 5 µm

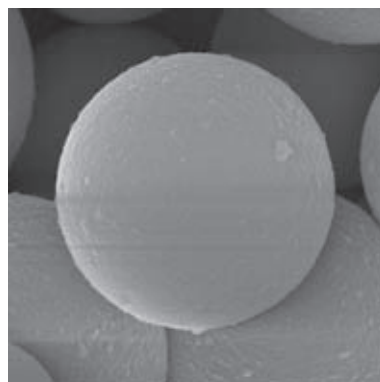
Main particle characteristics:

- The closest proximity to a sphere.
- Unique surface smoothness shown in the pictures above.
- Tight particle size distribution.
- No broken particles.
- No presence of clustered particles.
- No "Moon craters or mountains".

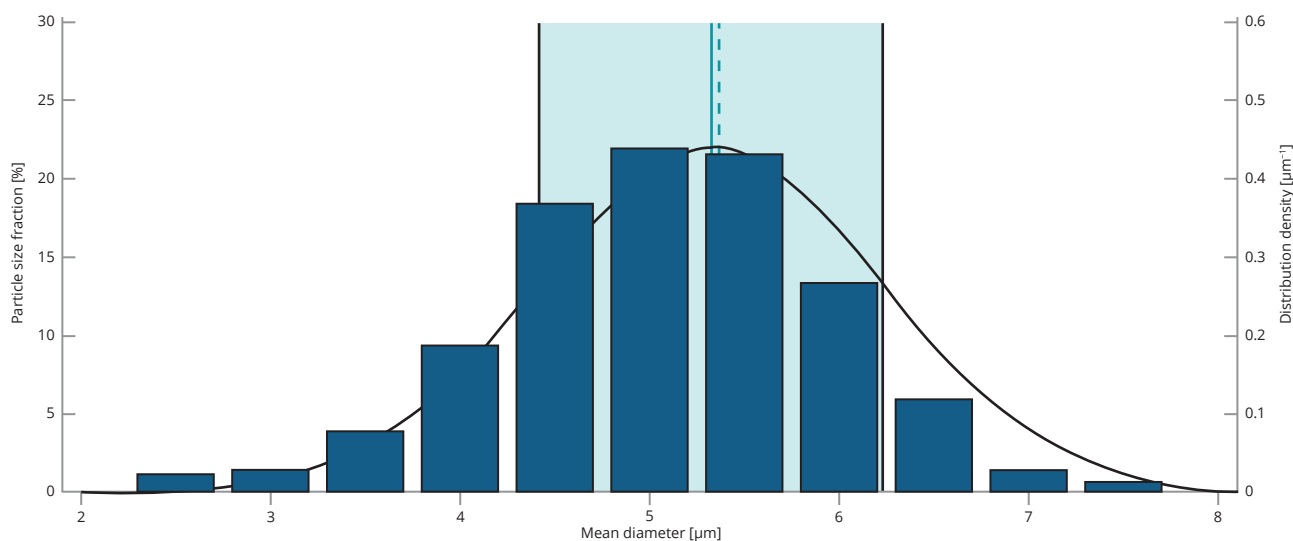
Particle size distribution



ARION® particle 1.7 µm



ARION® particle 2.2 µm

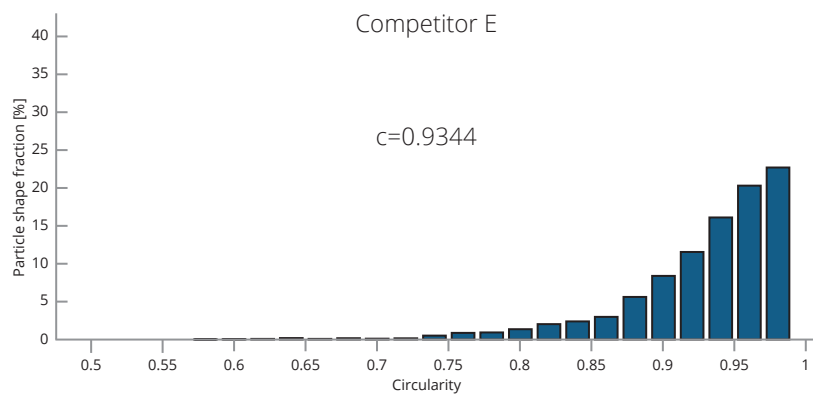
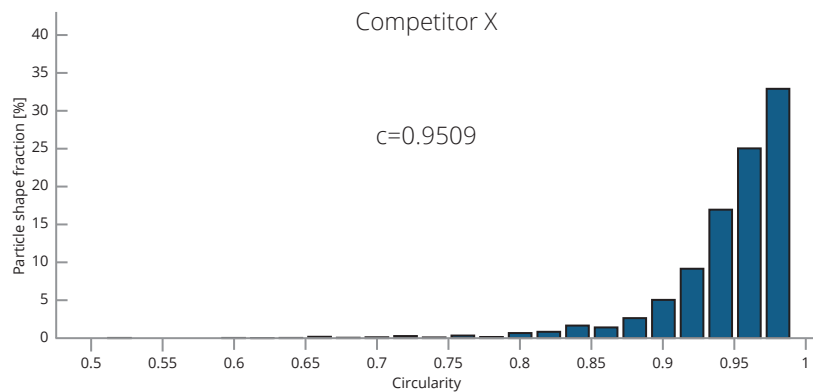
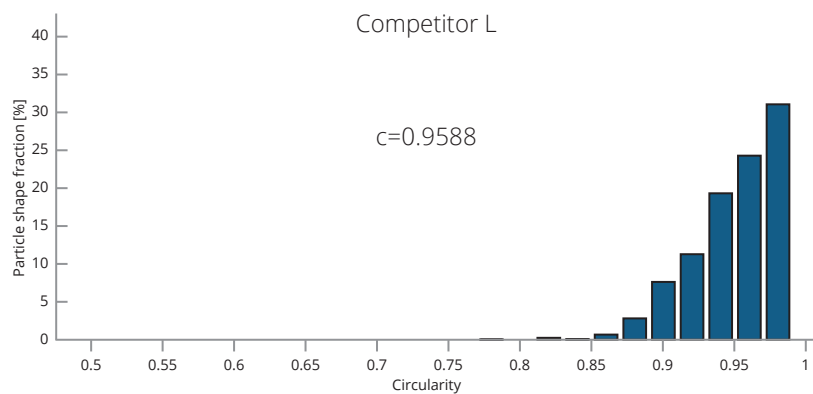
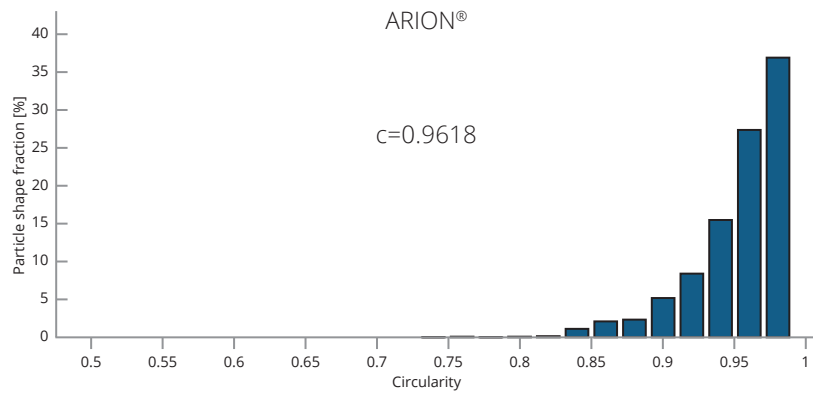


Particle size distribution of ARION® 5 µm particles shows a tight profile calculated from ferret figures by SEM.

ARION® column hardware:

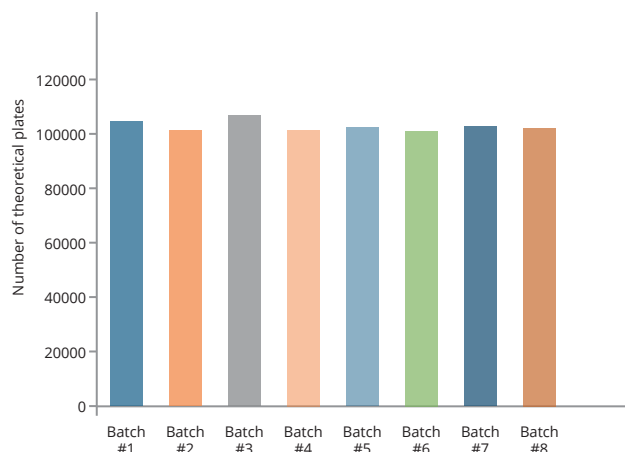
- Modern column hardware for easy handling in a narrow space.
- UHPLC grade Stainless Steel with an amazingly smooth internal surface.
- Colour coded fittings.

Circularity

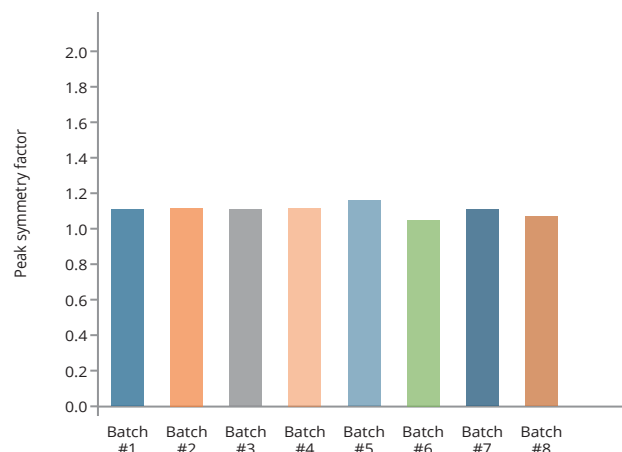


Batch to batch reproducibility

Batch-to-batch reproducibility is shown in the two bar graphs below. The silica batches are strictly controlled and checked for symmetry, and efficiency (number of theoretical plates/meter).



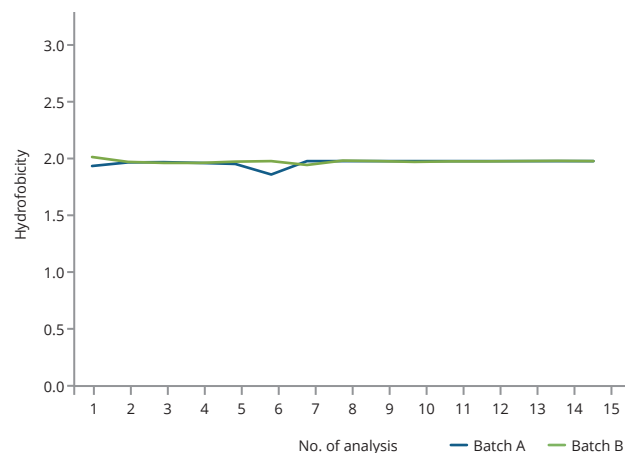
Theoretical plates reproducibility



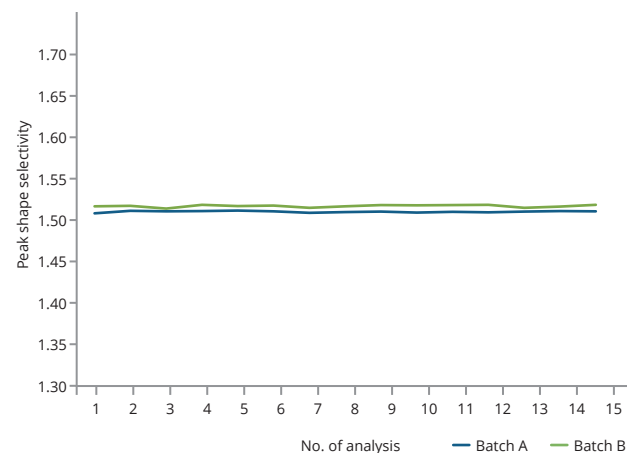
Symmetry reproducibility

Both the silanol activity and hydrophobicity tests are defined e.g. by the Engelhardt test. The hydrophobicity test is based on calculation of the ratio of retention factors $k_{\text{ethylbenzene}}/k_{\text{toluene}}$. The first picture of the Engelhardt test shows a comparison of 2 batches to UHPLC columns for 15 replicates.

Peak shape selectivity is based on a calculation of ratio of $k_{\text{triphenylene}}/k_{\text{o-terpenyl}}$.

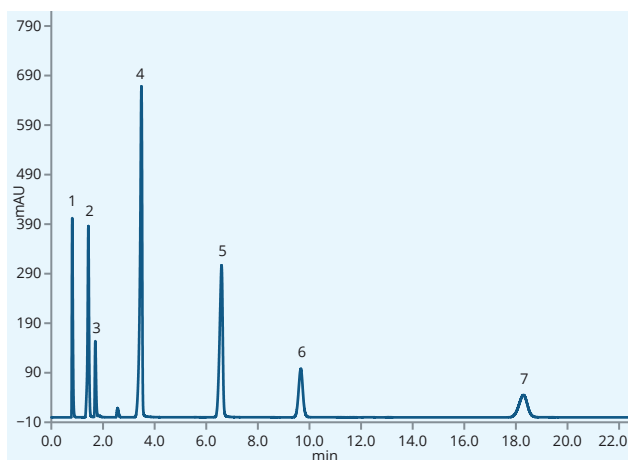


Hydrophobicity test

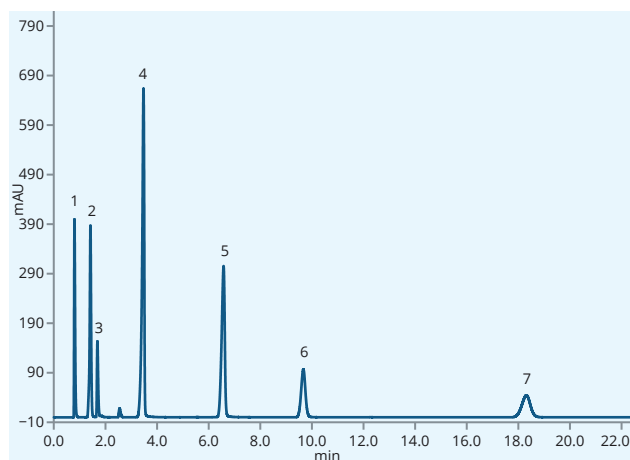


Peak shape selectivity

Batch to batch reproducibility



Batch A



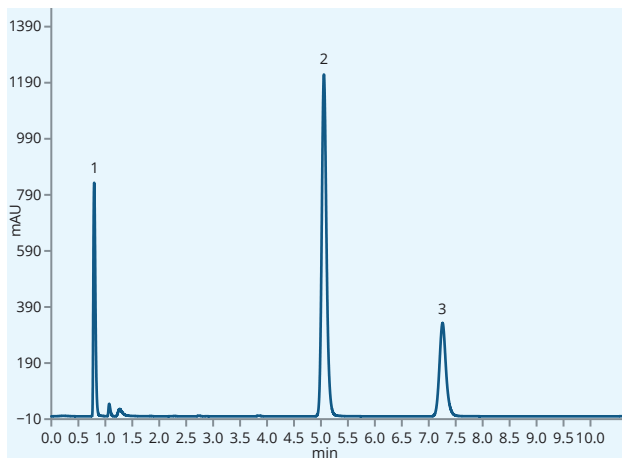
Batch B

Analysis of two batches based on the Engelhardt test.

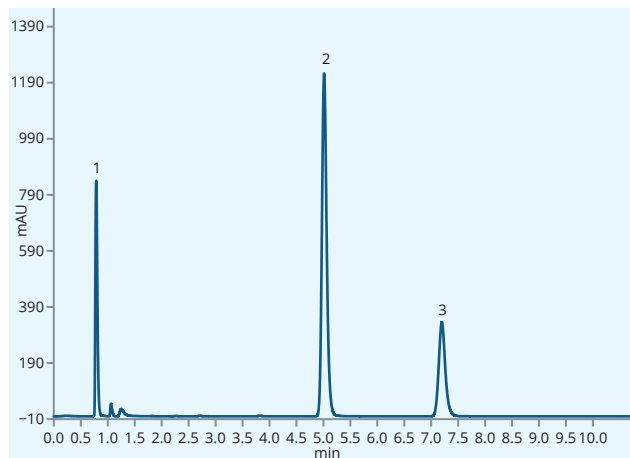
Column	ARION® Plus C18, 1.7 µm
Dimensions	100 mm × 2.1 mm
Mobile phase	Methanol : water 49/51 (v/v) Isocratic elution
Flow rate	0.3 mL/min
Temperature	40 °C

Analytes

1. Uracil (t_R)
2. Aniline
3. Phenol
4. N,N-dimethyl-aniline
5. p-Ethyl-aniline
6. Toluene
7. Ethylbenzene



Batch A



Batch B

Analysis of two batches based on the Shape selectivity test.

Column	ARION® Plus C18, 1.7 µm
Dimensions	100 mm × 2.1 mm
Mobile phase	Methanol : water 79/21 (v/v) Isocratic elution
Flow rate	0.3 mL/min

Temperature

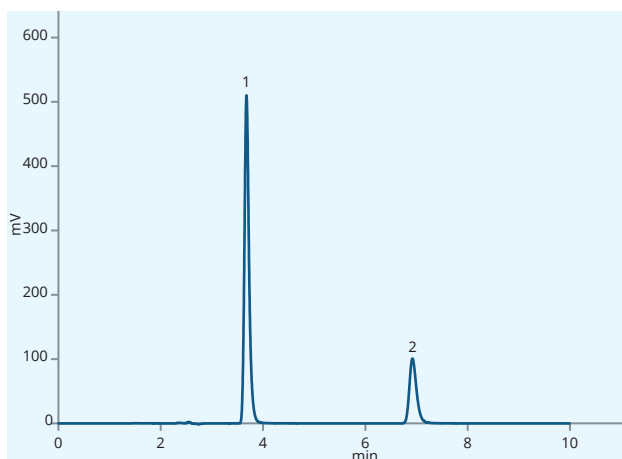
40 °C

Analytes

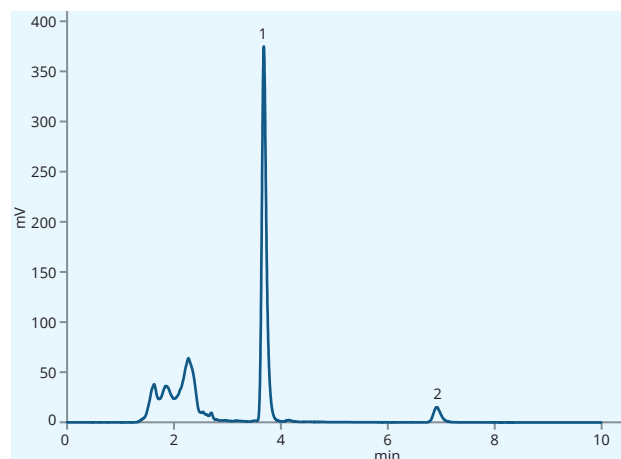
1. Uracil (t_R)
2. Triphenylene
3. o-Terpenyl

Alcaloids – xanthine derivatives

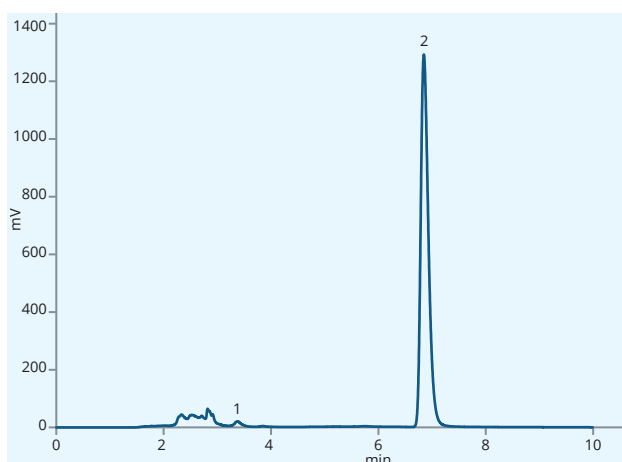
Xanthine alkaloids occur naturally in various plants, such as cocoa, tea and coffee trees. They are commonly used for their effects as mild stimulants. Xanthine alkaloids are monitored in food and drinks, e.g. in chocolate, cocoa powder, and energy drinks.



Theobromine and caffeine standard



Cocoa sample

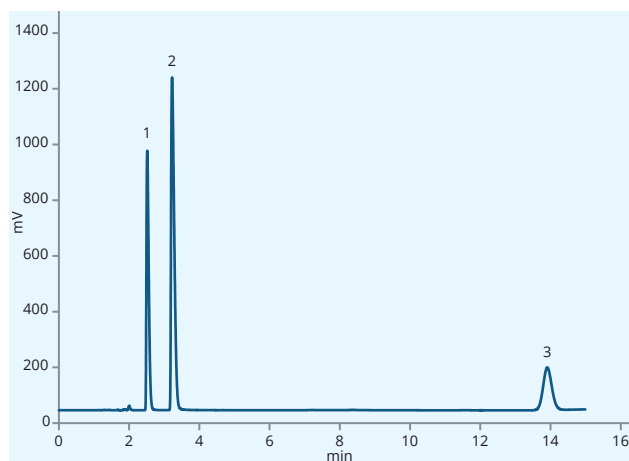


Energy drink

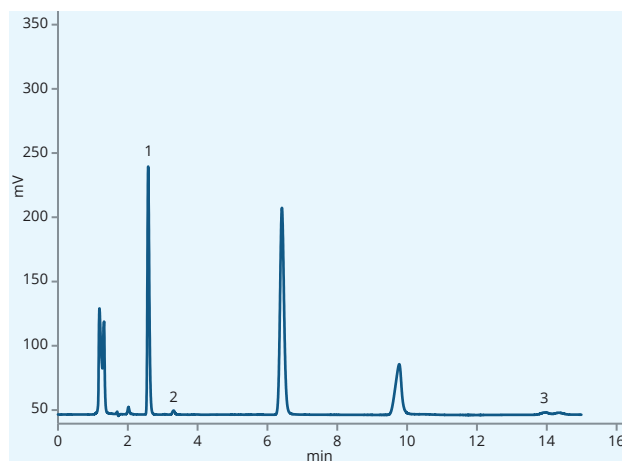
Column	ARION® Plus C18, 5.0 µm
Dimensions	250 mm × 4.6 mm
Part number	ARI-5720-LM46
Mobile phase	Methanol : water 30/70 (v/v)
Flow rate	1.0 mL/min
Temperature	30 °C
Detection	UV @280 nm
Analytes	1. Theobromine 2. Caffeine

Non-nutritive sweeteners

Low-calorie sweeteners are commonly used worldwide in the food and drink industry. The list of approved sweeteners varies from country to country. The most common method used to monitor these highly consumed products involves high performance liquid chromatography (HPLC or UHPLC).



Standard mixture

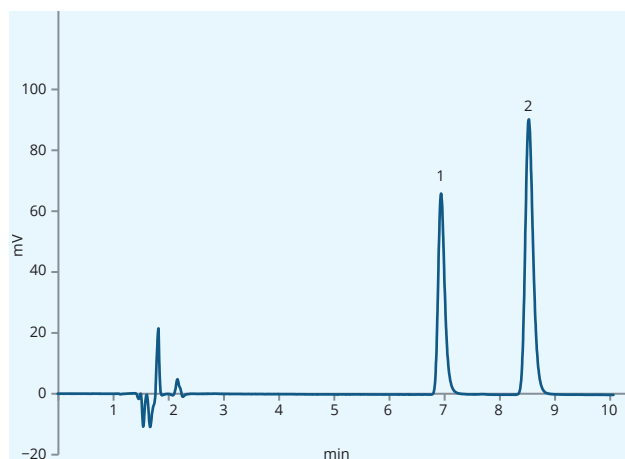


Energy drink

Column	ARION® Plus C18, 5.0 µm
Dimensions	250 mm × 4.6 mm
Part number	ARI-5720-LM46
Mobile phase	20 mM KH ₂ PO ₄ : ACN 90/10 (v/v)
Flow rate	2.0 mL/min
Temperature	30 °C
Detection	UV @220 nm
Analytes	1. Acesulfame-K (ACS-K) 2. Saccharin (SAC) 3. Aspartame (ASP)

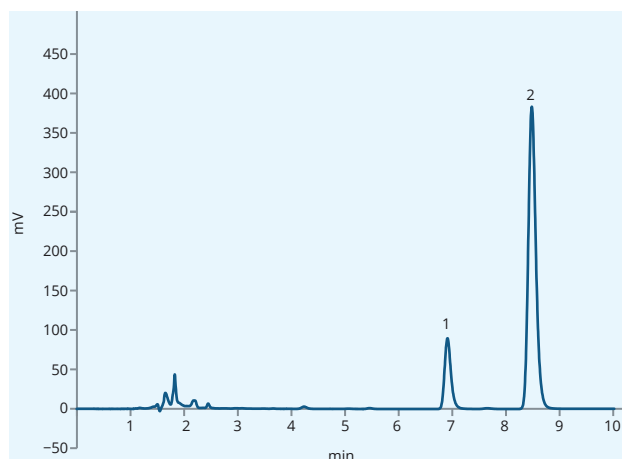
Preservatives in syrup

Sodium and potassium salts of benzoic acid and sorbic acid are well-known food preservatives. The permitted amount in food is strictly regulated with the level depending on the food group. As an example, European regulation EC 1333/2008 sets the rules on food additives: definitions, conditions of use, labelling and procedures.



Standard mixture

Column	ARION® Plus C18, 5.0 µm
Dimensions	250 mm × 4.6 mm
Part number	ARI-5720-LM46
Mobile phase	Citrate buffer pH 4.1 : ACN : MeOH 70/20/10 (v/v/v)

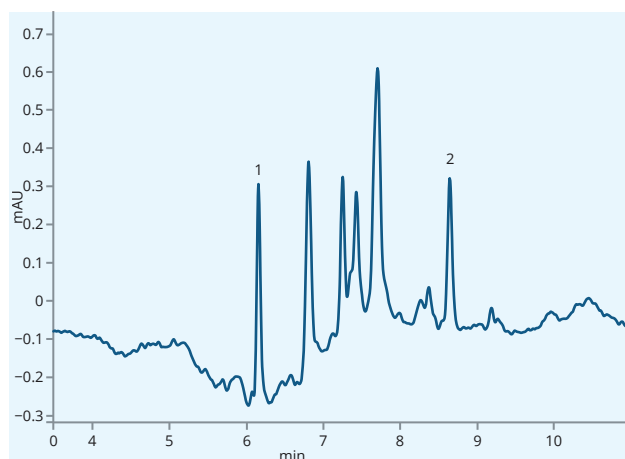


Fruit syrup sample

Flow rate	1.5 mL/min
Temperature	30 °C
Detection	UV @240 nm
Analytes	1. Sodium benzoate 2. Potassium sorbate

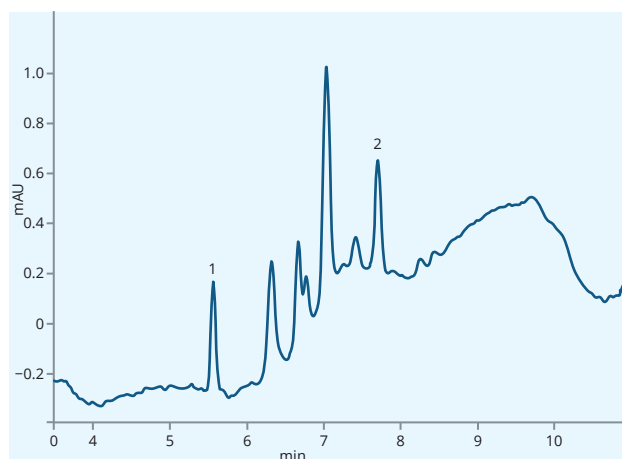
Preservatives in fats and oils

BHA is used as an antioxidant and preservative in food, animal feed, cosmetics and in rubber and petroleum products. BHT is also used as a preservative and, additionally, as a dietary supplement. BHA is generally recognized as being safe for use in food if the total amount does not exceed 0.02 % fat or oil (FDA). It is suspected of being a human carcinogen.



Matrix standard on ARION® column

Column	ARION® Plus C18, 5.0 µm
Dimensions	250 mm × 4.6 mm
Part number	ARI-5720-LM46
Mobile phase	Citrate buffer pH 4.1 : ACN : MeOH 70/20/10 (v/v/v)

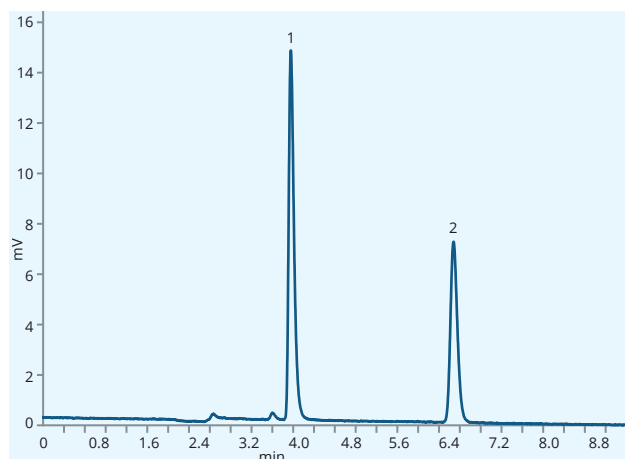


Matrix standard on competitive column (Competitor LI)

Flow rate	Proprietary
Temperature	Proprietary
Detection	UV (wavelength proprietary)
Analytes	1. BHA 2. BHT

Organic acids

The identification and quantitative analysis of major organic acids in fruits and vegetables is considered very important for the food and beverage industry. Organic acids play a significant role thanks to their influence on flavour, stability and keeping quality. Organic acids are generated during the aerobic oxidation of carbohydrates, proteins and fats in most biological systems.

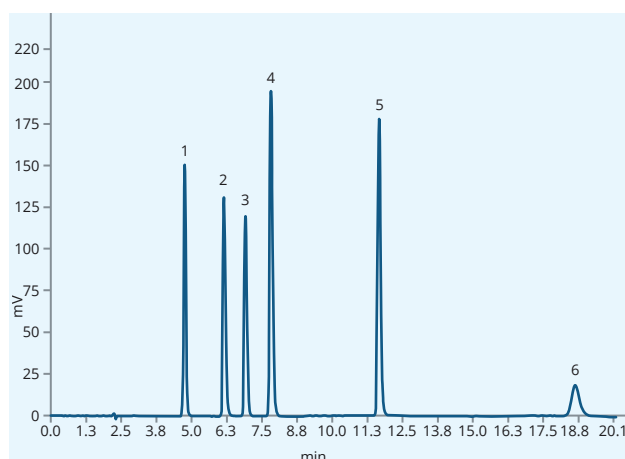


Standard mixture

Column	ARION® Polar C18, 5.0 µm
Dimensions	250 mm × 4.6 mm
Part number	ARI-5721-LM46
Mobile phase	0.05% H ₃ PO ₄
Flow rate	1.0 mL/min
Temperature	30 °C
Detection	UV @207 nm
Analytes	1. Formic acid 2. Acetic acid

Drink additives

This application shows the separation of three groups of compounds in parallel: non-nutritive sweeteners, preservatives (organic acids) and xanthine derivatives.



Standard mixture

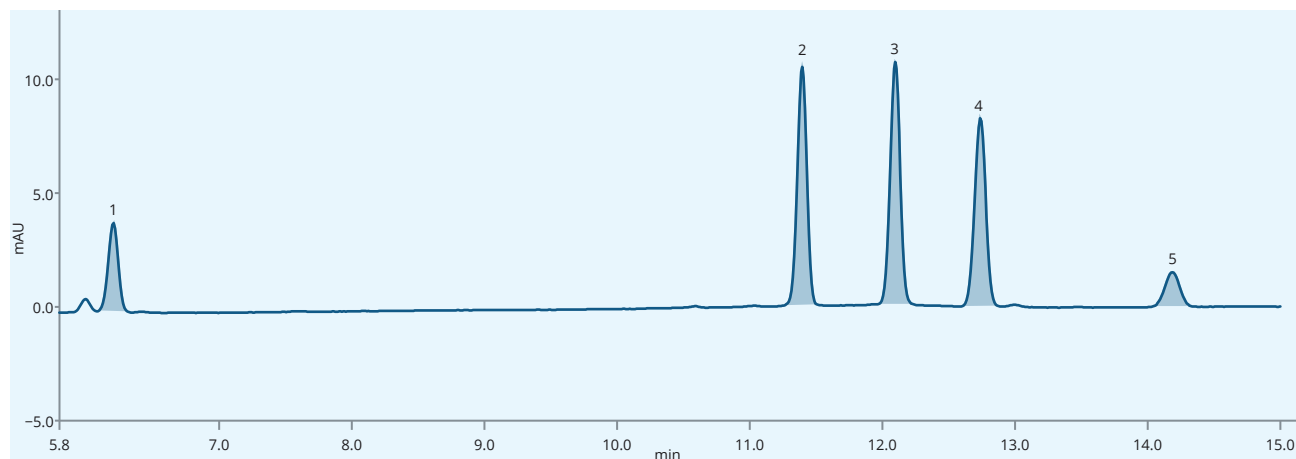
Column	ARION® Plus C18, 5.0 µm
Dimensions	150 mm × 4.6 mm
Part number	ARI-5720-LK46
Mobile phase	Acetonitril : methanol : 17.5 mmol/L KH ₂ PO ₄ 0.1 mol/L NaOH > pH=6.0 gradient according table below*
Temperature	Ambient
Detection	UV @214 & 230 nm
Analytes	1. Acesulfame-K 2. Benzoic acid 3. Saccharin 4. Sorbic acid 5. Caffeine 6. Aspartame

* Gradient program

Time (min)	Flow rate (mL/min)	Wavelength (nm)	A (%) Water	B (%) 17.5 mmol KH ₂ PO ₄	C (%) Acetonitrile	D (%) Methanol
0	1.3	230	0	90	2	8
7	1.5	214	0	80	8	12
14	1.5	214	0	80	8	12
15	1.3	214	0	90	2	8
17	1.3	214	0	90	2	8

Vitamins A and E

Fat-soluble vitamins are monitored not only in patient's samples, but are also the subject of quality control in various food and dietary supplements.

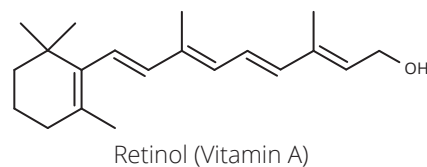
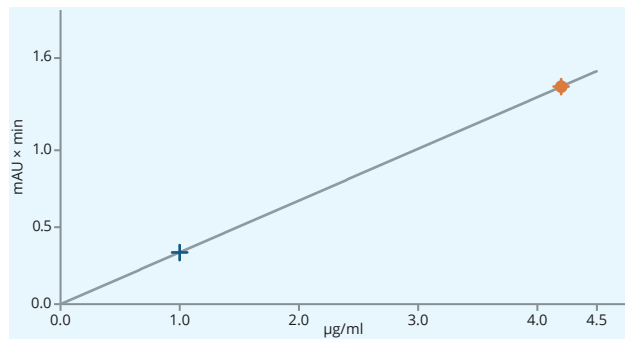


Standard on ARION® column

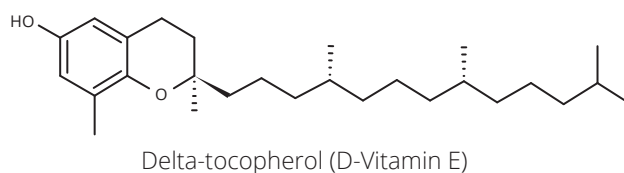
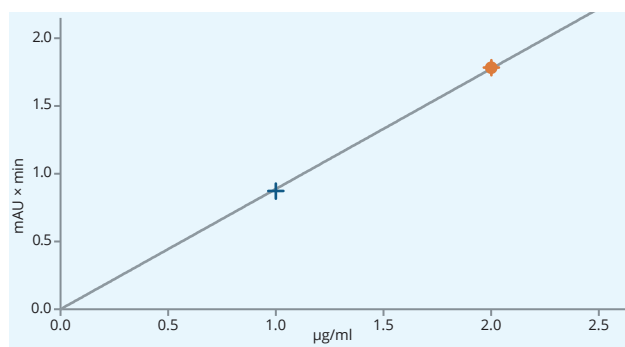
Column	ARION® Plus C18, 3 µm		
Dimensions	100 mm × 4.6 mm		
Part number	ARI-5720-II46		
Mobile phase	A: Water B: Methanol		
Gradient elution	Time	A (%)	B (%)
	0	15	85
	10	0	100
	18	0	100
Flow rate	1.0 mL/min		
Temperature	40 °C		
Injection volume	5.0 µL		
Detection	UV @284 nm		
Analytes	1. Retinol (Vitamin A) 2. Delta-tocopherol (D-Vitamin E) 3. Gamma-tocopherol (Vitamin E γ) 4. Alfa-tocopherol (Vitamin E α) 5. Alpha-Tocopheryl acetate (Vitamin E acetate)		

Vitamins A and E

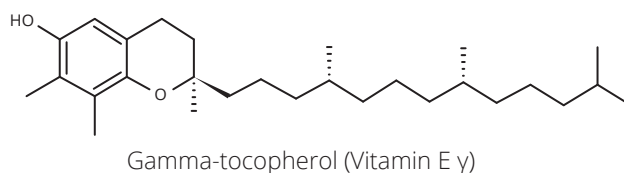
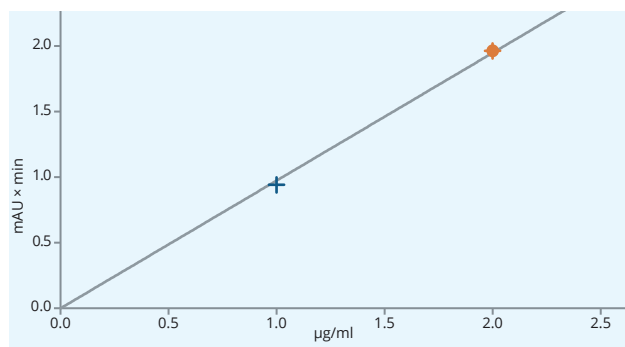
Calibration curves of analytes



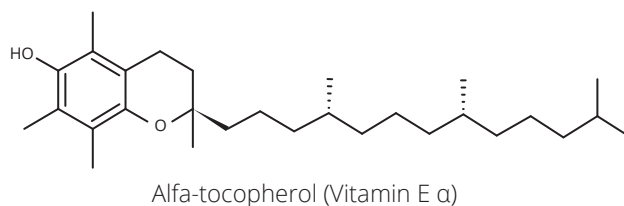
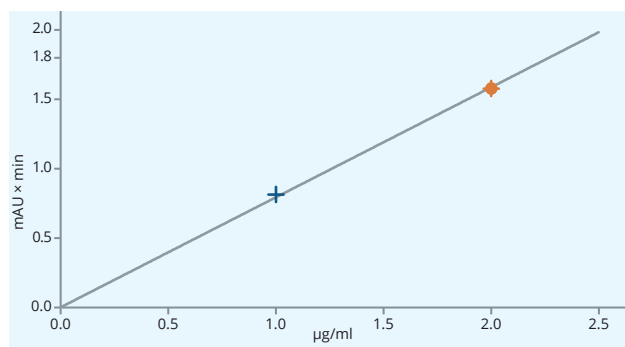
Retinol (Vitamin A)



Delta-tocopherol (D-Vitamin E)



Gamma-tocopherol (Vitamin E γ)

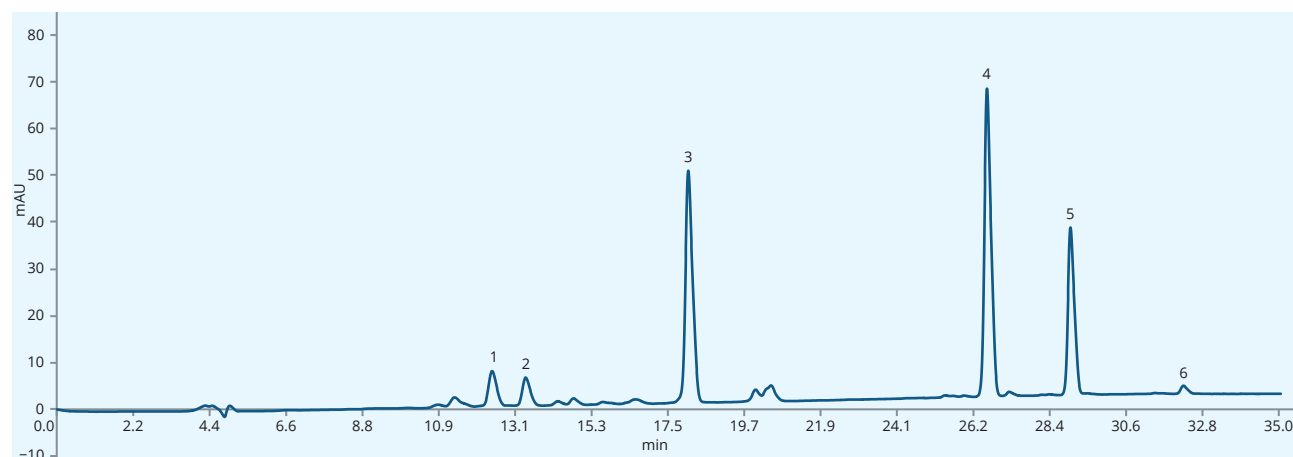


Alfa-tocopherol (Vitamin E α)

This application has been developed by WESSLING Hungary Kft.

Wheat pigments

This application has been developed by ALGATECH, the Institute of Microbiology of the Academy of Sciences, Czech Republic. Chlorophylls and carotenoids are essential cofactors for oxygenic photosynthesis. As the content and stoichiometries of individual pigments are vary significantly in plant leaves under different environmental conditions, the quantification of pigments is important for understanding plant physiology, but also for food-quality monitoring.

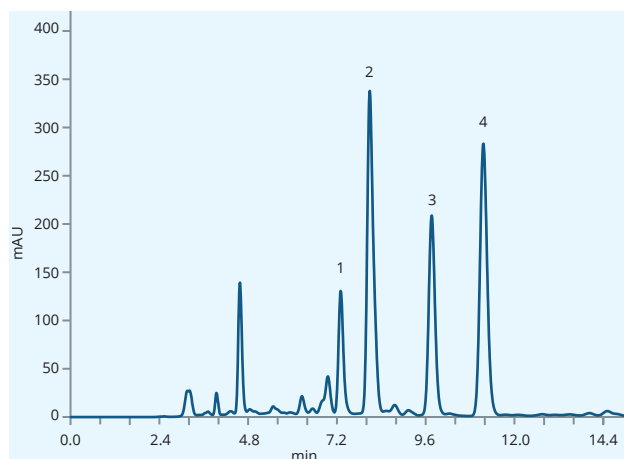


Wheat extract on ARION® column

Column	ARION® C8, 5 µm
Dimensions	250 mm × 4.6 mm
Part number	ARI-5734-LM46
Mobile phase	A: Methanol : Acetonitrile : 0.25M pyridine 32/14/54 (v/v/v) B: Methanol : Acetonitrile : Acetone 20/60/20 (v/v/v)
Gradient	Linear gradient of solvent B (60–100 % in 25 min) followed by 100 % solvent B
Flow rate	0.8 mL/min
Temperature	40 °C
Detection	DAD @450 nm
Analytes	1. Neoxanthin 2. Violaxanthin 3. Lutein 4. Chlorophyll b 5. Chlorophyll a 6. β-Carotene

Bitter acids in hop

Alpha-bitter acids are precursors of iso- α -bitter acids that are formed during the brewing process. They are present in hops (*Humulus Lupulus L.*) and their content depends on plant species and growing conditions. Iso- α -bitter acids give an appreciable bitter taste to the beer.

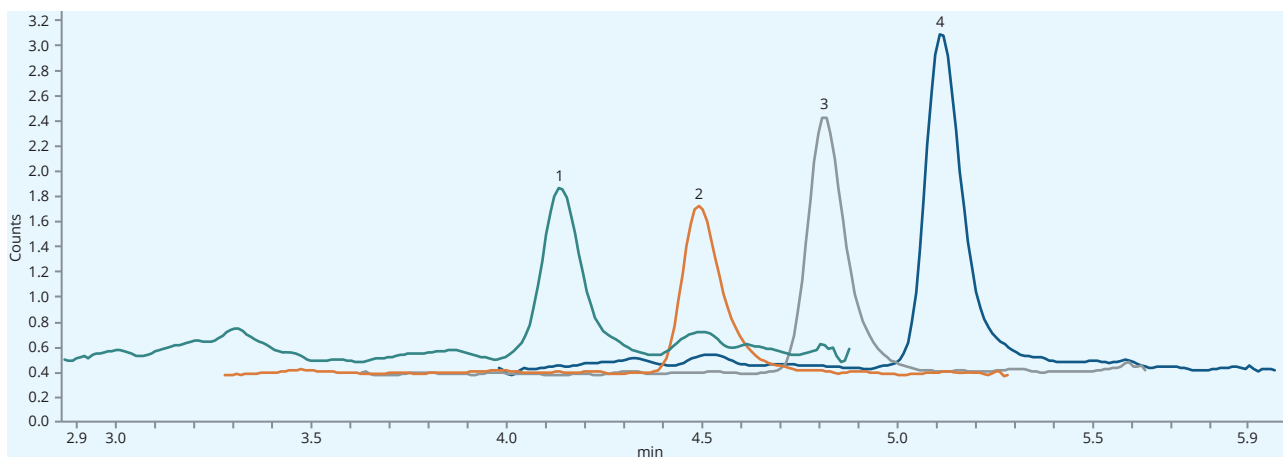


Alpha- & beta- acids in hop sample

Column	ARION® Plus C18, 5.0 μ m
Dimensions	250 mm $\times$ 4.6 mm
Part number	ARI-5720-LM46
Mobile phase	MeOH : water : phosphoric acid 850/150/5 (v/v/v) Isocratic elution
Flow rate	0.8 mL/min
Temperature	40 °C
Detection	UV @314 nm
Analytes	1. Co-humulone 2. Humulone 3. Co-lupulone 4. Lupulone

Aflatoxins by LC/MS

Aflatoxins are Group 1 carcinogens and are a natural product of mould. Mycotoxins are monitored worldwide and allowed concentration limits depend not only on the territory, but also on the food/feed matrix and are given by local administrations.

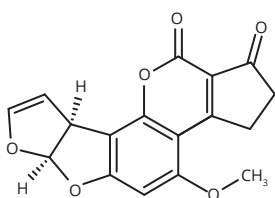


Stress test – test mixture on ARION® column

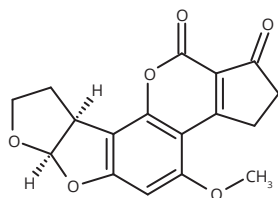
Column	ARION® Plus C18, 2.2 µm	
Dimensions	100 mm × 2.1 mm	
Part number	ARI-5720-EI21	
Mobile phase	A: 5mM ammonium formate / 0.2% formic acid B: Methanol / 0.2% formic acid	
Gradient elution	Time	A (%)
	0.0	70
	0.5	70
	8.0	0
	10.5	0
	10.6	70
Flow rate	0.35 mL/min	
Temperature	40 °C	
Analytes	1. Aflatoxin B1 2. Aflatoxin B2 3. Aflatoxin G1 4. Aflatoxin G2	

MS method:

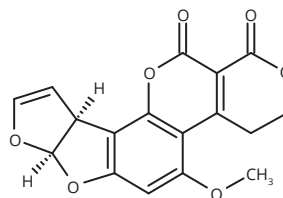
Compound name	Precursor Ion	Product Ion	Collision energy
Aflatoxin B1	313.07	284.9	25
Aflatoxin B1	313.07	240.9	45
Aflatoxin B2	315.09	286.9	33
Aflatoxin B2	315.09	259	33
Aflatoxin G1	329.07	310.9	25
Aflatoxin G1	329.07	198.9	57
Aflatoxin G2	331.08	312.9	25
Aflatoxin G2	331.08	189.1	49



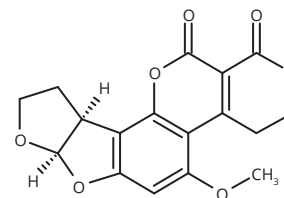
Aflatoxin B1



Aflatoxin B2



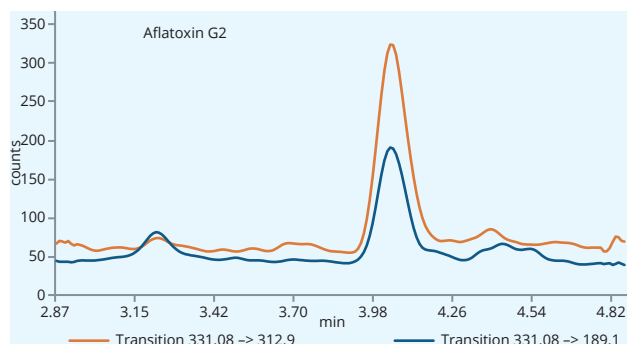
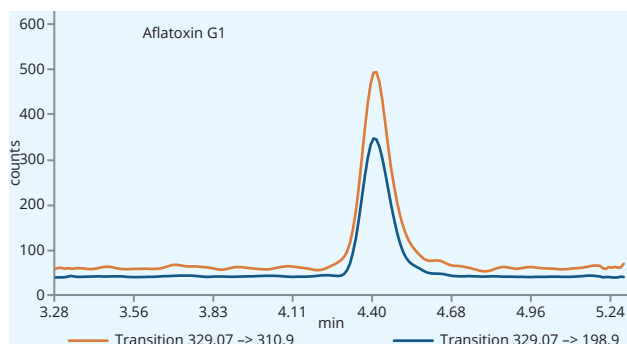
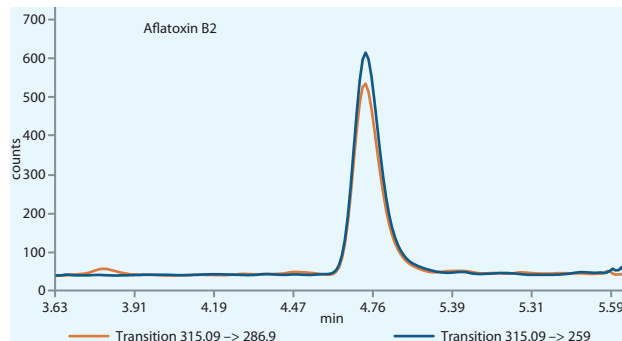
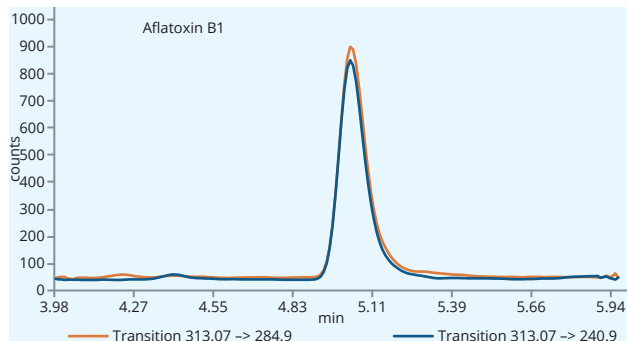
Aflatoxin G1



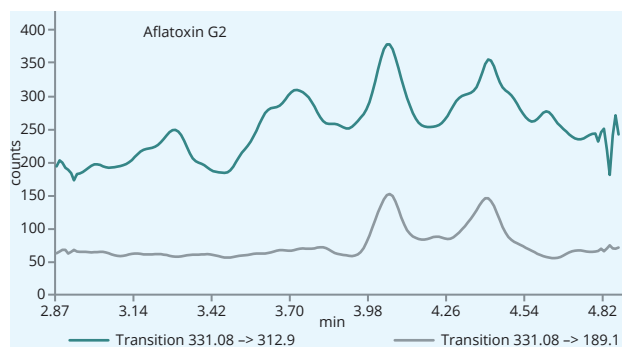
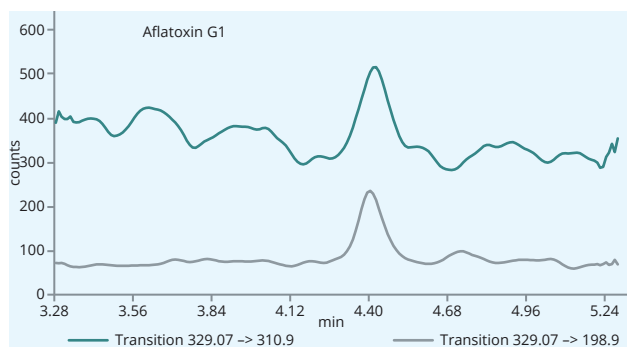
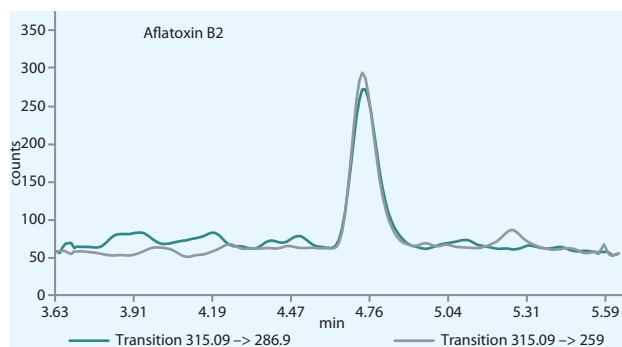
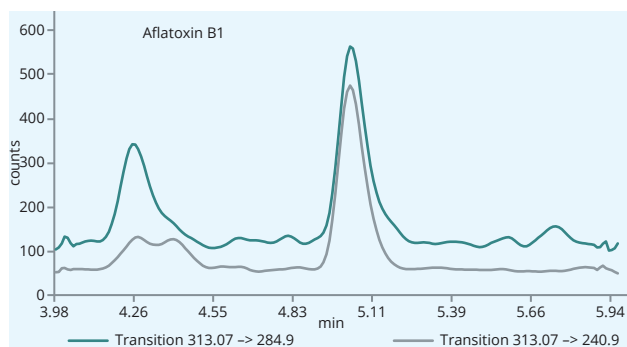
Aflatoxin G2

Aflatoxins by LC/MS

This page shows analyses of peppers and Brazil nuts.



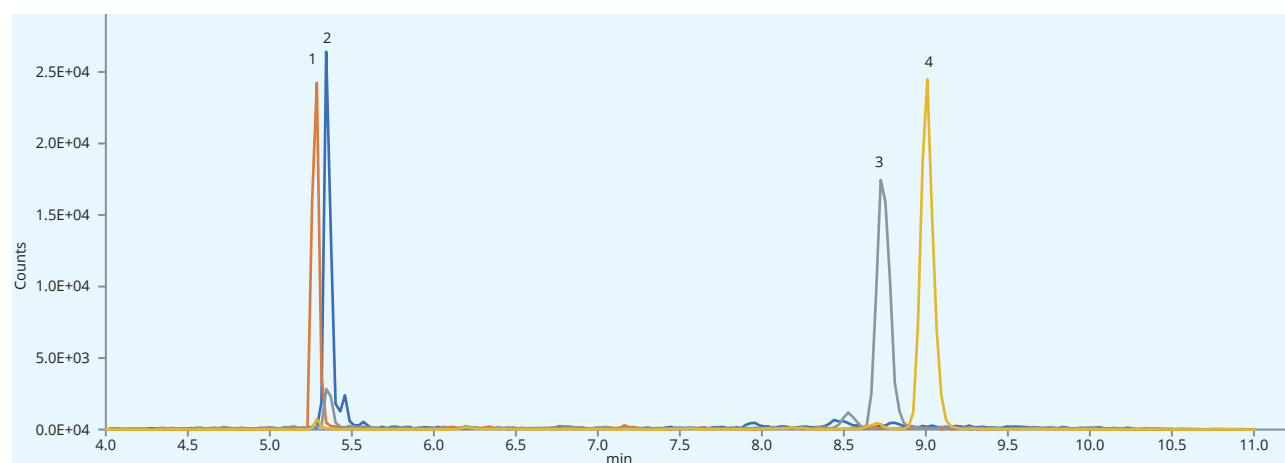
LC/MS analyses of aflatoxins in Brazil nuts



LC/MS analyses of aflatoxins in peppers

Vitamin D in dry blood spot

Vitamin D is a group of steroids that have various effects on the human body and support the immune system. This application shows LC/MS/MS separation of the hydroxylated and non-hydroxylated forms of vitamin D2 and vitamin D3. The amount of their hydroxylated forms determines the total vitamin D in a blood sample. Non-hydroxylated forms of vitamin D2 and vitamin D3 are important for food analysis. The LC/MS/MS chromatogram shows the separation of all the above mentioned analytes.



Standard mixture on ARION® column

Chromatography method:

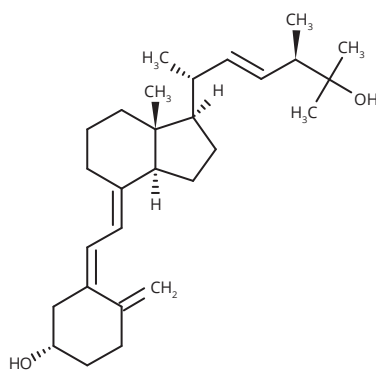
Column	ARION® Polar C18, 2.2 µm		
Dimensions	100 mm × 2.1 mm		
Part number	ARI-5720-EI21		
Mobile phase	A: H ₂ O, 0.1% formic acid B: MeOH, 0.1% formic acid		
Gradient elution	Time	A (%)	B (%)
	0.0	70	30
	2.0	0	100
	7.0	0	100
	7.1	30	70
	12.0	30	70
Flow rate	0.4 mL/min		
Temperature	25 °C		
Injection volume	10 µL		
Detection	UV @280 nm		
Analytes	1. 25-OH-Vitamin D3 2. 25-OH-Vitamin D2 3. Vitamin D2 4. Vitamin D3		

Vitamin D in dry blood spot

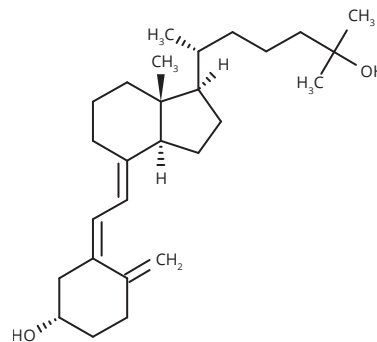
MS method:

Ionisation	Positive APCI		
Collision gas	Nitrogen		
MRM transition	Analyte	Q1 (Da)	Q3 (Da)
	25-OH-Vitamin D2	413.32	395.30
	25-OH-Vitamin D3	401.22	365.40
	Vitamin D2	397.44	379.20
	Vitamin D3	385.32	259.40
Dwell time	150 ms		

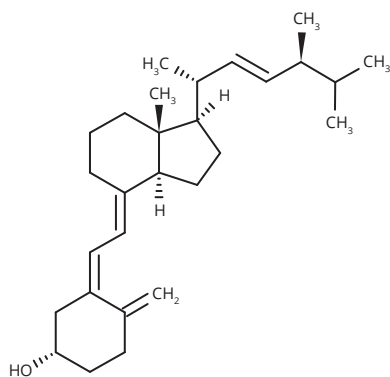
This application was developed by Ján Šmoldas.



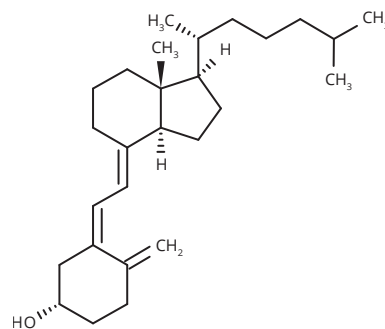
25-OH-Vitamin D2



25-OH-Vitamin D3



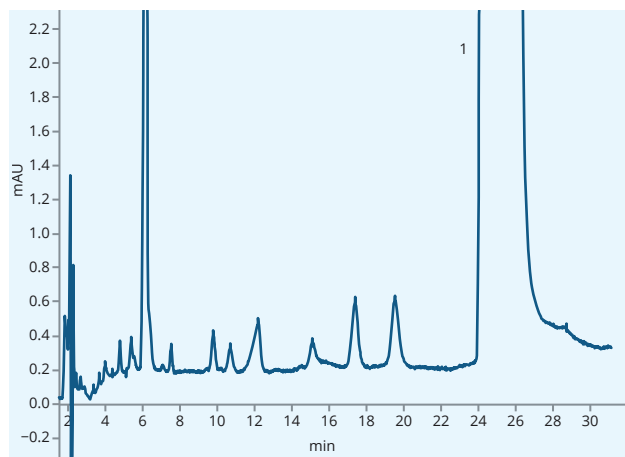
Vitamin D2



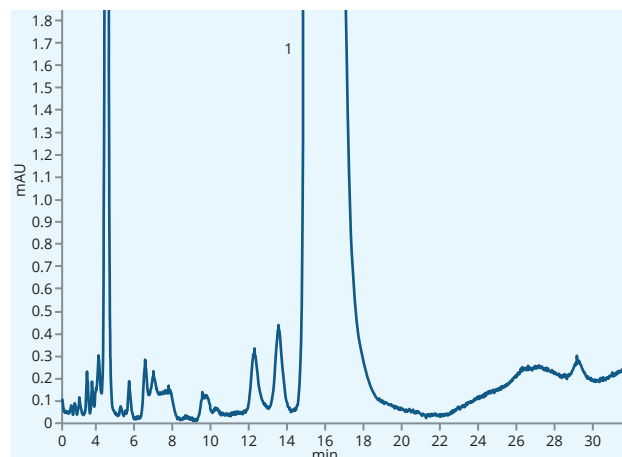
Vitamin D3

Pharmaceutical drugs

Penicillin is a well known antibiotic discovered by Alexander Fleming, which was isolated from the mold *Penicillium notatum*. The application shows better separation of impurities in pharmaceutical production.



Separation on ARION® column

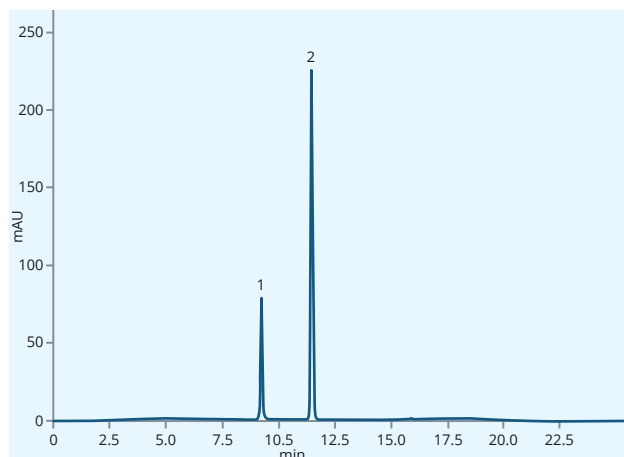


Separation on competitive column (Competitor LI)

Column	ARION® Plus C18, 5.0 µm
Dimensions	250 mm × 4.6 mm
Part number	ARI-5720-LM46
Mobile phase	Gradient elution (proprietary)
Flow rate	1.2 mL/min
Detection	UV @254 nm
Analytes	1. Penicillin

Ipidacrine

Ipidacrine is a drug inhibitor of acetylcholinesterase produced for the treatment of memory disorders caused by various diseases. It was first synthesized by the National Research Centre for Biologically Active Compounds (Russian Federation).

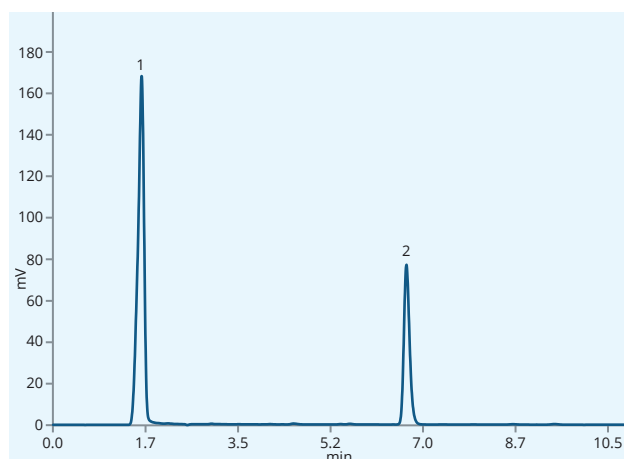


Standard mixture

Column	ARION® Plus C18, 5.0 µm
Dimensions	250 mm × 4.6 mm
Part number	ARI-5720-LM46
Mobile phase	Proprietary
Flow rate	Proprietary
Temperature	Proprietary
Detection	DAD
Analytes	1. Impurity A 2. Ipidacrine

Ibuprofen

Ibuprofen is a substance from a group of non-steroidal anti-inflammatory drugs. In order for the drug release to be targeted on the basis of pH change (gradual release for up to 30 days), binding to a polymeric carrier is used.

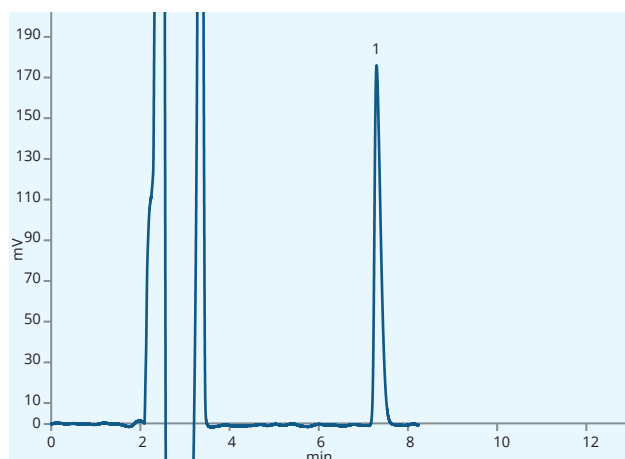


Standard mixture

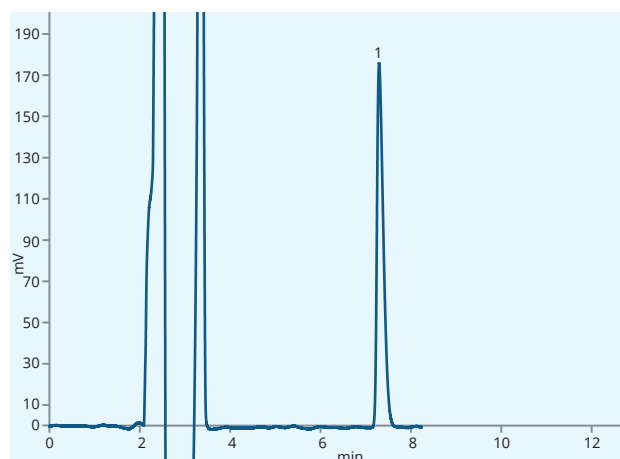
Column	ARION® Plus C18, 5.0 µm
Dimensions	250 mm × 4.6 mm
Part number	ARI-5720-LM46
Mobile phase	ACN : water 70/30 (v/v) + 0.1% formic acid Isocratic elution
Flow rate	1.0 mL/min
Temperature	Ambient
Detection	UV @265 nm
Analytes	1. Ibuprofen on polymer carrier 2. Ibuprofen

Pharmaceutical drugs

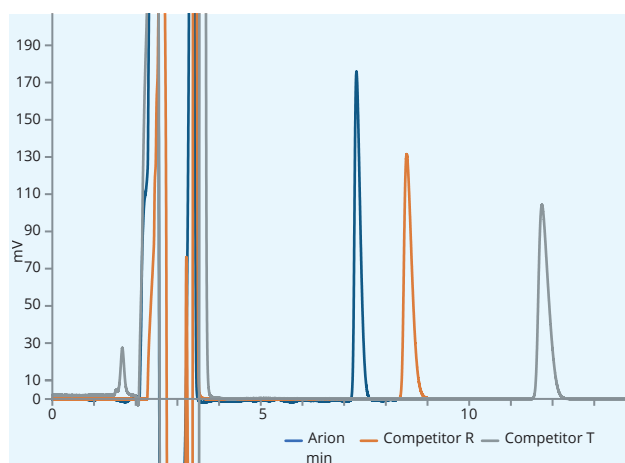
Tamsulosin hydrochloride is used to treat the symptoms of an enlarged prostate. Tamsulosin hydrochloride is an alpha-blocker which is used to treat the symptoms of an enlarged prostate by relaxing the muscles of the prostate and bladder. Tamsulosin is sold under various trade names, e.g. Flomax, Urimax, Contiflo XL, Mesir LP, Prostanil MR, Tamsin and Fokusin. Shown below is a chromatogram of the determination of the tamsulosin hydrochloride content according to the proprietary method.



Standard mixture



Drug sample

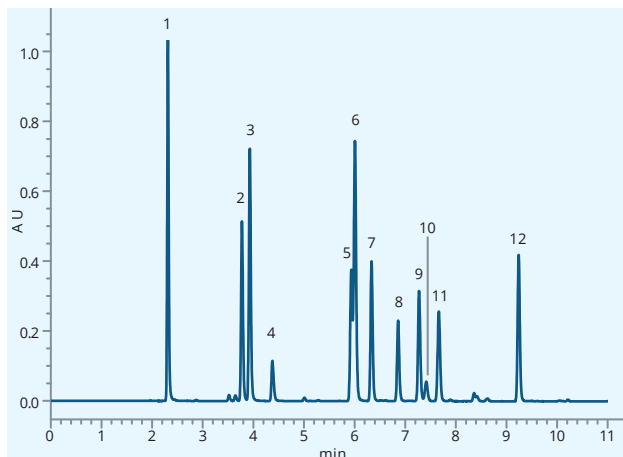


Comparison of fully porous particles

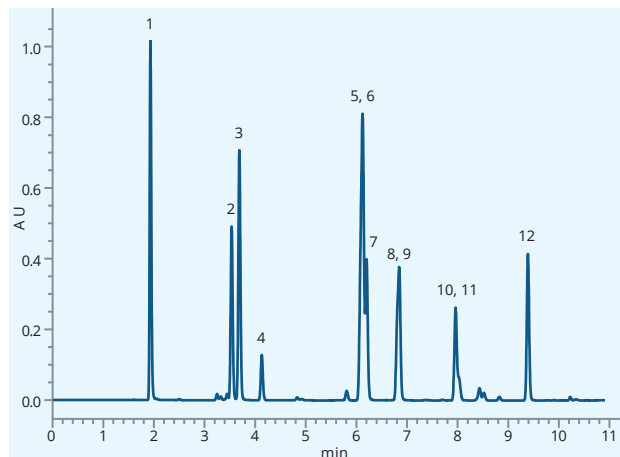
Column	ARION® Plus C18, 5.0 µm
Dimensions	250 mm × 4.6 mm
Part number	ARI-5720-LM46
Mobile phase	Acetate buffer : acetonitrile
Flow rate	1.0 mL/min
Temperature	30 °C
Detection	UV @225 nm
Analytes	1. Tamsulosin hydrochloride

Fluorinated compounds

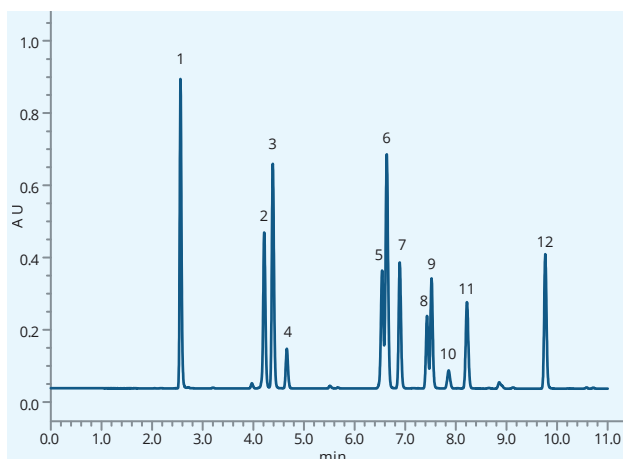
This application shows the ARION® column overcomes a co-elution of two critical pairs of fluoro- and des-fluoro-compounds. Separation of these compounds is problematic in general.



Sample on ARION® column



Sample on Competitive hybrid column TE

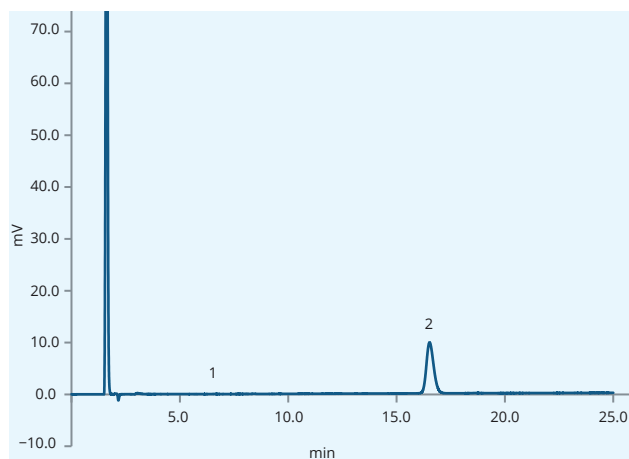


Sample on Competitive hybrid column TS

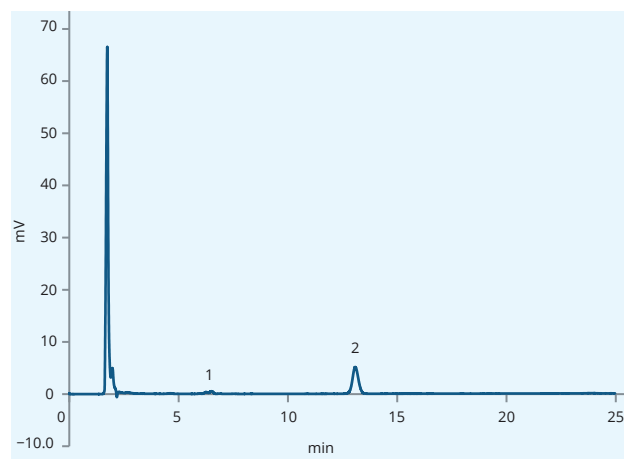
Column	ARION® Plus C18, 3.0 µm		
Dimensions	150 mm × 4.6 mm		
Part number	ARI-5720-IK46		
Mobile phase	A: 0.1% formic acid (dissolve 1 mL of formic acid in 1000 mL of Milli-Q water) B: ACN		
Gradient elution	Time	A (%)	B (%)
	0	60	40
	9	20	80
	10	5	95
	14	5	95
	14.1	60	40
	15.5	60	40
Flow rate	1.0 mL/min		
Temperature	30 °C		
Detection	UV @275 nm		
Analytes	5. Fluoro-compound 6. Fluoro-compound 7. Des-fluoro-compound 8. Des-fluoro-compound All other compounds are confidential.		

Veterinary drugs

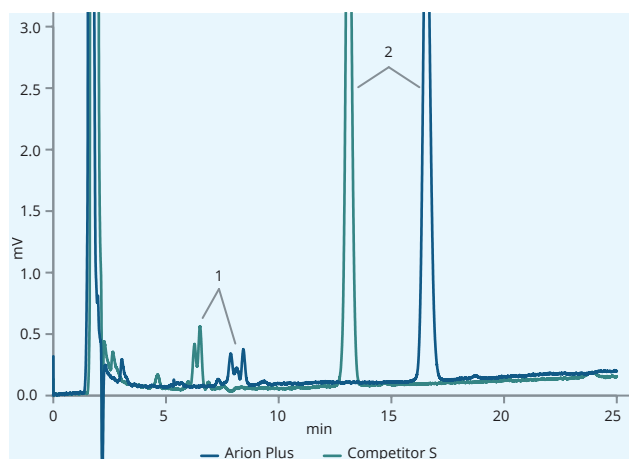
Tiamulin hydrogen fumarate is a semisynthetic drug with an antibacterial effect. It is used to treat animal diseases, such as swine dysentery (caused by *Brachyspira hyodysenteriae*), swine pneumonia or mycoplasmal arthritis. Tiamulin is also used for the prevention and treatment of chronic respiratory diseases in domestic chickens and turkeys.



Sample – 2% premix on ARION® column



Sample – 2% premix on competitive column (Competitor S)

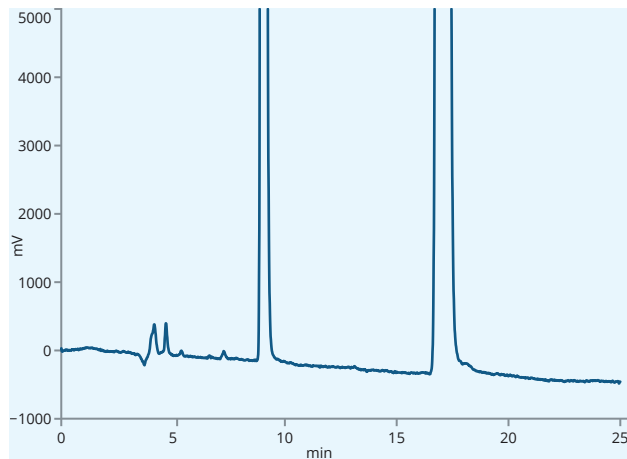


Detailed view on impurities

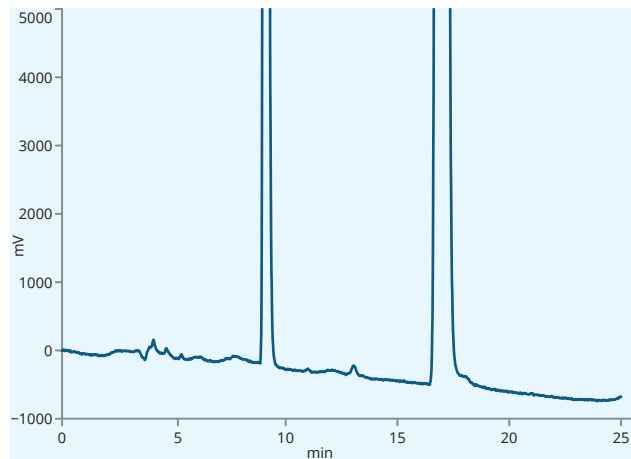
Column	ARION® Plus C18, 5.0 µm
Dimensions	250 mm × 4.6 mm
Part number	ARI-5720-LM46
Mobile phase	Confidential, optimized method of Czech Pharmacopoeia (2017, 6.0:1659)
Analytes	1. Impurities 2. Tiamulin hydrogen fumarate

Veterinary drugs

Trimetoprim and Sulfamethazine are veterinary drugs used to treat animals of various species with gastrointestinal and respiratory tract infections. This drug is used in diseases of various species of animals.



Standard on ARION® column



Drug sample

Column	ARION® Plus C18, 5.0 µm
Dimensions	250 mm × 4.6 mm
Part number	ARI-5720-LM46
Mobile phase	0.1% TEA : Methanol : ACN 80/10/10 (v/v/v) Isocratic elution
Flow rate	1.0 mL/min
Temperature	40 °C
Detection	UV @254 nm
Analytes	1. Trimetoprim 2. Sulfamethazine sodium

Opioids and Tramadol and their metabolites by LC/MS

This application shows the LC/MS method for the most common opiates and their metabolites analyzed by toxicological labs.

Substance

Codeine,

CAS Number 76-57-3

Morphine,

CAS Number 57-27-2

6-O-Acetylmorphine,

6-Monoacetylmorphine,

CAS Number 2784-73-8

Morphine-6-glucuronide,

CAS Number 20290-10-2

Buprenorphine,

CAS Number 52485-79-7

Dihydrocodeine,

CAS Number 125-28-0

Fentanyl,

CAS Number 437-38-7

Acetylfentanyl,

CAS Number 3258-84-2

Naloxone,

CAS Number 465-65-6

Naltrexone,

CAS Number 16590-41-3

Hydromorphone,

CAS Number 466-99-9

Oxymorphone,

CAS Number 76-41-5

Hydrocodone,

CAS Number 125-29-1

Norbuprenorphine,

CAS Number 78715-23-8

Norcodeine,

CAS Number 467-15-2

Norfentanyl,

CAS Number 1609-66-1

Oxycodone,

CAS Number 76-42-6

Meperidine, Pethidine,

CAS Number 57-42-1

Tramadol,

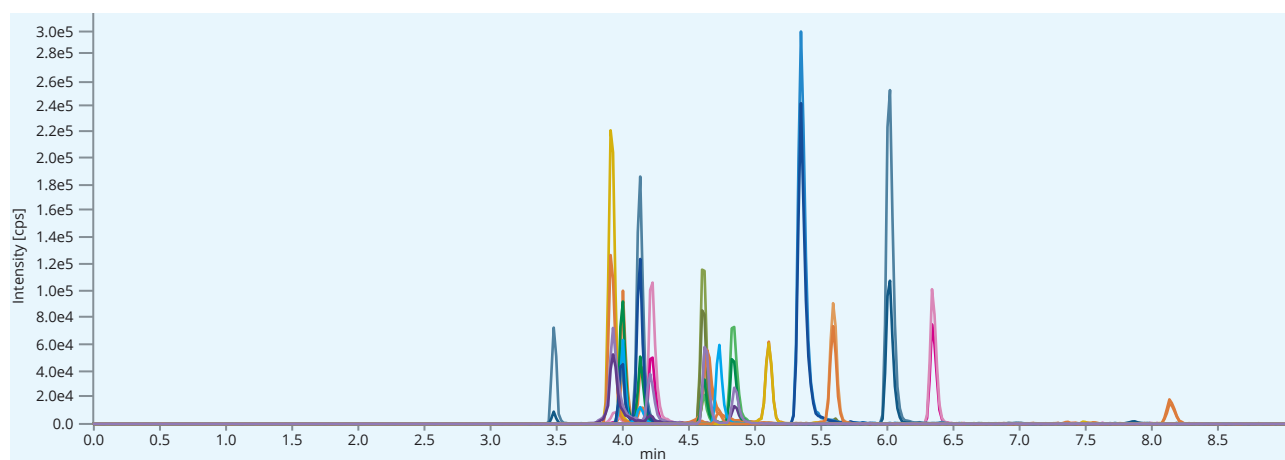
CAS Number 27203-92-5

Methadone,

CAS Number 76-99-3

EDDP,

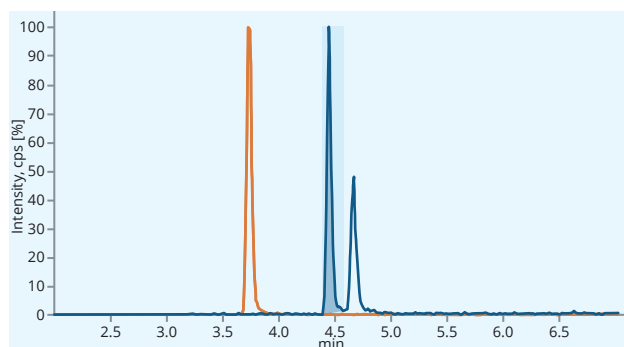
CAS Number 30223-73-5



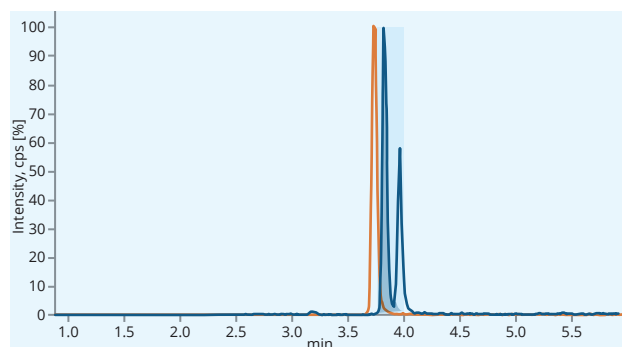
Standard mixture on ARION® column (50 mg/L)

Opioids and Tramadol and their metabolites by LC/MS

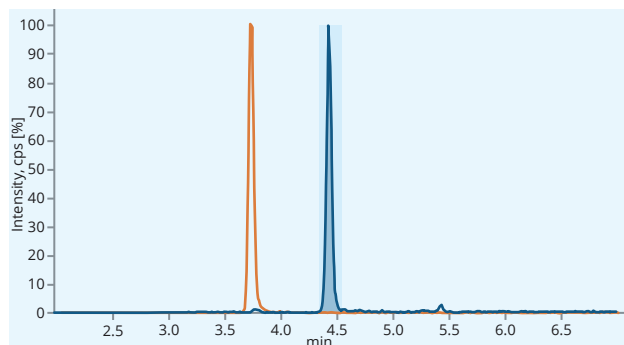
Column	ARION® Plus C18, 3 µm		
Dimensions	50 mm × 3.0 mm		
Part number	ARI-5720-IG30		
Mobile phase	A: 1% ammonium formate in water B: Methanol : 1% ammonium formate in ACN 50/50 (v/v)		
Gradient elution	Time	A (%)	B (%)
	0	100	0
	1	100	0
	6	10	90
	8	10	90
	8.1	100	0
Flow rate	0.5 mL/min		
Temperature	30 °C		
Detection	MS/MS		
Analytes	See MS/MS method		



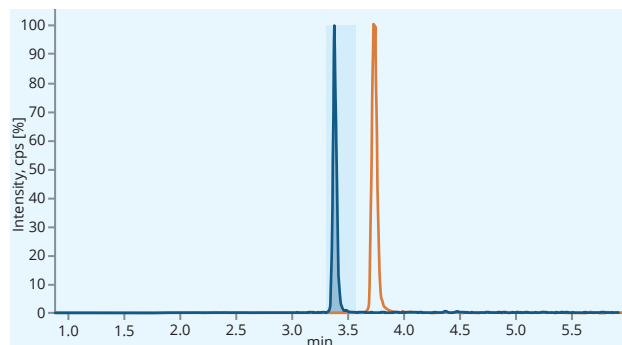
Codeine (300.1->152.0)



Morphine (286.1 -> 152.0)

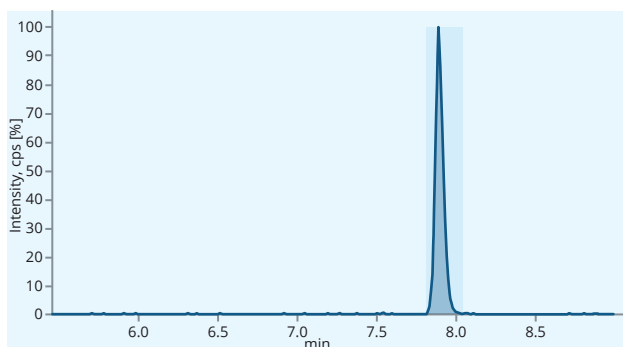


6-O-Acetylmorphine (328.1 -> 165.0)

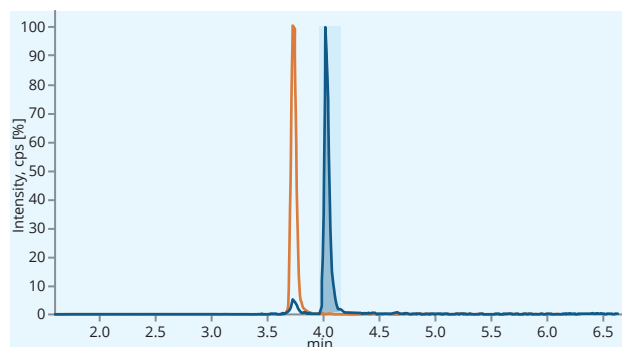


Morphine-6-glucuronide (462.2 -> 286.2)

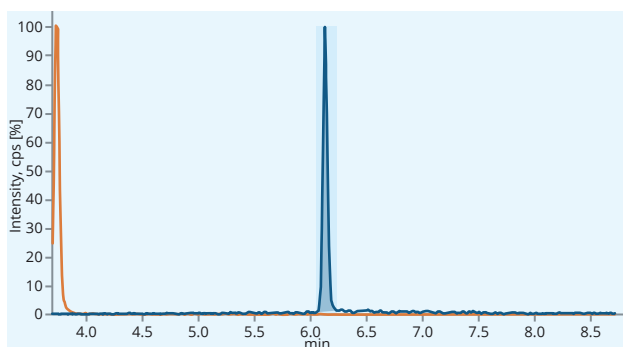
Opioids and Tramadol and their metabolites by LC/MS



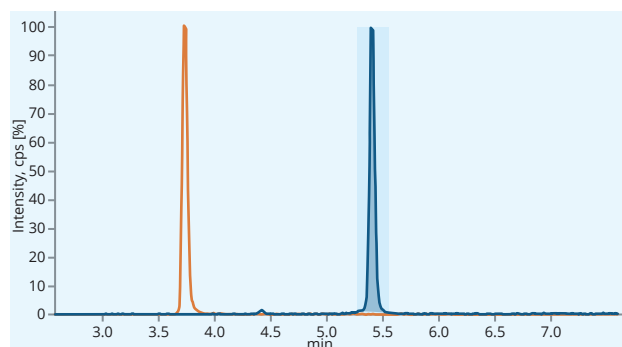
Buprenorphine (468.2 → 396.0)



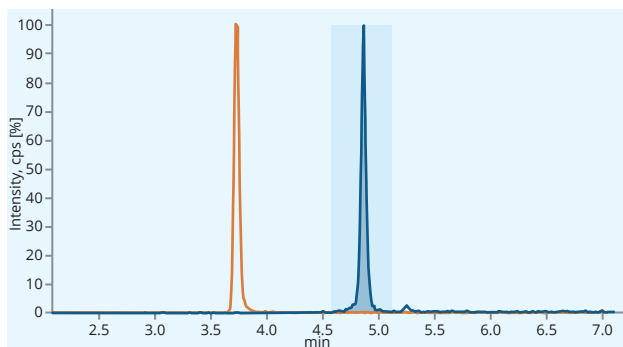
Dihydrocodeine (302.2 → 199.2)



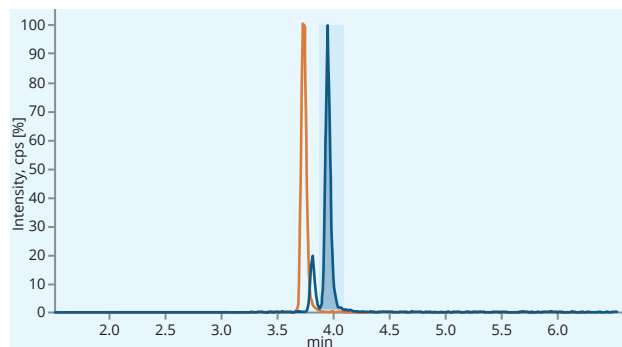
Fentanyl (337.2 → 105.1)



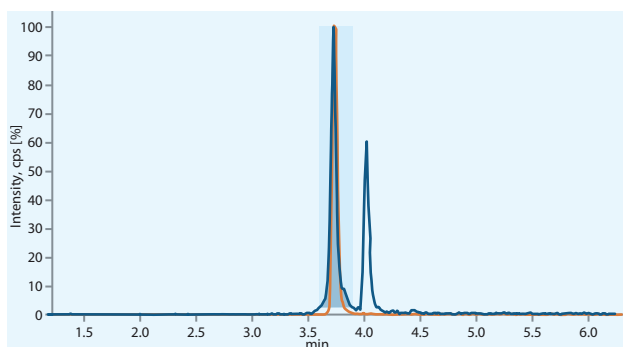
Naloxone (328.1 → 212.1)



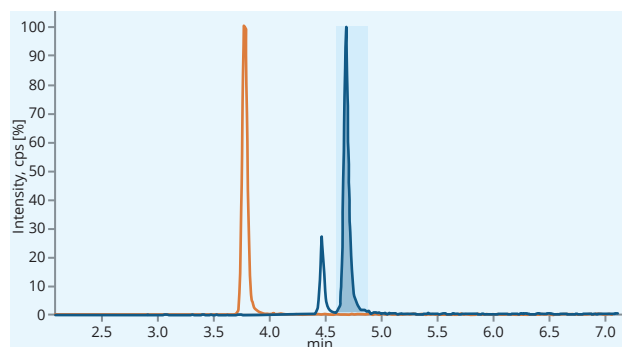
Naltrexone (342.1 → 267.2)



Hydromorphone (286.1 → 185.0)

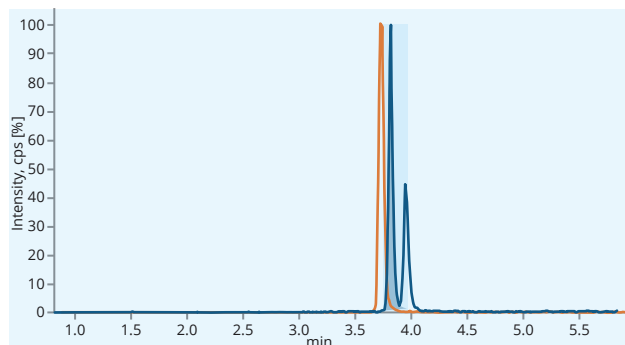


Oxycodone (302.0 → 227.1)

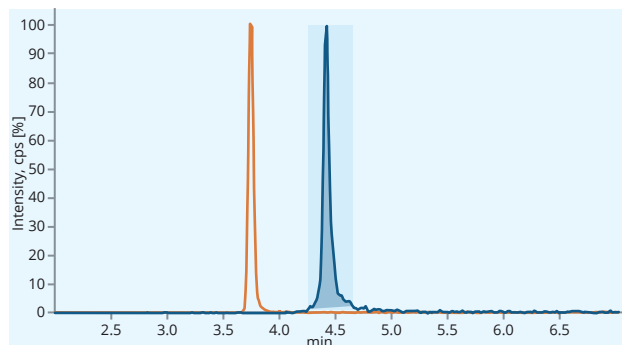


Hydrocodone (300.1 → 199.0)

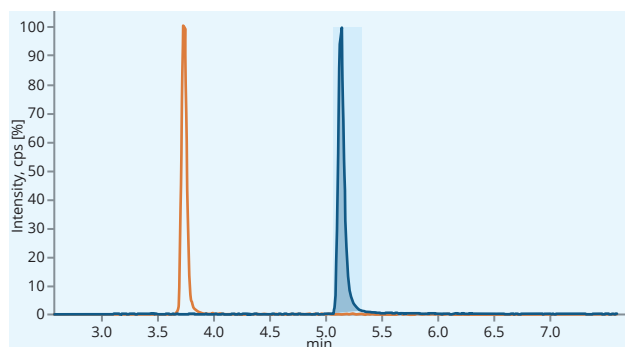
Opioids and Tramadol and their metabolites by LC/MS



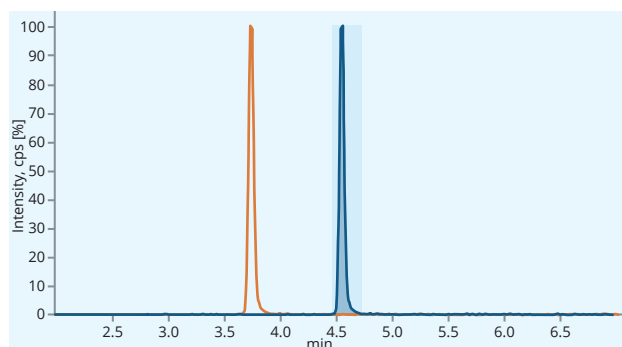
Norcodeine (286.1 → 152.0)



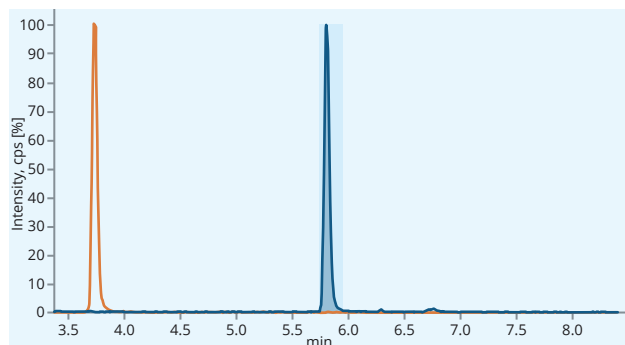
Oxycodone (316.1 → 241.1)



Meperidine (Pethidine) (248.1 → 220.1)



Tramadol (264.1 → 58.1)



Methadone (310.1 → 265.0)

Opioids and Tramadol and their metabolites by LC/MS

MS/MS method

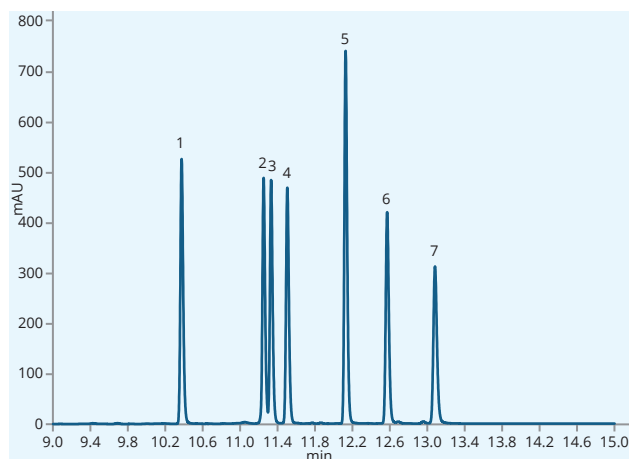
Compound name	Precursor mass	Fragment mass	Type	Collision energy
Codeine	300.1	152.0	Quantifier	35 ± 15 eV
	300.1	165.1	Qualifier	35 ± 15 eV
Morphine	286.1	152.0	Quantifier	35 ± 15 eV
	286.1	165.1	Qualifier	35 ± 15 eV
6-O-Acetylmorphine	328.1	165.0	Quantifier	35 ± 15 eV
	328.1	211.0	Qualifier	35 ± 15 eV
Morphine-6-glucuronide	462.2	286.2	Qualifier	35 ± 15 eV
	462.2	201.1	Qualifier	35 ± 15 eV
Buprenorphine	468.2	396.0	Quantifier	35 ± 15 eV
	468.2	414.0	Qualifier	35 ± 15 eV
Dihydrocodeine	302.2	199.2	Quantifier	35 ± 15 eV
	302.2	171.2	Qualifier	35 ± 15 eV
Fentanyl	337.2	105.1	Quantifier	35 ± 15 eV
	337.2	188.2	Qualifier	35 ± 15 eV
Acetylfentanyl*	323.1	188.1	Quantifier	35 ± 15 eV
	323.1	105.1	Qualifier	35 ± 15 eV
Naloxone	328.1	212.1	Quantifier	35 ± 15 eV
	328.1	253.1	Qualifier	35 ± 15 eV
Naltrexone	342.1	267.2	Quantifier	35 ± 15 eV
	342.1	282.1	Qualifier	35 ± 15 eV
Hydromorphone	286.1	185.0	Quantifier	35 ± 15 eV
	286.1	157.0	Qualifier	35 ± 15 eV
Oxymorphone	302.0	227.1	Quantifier	35 ± 15 eV
	302.0	198.1	Qualifier	35 ± 15 eV
Hydrocodone	300.1	199.0	Quantifier	35 ± 15 eV
	300.1	128.0	Qualifier	35 ± 15 eV
Norbuprenorphine*	414.3	55.0	Quantifier	35 ± 15 eV
	414.3	83.0	Qualifier	35 ± 15 eV
Norcodeine	286.1	152.0	Quantifier	35 ± 15 eV
	286.1	165.0	Qualifier	35 ± 15 eV
Norfentanyl*	233.1	84.1	Quantifier	35 ± 15 eV
	233.1	150.1	Qualifier	35 ± 15 eV
Oxycodone	316.1	241.1	Quantifier	35 ± 15 eV
	316.1	256.1	Qualifier	35 ± 15 eV
Meperidine (Pethidine)	248.1	220.1	Quantifier	35 ± 15 eV
	248.1	174.0	Qualifier	35 ± 15 eV
Tramadol	264.1	58.1	Quantifier	35 ± 15 eV
	264.1	42.2	Qualifier	35 ± 15 eV
Methadone	310.1	265.0	Quantifier	35 ± 15 eV
	310.1	105.0	Qualifier	35 ± 15 eV
EDDP*	278.1	234.1	Quantifier	35 ± 15 eV
	278.1	186.1	Qualifier	35 ± 15 eV

* Not shown in chromatogram.

Note: Internal standard: Morphine D6.

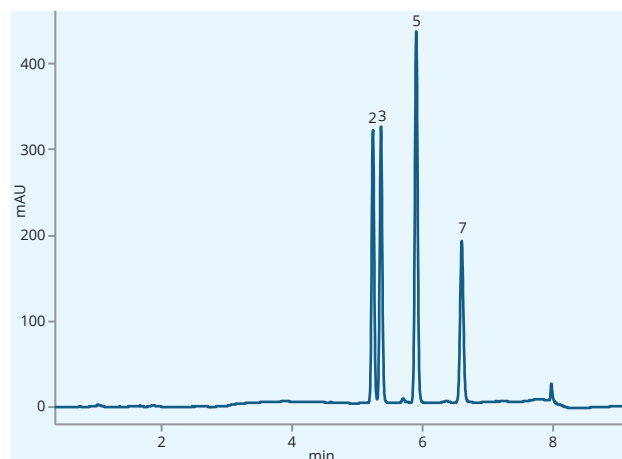
Cannabinoids

Cannabinoids have become more and more popular thanks to their health effects and the decriminalisation of their use. Analytical columns that can offer a suitable resolution play an important role. The challenge is to achieve the separation of the critical pair – CBD and CBG.



Standard on ARION® Plus C18, 1.7 µm

Columns	ARION® Plus C18, 1.7 µm		
Dimensions	100 mm × 2.1 mm		
Part numbers	ARI-5720-BI21		
Mobile phase	A: Water B: Acetonitrile		
Gradient elution	Time	A (%)	B (%)
	0	70	30
	1	70	30
	5	50	50
	10	10	90
	13	10	90
	14	70	30
	16	70	30
Flow rate	0.3 mL/min		
Temperature	30 °C		
Detection	DAD @220 nm		
Analytes	1. CBDV 2. CBG 3. CBD 4. THCV 5. CBN 6. THC 7. CBC		



Fast method – standard on ARION® Plus C18, 3.0 µm

Columns	ARION® Plus C18, 3.0 µm		
Dimensions	150 mm × 4.6 mm		
Part numbers	ARI-5720-IK46		
Mobile phase	A: Acetonitrile B: Water with formic acid (0.1%)		
Gradient elution	Time	A (%)	B (%)
	0	30	70
	0.3	30	70
	2.3	100	0
	5.3	100	0
	8.3	30	70
	11.0	30	70
Flow rate	1.0 mL/min		
Temperature	40 °C		
Injection volume	20 µL		
Detection	DAD @220 nm		
Analytes	2. CBG 3. CBD 5. CBN 7. CBC		

Ordering information

UHPLC and LC/MS columns

1.7 µm ARION® all dimensions in mm						ARION® Guard Cartridges*
Phase	30 × 2.1	50 × 2.1	75 × 2.1	100 × 2.1	150 × 2.1	5 × 2.1
Plus C18	 ARI-5720-BD21	ARI-5720-BG21	ARI-5720-BH21	ARI-5720-BI21	ARI-5720-BK21	AGS-5731-RA2

1.7 µm ARION® all dimensions in mm					ARION® Guard Cartridges*
Phase	50 × 3.0	75 × 3.0	100 × 3.0	150 × 3.0	
Plus C18	 ARI-5720-BG30	ARI-5720-BH30	ARI-5720-BI30	ARI-5720-BK30	Inquire**

1.7 µm ARION® all dimensions in mm					ARION® Guard Cartridges*
Phase	50 × 4.6	75 × 4.6	100 × 4.6	150 × 4.6	5 × 4.0
Plus C18	 ARI-5720-BG46	ARI-5720-BH46	ARI-5720-BI46	ARI-5720-BK46	Inquire**

2.2 µm ARION® all dimensions in mm						ARION® Guard Cartridges*
Phase	30 × 2.1	50 × 2.1	75 × 2.1	100 × 2.1	150 × 2.1	5 × 2.1
Plus C18	 ARI-5720-ED21	ARI-5720-EG21	ARI-5720-EH21	ARI-5720-EI21	ARI-5720-EK21	AGS-5731-RB2
Polar C18	 ARI-5721-ED21	ARI-5721-EG21	ARI-5721-EH21	ARI-5721-EI21	ARI-5721-EK21	AGS-5731-RB2
Phenyl-Butyl	 ARI-5735-ED21	ARI-5735-EG21	ARI-5735-EH21	ARI-5735-EI21	ARI-5735-EK21	AGS-5731-RB2
NH ₂	 ARI-5736-ED21	ARI-5736-EG21	ARI-5736-EH21	ARI-5736-EI21	ARI-5736-EK21	AGS-5731-CB2
HILIC Plus	 ARI-5738-ED21	ARI-5738-EG21	ARI-5738-EH21	ARI-5738-EI21	ARI-5738-EK21	AGS-5731-HB2
Si	 ARI-5739-ED21	ARI-5739-EG21	ARI-5739-EH21	ARI-5739-EI21	ARI-5739-EK21	AGS-5731-NB2

2.2 µm ARION® all dimensions in mm					ARION® Guard Cartridges*
Phase	50 × 3.0	75 × 3.0	100 × 3.0	150 × 3.0	5 × 2.1
Plus C18	 ARI-5720-EG30	ARI-5720-EH30	ARI-5720-EI30	ARI-5720-EK30	AGS-5731-RB2
Polar C18	 ARI-5721-EG30	ARI-5721-EH30	ARI-5721-EI30	ARI-5721-EK30	AGS-5731-RB2
Phenyl-Butyl	 ARI-5735-EG30	ARI-5735-EH30	ARI-5735-EI30	ARI-5735-EK30	AGS-5731-RB2
NH ₂	 ARI-5736-EG30	ARI-5736-EH30	ARI-5736-EI30	ARI-5736-EK30	AGS-5731-CB2
HILIC Plus	 ARI-5738-EG30	ARI-5738-EH30	ARI-5738-EI30	ARI-5738-EK30	AGS-5731-HB2
Si	 ARI-5739-EG30	ARI-5739-EH30	ARI-5739-EI30	ARI-5739-EK30	AGS-5731-NB2

2.2 µm ARION® all dimensions in mm					ARION® Guard Cartridges*
Phase	50 × 4.6	75 × 4.6	100 × 4.6	150 × 4.6	5 × 4.0
Plus C18	 ARI-5720-EG46	ARI-5720-EH46	ARI-5720-EI46	ARI-5720-EK46	AGS-5731-RC4
Polar C18	 ARI-5721-EG46	ARI-5721-EH46	ARI-5721-EI46	ARI-5721-EK46	AGS-5731-RC4
Phenyl-Butyl	 ARI-5735-EG46	ARI-5735-EH46	ARI-5735-EI46	ARI-5735-EK46	AGS-5731-RC4
NH ₂	 ARI-5736-EG46	ARI-5736-EH46	ARI-5736-EI46	ARI-5736-EK46	Inquire**
HILIC Plus	 ARI-5738-EG46	ARI-5738-EH46	ARI-5738-EI46	ARI-5738-EK46	Inquire**
Si	 ARI-5739-EG46	ARI-5739-EH46	ARI-5739-EI46	ARI-5739-EK46	Inquire**

* ARION® Guard cartridges require ARION® Guard Holder p/n AGS-5731-000 (supplied without cartridges).

** The use of appropriate guard cartridge depends on the application. Please contact us.

Ordering information

Analytical columns

3 µm ARION® all dimensions in mm						ARION® Guard Cartridges*
Phase	50 × 2.1	75 × 2.1	100 × 2.1	150 × 2.1	250 × 2.1	5 × 2.1
Plus C18	ARI-5720-IG21	ARI-5720-IH21	ARI-5720-II21	ARI-5720-IK21	ARI-5720-IM21	AGS-5731-RC2
Polar C18	ARI-5721-IG21	ARI-5721-IH21	ARI-5721-II21	ARI-5721-IK21	–	AGS-5731-RC2
C8	ARI-5734-IG21	ARI-5734-IH21	ARI-5734-II21	ARI-5734-IK21	–	AGS-5731-RC2
Biphenyl	ARI-5868-IG21	ARI-5868-IH21	ARI-5868-II21	ARI-5868-IK21	–	AGS-5731-RC2
Phenyl-Butyl	ARI-5735-IG21	ARI-5735-IH21	ARI-5735-II21	ARI-5735-IK21	–	AGS-5731-RC2
NH ₂	ARI-5736-IG21	ARI-5736-IH21	ARI-5736-II21	ARI-5736-IK21	–	AGS-5731-CC2
CN	ARI-5737-IG21	ARI-5737-IH21	ARI-5737-II21	ARI-5737-IK21	–	Inquire**
HILIC Plus	ARI-5738-IG21	ARI-5738-IH21	ARI-5738-II21	ARI-5738-IK21	–	AGS-5731-HC2
Si	ARI-5739-IG21	ARI-5739-IH21	ARI-5739-II21	ARI-5739-IK21	–	AGS-5731-NC2

3 µm ARION® all dimensions in mm						ARION® Guard Cartridges*
Phase	50 × 3.0	75 × 3.0	100 × 3.0	150 × 3.0	250 × 3.0	5 × 4.0
Plus C18	ARI-5720-IG30	ARI-5720-IH30	ARI-5720-II30	ARI-5720-IK30	ARI-5720-IM30	AGS-5731-RC4
Polar C18	ARI-5721-IG30	ARI-5721-IH30	ARI-5721-II30	ARI-5721-IK30	ARI-5721-IM30	AGS-5731-RC4
C8	ARI-5734-IG30	ARI-5734-IH30	ARI-5734-II30	ARI-5734-IK30	–	AGS-5731-RC4
Biphenyl	ARI-5868-IG30	ARI-5868-IH30	ARI-5868-II30	ARI-5868-IK30	ARI-5868-IM30	AGS-5731-RC4
Phenyl-Butyl	ARI-5735-IG30	ARI-5735-IH30	ARI-5735-II30	ARI-5735-IK30	ARI-5735-IM30	AGS-5731-RC4
NH ₂	–	–	ARI-5736-II30	ARI-5736-IK30	–	AGS-5731-CC4
CN	–	–	ARI-5737-II30	ARI-5737-IK30	–	Inquire**
HILIC Plus	ARI-5738-IG30	ARI-5738-IH30	ARI-5738-II30	ARI-5738-IK30	–	AGS-5731-HC4
Si	ARI-5739-IG30	ARI-5739-IH30	ARI-5739-II30	ARI-5739-IK30	–	AGS-5731-NC4

3 µm ARION® all dimensions in mm							ARION® Guard Cartridges*
Phase	50 × 4.6	75 × 4.6	100 × 4.6	125 × 4.6	150 × 4.6	250 × 4.6	5 × 4.0
Plus C18	ARI-5720-IG46	ARI-5720-IH46	ARI-5720-II46	ARI-5720-IJ46	ARI-5720-IK46	ARI-5720-IM46	AGS-5731-RC4
Polar C18	ARI-5721-IG46	ARI-5721-IH46	ARI-5721-II46	–	ARI-5721-IK46	ARI-5721-IM46	AGS-5731-RC4
C8	ARI-5734-IG46	ARI-5734-IH46	ARI-5734-II46	–	ARI-5734-IK46	ARI-5734-IM46	AGS-5731-RC4
Biphenyl	ARI-5868-IG46	ARI-5868-IH46	ARI-5868-II46	–	ARI-5868-IK46	ARI-5868-IM46	AGS-5731-RC4
Phenyl-Butyl	ARI-5735-IG46	ARI-5735-IH46	ARI-5735-II46	–	ARI-5735-IK46	ARI-5735-IM46	AGS-5731-RC4
NH ₂	ARI-5736-IG46	ARI-5736-IH46	ARI-5736-II46	–	ARI-5736-IK46	ARI-5736-IM46	AGS-5731-CC4
CN	ARI-5737-IG46	–	ARI-5737-II46	–	ARI-5737-IK46	–	Inquire**
HILIC Plus	ARI-5738-IG46	ARI-5738-IH46	ARI-5738-II46	–	ARI-5738-IK46	–	AGS-5731-HC4
Si	ARI-5739-IG46	ARI-5739-IH46	ARI-5739-II46	–	ARI-5739-IK46	ARI-5739-IM46	AGS-5731-NC4

* ARION® Guard cartridges require ARION® Guard Holder p/n AGS-5731-000 (supplied without cartridges).

** The use of appropriate guard cartridge depends on the application. Please contact us.

Ordering information

Analytical columns

5 µm ARION® all dimensions in mm					ARION® Guard Cartridges*
Phase	30 × 2.1	50 × 2.1	100 × 2.1	150 × 2.1	5 × 2.1
Plus C18	ARI-5720-LD21	ARI-5720-LG21	ARI-5720-LI21	ARI-5720-LK21	AGS-5731-RD2
Polar C18	ARI-5721-LD21	ARI-5721-LG21	ARI-5721-LI21	ARI-5721-LK21	AGS-5731-RD2
C8	–	–	–	ARI-5734-LK21	AGS-5731-RD2
Biphenyl	ARI-5868-LD21	ARI-5868-LG21	ARI-5868-LI21	ARI-5868-LK21	AGS-5731-RD2
Phenyl-Butyl	ARI-5735-LD21	ARI-5735-LG21	ARI-5735-LI21	ARI-5735-LK21	AGS-5731-RD2
PFP	ARI-5873-LD21	ARI-5873-LG21	ARI-5873-LI21	ARI-5873-LK21	AGS-5731-RD2
NH ₂	–	–	–	ARI-5736-LK21	AGS-5731-CD2
CN	–	–	–	ARI-5737-LK21	Inquire**
HILIC Plus	ARI-5738-LD21	ARI-5738-LG21	ARI-5738-LI21	ARI-5738-LK21	AGS-5731-HD2
Si	ARI-5739-LD21	ARI-5739-LG21	ARI-5739-LI21	ARI-5739-LK21	AGS-5731-ND2

5 µm ARION® all dimensions in mm					ARION® Guard Cartridges*
Phase	30 × 3.0	50 × 3.0	75 × 3.0	100 × 3.0	5 × 4.0
Plus C18	ARI-5720-LD30	ARI-5720-LG30	ARI-5720-LH30	ARI-5720-LI30	AGS-5731-RD4
Polar C18	ARI-5721-LD30	ARI-5721-LG30	ARI-5721-LH30	ARI-5721-LI30	AGS-5731-RD4
C8	–	ARI-5734-LG30	–	ARI-5734-LI30	AGS-5731-RD4
Biphenyl	ARI-5868-LD30	ARI-5868-LG30	ARI-5868-LH30	ARI-5868-LI30	AGS-5731-RD4
Phenyl-Butyl	ARI-5735-LD30	ARI-5735-LG30	ARI-5735-LH30	ARI-5735-LI30	AGS-5731-RD4
PFP	ARI-5873-LD30	ARI-5873-LG30	ARI-5873-LH30	ARI-5873-LI30	AGS-5731-RD4
NH ₂	–	ARI-5736-LG30	ARI-5736-LH30	ARI-5736-LI30	AGS-5731-CD4
CN	–	ARI-5737-LG30	ARI-5737-LH30	ARI-5737-LI30	Inquire**
HILIC Plus	ARI-5738-LD30	ARI-5738-LG30	ARI-5738-LH30	ARI-5738-LI30	AGS-5731-HD4
Si	ARI-5739-LD30	ARI-5739-LG30	ARI-5739-LH30	ARI-5739-LI30	AGS-5731-ND4
SAX	–	ARI-5806-LG30	–	ARI-5806-LI30	–
SCX	–	ARI-5799-LG30	–	ARI-5799-LI30	–

5 µm ARION® all dimensions in mm				ARION® Guard Cartridges*
Phase	125 × 3.0	150 × 3.0	250 × 3.0	5 × 4.0
Plus C18	ARI-5720-LJ30	ARI-5720-LK30	–	AGS-5731-RD4
Polar C18	–	ARI-5721-LK30	–	AGS-5731-RD4
C8	–	ARI-5734-LK30	ARI-5734-LM30	AGS-5731-RD4
Biphenyl	ARI-5868-LJ30	ARI-5868-LK30	ARI-5868-LM30	AGS-5731-RD4
Phenyl-Butyl	–	ARI-5735-LK30	–	AGS-5731-RD4
PFP	ARI-5873-LJ30	ARI-5873-LK30	ARI-5873-LM30	AGS-5731-RD4
NH ₂	–	ARI-5736-LK30	–	AGS-5731-CD2
CN	–	ARI-5737-LK30	–	Inquire**
HILIC Plus	–	ARI-5738-LK30	–	AGS-5731-HD4
Si	–	ARI-5739-LK30	–	AGS-5731-ND4
SAX	–	ARI-5806-LK30	ARI-5806-LM30	–
SCX	–	ARI-5799-LK30	ARI-5799-LM30	–

* ARION® Guard cartridges require ARION® Guard Holder p/n AGS-5731-000 (supplied without cartridges).

** The use of appropriate guard cartridge depends on the application. Please contact us.



Ordering information

Analytical columns

5 µm ARION® all dimensions in mm					ARION® Guard Cartridges*
Phase	125 × 4.0	30 × 4.6	50 × 4.6	75 × 4.6	5 × 4.0
Plus C18	ARI-5720-LJ40	ARI-5720-LD46	ARI-5720-LG46	ARI-5720-LH46	AGS-5731-RD4
Polar C18	ARI-5721-LJ40	ARI-5721-LD46	ARI-5721-LG46	ARI-5721-LH46	AGS-5731-RD4
C8	ARI-5734-LJ40	–	–	–	AGS-5731-RD4
Biphenyl	ARI-5868-LJ40	ARI-5868-LD46	ARI-5868-LG46	ARI-5868-LH46	AGS-5731-RD4
Phenyl-Butyl	–	–	–	–	AGS-5731-RD4
PFP	ARI-5873-LJ40	ARI-5873-LD46	ARI-5873-LG46	ARI-5873-LH46	AGS-5731-RD4
NH ₂	–	–	–	–	AGS-5731-CD4
CN	–	–	–	–	Inquire**
HILIC Plus	–	ARI-5738-LD46	ARI-5738-LG46	ARI-5738-LH46	AGS-5731-HD4
Si	–	ARI-5739-LD46	ARI-5739-LG46	ARI-5739-LH46	AGS-5731-ND4
SAX	–	–	ARI-5806-LG46	–	Inquire
SCX	–	–	ARI-5799-LG46	–	Inquire

5 µm ARION® all dimensions in mm					ARION® Guard Cartridges*
Phase	100 × 4.6	125 × 4.6	150 × 4.6	250 × 4.6	5 × 4.0
Plus C18	ARI-5720-LI46	ARI-5720-LJ46	ARI-5720-LK46	ARI-5720-LM46	AGS-5731-RD4
Polar C18	ARI-5721-LI46	–	ARI-5721-LK46	ARI-5721-LM46	AGS-5731-RD4
C8	ARI-5734-LI46	ARI-5734-LJ46	ARI-5734-LK46	ARI-5734-LM46	AGS-5731-RD4
Biphenyl	ARI-5868-LI46	ARI-5868-LJ46	ARI-5868-LK46	ARI-5868-LM46	AGS-5731-RD4
Phenyl-Butyl	ARI-5735-LI46	–	ARI-5735-LK46	ARI-5735-LM46	AGS-5731-RD4
PFP	ARI-5873-LI46	ARI-5873-LJ46	ARI-5873-LK46	ARI-5873-LM46	AGS-5731-RD4
NH ₂	ARI-5736-LI46	–	ARI-5736-LK46	ARI-5736-LM46	AGS-5731-CD4
CN	ARI-5737-LI46	–	ARI-5737-LK46	ARI-5737-LM46	Inquire**
HILIC Plus	ARI-5738-LI46	–	ARI-5738-LK46	ARI-5738-LM46	AGS-5731-HD4
Si	ARI-5739-LI46	–	ARI-5739-LK46	ARI-5739-LM46	AGS-5731-ND4
SAX	ARI-5806-LI46	–	ARI-5806-LK46	ARI-5806-LM46	Inquire
SCX	ARI-5799-LI46	–	ARI-5799-LK46	ARI-5799-LM46	Inquire

Note: Other dimensions on request.

* ARION® Guard cartridges require ARION® Guard Holder p/n AGS-5731-000 (supplied without cartridges).

** The use of appropriate guard cartridge depends on the application. Please contact us.

ARION® column test mixture 1 for RP columns p/n ARI-MIX-1

4 components in Acetonitrile / Water (75/25), 1 mL ampoule

Uracil	[CAS:66-22-8]	20 mg/L
Acetophenone	[CAS:98-86-2]	200 mg/L
Toluene	[CAS:108-88-3]	10000 mg/L
Naphthalene	[CAS:91-20-3]	9000 mg/L

ARION® column test mixture 5 for DIOL/HILIC phases p/n ARI-MIX-5

3 components in Acetonitrile ampoule

Acenaphthene	[CAS:108-88-3]	600 mg/L
Uracil	[CAS:66-22-8]	100 mg/L
Cytosine	[CAS:71-30-7]	200 mg/L

ARION® column test mixture 2 p/n ARI-MIX-2

7 components in Methanol, 1 mL ampoule

Uracil	[CAS:66-22-8]	200 mg/L
Aniline	[CAS:62-53-3]	1000 mg/L
Phenol	[CAS:108-95-2]	2000 mg/L
N,N-Dimethylaniline	[CAS:121-69-7]	400 mg/L
4-Ethylaniline	[CAS:589-16-2]	2000 mg/L
Toluene	[CAS:108-88-3]	10000 mg/L
Ethylbenzene	[CAS:100-41-4]	10000 mg/L

Ordering information

Semi-preparative and preparative columns

5 µm ARION® all dimensions in mm						ARION® Guard Cartridges
Phase	250 × 10	50 × 21.2	100 × 21.2	150 × 21.2	250 × 21.2	
Plus C18	ARI-5720-LM1X	ARI-5720-LG2Y	ARI-5720-LI2Y	ARI-5720-LK2Y	ARI-5720-LM2Y	PGS-5856-UD9**
Polar C18	ARI-5721-LM1X	ARI-5721-LG2Y	ARI-5721-LI2Y	ARI-5721-LK2Y	ARI-5721-LM2Y	Inquire*
Phenyl-Butyl	–	–	–	–	ARI-5735-LM2Y	Inquire*
Si	ARI-5739-LM1X	ARI-5739-LG2Y	ARI-5739-LI2Y	ARI-5739-LK2Y	ARI-5739-LM2Y	PGS-5856-VD9**

Preparative columns

5 µm ARION® all dimensions in mm					ARION® Guard Cartridges
Phase	100 × 30	150 × 30	250 × 30	250 × 50	
Plus C18	ARI-5720-LI3X	ARI-5720-LK3X	ARI-5720-LM3X	ARI-5720-LM5X	Inquire*
Polar C18	ARI-5721-LI3X	ARI-5721-LK3X	ARI-5721-LM3X	ARI-5721-LM5X	Inquire*
Phenyl-Butyl	–	–	ARI-5735-LM3X	ARI-5735-LM5X	Inquire*
Si	ARI-5739-LI3X	ARI-5739-LK3X	ARI-5739-LM3X	ARI-5739-LM5X	Inquire*

* The use of appropriate guard cartridge depends on the application. Please contact us.

** This guard cartridge requires a Preparative Guard Holder p/n PGS-5856-000



Semi-preparative column 250 × 10 mm



Preparative column 250 × 21.2 mm



Preparative column 250 × 30 mm



Preparative column 250 × 50 mm

Ordering information

Preparative columns

10 µm ARION® all dimensions in mm					ARION® Guard Cartridges
Phase	150 × 4.6	250 × 4.6	150 × 10	250 × 10	
Plus C18	ARI-5720-PK46	ARI-5720-PM46	ARI-5720-PK1X	ARI-5720-PM1X	Inquire*
Polar C18	ARI-5721-PK46	ARI-5721-PM46	ARI-5721-PK1X	ARI-5721-PM1X	Inquire*
Si	–	–	–	ARI-5739-PM1X	Inquire*

10 µm ARION® all dimensions in mm					ARION® Guard Cartridges
Phase	50 × 21.2	100 × 21.2	150 × 21.2	250 × 21.2	
Plus C18	ARI-5720-PG2Y	ARI-5720-PI2Y	ARI-5720-PK2Y	ARI-5720-PM2Y	Inquire*
Polar C18	ARI-5721-PG2Y	ARI-5721-PI2Y	ARI-5721-PK2Y	ARI-5721-PM2Y	Inquire*
Si	ARI-5739-PG2Y	ARI-5739-PI2Y	ARI-5739-PK2Y	ARI-5739-PM2Y	Inquire*

10 µm ARION® all dimensions in mm					ARION® Guard Cartridges
Phase	100 × 30	150 × 30	250 × 30	250 × 50	
Plus C18	ARI-5720-PI3X	ARI-5720-PK3X	ARI-5720-PM3X	ARI-5720-PM5X	Inquire*
Polar C18	ARI-5721-PI3X	ARI-5721-PK3X	ARI-5721-PM3X	ARI-5721-PM5X	Inquire*
Si	ARI-5739-PI3X	ARI-5739-PK3X	ARI-5739-PM3X	ARI-5739-PM5X	Inquire*

* The use of appropriate guard cartridge depends on the application. Please contact us.

Note: Bulk media available on request for 10 and 15 µm particles, in quantities: 10 g, 100 g, 1 kg.

Ordering information

Preparative columns

15 µm ARION® all dimensions in mm					ARION® Guard Cartridges
Phase	150 × 4.6	250 × 4.6	150 × 10	250 × 10	
Plus C18	ARI-5720-QK46	ARI-5720-QM46	ARI-5720-QK1X	ARI-5720-QM1X	Inquire*
Polar C18	ARI-5721-QK46	ARI-5721-QM46	ARI-5721-QK1X	ARI-5721-QM1X	Inquire*

15 µm ARION® all dimensions in mm					ARION® Guard Cartridges
Phase	50 × 21.2	100 × 21.2	150 × 21.2	250 × 21.2	
Plus C18	ARI-5720-QG2Y	ARI-5720-QI2Y	ARI-5720-QK2Y	ARI-5720-QM2Y	Inquire*
Polar C18	ARI-5721-QG2Y	ARI-5721-QI2Y	ARI-5721-QK2Y	ARI-5721-QM2Y	Inquire*

15 µm ARION® all dimensions in mm					ARION® Guard Cartridges
Phase	50 × 30	100 × 30	150 × 30	250 × 30	
Plus C18	ARI-5720-QG3X	ARI-5720-QI3X	ARI-5720-QK3X	ARI-5720-QM3X	Inquire*
Polar C18	ARI-5721-QG3X	ARI-5721-QI3X	ARI-5721-QK3X	ARI-5721-QM3X	Inquire*

Note: Bulk media available on request for 10 and 15 µm particles, in quantities: 10 g, 100 g, 1 kg.

* The use of appropriate guard cartridge depends on the application. Please contact us.

Product support

Not found the information you require? The ARION® website www.arionchromatography.com serves as your support source.



Application database

The ARION® website has a search engine to find an application based on different keywords, e.g. compound name, trivial name, formula etc.



Product selection guide

The section catalogue offers you text engine as well as sorting the required HPLC columns based on various parameters (column dimensions, particle size, surface chemistry, ...).



Distributor finder

The ARION® website includes a world map with an active finder of your distributor, who will support you with technical and price information.



Certificate download

If you cannot find your column certificate, please contact your local distributor or download the certificate from the **Downloads section**.





ARION® BIO columns have been developed for the protein, polypeptide and peptide characterisation and purification. They are offered with C18 and C4 stationary phases. ARION® C18-BIO phase is intended to separate weakly hydrophobic oligopeptides and peptides up to 50 kDa. ARION® C4-BIO HPLC columns are designed for highly hydrophobic proteins and polypeptides from 50 to 150 kDa.

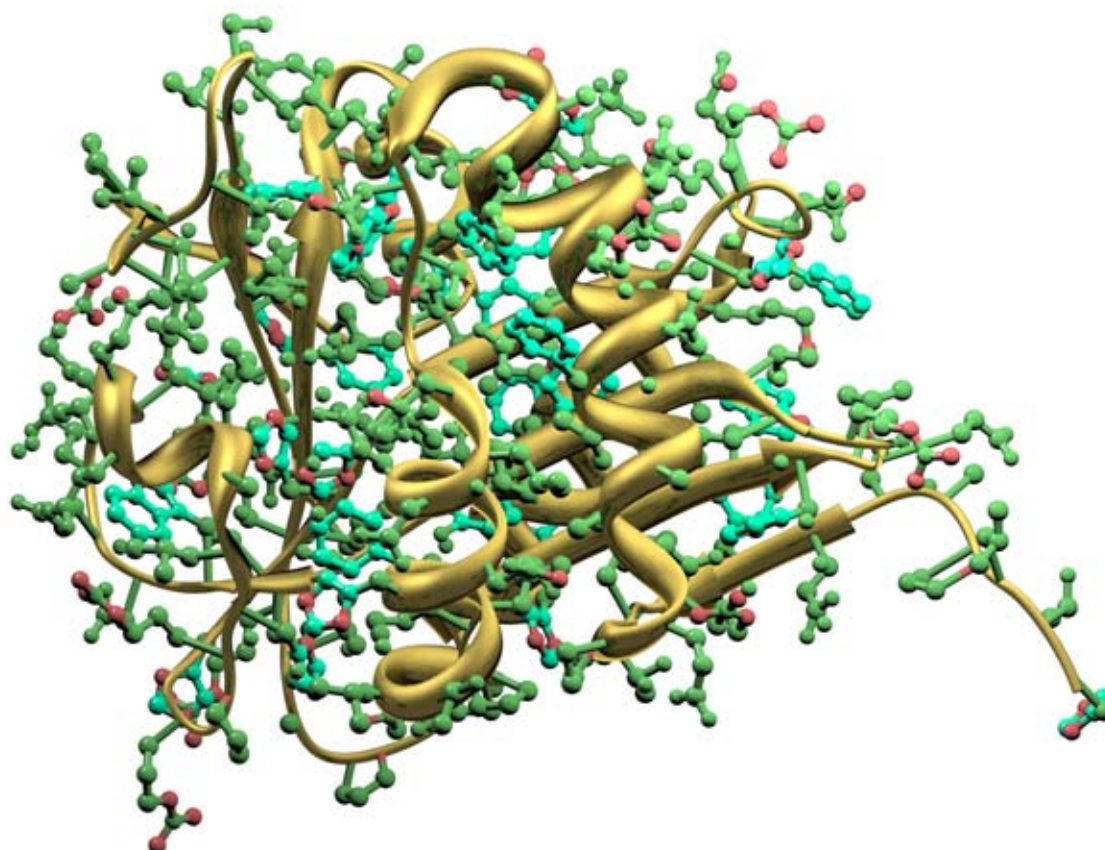
- Biomolecule separation up to 150 kDa.
- Pre-columns with corresponding media.
- Scale-up to 15 µm.

ARION® BIO Silicagel

Particle size	15 µm	5 µm	3 µm
Metal content	<20 ppm	<20 ppm	<20 ppm
Temperature stability	60 °C*	60 °C*	60 °C*
Mean particle diameter	15.0 ± 1.5 µm	5.0 ± 0.3 µm	3.0 ± 0.2 µm

* Depends on mobile phase used and silica bonding.

ARION® BIO phases	Particle size (µm)	Pore size (Å)	Surface area (m ² /g)	Carbon load	pH stability	Endcapping	100% aqueous mobile phase	USP code
C18-BIO	3, 5, 15	300	110	11 %	1.5 to 7.5	Single-step	×	L1
C4-BIO	3, 5	300	110	4.5 %	1.5 to 7.5	Single-step	×	L26
C8-BIO	3	200	110	n/a	1.5 to 7.5	Single-step	×	L7

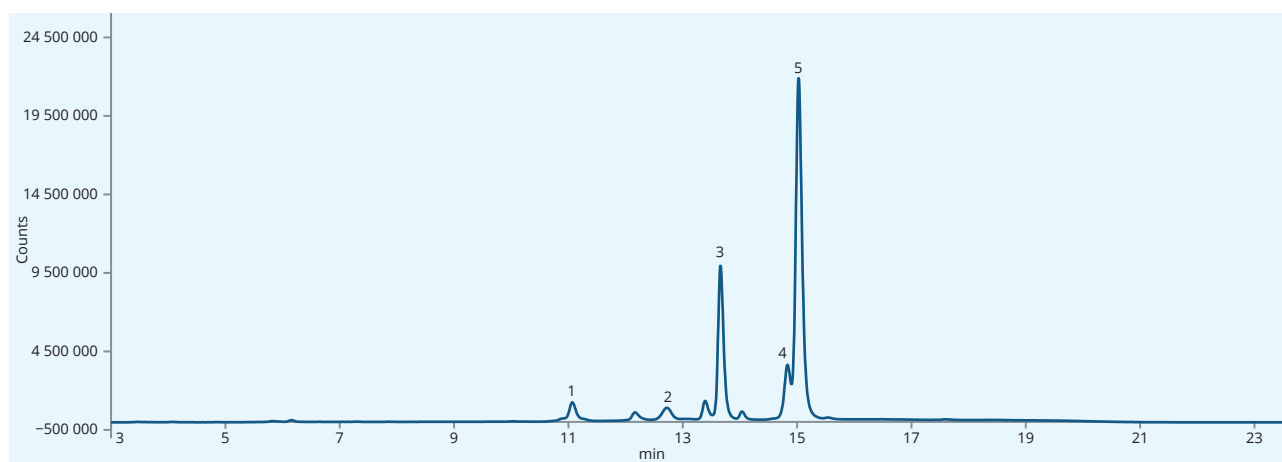


Lactoferrin in bovine milk

Lactoferrin (LT) is a glycoprotein, which is one of the group of transferrins. It is an iron-binding protein with a mass of 80 kDa. Lactoferrin has microbial properties against many microorganisms (bacteria, viruses and fungi, including parasites). It is one of the non-specific components of the immune system and has anticancer and anti-inflammatory properties.

Lactoferrin is widely represented in various animal fluids, mainly milk, saliva and tears. It is separated from bovine milk to produce this key ingredients of infant formulas. Lactoferrin is also used as a food supplement to support the natural immune system, gut microbiome and healthy skin.

Substance	Lactoferrin (LT)
Synonym	Lactotransferrin (LTF)



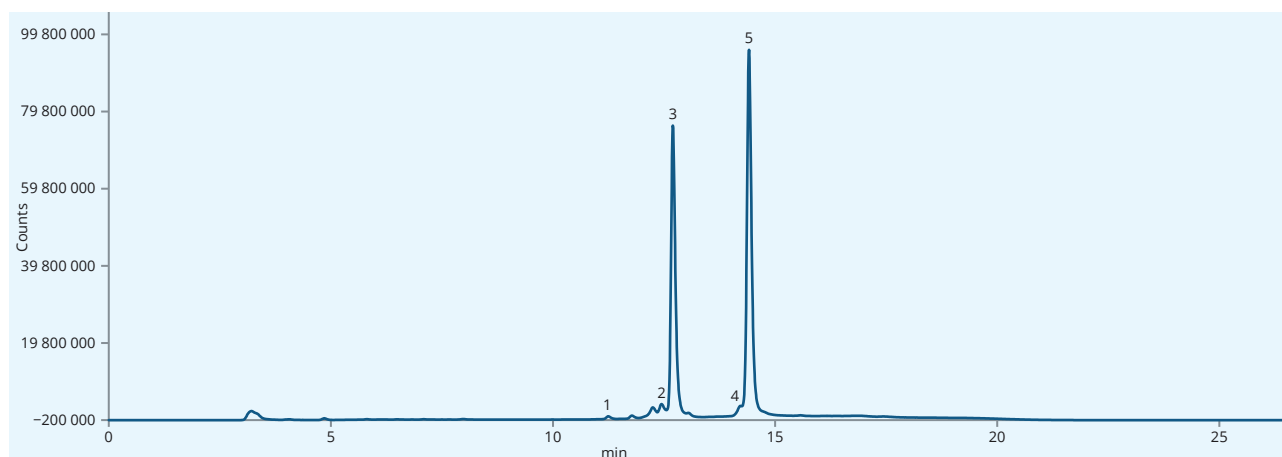
Lactoferrin analysis in bovine milk

Column	Arion® C4-BIO, 5 µm				
Dimensions	250 mm × 4.6 mm				
Part number	ARI-5846-LM46				
Mobile phase	A: 100% acetonitrile (ACN) B: 95 % ACN + 5 % H ₂ O + 0.1 % TFA C: 5 % ACN + 95 % H ₂ O + 0.1 % TFA				
Gradient elution	Retention (min)	Flow (mL/min)	%A	%B	%C
	0.0	0.5	0.0	20.0	80.0
	0.5	0.5	0.0	30.0	70.0
	6.0	0.5	0.0	35.0	65.0
	10.0	0.5	5.0	40.0	55.0
	15.0	0.5	0.0	50.0	50.0
	16.0	0.5	0.0	20.0	80.0
	19.0	0.5	0.0	20.0	80.0
Temperature	60 °C				
Detection	FLD @280/340 nm*				
Injection volume	10 µL				
Analytes	1. Lysozyme 2. Lactoferrin 3. α-La (α-Lactalbumin) 4. β-LgB (β-Lactoglobulin B) 5. β-LgA (β-Lactoglobulin A)				

* The detection can be at UV @205 nm.

Lactoferrin in goat's milk

Substance	Lactoferrin (LT)
Synonym	Lactotransferrin (LTF)



Lactoferrin analysis in goat's milk

Column	Arion® C4-BIO, 5 µm				
Dimensions	250 mm × 4.6 mm				
Part number	ARI-5846-LM46				
Mobile phase	A: 100% acetonitrile (ACN) B: 95 % ACN + 5 % H ₂ O + 0.1 % TFA C: 5 % ACN + 95 % H ₂ O + 0.1 % TFA				
Gradient elution	Retention (min)	Flow (mL/min)	%A	%B	%C
	0.0	0.5	0.0	20.0	80.0
	0.5	0.5	0.0	30.0	70.0
	6.0	0.5	0.0	35.0	65.0
	10.0	0.5	5.0	40.0	55.0
	15.0	0.5	0.0	50.0	50.0
	16.0	0.5	0.0	20.0	80.0
	19.0	0.5	0.0	20.0	80.0
Temperature	60 °C				
Detection	FLD @280/340 nm*				
Injection volume	10 µL				
Analytes	1. Lysozyme 2. Lactoferrin 3. α-La (α-Lactalbumin) 4. β-LagB (β-Lactoglobulin, BLG) 5. β-LgA (β-Lactalbumin)				

* The detection can be at UV @205 nm.

Ordering information

Peptides and oligopeptides columns

ARION® BIO C18 all dimensions in mm				ARION® Guard Cartridges*
Phase	100 × 4.6	150 × 4.6	250 × 4.6	
3 µm	ARI-5840-II46	ARI-5840-IK46	ARI-5840-IM46	AGS-5731-BC4
5 µm	ARI-5840-LI46	ARI-5840-LK46	ARI-5840-LM46	AGS-5731-BD4
15 µm	–	–	ARI-5840-QM46	–

ARION® BIO C18 all dimensions in mm				ARION® Guard Cartridges*
Phase	100 × 3.0	150 × 3.0	50 × 2.1	150 × 2.1
3 µm	–	–	ARI-5840-IG21	ARI-5840-IK21
5 µm	ARI-5840-LI30	ARI-5840-LK30	–	ARI-5840-LK21
				AGS-5731-BD2

ARION® BIO C8 all dimensions in mm		ARION® Guard Cartridges*
Phase	150 × 4.6	
3 µm	ARI-5954-IK46	–

Proteins and polypeptides

ARION® BIO C4 all dimensions in mm					ARION® Guard Cartridges*
Phase	50 × 4.6	100 × 4.6	150 × 4.6	250 × 4.6	
3 µm	–	–	ARI-5846-IK46	–	AGS-5731-BC4
5 µm	ARI-5846-LG46	ARI-5846-LI46	ARI-5846-LK46	ARI-5846-LM46	AGS-5731-BD4

ARION® BIO C4 all dimensions in mm				ARION® Guard Cartridges*
Phase	50 × 2.1	150 × 2.1	250 × 2.1	
5 µm	ARI-5846-LG21	ARI-5846-LK21	ARI-5846-LM21	AGS-5731-BD2

* ARION® Guard cartridges require ARION® Guard Holder p/n AGS-5731-000 (supplied without cartridges).

Semipreparative columns

ARION® BIO C4 all dimensions in mm			ARION® Guard Cartridges*
Phase	150 × 10	250 × 10	
5 µm	ARI-5846-LK1X	ARI-5846-LM1X	–

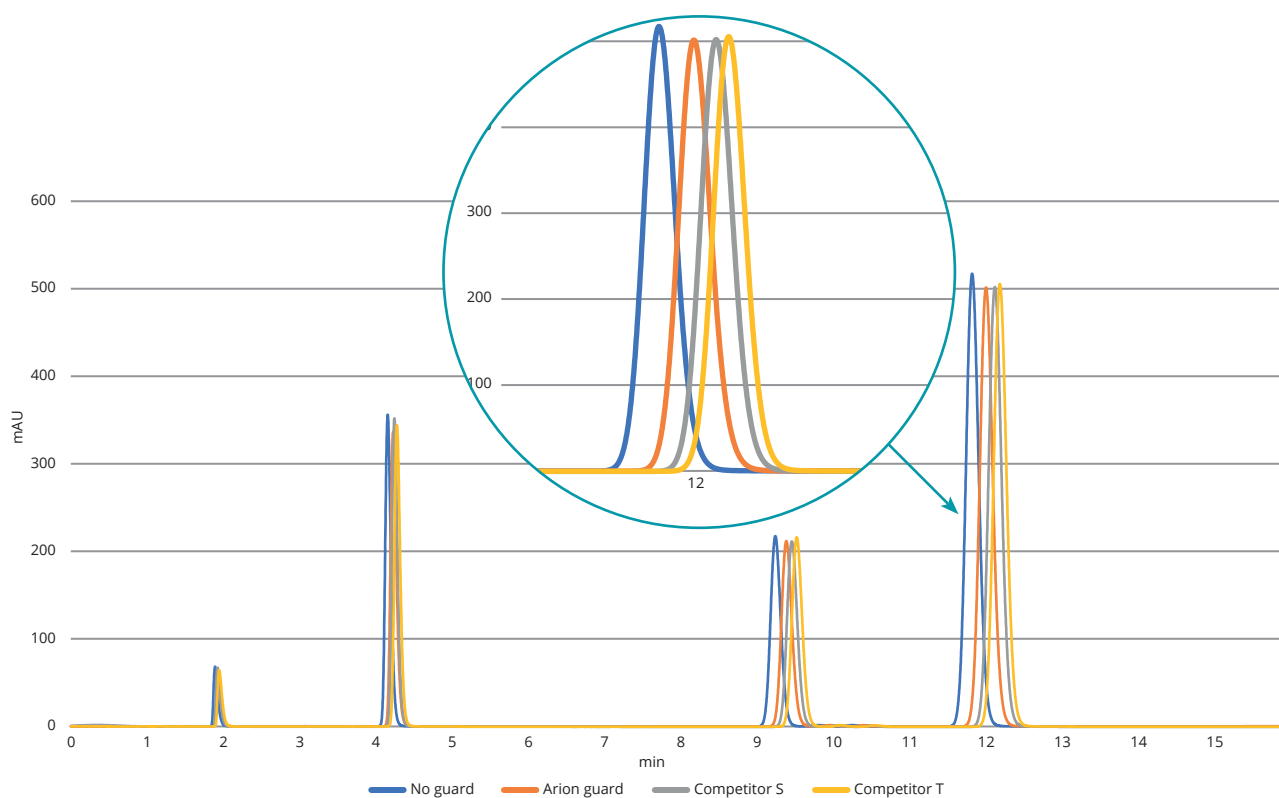
Guard column system

The ARION® Guard System (AGS) is a universal guard system, which can be connected to almost any column hardware on the market. It is easy to use and it offers the shortest retention time shift of analytes in comparison with other major manufacturers. The AGS consists of a Guard holder and Guard cartridge, which is offered with various silica materials according to the stationary phase in the HPLC column used.

- Universal – fits virtually any column on the market.
- The **lowest influence on retention times** compared with other guard systems.
- Small size for easier installation in the column oven.
- **Any orientation** of the cartridge.
- Pressure rating up to **900 bar**.
- Higher cartridge capacity.

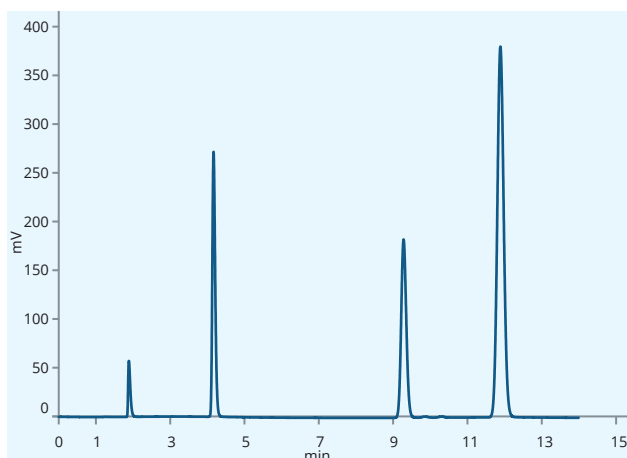


AGS system holder

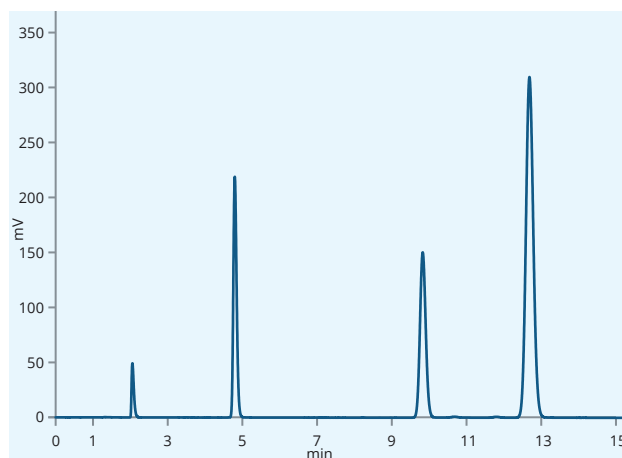


Comparison of guard systems from various manufacturers

Guard column system



ARION® Plus with ARION® Guard System



ARION® Polar with ARION® Guard System



Both chromatograms above show the separation of Uracil, Acetophenone, Toluene and Naphthalene with the ARION® Guard system in Acetonitrile/Water (65:35) at 254 nm. The ARION® Guard system does not affect column performance. It does not show any influence on peak symmetry or column resolution.

A higher sorbent bed (5×4 mm ID) offers a **raised capacity** without needing to couple two cartridges together. All this ensures lower running costs.



Guard System Selection Guide

Material	Pore size	pH Stability	Column ID 2.1–3.0 5.0 × 2.1 mm	Column ID 3.0–4.6 5.0 × 4.0 mm	100% aqueous mobile phase
					
			Package of 3 pcs	Package of 3 pcs	
RP 1.7 µm	100 Å	1 to 10	AGS-5731-RA2	–	×
RP 2.2 µm	100 Å	1 to 10	AGS-5731-RB2	–	✓
RP 3.0 µm	100 Å	1 to 10	AGS-5731-RC2	AGS-5731-RC4	✓
RP 5.0 µm	100 Å	1 to 10	AGS-5731-RD2	AGS-5731-RD4	✓
HILIC 2.2 µm	100 Å	1.5 to 7	AGS-5731-HB2	–	OM/W*
HILIC 3.0 µm	100 Å	1.5 to 7	AGS-5731-HC2	AGS-5731-HC4	OM/W*
HILIC 5.0 µm	100 Å	1.5 to 7	AGS-5731-HD2	AGS-5731-HD4	OM/W*
NP 2.2 µm	100 Å	n/a	AGS-5731-NB2	–	n/a
NP 3.0 µm	100 Å	n/a	AGS-5731-NC2	AGS-5731-NC4	n/a
NP 5.0 µm	100 Å	n/a	AGS-5731-ND2	AGS-5731-ND4	n/a
NH ₂ 2.2 µm	120 Å	2 to 6.5	AGS-5731-CB2	–	✓
NH ₂ 3.0 µm	120 Å	2 to 6.5	AGS-5731-CC2	AGS-5731-CC4	✓
NH ₂ 5.0 µm	120 Å	2 to 6.5	AGS-5731-CD2	AGS-5731-CD4	✓
BIO RP 3.0 µm	300 Å	1.5 to 7	AGS-5731-BC2	AGS-5731-BC4	×
BIO RP 5.0 µm	300 Å	1.5 to 7	AGS-5731-BD2	AGS-5731-BD4	×

* OM/W – Organic modifier (water-miscible)/water mobile phase recommended.

Ferrules for ARION® Guard System

Material	Pressure	10 pcs
PEEK	<400 bar*	AGS-5731-Y00
Stainless Steel, Type 316	<689 bar	AGS-5731-Z00

* Maximum pressure of PEEK ferrules depends on the tubing used. Max. pressure of 400 bar is for 1/16: OD tubing with ID 0.05 to 0.18 mm. ARION® Guard System includes one Stainless Steel ferrule in standard package.



AGS holder with PEEK ferrule
p/n AGS-5731-00P



AGS holder with Stainless Steel ferrule
p/n AGS-5731-000

Guard system for preparative columns

Preparative guard column system (PGS) is intended to use with 10 mm, 21.2 mm and 30 mm ID preparative HPLC columns.

Preparative Guard System Holders

ID	Description	Part number
10 mm	ARION® Preparative 10 mm Guard System, Holder only for ID 10 mm	PGS-5856-001
21.2 mm	ARION® Preparative 10 mm Guard System, Holder only for ID 21.2 mm	PGS-5856-000
30 mm	ARION® Preparative 10 mm Guard System, Holder only for ID 30 mm	PGS-5856-00Q

Preparative Guard System cartridges

5 µm AGS all dimensions in mm			
Phase	10 × 10	10 × 21.2	10 × 30
C18	PGS-5856-UD8	PGS-5856-UD9	PGS-5856-UDC
C18 Polar	On request	PGS-5856-WD9	PGS-5856-WDC
C8	On request	PGS-5856-TD9	On request
Pheny-butyl	On request	On request	On request
Biphenyl	On request	PGS-5868-UD9	On request
Si	On request	PGS-5856-VD9	PGS-5856-VDC

Preparative Guard System cartridges

10 µm AGS all dimensions in mm			
Phase	10 × 10	10 × 21.2	10 × 30
C18	PGS-5856-UF8	PGS-5856-UF9	PGS-5856-UFC
C18 Polar	PGS-5856-WF8	PGS-5856-WF9	PGS-5856-WFC
C8	On request	On request	On request
Pheny-butyl	PGS-5856-PF8	PGS-5856-PF9	On request
Biphenyl	On request	On request	On request
Si	On request	On request	PGS-5856-VFC

Preparative Guard System cartridges

15 µm AGS all dimensions in mm			
Phase	10 × 10	10 × 21.2	10 × 30
C18	PGS-5856-UG8	PGS-5856-UG9	On request
C18 Polar	PGS-5856-WG8	PGS-5856-WG9	On request
C8	On request	On request	On request
Pheny-butyl	PGS-5856-PG8	PGS-5856-PG9	On request
Biphenyl	On request	On request	On request
Si	On request	On request	On request



PGS holder
p/n PGS-5856-000



Preparative guard system cartridge

CHROMSHELL®



CHROMSHELL® extends the ARION® phases in the area of core-shell technology (SPP, Superficially-Porous Particles). These columns use an ultra high purity silica of 2.6 µm particles.

- Ultrapure silica with low metal content.
- Maximum pressure 600 bar.
- Temperature stability up to 90 °C.

Metal content	<10 ppm
Temperature stability	100 °C
Mean Particle diameter	2.54 ± 0.18 µm
Proximity to the shape of a sphere	0.95 ± 0.04

CHROMSHELL® phases	Particle size (µm)	Pore size (Å)	Surface area (m²/g)	Carbon load	pH stability	100% aqueous mobile phase	Endcapping	USP code
C18 Plus	2.6	85	130	9 %	1.5 to 7.5	×	Single-step	L1
C18-XB	2.6	85	130	8 %	1.5 to 8.0	×	Single-step	L1
C18 Polar	2.6	85	130	6.5 %	1.5 to 7.0	✓	Mixed	L1



A C18 phase with a balanced retention profile with the highest hydrophobicity

pH Range	1.5 to 7.5
USP Code	L1



A hydrophobic C18 phase with a specific surface treatment for high temperature applications

pH Range	1.5 to 8.0
USP Code	L1



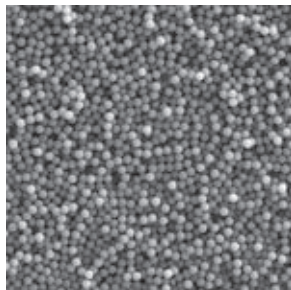
A polar end-capped developed for mid-polar and polar retention together with stability in the 100% aqueous mobile phase

pH Range	1.5 to 7.0
USP Code	L1

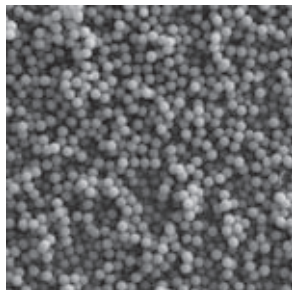
CHROMSHELL®

Up close

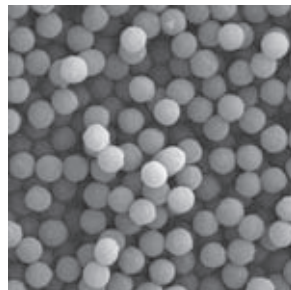
The 2.6-micron electron microscope field clearly shows the superlative quality of CHROMSHELL® particles.



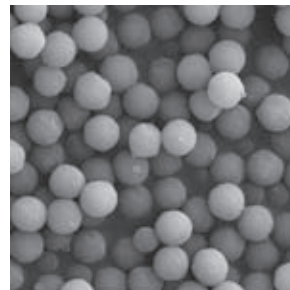
CHROMSHELL®
(100 × 100 μm)



Competitor K
(100 × 100 μm)



CHROMSHELL®
(30 × 30 μm)

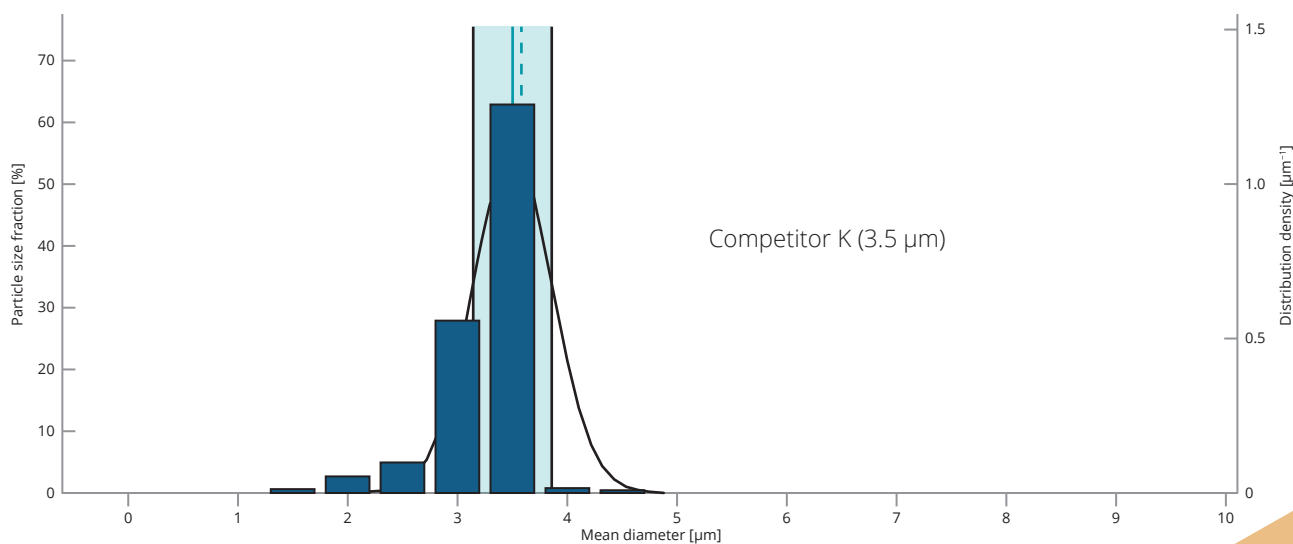
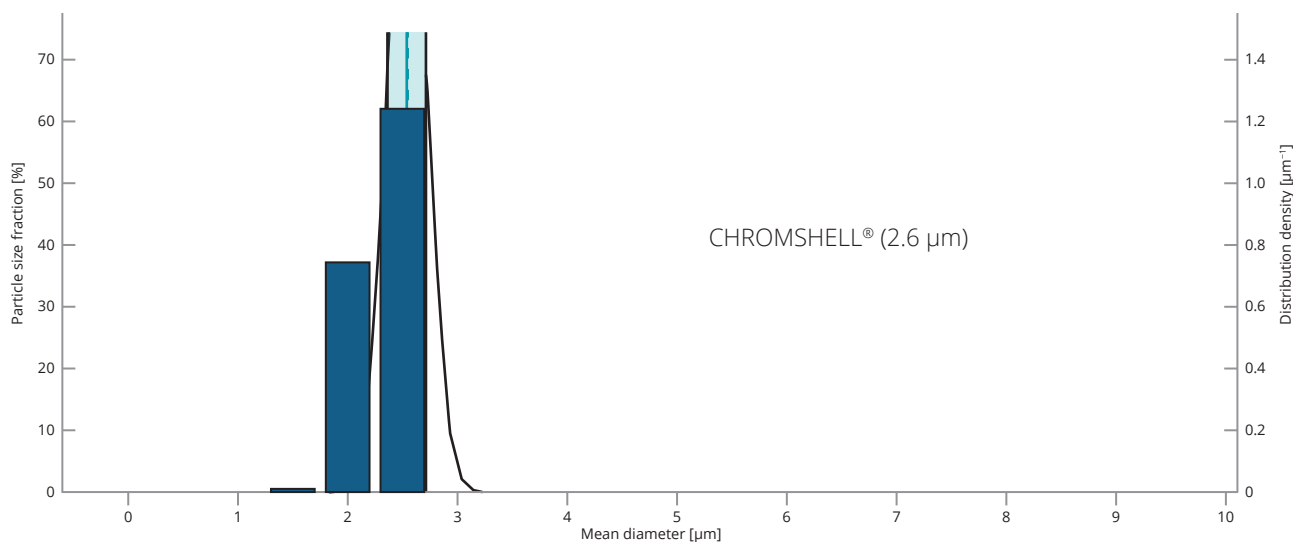


Competitor K
(30 × 30 μm)

The main particle characteristics:

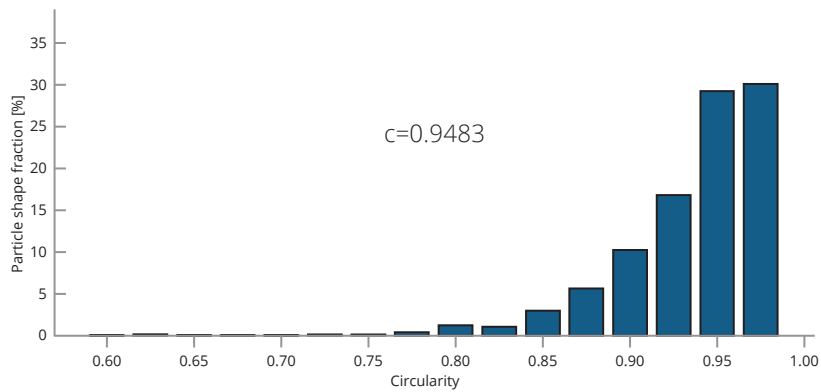
- High proximity to a sphere.
- Tight particle size distribution.
- No broken particles.
- No presence of clustered particles.
- Particle uniformity/homogeneity.

Particle size distribution

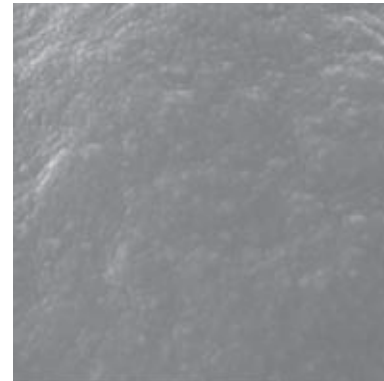


Circularity & surface smoothness

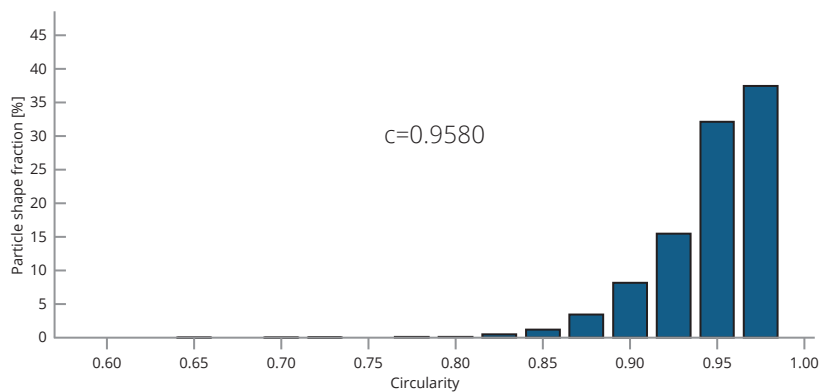
The core-shell particles were subjected to SEM analysis to determine circularity and surface smoothness.



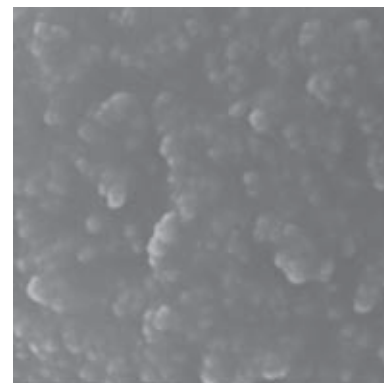
CHROMSHELL® (2.6 µm)



Detail view on pores



Competitor K (3.5 µm)



Detail view on pores up close

CHROMSHELL®

Ordering information

2.6 µm CHROMSHELL®

all dimensions in mm

Phase		30 × 2.1	50 × 2.1	75 × 2.1	100 × 2.1	150 × 2.1
C18 Plus		CSH-5722-GD21	CSH-5722-GG21	CSH-5722-GH21	CSH-5722-GI21	CSH-5722-GK21
C18-XB		CSH-5749-GD21	CSH-5749-GG21	CSH-5749-GH21	CSH-5749-GI21	CSH-5749-GK21
C18 Polar		CSH-5751-GD21	CSH-5751-GG21	CSH-5751-GH21	CSH-5751-GI21	CSH-5751-GK21

2.6 µm CHROMSHELL®

all dimensions in mm

Phase		30 × 3.0	50 × 3.0	75 × 3.0	100 × 3.0	150 × 3.0	250 × 3.0
C18 Plus		CSH-5722-GD30	CSH-5722-GG30	CSH-5722-GH30	CSH-5722-GI30	CSH-5722-GK30	–
C18-XB		CSH-5749-GD30	CSH-5749-GG30	CSH-5749-GH30	CSH-5749-GI30	CSH-5749-GK30	–
C18 Polar		CSH-5751-GD30	CSH-5751-GG30	CSH-5751-GH30	CSH-5751-GI30	CSH-5751-GK30	–

2.6 µm CHROMSHELL®

all dimensions in mm

Phase		50 × 4.6	75 × 4.6	100 × 4.6	150 × 4.6	250 × 4.6
C18 Plus		CSH-5722-GG46	CSH-5722-GH46	CSH-5722-GI46	CSH-5722-GK46	–
C18-XB		CSH-5749-GG46	CSH-5749-GH46	CSH-5749-GI46	CSH-5749-GK46	–
C18 Polar		CSH-5751-GG46	CSH-5751-GH46	CSH-5751-GI46	CSH-5751-GK46	–

Chemicals of emerging concern (CECs) in river water

Chemical pollution causes enormous damage to the aquatic environment. The simultaneous determination of pollutants with different physico-chemical properties, such as pesticides, metabolites, personal care products, plastic-related chemicals, is always challenging. The application shows a sensitive LC/MS method for the fast determination of a diverse group of pollutants in river water.

Substance	Deisopropylatrazine , CAS number 1007-28-9
	Hexazinon , CAS number 51235-04-2
	Simazine , CAS number 122-34-9
	Atrazine , CAS number 1912-24-9
	Terbuthylazine , CAS number 5915-41-3
	Terbutryn , CAS number 886-50-0
	Prometryn , CAS number 7287-19-6
	Metolachlor , CAS number 51218-45-2
	Metazachlor , CAS number 67129-08-2
	Diuron , CAS number 330-54-1
	Isoproturon , CAS number 34123-59-6
	Chlorotoluron , CAS number 15545-48-9
	Desethylterbuthylazine , CAS number 30125-63-4
	Acetochlor , CAS number 34256-82-1
	Tebuconazole , CAS number 107534-96-3
	Propiconazole , CAS number 60207-90-1
	Ametryn , CAS number 834-12-8
	Epoxiconazole , CAS number 135319-73-2
	Cybutryne (Irgarol), CAS number 28159-98-0
	Alachlor , CAS number 15972-60-8
	Chlorfenvinphos , CAS number 470-90-6
	Ethofumesate , CAS number 26225-79-6
	Linuron , CAS number 330-55-2
	Pendimethalin , CAS number 40487-42-1
	Fenthion , CAS number 55-38-9
	Dichlorvos , CAS number 62-73-7

Substance	Quinoxifen , CAS number 124495-18-7
	Thiamethoxam , CAS number 153719-23-4
	Imidacloprid , CAS number 138261-41-3
	Clothianidin , CAS number 210880-92-5
	Fenpropimorph , CAS number 67564-91-4
	Carbendazim , CAS number 10605-21-7
	Thiacloprid , CAS number 111988-49-9
	Spiroxamine , CAS number 118134-30-8
	Metamitron , CAS number 41394-05-2
	Propazine , CAS number 139-40-2
	Thiophanate-methyl , CAS number 23564-05-8
	(4-Chloro-2-methylphenoxy)acetic acid (MCPA), CAS number 94-74-6
	Mecoprop (MCP+MCP-p), CAS number 93-65-2
	2,4-Dichlorophenoxyacetic acid (2,4-D), CAS number 94-75-7
	4-(4-Chloro-2-methylphenoxy)butanoic acid (MCPB), CAS number 94-81-5
	Dichlorprop (2,4-DP), CAS number 120-36-5
	Bentazone , CAS number 25057-89-0
	2,4,5-Trichlorophenoxyacetic acid (2,4,5-T), CAS number 93-76-5
	Perfluorooctanesulfonic acid (PFOS), CAS number 1763-23-1
	Desethylatrazine (Desethyl-atrazine), CAS number 6190-65-4
	Methiocarb , CAS number 2032-65-7

Column	CHROMSHELL® C18 Plus, 2.6 µm		
Dimensions	50 mm × 2.1 mm		
Part number	CSH-5722-GG21		
Mobile phase	A: 5mM ammonium formate in water B: 5mM ammonium formate in MeOH		
Gradient elution	Time (min)	%A	%B
	0	100	0
	2	100	0
	7	0	100
	8	0	100
	8.1	100	0
	11	100	0
Flow rate	0.350 mL/min		
Temperature	40 °C		
Detection	MS/MS Low Mass		
Injection volume	100 µL		
Analytes	See MS/MS method		

Chemicals of emerging concern (CECs) in river water

Validation parameters	LOD, µg/L	LOQ, µg/L
desethylatrazine	4.6	15.5
hexazinon	2.9	9.7
simazine	3.5	11.6
atrazine	2.1	7.1
terbuthylazine	3.8	12.6
terbutryn	3.5	11.7
prometryn	3.7	12.3
metolachlor	4.9	16.2
metazachlor	3	9.8
diuron	3.8	12.8
isoproturon	4	13.2
chlorotoluron	2.8	9.3
desethylterbuthylazine	6.3	21
acetochlor	4	13.4
tebuconazole	3.2	10.8
propiconazole	5	16.8
ametryn	3.4	11.4
epoxiconazole	2.7	8.9
cybutryne	3.9	12.8
alachlor	4.3	14.3
chlorfenvinphos	3	10
deisopropylatrazine	5.6	18.5
ethofumesate	2.7	8.9
linuron	4.7	15.6
pendimethalin	5.1	16.9
fenthion	2.3	7.6
dichlorvos	8.9	29.7
quinoxifen	3	10.1
thiamethoxam	3.3	11
imidacloprid	3.3	11
clothianidin	5.8	19.3
fenpropimorph	3	9.9
carbendazim	4.5	15.1
thiacloprid	4.4	14.6
spiroxamine	3.6	12.1
metamitron	2.9	9.5
propazin	3.5	11.8
thiophanate-methyl	5.2	17.4
(4-chloro-2-methylphenoxy)acetic acid	5.1	16.8
mecoprop	6	20.1
2,4-dichlorophenoxyacetic acid	3.8	12.7
4-(4-chloro-2-methylphenoxy)butanoic acid	6	20.1
dichlorprop	6	20
bentazone	3	9.9
2,4,5-trichlorophenoxyacetic acid	3.4	11.2
methiocarb	4.9	16.4
perfluorooctanesulfonic acid	5.4	18.1

* The LOD and LOQ were calculated from real surface river water samples, not pure standards.

Chemicals of emerging concern (CECs) in river water

Internal standard are used:

Bentazone D6 RT: 4.22

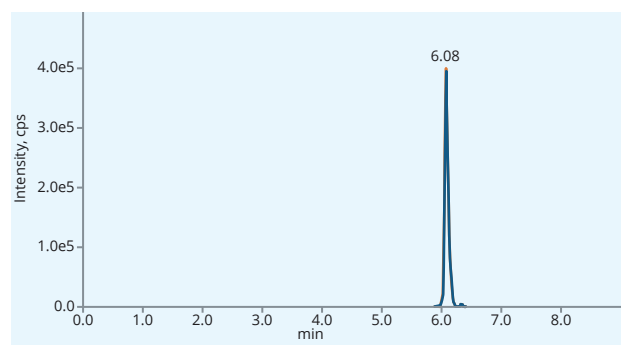
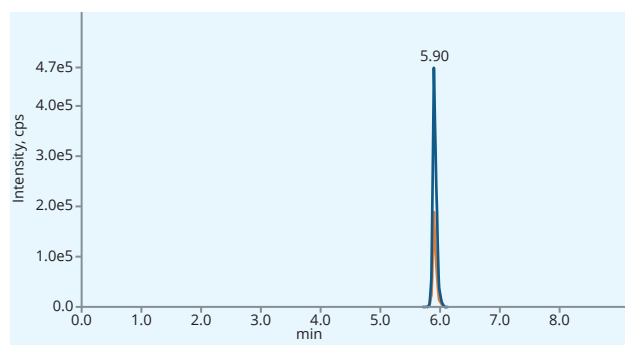
Isoproturon D6 RT: 6.35

Simazine D10 RT: 5.84

(-) Qualifier 244.9 > 132.0 [-38.0 V], Quantifier 244.9 > 181.0 [-30.0 V]

(+) Qualifier 213.3 > 78.2 [27.0 V], Quantifier 213.3 > 52.2 [31.0 V]

(+) Qualifier 212.1 > 137.1 [25.0 V], Quantifier 212.1 > 134.2 [25.0 V]



Mecoprop RT: 5.91

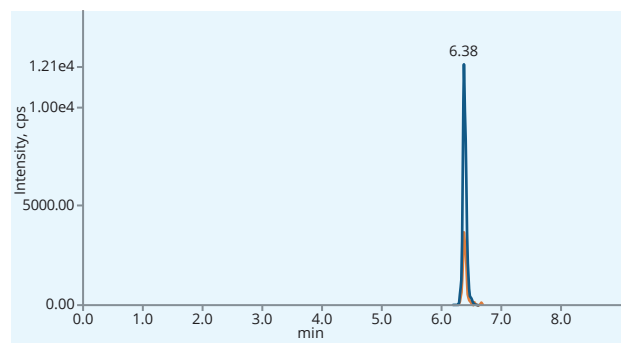
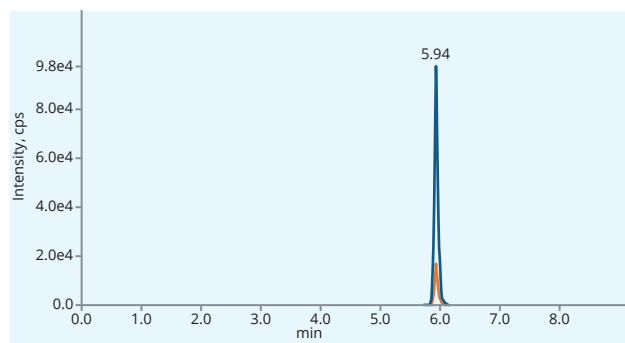
(-) Qualifier 213.0 > 141.0 [-18.0 V],

Quantifier 215.0 > 143.0 [-18.0 V]

2,4,5-Trichlorophenoxyacetic acid RT: 6.07

(-) Qualifier 252.7 > 194.9 [-16.0 V],

Quantifier 254.7 > 196.8 [-16.0 V]



Dichlorprop RT: 5.92

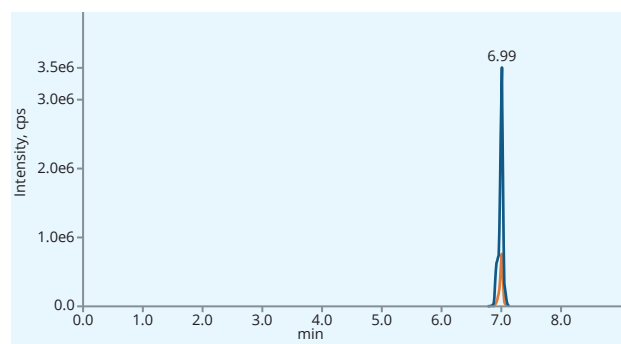
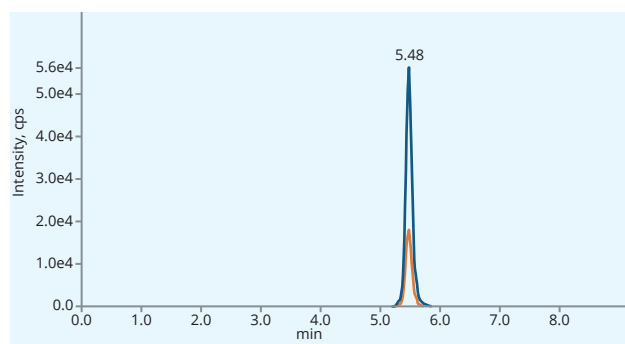
(-) Qualifier 233.0 > 161.0 [-18.0 V],

Quantifier 233.0 > 125.0 [-32.0 V]

4-(4-Chloro-2-methylphenoxy)butanoic acid RT: 6.5

(-) Qualifier 227.0 > 141.0 [-12.0 V],

Quantifier 229.0 > 143.0 [-12.0 V]



(4-Chloro-2-methylphenoxy)acetic acid RT: 5.48

(-) Qualifier 199.0 > 141.0 [-20.0 V],

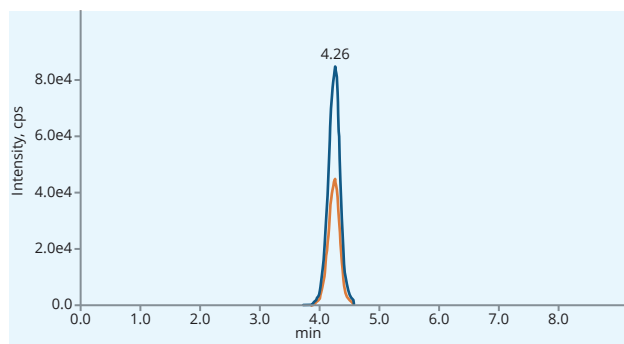
Quantifier 201.0 > 143.0 [-20.0 V]

Perfluorooctanesulfonic acid RT: 7.0

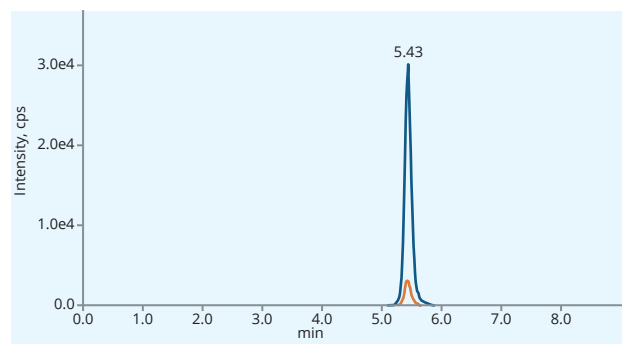
(-) Qualifier 498.8 > 79.8 [-118.0 V],

Quantifier 498.8 > 98.8 [-98.0 V]

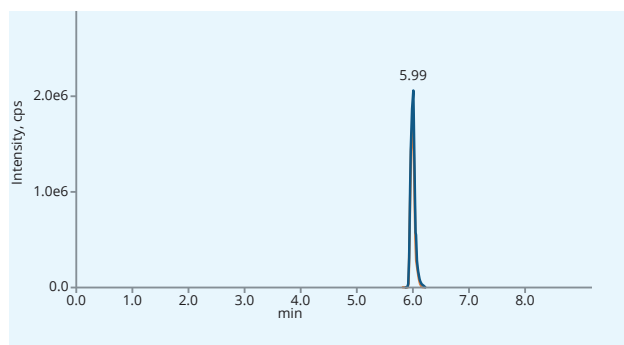
Chemicals of emerging concern (CECs) in river water



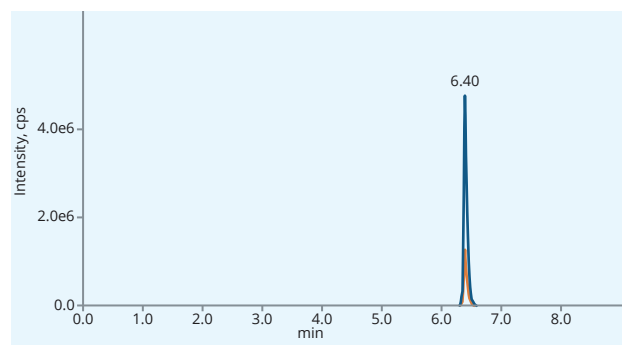
Bentazone RT: 4.22
(-) Qualifier 239.0 > 132.0 [-36.0 V],
Quantifier 239.0 > 197.0 [-30.0 V]



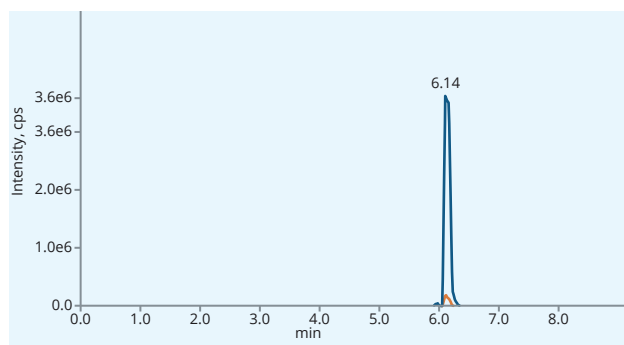
2,4-Dichlorophenoxyacetic acid RT: 5.44
(-) Qualifier 219.0 > 161.0 [-18.0 V],
Quantifier 219.0 > 125.0 [-36.0 V]



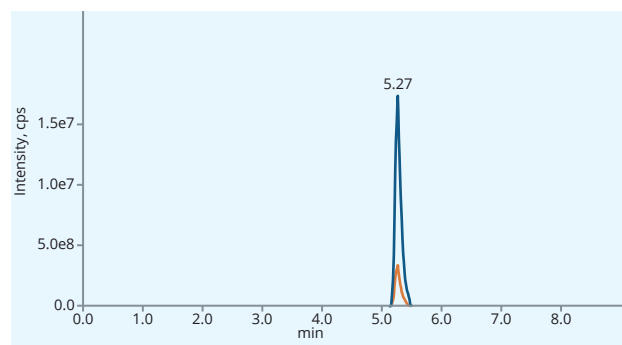
Simazine RT: 5.9
(+) Qualifier 202.1 > 132.1 [25.0 V],
Quantifier 202.1 > 124.3 [25.0 V]



Isoproturon RT: 6.35
(+) Qualifier 207.2 > 72.1 [29.0 V],
Quantifier 207.2 > 46.1 [31.0 V]

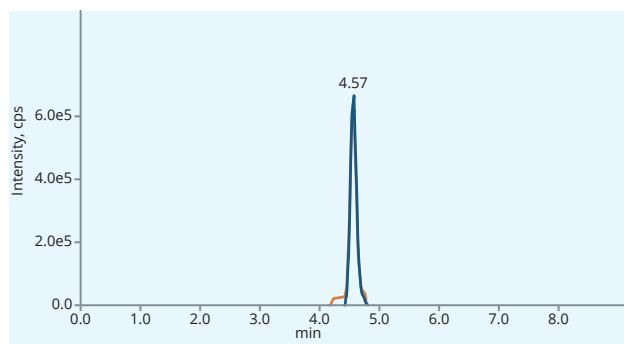


Desethylterbutylazine RT: 6.1
(+) Qualifier 202.1 > 146.0 [23.0 V],
Quantifier 202.1 > 79.0 [50.0 V]

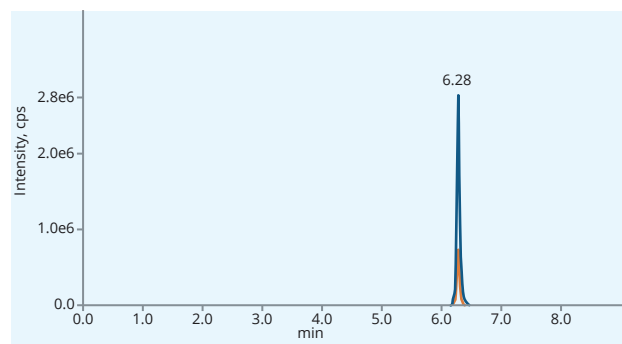


Carbendazim RT: 5.14
(+) Qualifier 192.2 > 160.2 [27.0 V],
Quantifier 192.2 > 132.1 [41.0 V]

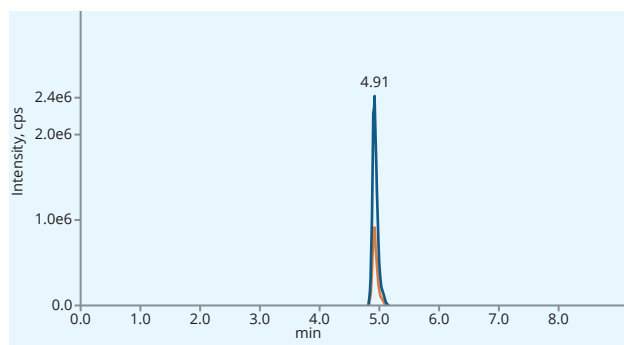
Chemicals of emerging concern (CECs) in river water



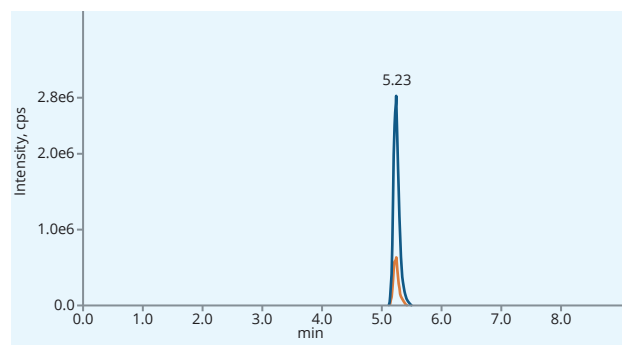
Deisopropylatrazine RT: 4.38
(+) Qualifier 174.1 > 104.1 [31.0 V],
Quantifier 174.1 > 96.1 [27.0 V]



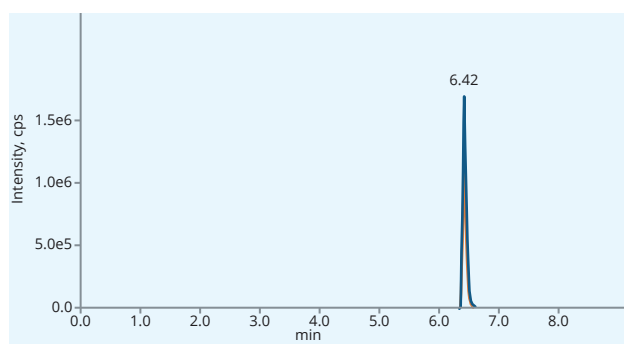
Chlorotoluron RT: 6.21
(+) Qualifier 213.1 > 72.2 [31.0 V],
Quantifier 213.1 > 46.2 [27.0 V]



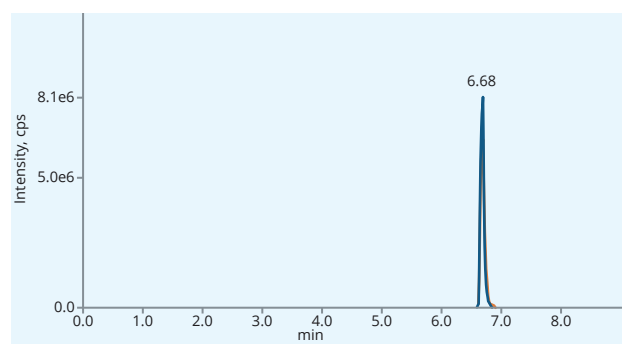
Metamitron RT: 4.8
(+) Qualifier 203.2 > 175.1 [23.0 V],
Quantifier 203.2 > 104.1 [33.0 V]



Desethylatrazine RT: 5.1
(+) Qualifier 188.1 > 146.2 [21.0 V],
Quantifier 188.1 > 104.1 [33.0 V]

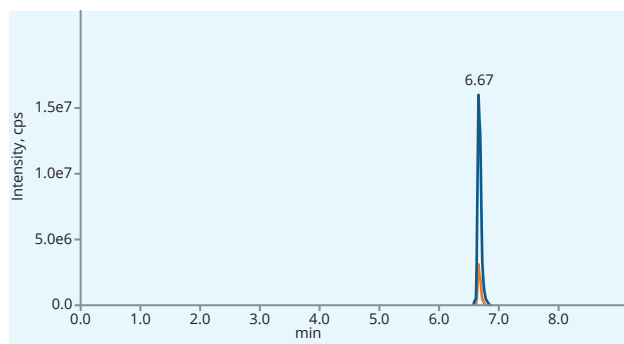


Diuron RT: 6.35
(+) Qualifier 233.1 > 72.0 [33.0 V],
Quantifier 235.1 > 72.1 [37.0 V]

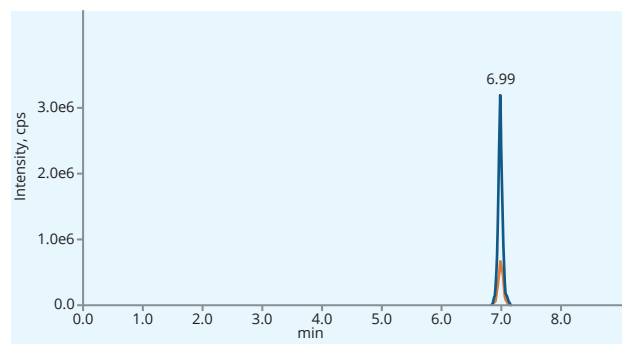


Propazin RT: 6.33
(+) Qualifier 230.1 > 188.0 [25.0 V],
Quantifier 230.1 > 146.0 [33.0 V]

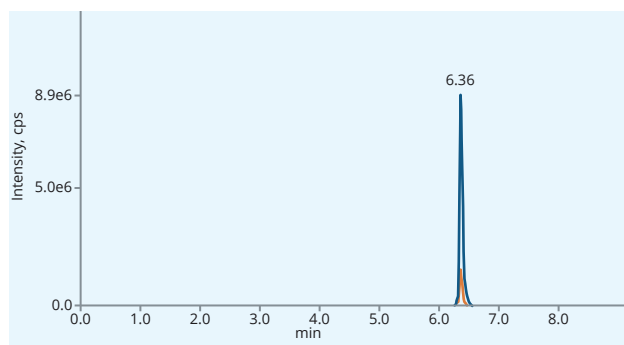
Chemicals of emerging concern (CECs) in river water



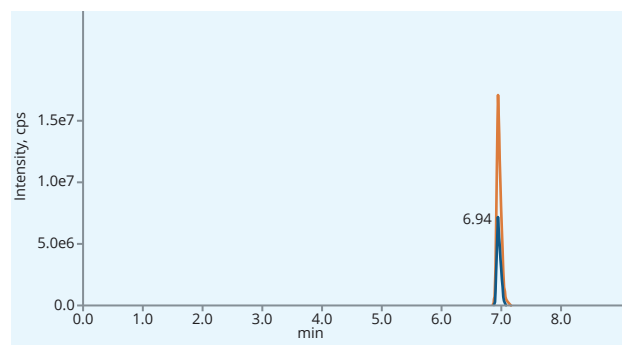
Ametryn RT: 6.63
(+) Qualifier 228.2 > 186.2 [23.0 V],
Quantifier 228.2 > 96.1 [33.0 V]



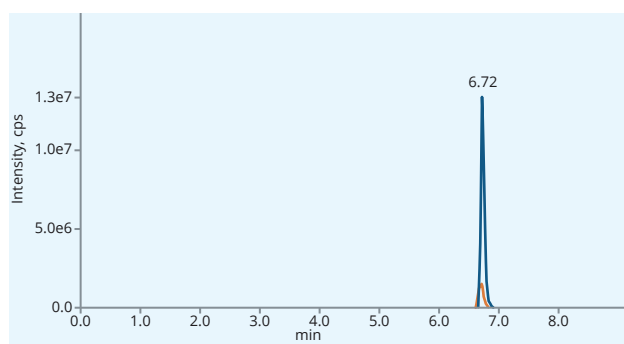
Acetochlor RT: 6.59
(+) Qualifier 224.1 > 148.1 [27.0 V],
Quantifier 270.0 > 224.0 [27.0 V]



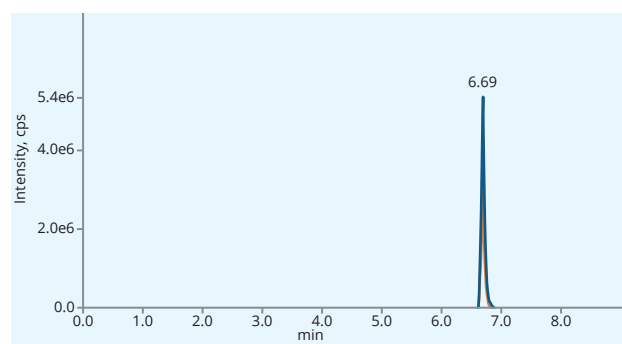
Atrazine RT: 6.31
(+) Qualifier 216.1 > 174.0 [23.0 V],
Quantifier 216.1 > 104.1 [39.0 V]



Prometryn RT: 6.9
(+) Qualifier 242.2 > 200.1 [19.0 V],
Quantifier 242.2 > 158.1 [35.0 V]

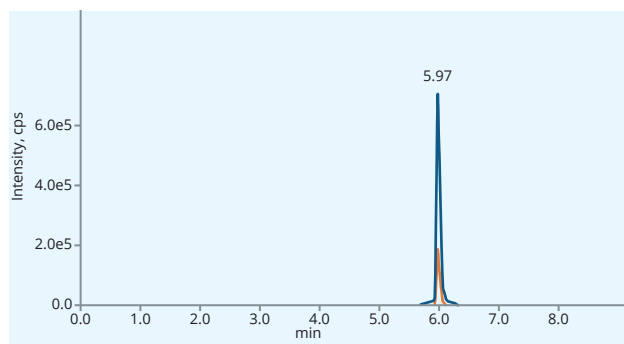


Terbutylazine RT: 6.7
(+) Qualifier 230.1 > 174.1 [23.0 V],
Quantifier 230.1 > 104.1 [41.0 V]

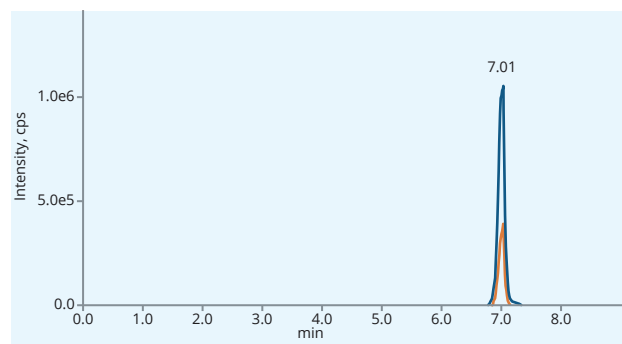


Methiocarb RT: 6.63
(+) Qualifier 226.1 > 169.2 [13.0 V],
Quantifier 226.1 > 121.1 [23.0 V]

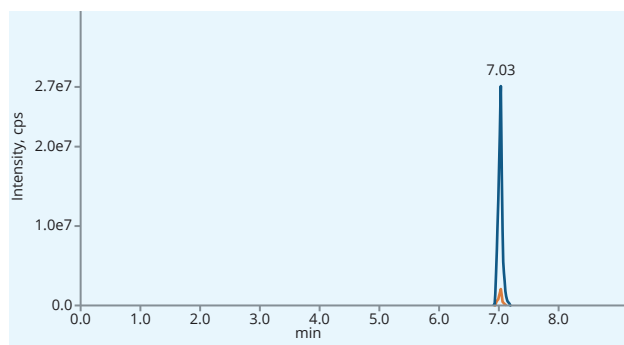
Chemicals of emerging concern (CECs) in river water



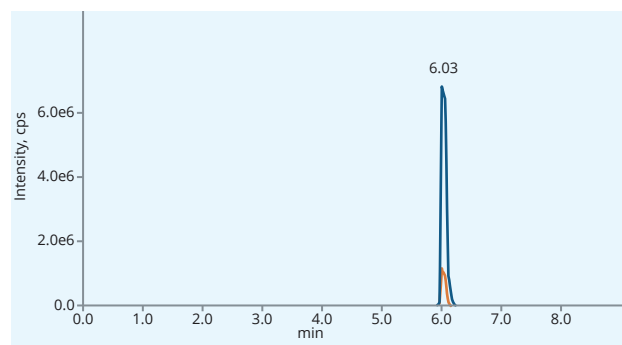
Dichlorvos RT: 5.88
(+) Qualifier 220.9 > 109.1 [25.0 V],
Qualifier 220.9 > 127.2 [23.0 V]



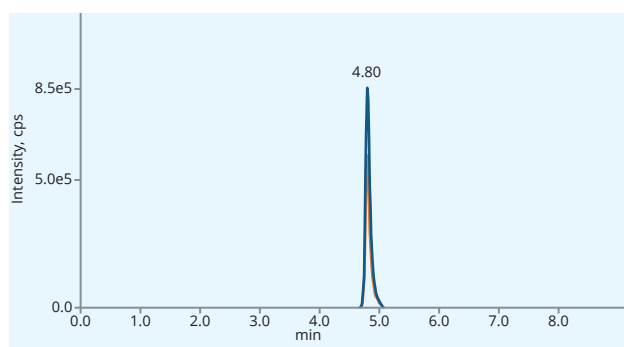
Alachlor RT: 7.0
(+) Qualifier 270.1 > 238.2 [17.0 V],
Qualifier 270.1 > 162.2 [28.0 V]



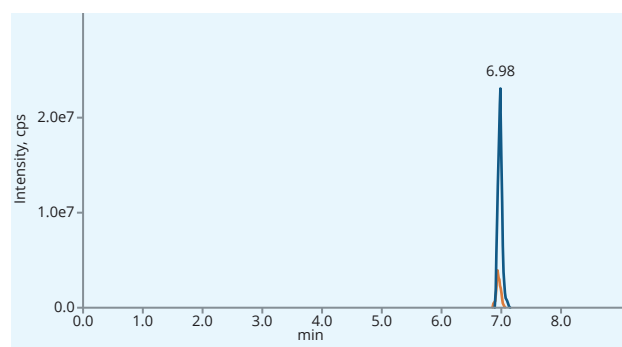
Cybutryne RT: 6.98
(+) Qualifier 254.2 > 198.2 [23.0 V],
Qualifier 254.2 > 83.2 [39.0 V]



Hexazinon RT: 5.94
(+) Qualifier 253.2 > 171.2 [27.0 V],
Qualifier 253.2 > 85.1 [44.0 V]

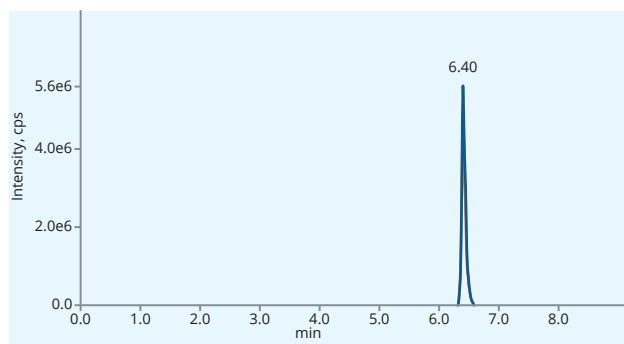


Clothianidin RT: 4.7
(+) Qualifier 250.0 > 169.1 [17.0 V],
Qualifier 250.0 > 132.0 [21.0 V]

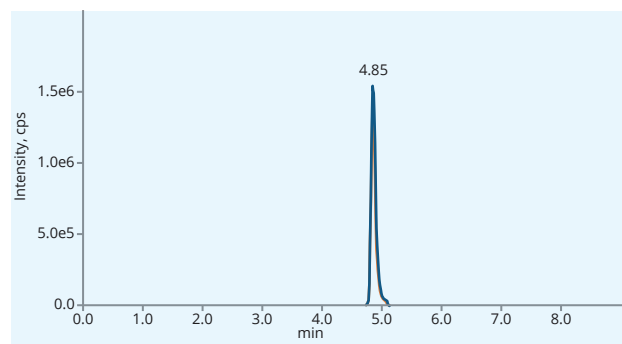


Terbutryn RT: 6.91
(+) Qualifier 242.2 > 186.1 [23.0 V],
Qualifier 242.2 > 68.1 [57.0 V]

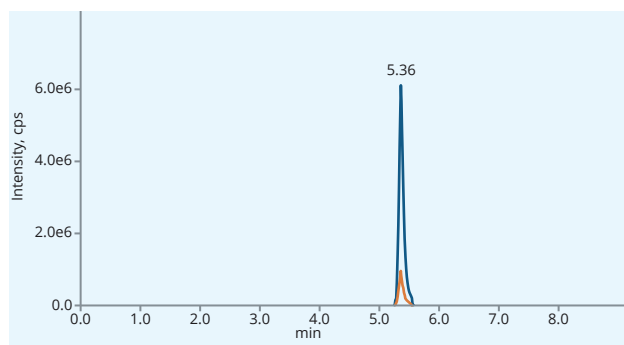
Chemicals of emerging concern (CECs) in river water



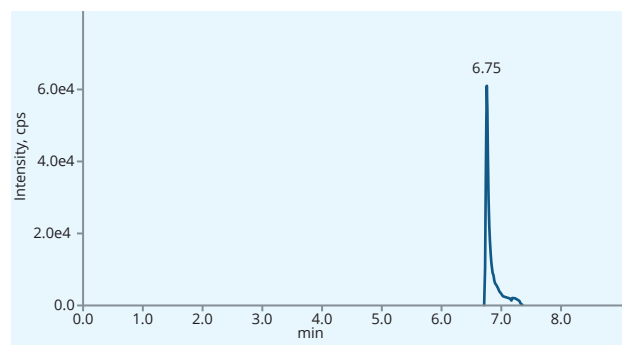
Metazachlor RT: 6.35
(+) Qualifier 278.2 > 134.2 [27.0 V],
Quantifier 278.2 > 210.2 [17.0 V]



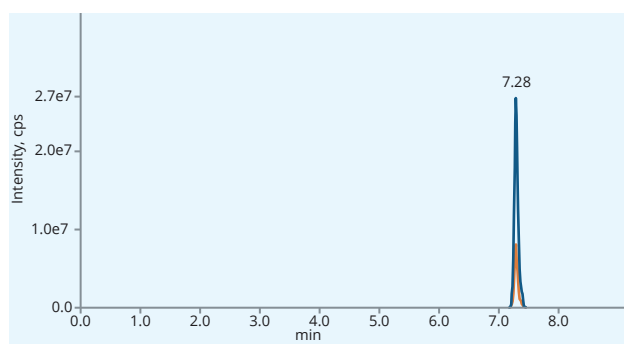
Imidacloprid RT: 4.62
(+) Qualifier 256.2 > 209.0 [23.0 V],
Quantifier 256.2 > 175.2 [23.0 V]



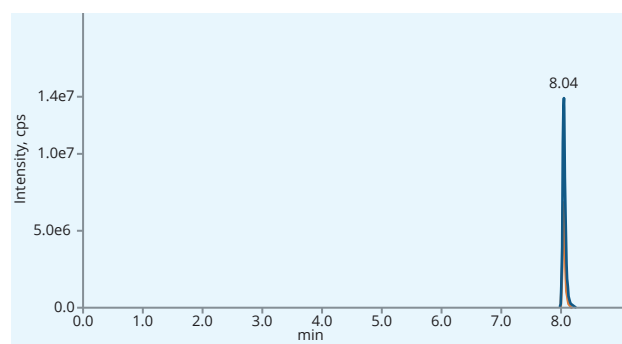
Thiachloprid RT: 5.22
(+) Qualifier 253.1 > 126.1 [29.0 V],
Quantifier 253.1 > 99.1 [57.0 V]



Linuron RT: 6.6
(+) Qualifier 249.1 > 160.0 [23.0 V],
Quantifier 249.1 > 182.1 [21.0 V]

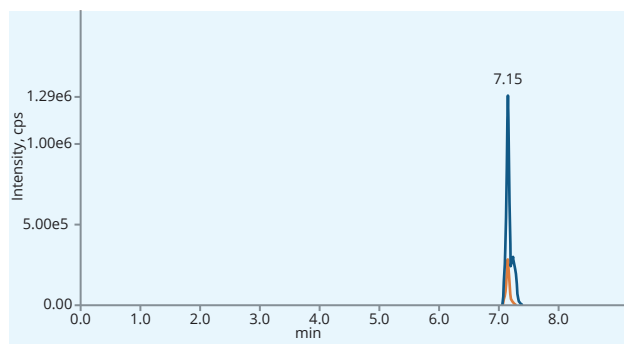


Spiroxamine RT: 7.1
(+) Qualifier 298.4 > 144.2 [27.0 V],
Quantifier 298.4 > 100.2 [43.0 V]

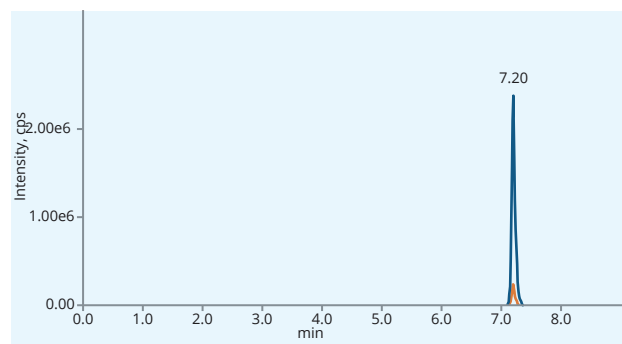


Fenpropimorph RT: 7.97
(+) Qualifier 304.0 > 147.0 [39.0 V],
Quantifier 304.0 > 117.0 [71.0 V]

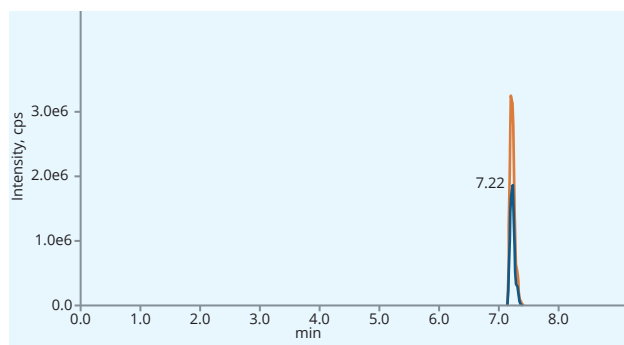
Chemicals of emerging concern (CECs) in river water



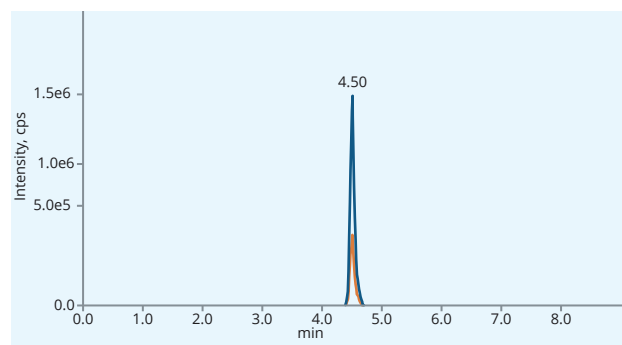
Tebuconazole RT: 7.1
(+) Qualifier 308.0 > 70.0 [39.0 V],
Quantifier 308.0 > 125.0 [47.0 V]



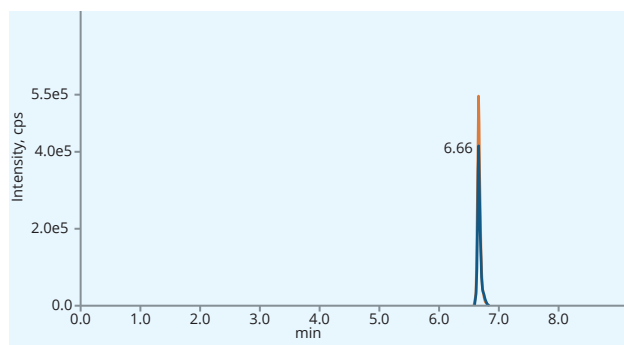
Propiconazole RT: 7.15
(+) Qualifier 342.1 > 159.1 [43.0 V],
Quantifier 342.1 > 69.1 [33.0 V]



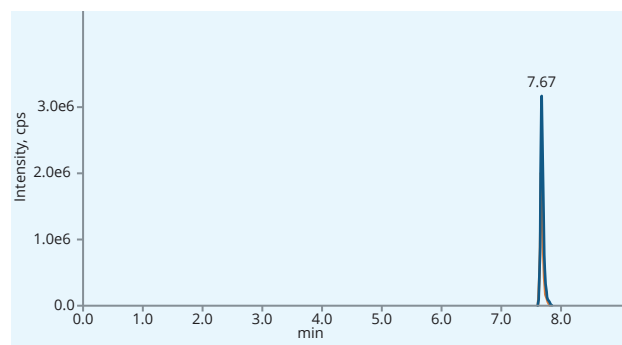
Chlorfenvinphos RT: 7.18
(+) Qualifier 358.9 > 99.0 [39.0 V],
Quantifier 358.9 > 155.1 [17.0 V]



Thiamethoxam RT: 4.34
(+) Qualifier 292.0 > 211.0 [17.0 V],
Quantifier 292.0 > 181.0 [31.0 V]

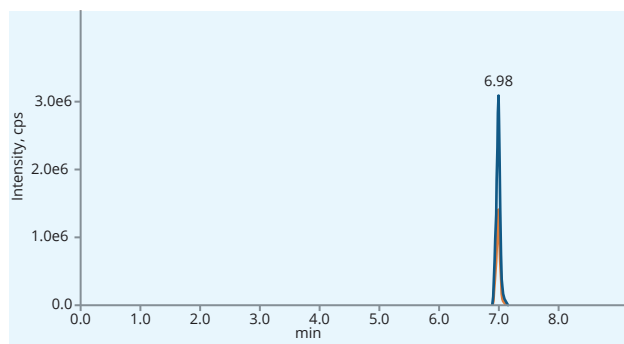


Ethofumesate RT: 6.62
(+) Qualifier 304.0 > 121.0 [27.0 V],
Quantifier 304.0 > 161.0 [31.0 V]

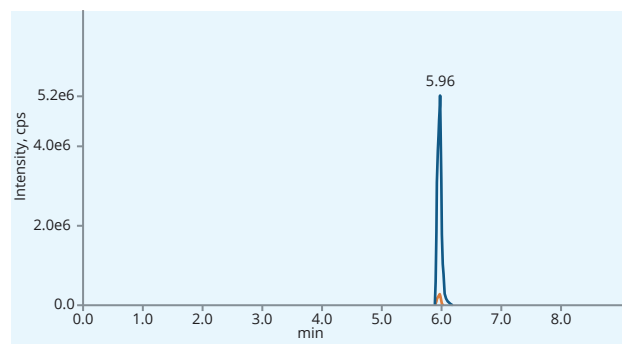


Quinoxifen RT: 7.61
(+) Qualifier 308.0 > 197.0 [43.0 V],
Quantifier 308.0 > 162.0 [57.0 V]

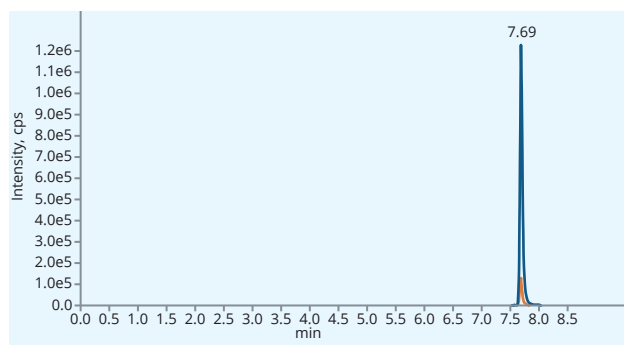
Chemicals of emerging concern (CECs) in river water



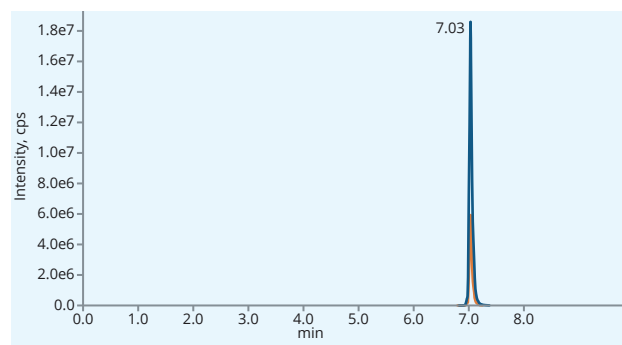
Epoxiconazole RT: 6.9
(+) Qualifier 330.0 > 121.0 [27.0 V],
Quantifier 330.0 > 101.0 [63.0 V]



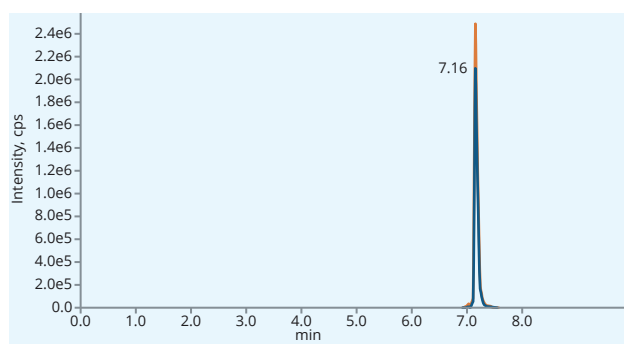
Thiophanate-methyl RT: 5.84
(+) Qualifier 343.0 > 151.0 [25.0 V],
Quantifier 343.0 > 192.0 [21.0 V]



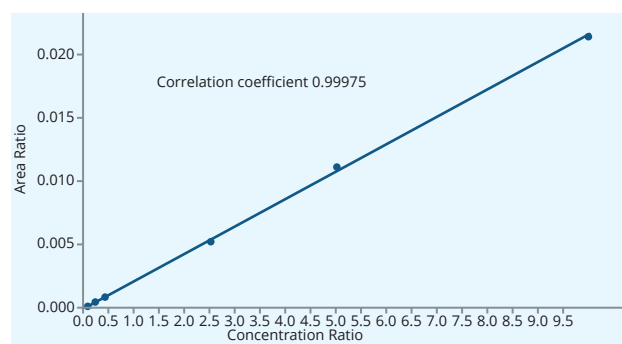
Pendimethalin RT: 7.65
(+) Qualifier 282.2 > 212.1 [15.0 V],
Quantifier 282.2 > 194.2 [21.0 V]



Metolachlor RT: 7.0
(+) Qualifier 284.2 > 252.2 [21.0 V],
Quantifier 284.2 > 176.2 [33.0 V]



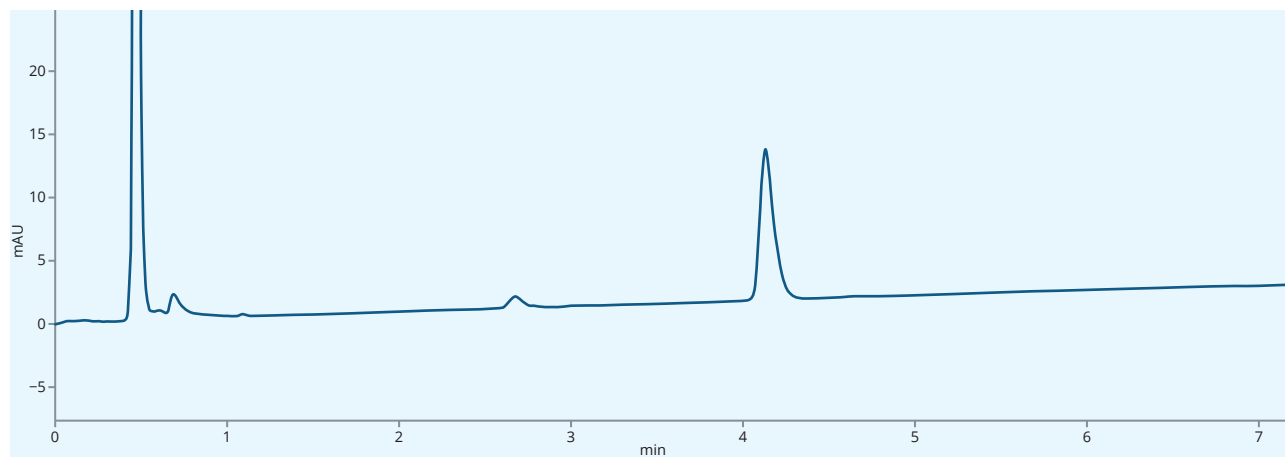
Fenthion RT: 7.1
(+) Qualifier 278.9 > 169.0 [25.0 V],
Quantifier 278.9 > 246.9 [19.0 V]



Example of calibration curve for
4-(4-Chloro-2-methylphenoxy)butanoic acid (MCPB)

Tween 80

Tween 80 is used to stabilize aqueous solutions with drugs and also as an emulgator in the pharma industry. It is also used as an additive in vaccine production. Currently it is added to Covid19 vaccines.



Analysis of hydrolyzed PS-80 on CHROMSHELL® C18-XB

Column	CHROMSHELL® C18-XB, 2.6 µm
Dimensions	100 mm × 4.6 mm
Part number	CSH-5749-GI46
Mobile phase	Proprietary
Temperature	Proprietary
Injection volume	2.5 µL
Detection	UV @195 nm
Analytes	1. Tween 80

Column protection

CHROMSHELL® UHPLC columns can be protected by means of a guard system or by using an appropriate guard column filter (in-line filter).

The ARION® Guard System (AGS) is ideal for the protection of CHROMSHELL® UHPLC columns. We recommend it as an easy and less expensive solution in comparison with high pressure guard systems. The AGS can be used with pressures up to **900 bar**. More details about this guard system are on page 50.

Protection can be perfectly ensured by installing a pre-column filter holder with a 0.2µm or 0.5µm frit. This in-line filter can withstand pressures of up to 1375 bar and is easy to use. The filter holder consists of a two-piece body and replaceable filter – a metal frit.

Main features and benefits:

- Minimized dead-volume.
- Easy installation and use.
- Pressure rating up to **1375 bar**.
- Works with 1/16inch column connections from all manufacturers.
- Spare frits with various porosities.



FGS in-line filter

In-line filter selection guide

The FGS in-line filter made from 316 stainless steel is designed to reduce the number of connections compared with standard pre-column filters.

The in-line filter guarantees a very small dead volume thanks to the small bore size (0.15 mm in the body and nut). The total length is 46.5 mm.



Replacement frits

FGS in-line filter holder

Description	Amount	Internal volume	Part number
FGS in-line filter holder for 0.2µm frit (including encased type frit)	1 pc	0.59 µL	FGS-5782-OR0
FGS in-line filter holder for 0.5µm frit (including encased type frit)	1 pc	0.61 µL	FGS-5782-OS0

Replacement frits

Description	Amount	Frit volume	Frit OD	Part number
FGS stainless steel frit for in-line filter 0.2 µm, ID 1.96 mm	5 pcs	0.11 µL	1.96 mm	FGS-5782-SRB
FGS stainless steel frit for in-line filter 0.5 µm, ID 1.96 mm	5 pcs	0.13 µL	1.96 mm	FGS-5782-SSB

Note: The frit consists of stainless steel frit and PEEK ring. The ring has 2.92 mm OD. The frit porosity values are only nominal. They do not reflect maximum pore size of the frit.



Exploded view



LION™ GC columns have arrived to offer you a broad range of stationary phases and flexibility in capillary dimensions. What benefits do these GC capillary columns bring you?

- Strict quality control, each column individually tested.
- Column box includes column test mixture and scoring wafer.
- High flexibility in column dimensions and film thickness.
- Customer specific columns on request.
- 5" and 3.5" cages available

LION™ stationary phases

Phase name	Stationary phase composition	Max. temp. *
LN-1	100% Dimethyl polysiloxane	350 °C
LN-5	5% Phenyl, 95% methyl polysiloxane	350 °C
LN-20	20% Phenyl, 80% dimethyl polysiloxane	340 °C
LN-35	35% Phenyl, 65% methyl polysiloxane	340 °C
LN-17	50% Phenyl, 50% methyl polysiloxane	340 °C
LN-200	Trifluoropropyl methyl polysiloxane	250 °C
LN-624	6% Cyanopropyl phenyl, 94% methyl polysiloxane	280 °C
LN-1301	6% Cyanopropyl phenyl, 94% methyl polysiloxane	280 °C
LN-1701	14% Cyanopropyl phenyl, 86% methyl polysiloxane	280 °C
LN-225	25% Cyanopropyl, 25% phenyl, 50% methyl polysiloxane	260 °C
LN-WAX	Polyethylene glycol (PEG)	250 °C
LN-WAX Plus	Polyethylene glycol (PEG) inert and water resistant	270 °C
LN-FFAP	Acid modified polyethylene glycol (PEG)	250 °C
LN-WAX BA	Basic modified polyethylene glycol (PEG)	270 °C
LN-23	50% Cyanopropyl, 50% methyl polysiloxane	260 °C
LN-FAME	100% Cyanopropyl polysiloxane	260 °C
LN-1 MS	100% Dimethyl polysiloxane – low bleeding	350 °C
LN-5 MS	5% Phenyl, 95% methyl polysiloxane – low bleeding	360 °C
LN-5 MS Plus	Silphenylene methyl polysiloxane – extra low bleeding and inert	350 °C
LN-5 Sil MS	Silphenylene methyl polysiloxane – extra low bleeding	360 °C
LN-XLB **	Proprietary phase for semi-volatiles – low bleeding	360 °C
LN-35 MS	35% Phenyl, 65% methyl polysiloxane – low bleeding	340 °C
LN-17 MS	50% Phenyl, 50% methyl polysiloxane – low bleeding	340 °C
LN-624 MS	6% Cyanopropylphenyl, 94% methyl polysiloxane – low bleeding	280 °C
LN-624 Sil MS	6% Cyanopropylphenyl, 94% methyl polysiloxane – low bleeding	320 °C
LN-1701 MS	14% Cyanopropyl phenyl, 86% methyl polysiloxane – low bleeding	280 °C
LN-225 MS	25% Cyanopropyl, 25% phenyl, 50% methyl polysiloxane – low bleeding	240 °C
LN-WAX MS	Polyethylene glycol (PEG) – low bleeding	270 °C
LN-1 HT	100% Dimethyl polysiloxane – high temperature	400 °C
LN-5 HT	5% Phenyl, 95% methyl polysiloxane – high temperature	400 °C
LN-8 HT	Low to mid proprietary high temperature phase	400 °C
LN-35 HT	35% Phenyl, 65% methyl polysiloxane – high temperature	370 °C
LN-17 HT	50% Phenyl, 50% methyl polysiloxane – high temperature	370 °C
LN-65 HT	65% Phenyl, 35% methyl polysiloxane – high temperature	370 °C
LN-1701 HT	14% Cyanopropyl phenyl, 86% methyl polysiloxane – high temperature	320 °C
LN-WAX HT	Polyethylene glycol (PEG) – high temperature	300 °C
LN-FAME HT	Cyanopropyl polysiloxane – high temperature	280 °C

* The max. temperature depends on the stationary phase film thickness.
Other phases are available on request.

** XLB GC column selectivities of various manufacturers may vary.

Cross reference guide

Standard GC phases

LION™	Agilent / Varian	Machery-Nagel	Phenomenex	Restek	SGE	Supelco	UPS Method Classification
LN-1	DB-1, HP-1, CP Sil 5 CB	OPTIMA-1	ZB-1	Rtx-1	BP-1	SPB-1, Equity-1	G1, G2, G9, G38
LN-5	DB-5, HP-5, CP Sil 8 CB	OPTIMA-5	ZB-5	Rtx-5	BP-5	SPB-5, Equity-5	G27, G36, G41
LN-13	CP Sil 13 CB	–	–	–	–	–	–
LN-20	–	–	–	Rtx-20	–	SPB-20	G28, G32
LN-35	DB-35, HP-35	–	ZB-35	Rtx-35	–	SPB-35, SPB-608	G28, G32, G42
LN-17	DB-17, HP-17, DB-608, CP Sil 24 CB	OPTIMA-17	ZB-50	Rtx-17	BPX-50	SPB-50	G3, G17
LN-200	DB-200, DB-210, VF-200 ms	OPTIMA-210	–	Rtx-200	–	–	G6
LN-624	DB-624, HP-624, VF-624ms	OPTIMA-1301, OPTIMA-624	ZB-624	Rtx-1301, Rtx-624	BP-624	SPB-624, Vocol	G43
LN-1301	DB-624, HP-624, VF-624ms	OPTIMA-1301, OPTIMA-624	ZB-624	Rtx-1301, Rtx-624	BP-624	SPB-624, Vocol	G43
LN-1701	DB-1701, HP-1701, DB-1701P, CP Sil 19 CB	OPTIMA-1701	ZB-1701	Rtx-1701	BP-10	SPB-1701, Equity-1701	G46
LN-225	DB-225, HP-225	OPTIMA-225	–	Rtx-225	BP-225	SPB-225	G7, G19, G26
LN-WAX	DB-Wax, HP-Wax, CP Wax 52 CB	OPTIMA-WAX	ZB-WAX	Rtx-Wax	BP-20	–	G14, G15, G16
LN-WAX Plus	InnoWax	–	ZB-WAXplus	Stabilwax	–	–	G14, G15, G16
LN-FFAP	DB-FFAP	–	ZB-FFAP	Stabilwax-DA	BP-21	Nukol	G14, G15, G16, G25, G35, G39
LN-WAX BA	CAM, HP-BasicWax	–	–	Stabilwax-DB	–	–	–
LN-23	DB-23, VF-23 ms	–	–	Rtx-2330	BPX-70	SP-2330, SP2331, SP2380	G8
LN-FAME	HP-88, CP Sil 88	–	ZB-FAME	Rtx-2560	BPX-70	SP-2560	G5, G8, G48

GC/MS low bleed phases

LION™	Agilent / Varian	Machery-Nagel	Phenomenex	Restek	SGE	Supelco	UPS Method Classification
LN-1 MS	DB-1 ms (UI), HP-1 ms, VF-1 ms	OPTIMA-1 MS Accent	ZB-1 ms	Rxi-1 ms	BP-1	Equity-1	G1, G2, G9, G38
LN-5 MS	HP-5 ms	OPTIMA-5 MS	ZB-5 plus	Rtx-5 MS	BPX-5	Equity-5	G27, G36, G41
LN-5 MS plus	DB-5 ms UI, VF-5 ms	OPTIMA-5 MS Accent	ZB-5 MSplus, ZB-Semivoaltiles	Rxi-5 Sil MS	–	SLB-5 ms	G27, G36, G41
LN-5 Sil MS	DB-5 ms, VF-5 ms	OPTIMA-5 MS Accent	ZB-5 ms	Rtx-5 Sil MS	–	SLB-5 ms	G27, G36, G41
LN-XLB*	DB-XLB	OPTIMA-XLB	ZB-XLB (HT)	Rtx-XLB	–	–	–
LN-35 MS	DB-35 ms (UI), VF-35 ms	OPTIMA-35 MS	ZB-MultiResidue 2 (MR-2)	Rxi-35 Sil MS	BPX-35, BPX-608	–	G28, G32, G42
LN-17 MS	DB-17 ms, VF-17 ms	OPTIMA-17 MS	–	Rxi-17 Sil MS	BPX-50	–	G3, G17
LN-225 MS	DB-225 ms	–	–	–	–	–	G7, G19
LN-624 MS LN-624 Sil MS	VF-1301 ms, VF-624 ms	OPTIMA-624 LB	–	Rxi-624 Sil MS	–	–	G43
LN-WAX MS	HP-INNOWax, VF-Wax ms	–	ZB-WAX	Stabilwax MS	–	–	G14, G15, G16

* XLB phases may vary from manufacturer to manufacturer.

High temperature GC phases

LION™	Agilent / Varian	Machery-Nagel	Phenomenex	Restek	SGE	Supelco	UPS Method Classification
LN-1 HT	DB-1 HT	–	ZB-1 HT inferno	Rxi-1HT	–	–	G1, G2, G9, G38
LN-5 HT	DB-5 HT	OPTIMA-5 HT	ZB-5 HT inferno	Rxi-5HT	–	–	G27, G36, G41
LN-8 HT	–	–	–	–	HT-8	–	–
LN-35 HT	–	–	ZB-35 HT inferno	–	–	–	G28, G32, G42
LN-17 HT	DB-17 HT	–	–	–	–	–	G3, G17
LN-1701 HT	–	–	–	–	–	–	G46
LN-WAX HT	DB-HeavyWax	–	–	–	–	–	G14, G15, G16
LN-65 HT	TAP-CB	–	–	Rtx-65TG	–	–	–
LN-FAME HT	–	–	–	–	–	–	G5, G8, G48

Recent developments

LION™ WAX HT

- Up to 290 °C for column ID 0.25 to 0.32 mm
- Up to 300 °C for column ID 0.10 mm (Fast GC)

LION™ WAX Plus

- Up to 270 °C
- Higher inertness
- Compatible with water injections

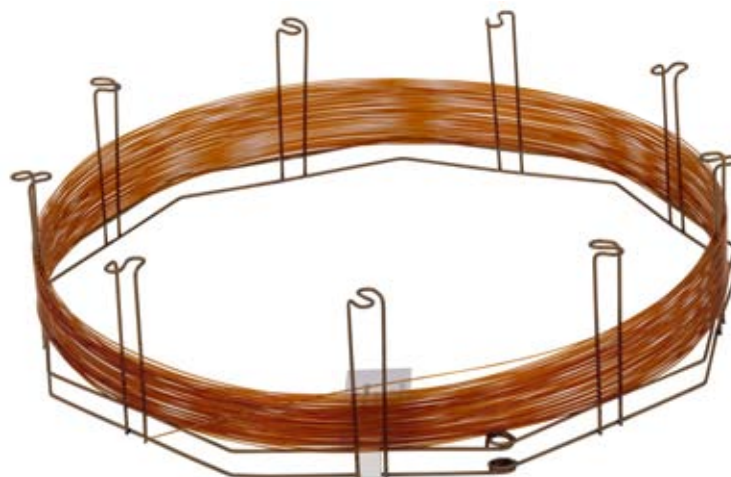
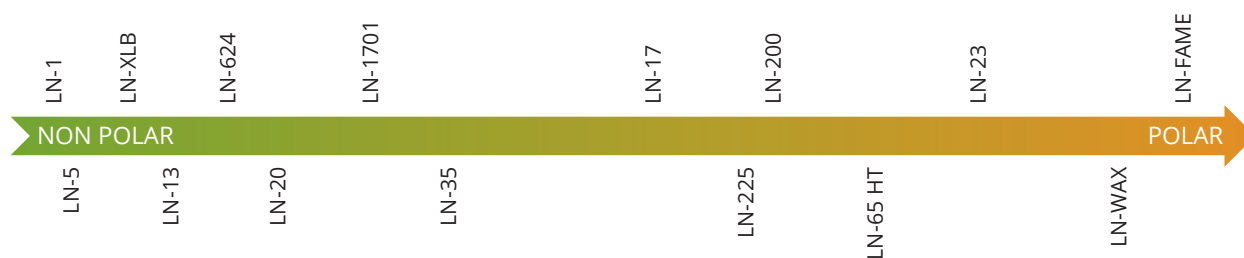
LION™ FAME HT

- Up to 280 °C
- Crossbond 100% Cyanopropyl Polysiloxane Phase

LION™ 624 Sil MS

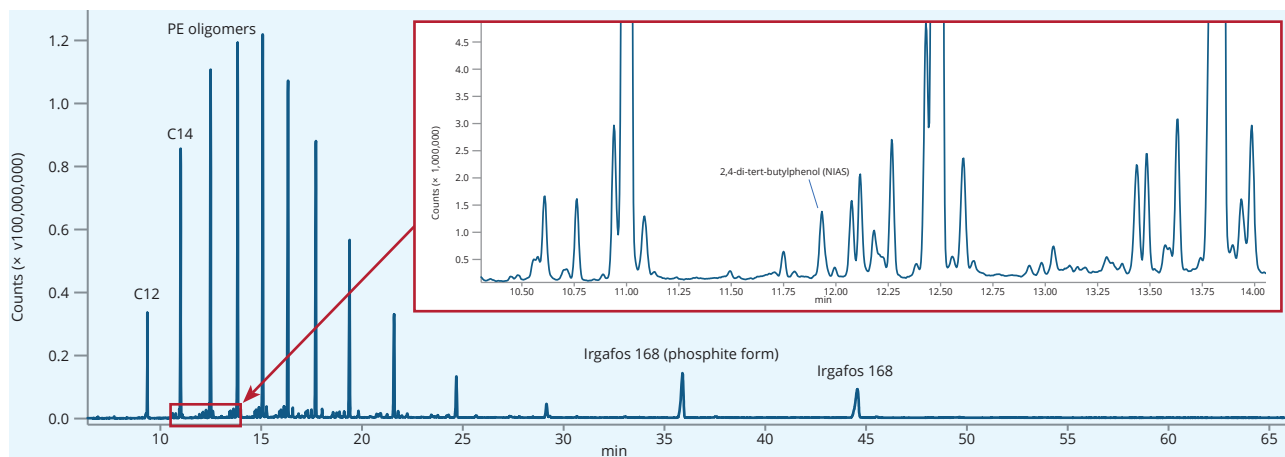
- Up to 300/320 °C
- Longer lifetime
- Better stability

Phases Polarity chart



Non-intentionally added substances (NIAS) in food simulants

2,4-di-tert-butylphenol is the degradation/hydrolysis product from the antioxidant Irgafos 168.



PE sample which has been migrated in 95% ethanol 10 days under 40 °C.

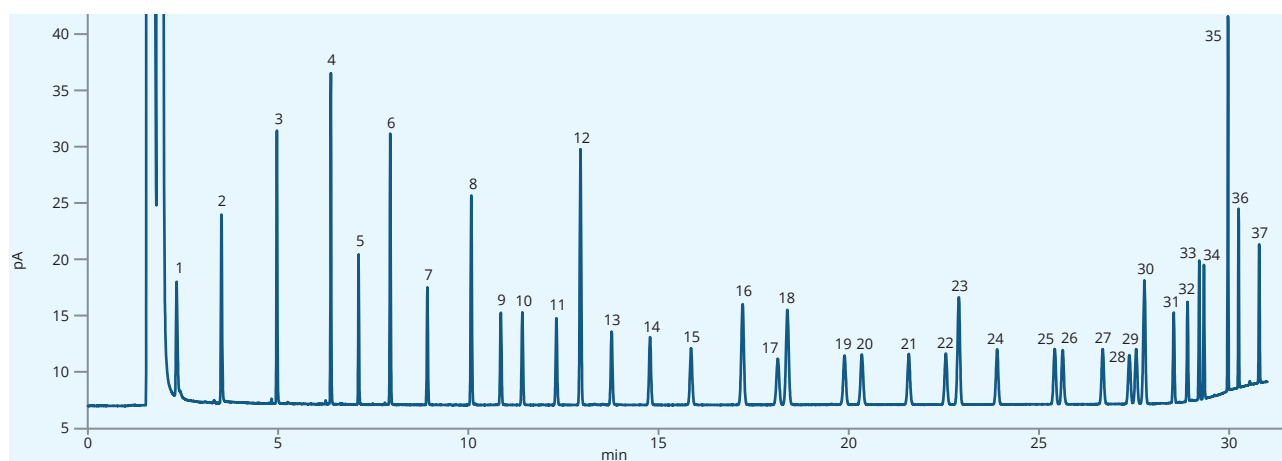
Column	LION™ LN-5 MS
Dimensions	60 m × 0.25 mm × 0.25 µm with integrated guard
Part number	LNI-5767-FF60-G05
Injection volume	2 µL
Injector temperature	PTV 280 °C, 120 °C/min to 335 °C, hold 0.64 min
Column flowrate	2.48 mL/min (40 cm/s)
Total flow	79.7 mL/min, purge 3 mL/min
Oven program	35 °C, hold 0 min 20 °C/min, 280 °C, hold 0 min 10 °C/min, 310 °C, hold 55 min
Detection	MS Shimadzu QP2010 NX
Ionization energy	70 eV
Interface temperature	240 °C
Acquisition	48 to 700 amu

FAME

Fatty acids are carboxylic acids with a long side carbon chain typically found in lipids. These acids differ by the number of carbon atoms in the chain and the number of double bonds in the chain. According to the number of double bonds we distinguish saturated fatty acids (SFA), monounsaturated fatty acids (MUFA) and polyunsaturated fatty acids (PUFA). Trans fatty acids are unsaturated fatty acids in which at least one double bond is in the trans position.

Capillary column LION™ LN-FAME was designed to provide the required polarity by the high-cyano propyl phase (G48). In this application note you can see a fast, robust and reproducible baseline separation of the 37 most common FAMEs.

Substance Fatty Acid Methyl Esters (see table below)



FAME standard on LION™ LN-FAME capillary column

Column	LION™ LN-FAME
Dimensions	30 m × 0.25 mm × 0.20 µm
Part number	LNI-5777-FE30
Injection volume	1 µL (air lock 1 µL), cold needle injection
Injector temperature	240 °C
Injection mode	S/SL, Split ratio 10:1
Column flowrate	Carrier Gas- Hydrogen, constant flow, 1 mL/min
Oven program	60 °C, hold 2 min 15 °C/min, 140 °C, hold 0 min 3 °C/min, 160 °C, hold 5 min 3 °C/min, 190 °C, hold 0 min 25 °C/min, 240 °C, hold 1 min
Detection	FID @240 °C Air: 350 mL/min Hydrogen: 35 mL/min Make-up gas (nitrogen): 30 mL/min
Sample	Supelco 37 FAME mix in DCM (dilution 1:10)
Analytes	See table below

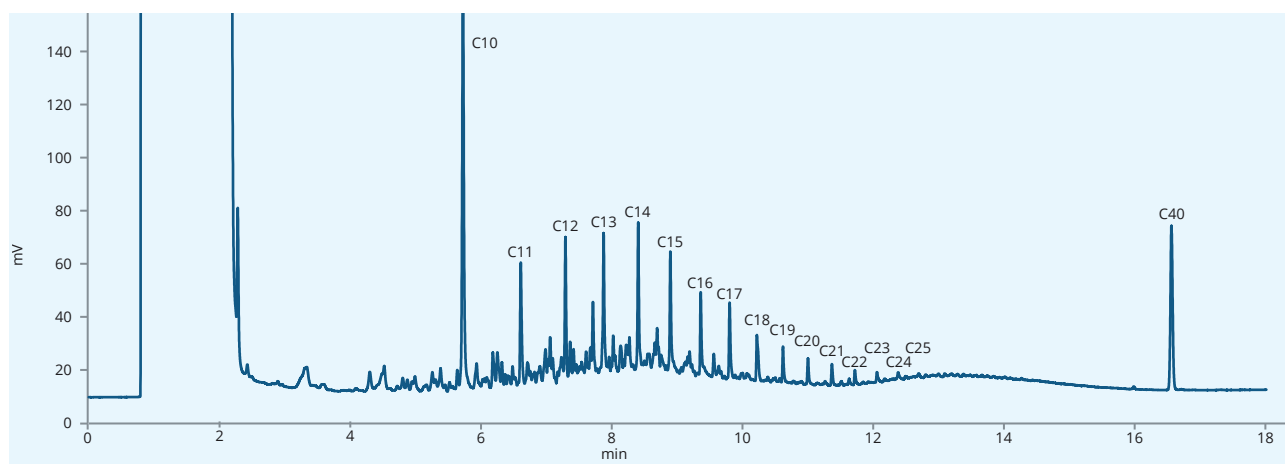
FAME

Peak No.	Compound name	Compound ID	Retention time (min)
1	Butanoic Acid Methyl Ester	C4:0	2.347
2	Hexanoic Acid Methyl Ester	C6:0	3.518
3	Octanoic Acid Methyl Ester	C8:0	4.968
4	Decanoic Acid Methyl Ester	C10:0	6.385
5	Undecanoic Acid Methyl Ester	C11:0	7.115
6	Dodecanoic Acid Methyl Ester	C12:0	7.947
7	Tridecanoic Acid Methyl Ester	C13:0	8.920
8	Myristic Acid Methyl Ester	C14:0	10.075
9	Myristoleic Acid Methyl Ester	C14:1 cis 9	10.848
10	Pentadecanoic Acid Methyl Ester	C15:0	11.415
11	cis-10-Pentadecenoic Acid Methyl Ester	C15:1 cis 10	12.310
12	Hexadecanoic Acid Methyl Ester	C16:0	12.953
13	Palmitoleic Acid Methyl Ester	C16:1 cis 9	13.762
14	Heptadecanoic Acid Methyl Ester	C17:0	14.773
15	cis-10-Heptadecenoic Acid Methyl Ester	C17:1 cis 10	15.852
16	Stearic Acid Methyl Ester	C18:0	17.223
17	Elaidic Acid Methyl Ester	C18:1 trans 9	18.137
18	Oleic Acid Methyl Ester	C18:1 cis 9	18.398
19	Linolelaidic Acid Methyl Ester	C18:2 trans 9,12	19.888
20	Linoleic Acid Methyl Ester	C18:2 cis 9,12	20.345
21	γ-Linolenic Acid Methyl Ester	C18:3 cis 6,9,12	21.575
22	α-Linolenic Acid Methyl Ester	C18:3 cis 9,12,15	22.553
23	Arachidic Acid Methyl Ester	C20:0	22.913
24	cis-11-Eicosenoic Acid Methyl Ester	C20:1 cis 11	23.907
25	cis-11,14-Eicosadienoic Acid Methyl Ester	C20:2 cis 11,14	25.433
26	Heneicosanoic Acid Methyl Ester	C21:0	25.630
27	cis-8,11,14-Eicosatrienoic Acid Methyl Ester	C20:3 cis 8,11,14	26.682
28	Arachidonic Acid Methyl Ester	C20:4 cis 5,8,11,14	27.378
29	cis-11,14,17-Eicosatrienoic Acid Methyl Ester	C20:3 cis 11,14,17	27.560
30	Behenic Acid Methyl Ester	C22:0	27.802
31	Erucic Acid Methyl Ester	C22:1 cis 13	28.548
32	cis-5,8,11,14,17-Eicosapentaenoic Acid Methyl Ester	C20:5 cis 5,8,11,14,17	28.903
33	cis-13,16-Docosadienoic Acid Methyl Ester	C22:2 cis 13,16	29.218
34	Tricosanoic Acid Methyl Ester	C23:0	29.337
35	Lignoceric Acid Methyl Ester	C24:0	29.975
36	Nervonic Acid Methyl Ester	C24:1 cis 15	30.250
37	cis-4,7,10,13,16,19-Docosahexaenoic Acid Methyl Ester	C22:6 cis 4,7,10,13,16,19	30.787

Total Petroleum Hydrocarbons (C10–C40 index)

Total petroleum hydrocarbons index (TPH) is a typical environmental analysis. It has replaced the infrared spectroscopy method using problematic solvents, i.e. Freons. This gas chromatography analysis (GC) monitors hydrocarbons between n-decane and n-tetracontane. These two hydrocarbons are used as the range marker and injection efficiency control. Additionally, the GC method has an important advantage – this can show a type of hydrocarbon contamination (e.g. gasoline, naphtha, motor oil) and weathering status (some n-alkanes disappear during their stay in the environment).

Substance Total petroleum hydrocarbons in the range of C10 to C40

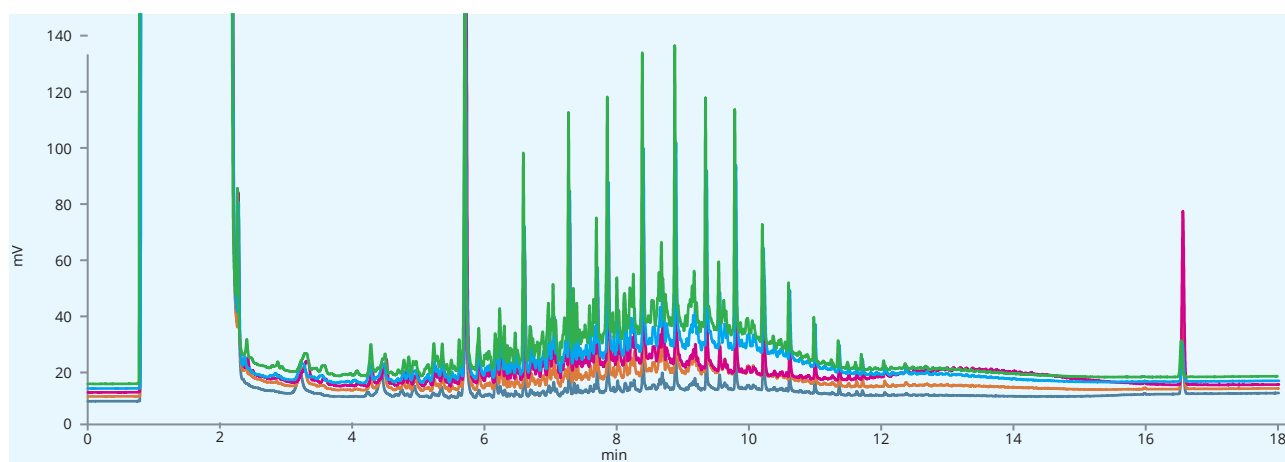


Calibration standard on LION™ LN-5HT capillary column

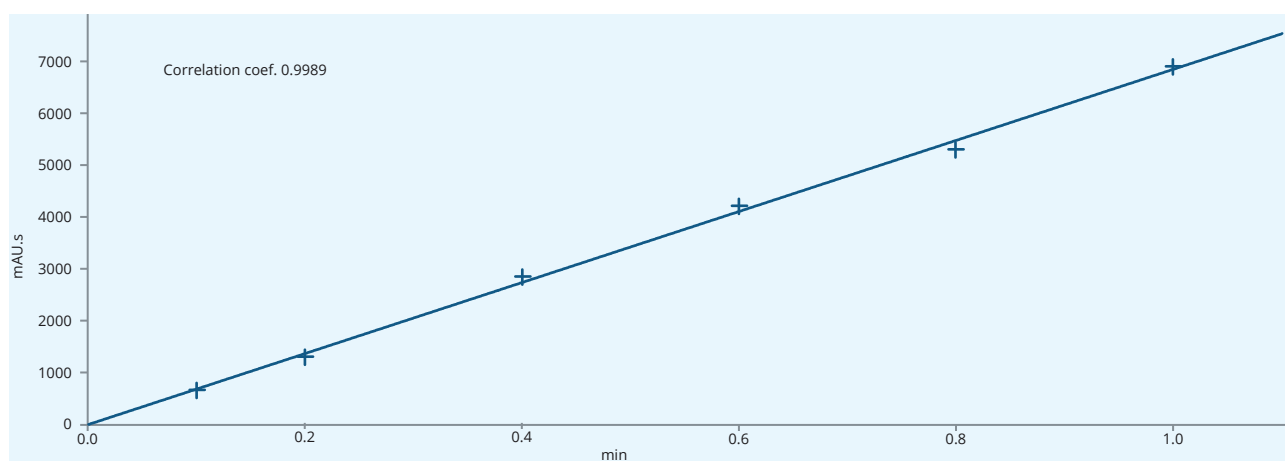
Column	LION™ LN-5HT
Dimensions	15 m × 0.25 mm × 0.10 µm
Part number	LNI-5765-FB15
Injection volume	1 µL
Injector temp.	300 °C
Injection mode	Splitless, hold 1 min, Split purge 50 mL/min, Septum purge 5 mL/min
Column flowrate	1 mL/min, constant flow, nitrogen
Oven program	40 °C, hold 4 min 25 °C/min, 330 °C, hold 2.4 min Total run time 18 min
Detection	FID @350 °C Air: 280 mL/min Hydrogen: 40 mL/min Make-up gas (nitrogen): 30 mL/min
Instrument	Master GC (Dani/Perkin-Elmer)

*Note: This method has been also developed on PTV injector.
Ask for more details.*

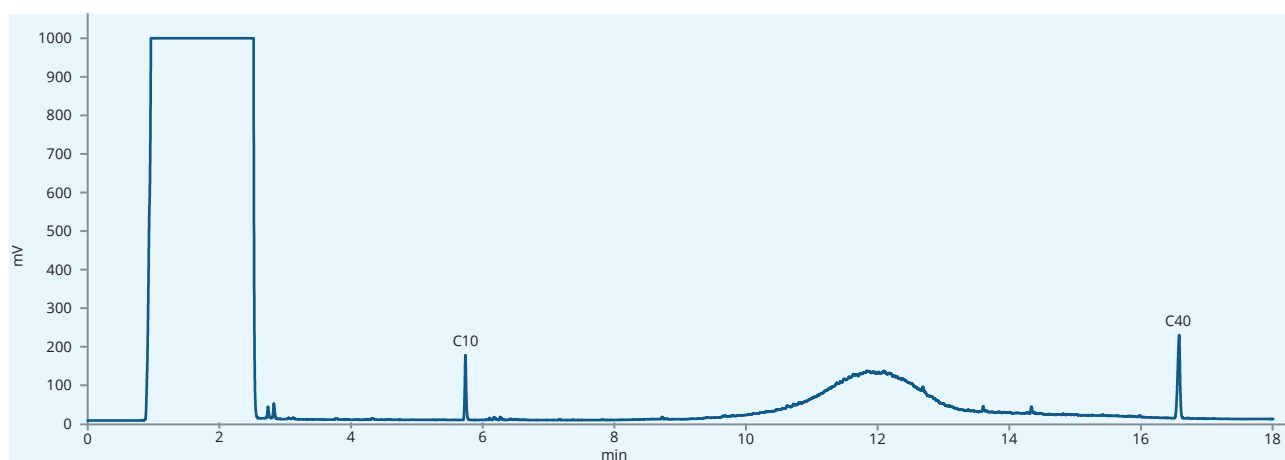
Total Petroleum Hydrocarbons (C10–C40 index)



Calibration standards for 5-level calibration



Calibration curve



Analysis of sewer water with presence of TPH

Note: More applications are available in LION(TM) GC columns brochure and at www.chromservis.eu.

MSPE

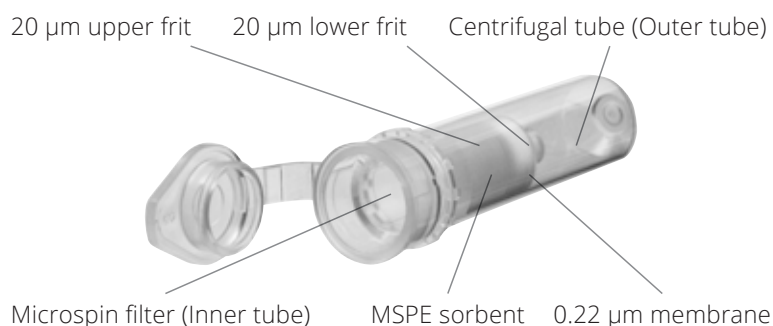


MSPE columns enable the quick and effective pretreatment of a sample using different types of membranes with 0.22 micrometer porosity and a suitable sorbent. They are a suitable replacement for 1–3 mL SPE columns, tips filled with sorbent and LL type extraction. With MSPE columns you will save time, use a minimum amount of solvents and perform more sample analyzes than with conventional SPE columns. Another advantage is high accuracy and repeatability due to the precise weighing of the sorbent. It is also no longer necessary to use an SPE manifold; a micro centrifuge is sufficient.

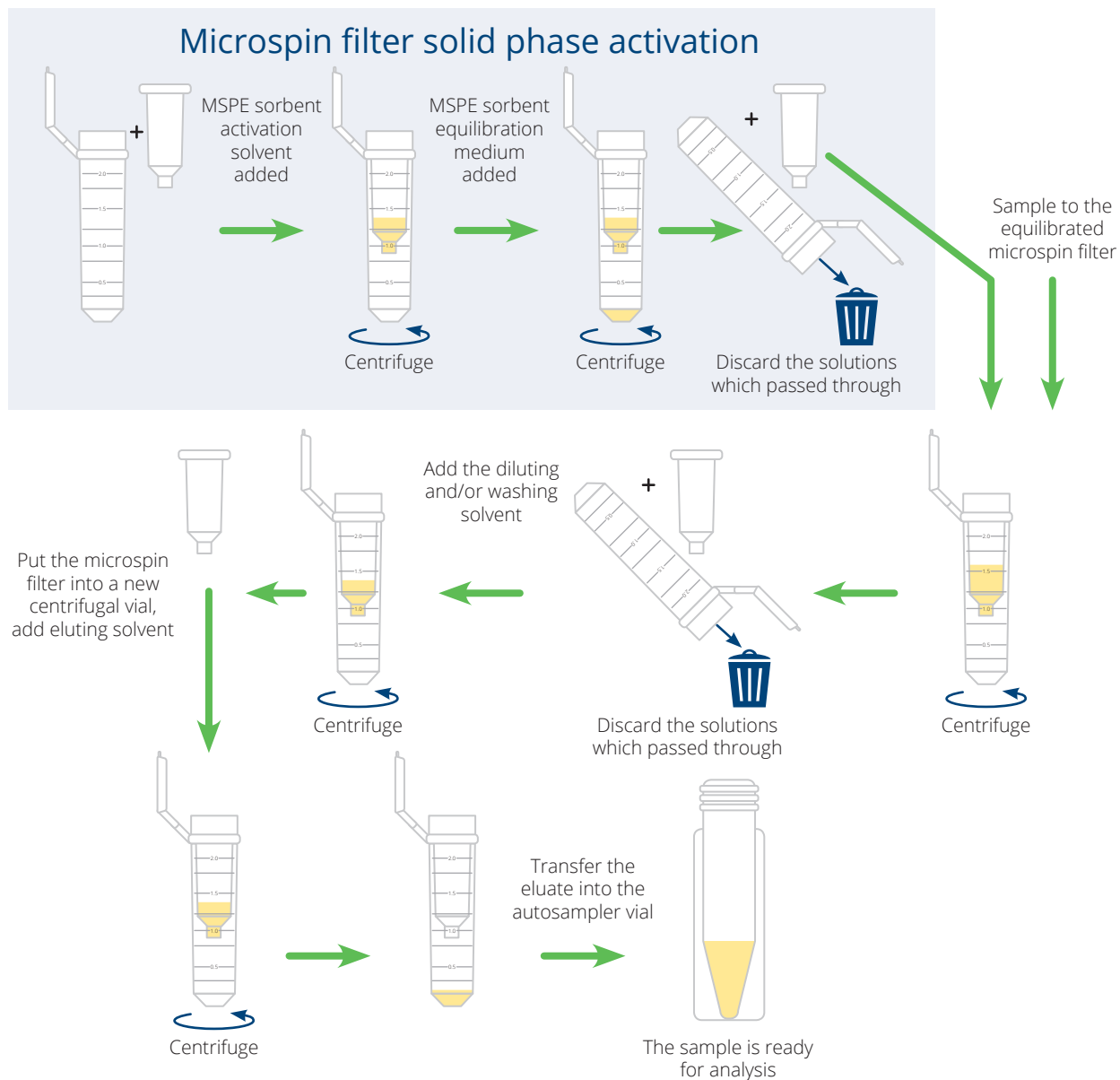
Speed up your sample preparation

- Simple and fast sample preparation.
- 2 in 1 – micro-solid phase extraction and filtration in one step.
- SPE manifold replaced by use of centrifuge.

MSPE – unique technology



General sample preparation workflow



Note: The workflow may vary depending on your application.

Ordering information

C18 MSPE SpeExtra™

all tubes 0.7 mL

Membrane	15 mg	30 mg	50 mg
Nylon	MSP-5876-AA07	MSP-5876-AB07	MSP-5876-AC07
PTFE hydrophilic	MSP-5876-DA07	MSP-5876-DB07	MSP-5876-DC07
PTFE hydrophobic	On request	MSP-5876-EB07	MSP-5876-EC07
PVDF	MSP-5876-BA07	MSP-5876-BB07	MSP-5876-BC07
MCE	MSP-5876-CA07	MSP-5876-CB07	MSP-5876-CC07

C18-P MSPE SpeExtra™

all tubes 0.7 mL

Membrane	15 mg	30 mg	50 mg
Nylon	MSP-5879-AA07	MSP-5879-AB07	On request
PTFE hydrophilic	On request	MSP-5879-DB07	MSP-5879-DC07
PTFE hydrophobic	On request	MSP-5879-EB07	MSP-5879-EC07
PVDF	On request	MSP-5879-BB07	MSP-5879-BC07
MCE	MSP-5879-CA07	MSP-5879-CB07	MSP-5879-CC07

HLB MSPE SpeExtra™

all tubes 0.7 mL

Membrane	5 mg	10 mg	15 mg	30 mg
Nylon	MSP-5877-AD07	MSP-5877-AE07	MSP-5877-AA07	MSP-5877-AB07
PTFE hydrophilic	MSP-5877-DD07	MSP-5877-DE07	MSP-5877-DA07	On request
PTFE hydrophobic	MSP-5877-ED07	MSP-5877-EE07	On request	On request
PVDF	MSP-5877-BD07	MSP-5877-BE07	On request	MSP-5877-BB07
MCE	MSP-5877-CD07	MSP-5877-CE07	MSP-5877-CA07	MSP-5877-CB07

WAX MSPE SpeExtra™

all tubes 0.7 mL

Membrane	15 mg	30 mg
Nylon	MSP-5957-AA07	MSP-5957-AB07
PTFE hydrophilic	MSP-5957-DA07	MSP-5957-DB07
PTFE hydrophobic	MSP-5957-EA07	MSP-5957-EB07
PVDF	MSP-5957-BA07	MSP-5957-BB07
MCE	MSP-5957-CA07	MSP-5957-CB07

SAX MSPE SpeExtra™

all tubes 0.7 mL

Membrane	15 mg	30 mg
Nylon	On request	On request
PTFE hydrophilic	MSP-5959-DA07	On request
PTFE hydrophobic	On request	On request
PVDF	On request	On request
MCE	On request	On request

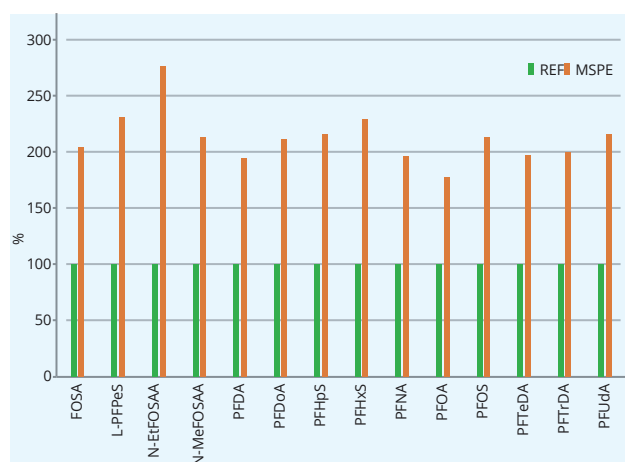
Accessories

Description	Amount	Part number
Micro Spin SpeExtra™, Outer tube only, 2 mL	50 pcs	MSP-0000-OT20
Frontier 5000 Series centrifuge, model FC5306	1 pc	30134156
Vortex Mini, Model VXMNFS, Fixed Speed, Orbit 4.9 mm	1 pc	30392110
Vortex Mini, Model VXMNAL, Analog control, Orbit 4.9 mm	1 pc	30392117
Vortex Mini Model VXMNDG, Digital control, Orbit 4.9 mm	1 pc	30392124

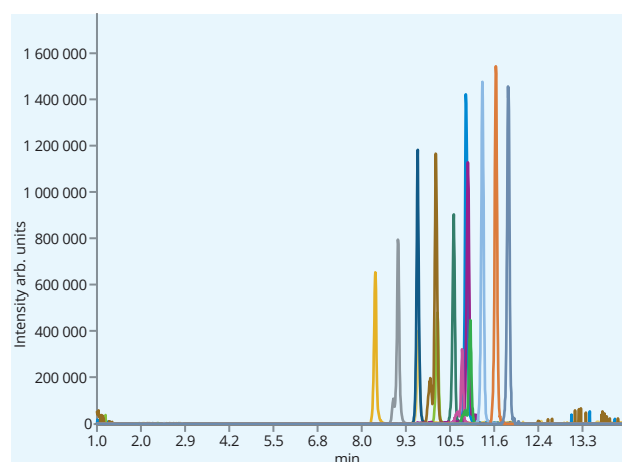


MSPE columns

Analysis of long-chain PFASs in biological sample matrix



MSPE method relative signal improvement in comparison to the reference extraction method without SPE



Mixture of PFASs on ASTRA® column

MSPE Method

MSPE Column	Micro Spin SpeExtra™ MSPE C18 column with 0.22 µm Nylon membrane, 15 mg (p/n MSP-5876-AA07)
Homogenization	TissueLyser II, Qiagen, Germany, 1800 min ⁻¹ for 10 min
Extraction	ACN + 0.1% FA
Centrifugation	Mini spin, Eppendorf, Germany; 4000 rpm for 2 min
Reconstitution	DDW + 0.1% FA
Dissolution	Ultrasonic bath 5 min
MSPE Activation	DDW + MeOH (50:50)
MSPE Equilibration	DDW + 0.1% FA
MSPE Extraction of analytes	500 µL of sample
MSPE Elution of analytes	200 µL ACN + 0.1% FA

We strongly recommend to use PFAS suitable vials and caps (e.g. CHS silicone/PP septa and PP caps).

LC-HRMS Method

Column	ASTRA® C18-HE, 3 µm			
Dimensions	75 mm × 2.1 mm			
Part number	AST-5732-IH21			
Mobile phase	A: DDW + 10mM Ammonium Acetate B: Methanol + 10mM Ammonium Acetate			
Gradient elution	Time	A (%)	B (%)	Flow rate (µL/min)
	0	90	10	350
	0.5	90	10	350
	6	40	60	350
	11	0	100	400
	14	0	100	400
	14.01	90	10	350
	16	90	10	350
Temperature	23 °C			
Injection volume	10 µL			
Detection	Full scan (resolving power 120 000, m/z 200), negative mode			

Substance

- 1. L-PFPs (perfluoropentanesulfonic acid)**, CAS number 2706-91-4
- 2. PFHxS (perfluorohexanesulfonic acid)**, CAS number 355-46-4
- 3. PFOA (perfluorooctanoic acid)**, CAS number 335-67-1
- 4. PFHpS (perfluoroheptanesulfonic acid)**, CAS number 375-92-8
- 5. PFNA (perfluorononanoic acid)**, CAS number 375-95-1
- 6. FOSA (perfluorooctanesulfonamide)**, CAS number 754-91-6
- 7. PFOS (perfluorooctanesulfonic acid)**, CAS number 1763-23-1
- 8. PFDA (perfluorodecanoic acid)**, CAS number 335-76-2

- 9. PFUdA (perfluoroundecanoic acid)**, CAS number 2058-94-8
- 10. N-MeFOSAA (2-(N-methylperfluorooctanesulfonamido) acetic acid)**, CAS number 2355-31-9
- 11. N-EtFOSAA (N-Ethyl-N-[(heptadecafluorooctyl) sulphonyl]glycine)**, CAS number 2991-50-6
- 12. PFDoA (perfluorododecanoic acid)**, CAS number 307-55-1
- 13. PFTrDA (perfluorotridecanoic acid)**, CAS number 72629-94-8
- 14. PFTeDA (perfluorotetradecanoic acid)**, CAS number 376-06-7



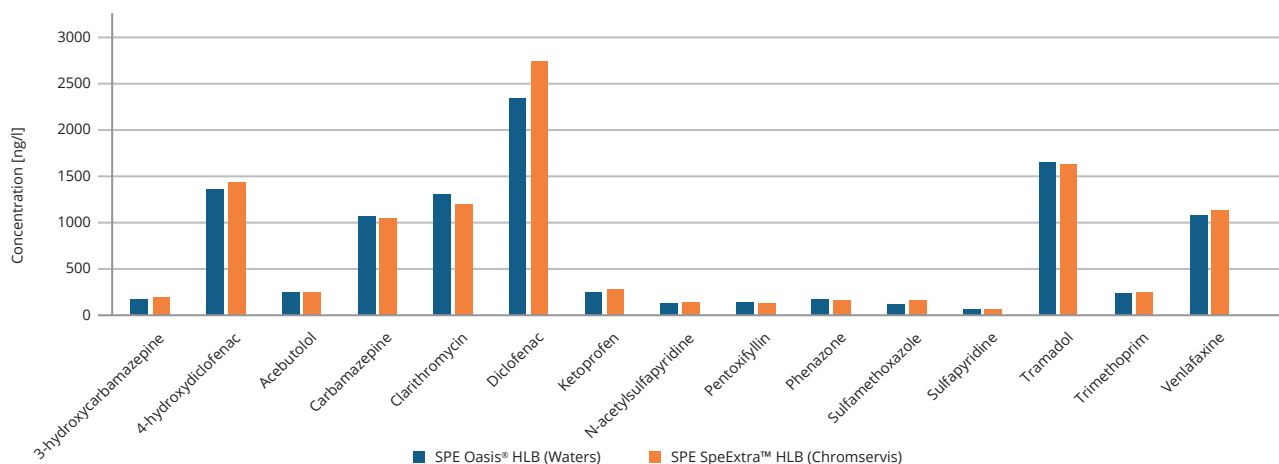
This application was developed in cooperation with the Faculty of Fisheries and Protection of Waters, Research Institute of Fish Culture and Hydrobiology, Laboratory of Environmental Chemistry and Biochemistry.

SPE columns



SpeExtra™ is a new range of SPE columns for your sample preparation.

Florisil® and HLB columns are suitable for use in the environmental and toxicology area. The SpeExtra™ HLB SPE column is based on a modified polymer of 100Å pore size. It offers a high surface area of >825 m²/g. The working pH range is from pH 1 to pH 13. The loading capacity is 20 %. It has been developed to clean a broad range of hydrophobic/hydrophilic compounds across various matrixes (plasma, urine, oil, water etc.).



Comparison of SpeExtra™ with Waters Oasis® HLB cartridges

SpeExtra™ C18	Sorbent mass mg	Particle size µm	Volume mL	Part Number	Box
	50	50	1	SPE-5812-DH01	50 pcs
	100	50	1	SPE-5812-DB01	100 pcs
	100	50	3	SPE-5812-DB03	50 pcs
	200	50	3	SPE-5812-DC03	50 pcs
	200	50	6	SPE-5812-DC06	30 pcs
	500	50	3	SPE-5812-DD03	50 pcs
	500	50	6	SPE-5812-DD06	30 pcs

SpeExtra™ C8	Sorbent mass mg	Particle size µm	Volume mL	Part Number	Box
	50	50	1	SPE-5813-DH01	50 pcs
	100	50	1	SPE-5813-DB01	100 pcs
	100	50	3	SPE-5813-DB03	50 pcs
	200	50	3	SPE-5813-DC03	50 pcs
	500	50	3	SPE-5813-DD03	50 pcs
	500	50	6	SPE-5813-DD06	30 pcs

SpeExtra™ Phenyl	Sorbent Mass mg	Particle size µm	Volume mL	Part Number	Box
	100	50	1	SPE-5961-DB01	100 pcs
	100	50	3	SPE-5961-DB03	50 pcs
	500	50	3	SPE-5961-DD03	50 pcs
	200	50	6	SPE-5961-DC06	30 pcs
	500	50	6	SPE-5961-DD06	30 pcs

SpeExtra™ HLB Clinical	Sorbent mass mg	Particle size µm	Volume ml	Part Number	Box
	30	30	1	SPE-5804-AA01	50 pcs



SPE columns

SPEEXTRA™

SPE columns

SpeExtra™ HLB Enviro	Sorbent Mass mg	Particle size µm	Volume ml	Part Number	Box
	60	30	1	SPE-5804-AG01	50 pcs
	60	60	1	SPE-5804-EG01	50 pcs
	60	30	3	SPE-5804-AG03	50 pcs
	60	60	3	SPE-5804-EG03	50 pcs
	150	30	6	SPE-5804-AI06	30 pcs
	150	60	6	SPE-5804-EI06	30 pcs
	200	30	3	SPE-5804-AC03	50 pcs
	200	30	6	SPE-5804-AC06	30 pcs
	200	30	6	SPE-5804-AC06-B	200 pcs
	200	60	3	SPE-5804-EC03	50 pcs
	200	60	6	SPE-5804-EC06	30 pcs
	500	30	6	SPE-5804-AD06	30 pcs
	500	60	6	SPE-5804-ED06	30 pcs

SpeExtra™ HXC	Sorbent Mass mg	Particle size µm	Volume ml	Part Number	Box
	200	60	3	SPE-5841-EC03	50 pcs

SpeExtra™ SAX	Sorbent Mass mg	Particle size µm	Volume ml	Part Number	Box
	50	50	1	SPE-5814-DH01	50 pcs
	100	50	1	SPE-5814-DB01	100 pcs
	100	50	3	SPE-5814-DB03	50 pcs
	200	50	3	SPE-5814-DC03	50 pcs
	500	50	3	SPE-5814-DD03	50 pcs
	1000	50	6	SPE-5814-DE06	30 pcs

SpeExtra™ SCX	Sorbent Mass mg	Particle size µm	Volume ml	Part Number	Box
	50	50	1	SPE-5815-DH01	50 pcs
	100	50	1	SPE-5815-DB01	100 pcs
	100	50	3	SPE-5815-DB03	50 pcs
	200	50	3	SPE-5815-DC03	50 pcs
	500	50	3	SPE-5815-DD03	50 pcs

SpeExtra™ WAX	Sorbent Mass mg	Particle size µm	Volume ml	Part Number	Box
	60	30	3	SPE-5956-AG03	50 pcs
	100	30	6	SPE-5956-AB06	30 pcs
	150	30	6	SPE-5956-AI06	50 pcs
	200	30	6	SPE-5956-AC06	30 pcs
	500	30	6	SPE-5956-AD06	30 pcs

SpeExtra™ Florisil® (pesticide grade)	Sorbent Mass mg	Particle size µm	Volume ml	Part Number	Box
	1000	150/250	6	SPE-5805-NE06	30 pcs
	1000	150/250	15	SPE-5805-NE15	20 pcs
	500	150/250	3	SPE-5805-ND03	50 pcs

SpeExtra™ Florisil® (ultra pure)	Sorbent Mass mg	Particle size µm	Volume ml	Part Number	Box
	2000	150/250	15	SPE-5805-NF15	20 pcs

SPE columns

SpeExtra™ Si	Sorbent Mass mg	Particle size µm	Volume ml	Part Number	Box
	500	50	3	SPE-5872-DD03	50 pcs
	500	50	6	SPE-5872-DD06	30 pcs
	1000	50	6	SPE-5872-DE06	30 pcs



12-position Vacuum SPE manifold (p/n SPE-5869-000A)

EasyFlash™ SPEEXTRA™

Flash columns

Chromservis has introduced Flash chromatography columns for high performance purifications. New EasyFlash™ columns offer high efficiency for a fast separation and isolation of impurities, reaction products and intermediates.

We offer wide range from 4 g up to 1600 g EasyFlash™ columns with various silicagel types – spherical and irregular.

Size [g]	EasyFlash™ Silica IR	EasyFlash™ Silica 68			EasyFlash™ Silica 50		
	50 µm	50 µm	25 µm	15 µm	50 µm	30 µm	15 µm
4	FLC-5933-AD1	FLC-5935-AD1	FLC-5935-AB1	FLC-5935-AA1	FLC-5934-AD1	FLC-5934-AC1	FLC-5934-AA1
12	FLC-5933-AD2	FLC-5935-AD2	FLC-5935-AB2	FLC-5935-AA2	FLC-5934-AD2	FLC-5934-AC2	FLC-5934-AA2
25	FLC-5933-AD3	FLC-5935-AD3	FLC-5935-AB3	FLC-5935-AA3	FLC-5934-AD3	FLC-5934-AC3	FLC-5934-AA3
40	FLC-5933-AD4	FLC-5935-AD4	FLC-5935-AB4	FLC-5935-AA4	FLC-5934-AD4	FLC-5934-AC4	FLC-5934-AA4
80	FLC-5933-AD5	FLC-5935-AD5	FLC-5935-AB5	FLC-5935-AA5	FLC-5934-AD5	FLC-5934-AC5	FLC-5934-AA5
120	FLC-5933-AD6	FLC-5935-AD6	FLC-5935-AB6	FLC-5935-AA6	FLC-5934-AD6	FLC-5934-AC6	FLC-5934-AA6
220	FLC-5933-AD7	FLC-5935-AD7	FLC-5935-AB7	FLC-5935-AA7	FLC-5934-AD7	FLC-5934-AC7	FLC-5934-AA7
330	FLC-5933-AD8	FLC-5935-AD8	FLC-5935-AB8	FLC-5935-AA8	FLC-5934-AD8	FLC-5934-AC8	FLC-5934-AA8
800	FLC-5933-AD9	FLC-5935-AD9	FLC-5935-AB9	n/a	FLC-5934-AD9	FLC-5934-AC9	n/a
1600	FLC-5933-ADA	FLC-5935-ADA	FLC-5935-ABA	n/a	FLC-5934-ADA	FLC-5934-ACA	n/a

Size [g]	EasyFlash™ Alumina Basic	EasyFlash™ Alumina Neutral	EasyFlash™ NH2		
	32/63 µm	32/63 µm	50 µm	30 µm	15 µm
4	FLC-5936-AE1	FLC-5937-AE1	FLC-5950-AD1	FLC-5950-AC1	FLC-5950-AA1
12	FLC-5936-AE2	FLC-5937-AE2	FLC-5950-AD2	FLC-5950-AC2	FLC-5950-AA2
25	FLC-5936-AE3	FLC-5937-AE3	FLC-5950-AD3	FLC-5950-AC3	FLC-5950-AA3
40	FLC-5936-AE4	FLC-5937-AE4	FLC-5950-AD4	FLC-5950-AC4	FLC-5950-AA4
80	FLC-5936-AE5	FLC-5937-AE5	FLC-5950-AD5	FLC-5950-AC5	FLC-5950-AA5
120	FLC-5936-AE6	FLC-5937-AE6	FLC-5950-AD6	FLC-5950-AC6	FLC-5950-AA6
220	FLC-5936-AE7	FLC-5937-AE7	FLC-5950-AD7	FLC-5950-AC7	FLC-5950-AA7
330	FLC-5936-AE8	FLC-5937-AE8	FLC-5950-AD8	FLC-5950-AC8	FLC-5950-AA8
800	FLC-5936-AE9	FLC-5937-AE9	FLC-5950-AD9	FLC-5950-AC9	n/a
1600	FLC-5936-AEA	FLC-5937-AEA	FLC-5950-ADA	FLC-5950-ACA	n/a

Size [g]	EasyFlash™ C18 High Performance			EasyFlash™ C18-AQ		EasyFlash™ SAX	EasyFlash™ SCX
	50 µm	30 µm	15 µm	30 µm	15 µm	50 µm	50 µm
4	FLC-5940-AD1	FLC-5940-AC1	FLC-5940-AA1	FLC-5941-AC1	FLC-5941-AA1	FLC-5952-AD1	FLC-5953-AD1
12	FLC-5940-AD2	FLC-5940-AC2	FLC-5940-AA2	FLC-5941-AC2	FLC-5941-AA2	FLC-5952-AD2	FLC-5953-AD2
25	FLC-5940-AD3	FLC-5940-AC3	FLC-5940-AA3	FLC-5941-AC3	FLC-5941-AA3	FLC-5952-AD3	FLC-5953-AD3
40	FLC-5940-AD4	FLC-5940-AC4	FLC-5940-AA4	FLC-5941-AC4	FLC-5941-AA4	FLC-5952-AD4	FLC-5953-AD4
80	FLC-5940-AD5	FLC-5940-AC5	FLC-5940-AA5	FLC-5941-AC5	FLC-5941-AA5	FLC-5952-AD5	FLC-5953-AD5
120	FLC-5940-AD6	FLC-5940-AC6	FLC-5940-AA6	FLC-5941-AC6	FLC-5941-AA6	FLC-5952-AD6	FLC-5953-AD6
220	FLC-5940-AD7	FLC-5940-AC7	FLC-5940-AA7	FLC-5941-AC7	FLC-5941-AA7	FLC-5952-AD7	FLC-5953-AD7
330	FLC-5940-AD8	FLC-5940-AC8	FLC-5940-AA8	FLC-5941-AC8	FLC-5941-AA8	FLC-5952-AD8	FLC-5953-AD8
800	FLC-5940-AD9	FLC-5940-AC9	n/a	FLC-5941-AC9	n/a	FLC-5952-AD9	FLC-5953-AD9
1600	FLC-5940-ADA	FLC-5940-ACA	n/a	FLC-5941-ACA	n/a	FLC-5952-ADA	FLC-5953-ADA

Size [g]	EasyFlash™ Diol		
	50 µm	30 µm	15 µm
4	FLC-5949-AD1	FLC-5949-AC1	FLC-5949-AA1
12	FLC-5949-AD2	FLC-5949-AC2	FLC-5949-AA2
25	FLC-5949-AD3	FLC-5949-AC3	FLC-5949-AA3
40	FLC-5949-AD4	FLC-5949-AC4	FLC-5949-AA4
80	FLC-5949-AD5	FLC-5949-AC5	FLC-5949-AA5
120	FLC-5949-AD6	FLC-5949-AC6	FLC-5949-AA6
220	FLC-5949-AD7	FLC-5949-AC7	FLC-5949-AA7
330	FLC-5949-AD8	FLC-5949-AC8	FLC-5949-AA8
800	FLC-5949-AD9	FLC-5949-AC9	n/a
1600	FLC-5949-ADA	FLC-5949-ACA	n/a



EasyFlash™ column

Sample preparation kit



MetAmino® kits offer an easy sample preparation method for your LC/MS or GC/MS analysis. MetAmino® kits include derivatization reagents and all clean-up accessories to prepare your sample for injection. They eliminate time consuming sample preparation procedures.

The new clean-up procedure uses a special material as the end-step. The other advantage is that the derivatization procedure enables the extension of the analyte list. Contact us for further details.

- 76 amino acids, polyamines, biogen amines and coenzymes in 25 minutes (sample preparation and analysis time).
- Easy sample preparation.
- Unique clean-up step.
- LC/MS and GC/MS kit.
- NIST library for GC/MS available.
- Possible extension to other analytes on request.



METAMINO®

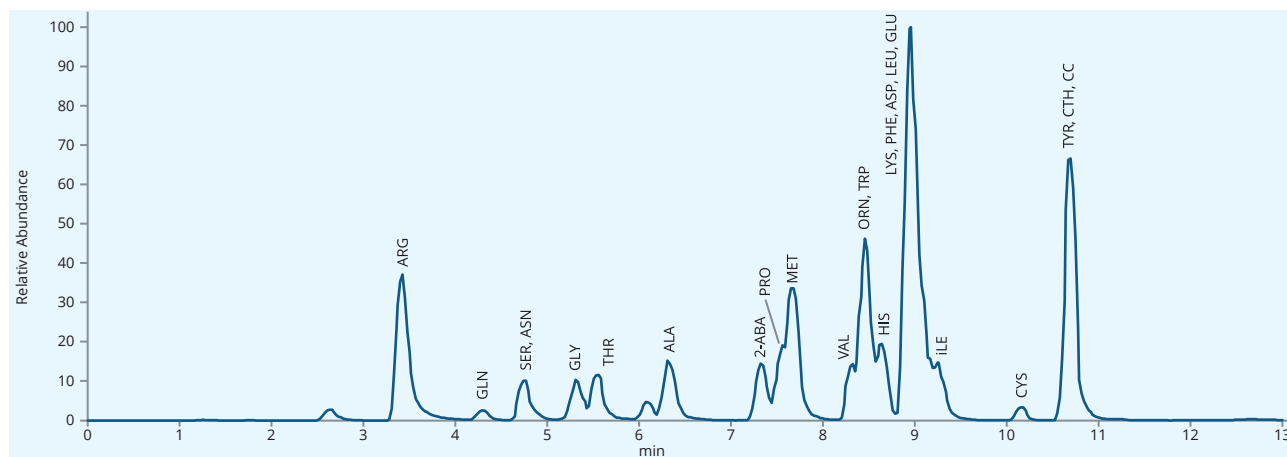
LC/MS kit

No.	Name	Synonyms	Quantification	[min]	[M+H] ⁺	Precursor	Quantifier	CE	Qualifier	CE
1	Cotinine	Syringe standard		1.15	177.1024	177.1	98	24	80	28
2	Putrescine			1.40	189.1599	189.2	72.1	16	115.9	12
3	Cadaverine			1.48	203.1755	203.2	86	20	69.2	28
4	Homoserine	HSER		1.67	202.1074	202.1	146	4	102	8
5	Pyroglutamic acid	PGLU		1.86	186.1125	186.1	84	20	130	8
6	Arginine	ARG	✓	3.35	331.2341	331.2	70.1	48	115.9	32
7	Homarginine	Internal standard		3.63	345.2497	345.2	84	52	125.9	24
8	Glutamine	GLN	✓	4.12	303.1916	303.2	186	12	84	44
9	Anserine	ANS		4.20	397.2447	397.2	109.1	52	226.2	28
10	Citrulline	CIT	✓	4.20	332.2181	332.2	70.2	36	215	16
11	Methionine sulfoxide	MET-SO		4.29	322.1683	322.2	248	12	100	32
12	Methionine sulfone	MET-SO ₂		4.30	338.1632	338.2	238	12	182	16
13	5-Hydroxylysine	HLY	✓	4.40	345.2021	345.2	82	48	128.1	28
14	1-Methylhistidine	1MHIS	✓	4.52	326.2075	326.2	124	36	224	20
15	3-Methylhistidine	3MHIS	✓	4.55	326.2075	326.2	95.7	52	270.1	24
16	Prolylhydroxyproline	PHP	✓	4.71	385.2333	385.2	170.1	16	114, 70.2	36, 56
17	Serine	SER	✓	4.73	262.1615	262.2	106	16	60.1	40
18	Asparagine	ASN	✓	4.78	271.1649	271.2	240.1	16	254.1	16
19	4-Hydroxyproline	HYP	✓	5.23	288.1807	288.2	86.1	32	188	12
20	Glycine	GLY	✓	5.23	232.1544	232.2	76	12	132	4
21	N-Acetylaspartic acid	NAA		5.36	288.1807	288.2	88	28	144.1, 158	20, 8
22	Glycylproline	GPR	✓	5.39	329.2072	329.2	70.1	52	172.1, 115.9	16, 36
23	Threonine	THR	✓	5.45	276.1806	276.2	74.2	28	176.1	12
24	5-Aminolevulinic acid	5-ALA		5.63	288.1807	288.2	158	8	86.1	32
25	Ethanolamine	EAM		6.09	262.1649	262.2	88	16	144.1	4
26	Beta-Alanine	3-ALA		6.22	246.1701	246.2	116	12	90	12
27	Alanine	ALA	✓	6.25	246.1701	246.2	90	16	146	8
28	Spermine			6.39	503.3804	503.4	102	44	229.2	32
29	Histamine	HTA		6.52	312.1919	312.2	212	12	95, 112	40, 20
30	Indoleacetic acid	IAA		6.65	232.1333	232.1	130	24	176	8
31	gamma-Aminobutyric acid	GABA	✓	6.75	260.1857	260.2	87.1	24	86	24
32	Sarcosine	SAR	✓	6.75	246.1701	246.2	90	12	146.1	8
33	4-Aminobenzoic acid	PABA		7.00	294.1701	294.2	134.1	20	91	56
34	β-Aminoisobutyric acid	BAIBA	✓	7.05	260.1857	260.2	130	12	112	20
35	2-Aminobutyric acid	2-ABA	✓	7.35	260.1857	260.2	160.2	8	104	12
36	Proline	PRO	✓	7.58	272.1857	272.2	70.1	36	172	12
37	Methionine	MET	✓	7.65	306.1735	306.2	204	8	104	20
38	Methionine-d ₃	Internal standard		7.65	309.1922	309.2	207	8	107	16
39	Thiaproline	TPR	✓	8.03	290.1422	290.1	88	28	134, 190.1	16, 8
40	Asparatame			8.15	451.2439	451.2	120	48	88	44
41	Serotonine	5-HT		8.22	377.2072	377.2	160	32	303.1	8
42	2,4-Diaminobutyric acid	DABA		8.25	375.2490	375.2	201.3	16	245	12
43	Valine	VAL	✓	8.30	274.2014	274.2	72	32	116	12
44	Norvaline			8.35	274.2014	274.2	72.1	24	174	8
45	Alanyl-lysine	ALA-LYS		8.36	474.3174	474.3	84.1	60	400.2	12
46	Carnosine	CAR		8.36	483.2814	483.3	110.1	40	212.1	24
47	Ornithine	ORN	✓	8.45	389.2647	389.3	70.1	60	315.2	8
48	Tryptophan	TRP	✓	8.45	361.2123	361.2	259	12	159	28
49	Ethionine	ETH		8.60	320.1890	320.2	218.1	8	75.1	44
50	Histidine	HIS	✓	8.90	412.2443	412.2	110	44	312.1	16
51	Lysine	LYS	✓	8.92	403.2804	403.3	84.1	56	329.1	8
52	Phenylalanine	PHE	✓	9.04	322.2014	322.2	120	36	164	16
53	Leucine	LEU	✓	9.06	288.2170	288.2	86.1	20	188.2, 130.1	8, 12
54	Aspartic acid	ASP	✓	9.06	346.2225	346.2	88.1	24	159.9	12
55	Spermidine			9.11	446.3226	446.3	198.1	28	298.1	12
56	Glutamic acid	GLU	✓	9.17	360.2382	360.2	163	16	105	36
57	Allo-isoleucine	aiLE		9.22	288.2169	288.2	130.1	12	86.1	24
58	Isoleucine	iLE	✓	9.24	288.2170	288.2	130.1	16	86.1	24
59	Norleucine	NLEU		9.40	288.2170	288.2	86.2	24	130.1	12
60	Pipecolic acid	PIP		9.45	286.2013	286.2	128.1	12	84.1	40
61	Homophenylalanine	Internal standard		9.67	336.2170	336.2	91	56	117	32
62	2-Aminoadipic acid	AAA	✓	9.67	374.2538	374.3	98	32	172	16
63	Adrenaline	ADN		10.15	484.2541	484.3	166	36	466.2	4
64	Cysteine	CYS		10.16	378.1946	378.2	120.1	32	278	12
65	2-Aminoheptanedioic acid	APA	✓	10.20	388.2695	388.3	112	36	186.1	20
66	Glutathione	GSH		10.27	620.3213	620.3	186.1	28	130.2	44
67	Dopamine	DAM		10.27	454.2435	454.2	196.1	24	152	40
68	Glutamyl-lysine	GLU-LYS		10.44	588.3855	588.4	84.1	56	128.1, 157.9	52, 32
69	Homocysteine	HCYS		10.48	392.2103	392.2	292.2	12	118.1	16
70	Diaminopimelic acid			10.54	503.3328	503.3	82.1	60	127.9	48
71	Tyrosine	TYR	✓	10.61	438.2487	438.2	136	44	179.9	28
72	Cystathionine	CTH	✓	10.68	535.3049	535.3	201.9	24	88.1	56
73	Cystine	C-C	✓	10.76	553.2613	553.3	276.1	16	219.9	24
74	Kynurenine acid			10.78	346.1649	346.2	246	8	144, 190	52, 24
75	Selenocystine	Se-C-C		11.12	649.1501	649.2	323.9	20	575	12
76	Kynurenine			11.17	465.2596	465.3	146	44	274.2	12
77	Homocystine	HC-CH		11.28	581.2926	581.3	290	16	190	20
78	3,4-Dihydroxyphenylalanine	DOPA		11.55	554.2961	554.3	152.1	44	454.1	12
79	Theanine	THE			331.2228	331.2	On request			

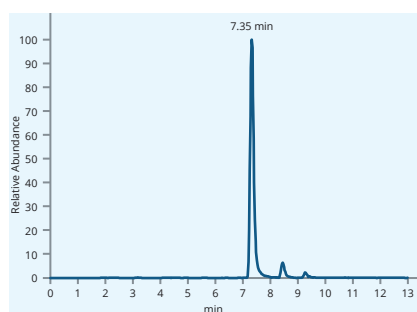
Note: CE = Collision energy

LC/MS separation

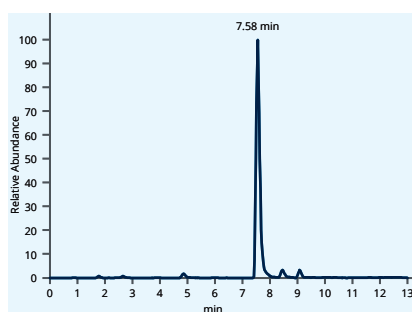
The chromatogram shown below displays TIC and some of the analyte's MRMs.



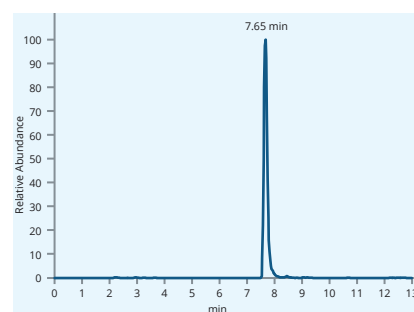
Chromatogram of 24 amino acids



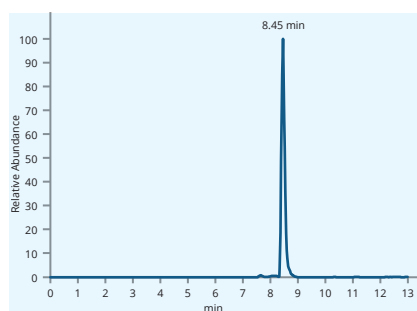
2-ABA (259.7–260.7)



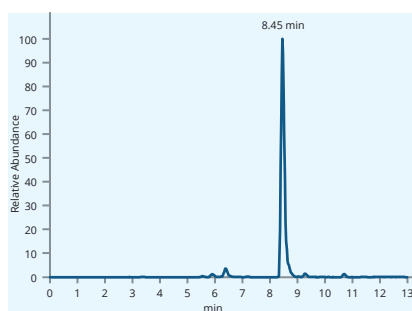
PRO (271.7–272.7)



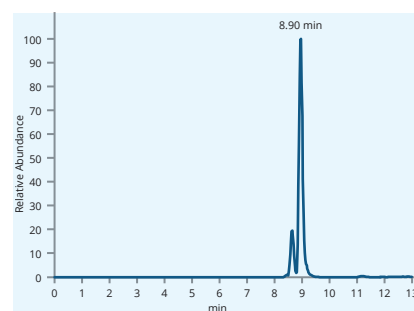
MET (305.7–306.7)



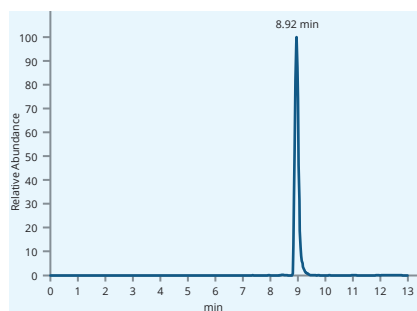
ORN (388.7–389.7)



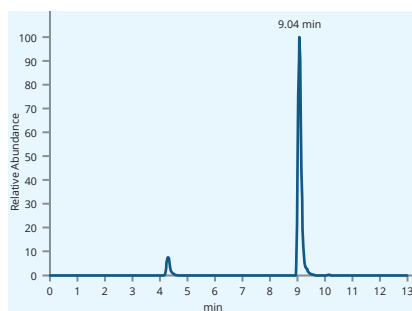
TRP (360.7–361.7)



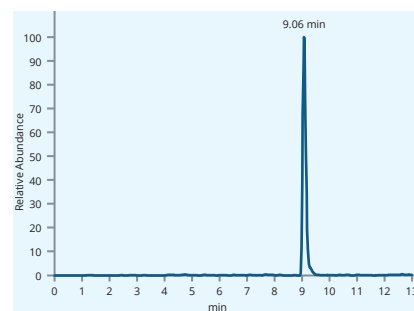
HIS (411.7–412.7)



LYS (420.7–403.7)



PHE (321.7–322.7)



ASP (345.7–346.7)

METAMINO®

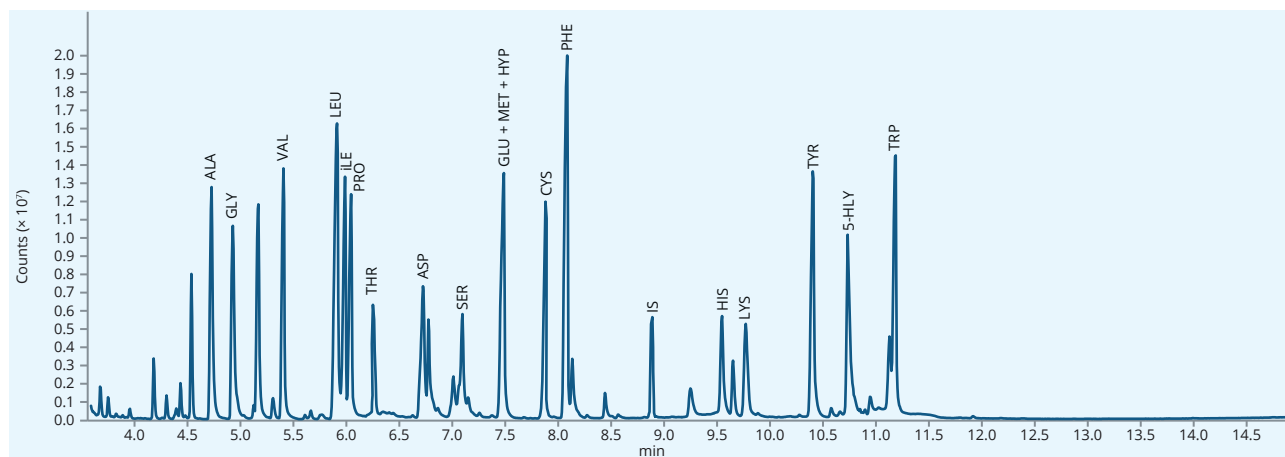
GC/MS kit

No.	Name	Synonyms	Quantification	[min]	Mmi*	Diagnostic ions		
						m/z	m/z	m/z
1	Sarcosine	SAR		4.62	497.0308	270	226	69
2	Alanine	ALA	✓	4.73	497.0308	270	70	69
3	N-Acetylglycine			4.92	299.0392	256	113	212
4	Glycine	GLY	✓	4.93	483.0151	256	212	56
5	3-Methylglutaric acid			4.97	510.0512	311	282	227
6	2-Aminobutyric acid	ABA		5.17	511.0465	284	84	113
7	3-Hydroxymethylglutaric acid			5.34	752.0325	285	311	85
8	3-Alanine			5.36	497.0308	269	256	98
9	Valine	VAL	✓	5.41	525.0621	298	283	98
10	N-Acetylcysteine			5.46	571.0134	282	309	509
11	3-Aminoisobutyric acid	BAIBA		5.47	511.0465	256	112	113
12	3-Amino-n-Butyric acid			5.52	511.0465	270	227	283
13	Norvaline	NVAL		5.69	525.0621	298	256	98
14	Leucine	LEU	✓	5.92	539.0778	312	270	256
15	Ethanolamine	EAM		5.98	513.0257	256	269	270
16	Isoleucine	iLE	✓	5.99	539.0778	283	312	256
17	Allo-isoleucine	aiLE		6.02	539.0778	312	283	256
18	Homoserine	HSER		6.04	753.0278	100	283	128
19	Proline	PRO	✓	6.05	523.0465	296	297	69
20	4-Aminobutyric acid	GABA		6.20	511.0465	112	256	69
21	Threonine	THR	✓	6.24	527.0415	100	283	483
22	Norleucine	NLEU		6.28	539.0778	312	256	112
23	Pipecolic acid	PIP		6.41	537.0621	310	518	407
24	N-Acetylaspargic acid			6.46	539.0414	270	312	228
25	Asparagine	ASN		6.70	522.0261	295	496	113
26	Aspartic acid	ASP	✓	6.73	723.0173	254	496	296
27	3-Methylcysteine			6.76	543.0185	61	300	316
28	Thiopropine	TPR		6.78	541.0029	314	287	86
29	2-Hydroxyglutaric acid			6.78	738.0169	283	239	511
30	Serine	SER	✓	7.07	739.0122	268	295	51
31	Acetylserine			7.09	555.0363	268	312	113
32	Pyroglutamic acid			7.43	537.0000	282	310	510
33	N-Acetylglutamic acid			7.44	567.0727	282	310	510
34	Glutamic acid	GLU	✓	7.45	737.0329	282	310	510
35	4-Hydroxyproline	4-HYP	✓	7.47	539.0414	312	294	68
36	Methionine	MET	✓	7.49	557.0342	538	294	494
37	Cysteine	CYS	✓	7.84	754.9895	328	285	113
38	Selenomethionine			7.88	604.9786	282	510	405
39	Ethionine	ETH		7.90	571.0498	282	311	571
40	2-Aminoadipic acid	AAA		8.09	751.0486	124	282	324
41	Phenylalanine	PHE	✓	8.09	573.0621	91	330	92
42	3-Hydroxyproline			8.12	539.0414	312	129	256
43	2,4-Diaminobutyric acid	DABA		8.52	752.0438	282	256	325
44	5-Carboxymethyl-Cysteine			8.55	769.0050	213	259	314
45	Homocysteine	HCYS		8.59	769.0045	282	342	82
46	2-Aminopimelic acid	APA		8.66	765.0642	338	138	95
47	Homophenylalanine	Internal standard		8.83	587.0778	283	117	483
48	Histamine	HTA		8.78	563.0526	308	320	113
49	Glutamine	GLN		8.86	554.0523	84	282	327
50	4-Aminobenzoic acid	PABA		9.05	545.0308	146	345	346
51	1-Methylhistidine			9.06	577.0682	95	150	350
52	Chloro-phenylalanine			9.16	607.0231	125	364	180
53	Methionine sulfone	MET-SO2		9.18	589.0240	282	82	189
54	Ornithine	ORN		9.25	766.0595	296	256	69
55	Acetyltyrosine			9.49	871.0489	333	289	188
56	Histidine	HIS	✓	9.55	789.0391	307	362	113
57	Glycylproline	GPR		9.69	580.0679	70	153	296
58	Lysine	LYS	✓	9.77	780.0751	310	256	153
59	Tyramine			9.85	589.0570	346	333	289
60	2,6-Diaminopimelic acid (isomers)			10.28	1006.0616	308	536	
61	Tyrosine	TYR	✓	10.41	815.0435	333	289	113
62	5-Hydroxylysine (isomers)	HLV	✓	10.76	1022.0565	269	256	69
63	Cystathionine	CTH		11.12	1038.0337	328	282	69
64	Dopamine	DAM		11.12	831.0000	256	531	113
65	Tryptophan	TRP	✓	11.19	612.0730	130	131	385
66	3,4-Dihydroxyphenylalanine	DOPA		11.32	1057.0249	149	531	575
67	Prolylhydroxyproline	PHP		11.52	862.0806	296	297	294
68	3-Nitrotyrosine			11.68	860.0286	334	113	378
69	Selenocystine	Se-C-C		11.93	1151.879	496	295	268

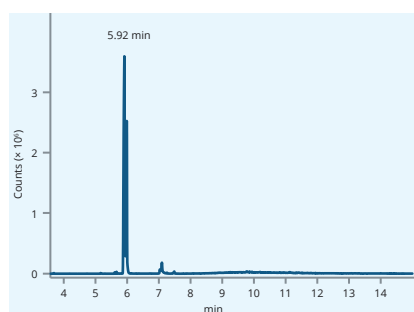
* Mmi = monoisotopic mass of the derivative of the relevant metabolite.

GC/MS separation

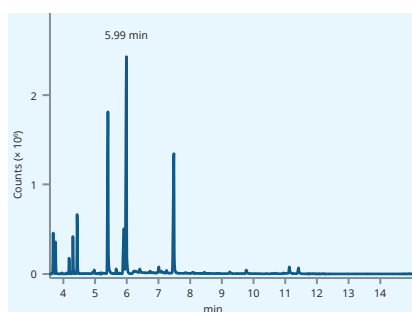
A typical chromatogram of the amino acid standard solution included in this kit.



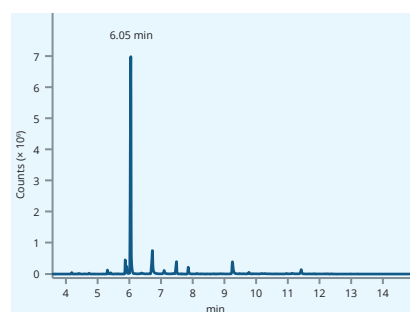
Chromatogram of standard solution (above)



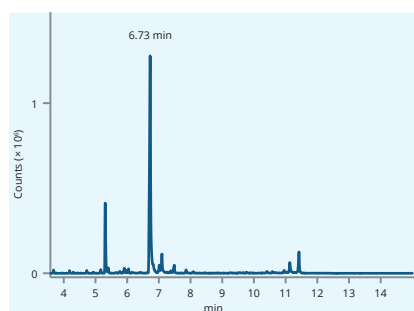
LEU (EIC 312)



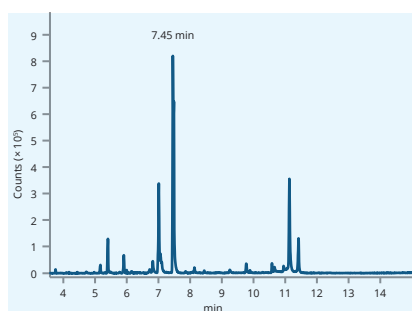
ILE (EIC 283)



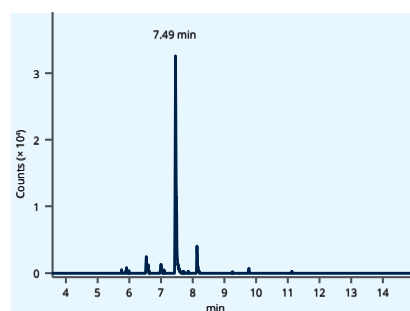
PRO (EIC 296)



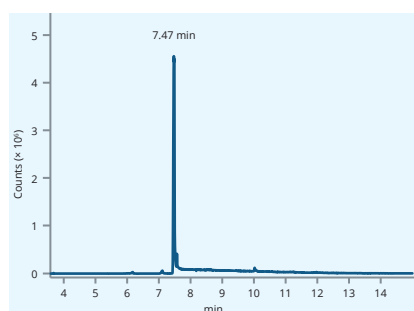
ASP (EIC 254)



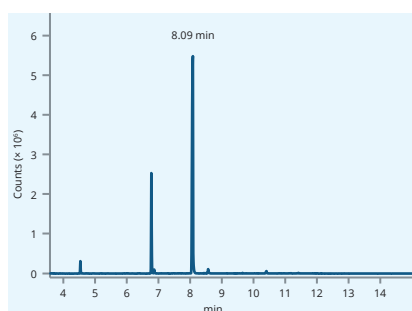
GLU (EIC 282)



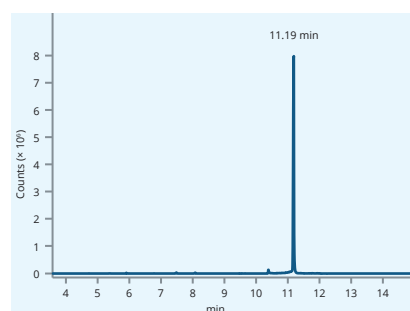
MET (EIC 538)



4-HYP (EIC 312)



PHE (EIC 91)



TRP (EIC 130)

Note: EIC = Extracted Ion Chromatogram.

Ordering information

Sample preparation kit (CF)	Part number	Samples
MetAmino® sample preparation LC/MS start-up kit, CF	MAK-5857-AA01	100
MetAmino® sample preparation GC/MS start-up kit, CF	MAK-5857-BA01	100
MetAmino® sample preparation LC/MS basic kit, CF	MAK-5857-CA04	400
MetAmino® sample preparation GC/MS basic kit, CF	On request	400
MetAmino® sample preparation LC-MS reagents kit	MAK-5857-L002	100
MetAmino® sample preparation GC-MS reagents kit	MAK-5857-M002	100

Metabolite sample preparation kit (CF)

- Derivatization reagents.
- Derivatization centrifugal filters (set of 100/400 pcs).
- 2mL screw top vials (set of 100/400 pcs).
- Micro tube rack.
- LC/MS or GC/MS column.
- Sample preparation manual.

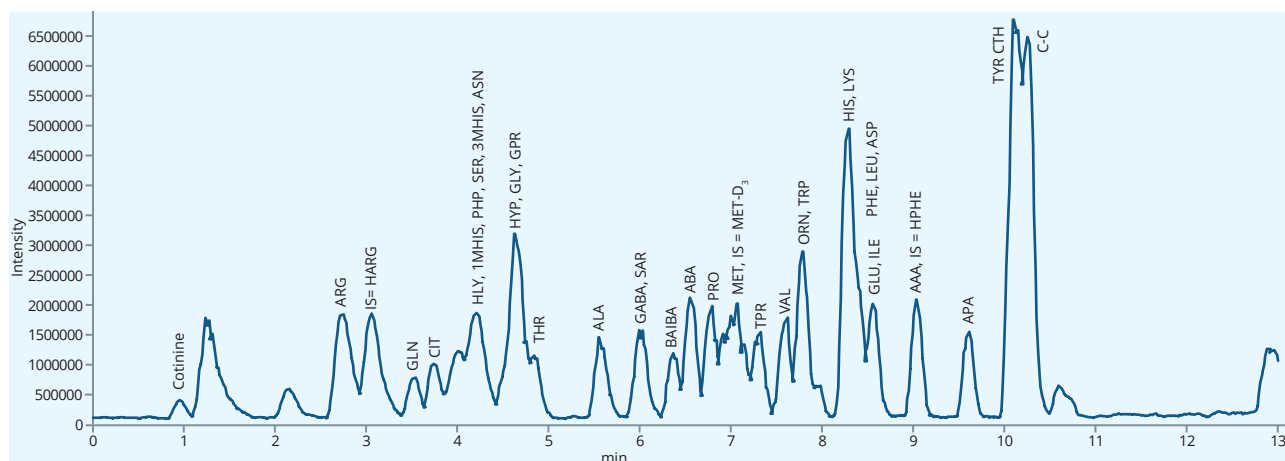


Fig. 1: Standard mixture – LC MetAmino® kit; mass extracted chromatogram; 5 nmol SD1 and SD2 according to the manual [2]

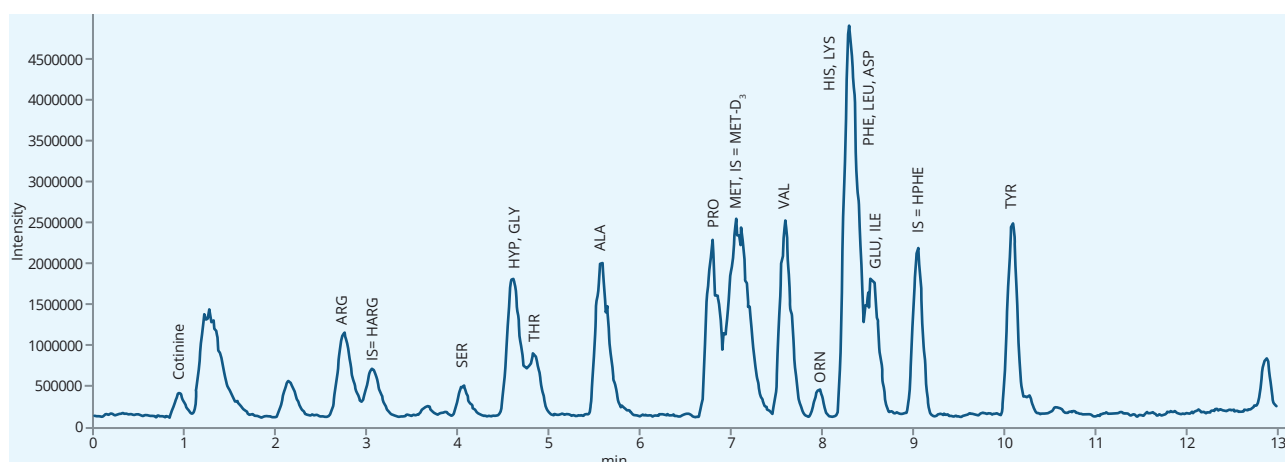


Fig. 2: Fish feed hydrolysate – LC MetAmino® kit; mass extracted chromatogram; (30 µg of sample after recalculation)

CENTRIFUGAL FILTERS

CENTRIFUGAL FILTERS

Centrifugal filters Nano-Spin and Micro-Spin (including Micro/Nano-Spin tube) with a porosity of 0.2 μm and 0.45 μm are suitable for sample purification, pre-filtration, removal of particles and cleaning of impurities in samples using membranes (Nylon, PTFE, PVDF, PE, CA, NC, RC).



Micro-Spin tube

Micro-Spin filter



Nano-Spin filter and tube



Nano-Spin tube

Nano-Spin filter

Description	Membrane	Capacity	Amount	Part number
Centrifugal Filters CA 0.2 μm , Nano – 400 μL Capacity	CA	400 μL	100 pcs	NICA02
Centrifugal Filters CA 0.45 μm , Nano – 400 μL Capacity	CA	400 μL	100 pcs	NICA45
Centrifugal Filters NC 0.2 μm , Nano – 400 μL Capacity	NC	400 μL	100 pcs	NINC02
Centrifugal Filters NC 0.45 μm , Nano – 400 μL Capacity	NC	400 μL	100 pcs	NINC45
Centrifugal Filters NY 0.2 μm , Nano – 400 μL Capacity	NY	400 μL	100 pcs	NINY02
Centrifugal Filters NY 0.45 μm , Nano – 400 μL Capacity	NY	400 μL	100 pcs	NINY45
Centrifugal Filters PE 0.2 μm , Nano – 400 μL Capacity	PE	400 μL	100 pcs	NIPE02
Centrifugal Filters PE 0.45 μm , Nano – 400 μL Capacity	PE	400 μL	100 pcs	NIPE45
Centrifugal Filters PP 0.2 μm , Nano – 400 μL Capacity	PP	400 μL	100 pcs	NIPP02
Centrifugal Filters PP 0.45 μm , Nano – 400 μL Capacity	PP	400 μL	100 pcs	NIPP45
Centrifugal Filters PTFE 0.2 μm , Nano – 400 μL Capacity	PTFE	400 μL	100 pcs	NIPT02
Centrifugal Filters PTFE 0.45 μm , Nano – 400 μL Capacity	PTFE	400 μL	100 pcs	NIPT45
Centrifugal Filters PVDF 0.2 μm , Nano – 400 μL Capacity	PVDF	400 μL	100 pcs	NIPV02
Centrifugal Filters PVDF 0.45 μm , Nano – 400 μL Capacity	PVDF	400 μL	100 pcs	NIPV45
Centrifugal Filters RC 0.2 μm , Nano – 400 μL Capacity	RC	400 μL	100 pcs	NIRC02
Centrifugal Filters RC 0.45 μm , Nano – 400 μL Capacity	RC	400 μL	100 pcs	NIRC45
Centrifugal Filters CA 0.2 μm , Micro – 800 μL Capacity	CA	800 μL	100 pcs	CICA02
Centrifugal Filters CA 0.45 μm , Micro – 800 μL Capacity	CA	800 μL	100 pcs	CICA45
Centrifugal Filters NC 0.2 μm , Micro – 800 μL Capacity	NC	800 μL	100 pcs	CINC02
Centrifugal Filters NC 0.45 μm , Micro – 800 μL Capacity	NC	800 μL	100 pcs	CINC45
Centrifugal Filters NY 0.2 μm , Micro – 800 μL Capacity	NY	800 μL	100 pcs	CINY02
Centrifugal Filters NY 0.45 μm , Micro – 800 μL Capacity	NY	800 μL	100 pcs	CINY45
Centrifugal Filters PE 0.2 μm , Micro – 800 μL Capacity	PE	800 μL	100 pcs	CIPE02
Centrifugal Filters PE 0.45 μm , Micro – 800 μL Capacity	PE	800 μL	100 pcs	CIPE45
Centrifugal Filters PP 0.2 μm , Micro – 800 μL Capacity	PP	800 μL	100 pcs	CIPP02
Centrifugal Filters PP 0.45 μm , Micro – 800 μL Capacity	PP	800 μL	100 pcs	CIPP45
Centrifugal Filters PTFE 0.2 μm , Micro – 800 μL Capacity	PTFE	800 μL	100 pcs	CIPT02
Centrifugal Filters PTFE 0.45 μm , Micro – 800 μL Capacity	PTFE	800 μL	100 pcs	CIPT45
Centrifugal Filters PVDF 0.2 μm , Micro – 800 μL Capacity	PVDF	800 μL	100 pcs	CIPV02
Centrifugal Filters PVDF 0.45 μm , Micro – 800 μL Capacity	PVDF	800 μL	100 pcs	CIPV45
Centrifugal Filters RC 0.2 μm , Micro – 800 μL Capacity	RC	800 μL	100 pcs	CIRC02
Centrifugal Filters RC 0.45 μm , Micro – 800 μL Capacity	RC	800 μL	100 pcs	CIRC45

CENTRIFUGAL FILTERS

CENTRIFUGAL FILTERS

Centrifugal filters Midi-Spin and Maxi-Spin (including spin tube) with a porosity of 0.2 µm and 0.45 µm are suitable for sample purification, pre-filtration, removal of particles and cleaning of impurities in samples using membranes (Nylon, PTFE, PVDF, PE, CA, NC, RC).



Midi filter



Maxi filter

Description	Membrane	Capacity	Amount	Part number
Centrifugal Filters CA 0.2 µm, Midi – 4 mL Capacity	CA	4 mL	25 pcs	BCA02
Centrifugal Filters CA 0.45 µm, Midi – 4 mL Capacity	CA	4 mL	25 pcs	BCA45
Centrifugal Filters NC 0.2 µm, Midi – 4 mL Capacity	NC	4 mL	25 pcs	BNC02
Centrifugal Filters NC 0.45 µm, Midi – 4 mL Capacity	NC	4 mL	25 pcs	BNC45
Centrifugal Filters NY 0.2 µm, Midi – 4 mL Capacity	NY	4 mL	25 pcs	BNY02
Centrifugal Filters NY 0.45 µm, Midi – 4 mL Capacity	NY	4 mL	25 pcs	BNY45
Centrifugal Filters PE 0.2 µm, Midi – 4 mL Capacity	PE	4 mL	25 pcs	BPE02
Centrifugal Filters PE 0.45 µm, Midi – 4 mL Capacity	PE	4 mL	25 pcs	BPE45
Centrifugal Filters PP 0.2 µm, Midi – 4 mL Capacity	PP	4 mL	25 pcs	BPP02
Centrifugal Filters PP 0.45 µm, Midi – 4 mL Capacity	PP	4 mL	25 pcs	BPP45
Centrifugal Filters PTFE 0.2 µm, Midi – 4 mL Capacity	PTFE	4 mL	25 pcs	BPT02
Centrifugal Filters PTFE 0.45 µm, Midi – 4 mL Capacity	PTFE	4 mL	25 pcs	BPT45
Centrifugal Filters PVDF 0.2 µm, Midi – 4 mL Capacity	PVDF	4 mL	25 pcs	BPV02
Centrifugal Filters PVDF 0.45 µm, Midi – 4 mL Capacity	PVDF	4 mL	25 pcs	BPV45
Centrifugal Filters RC 0.2 µm, Midi – 4 mL Capacity	RC	4 mL	25 pcs	BRC02
Centrifugal Filters RC 0.45 µm, Midi – 4 mL Capacity	RC	4 mL	25 pcs	BRC45
Centrifugal Filters CA 0.2 µm, Maxi – 25 mL Capacity	CA	25 mL	50 pcs	XCA02
Centrifugal Filters CA 0.45 µm, Maxi – 25 mL Capacity	CA	25 mL	50 pcs	XCA45
Centrifugal Filters NC 0.2 µm, Maxi – 25 mL Capacity	NC	25 mL	50 pcs	XNC02
Centrifugal Filters NC 0.45 µm, Maxi – 25 mL Capacity	NC	25 mL	50 pcs	XNC45
Centrifugal Filters NY 0.2 µm, Maxi – 25 mL Capacity	NY	25 mL	50 pcs	XNY02
Centrifugal Filters NY 0.45 µm, Maxi – 25 mL Capacity	NY	25 mL	50 pcs	XNY45
Centrifugal Filters PE 0.2 µm, Maxi – 25 mL Capacity	PE	25 mL	50 pcs	XPE02
Centrifugal Filters PE 0.45 µm, Maxi – 25 mL Capacity	PE	25 mL	50 pcs	XPE45
Centrifugal Filters PP 0.2 µm, Maxi – 25 mL Capacity	PP	25 mL	50 pcs	XPP02
Centrifugal Filters PP 0.45 µm, Maxi – 25 mL Capacity	PP	25 mL	50 pcs	XPP45
Centrifugal Filters PTFE 0.2 µm, Maxi – 25 mL Capacity	PTFE	25 mL	50 pcs	XPT02
Centrifugal Filters PTFE 0.45 µm, Maxi – 25 mL Capacity	PTFE	25 mL	50 pcs	XPT45
Centrifugal Filters PVDF 0.2 µm, Maxi – 25 mL Capacity	PVDF	25 mL	50 pcs	XPV02
Centrifugal Filters PVDF 0.45 µm, Maxi – 25 mL Capacity	PVDF	25 mL	50 pcs	XPV45
Centrifugal Filters RC 0.2 µm, Maxi – 25 mL Capacity	RC	25 mL	50 pcs	XRC02
Centrifugal Filters RC 0.45 µm, Maxi – 25 mL Capacity	RC	25 mL	50 pcs	XRC45

SYRINGE FILTERS

CHS Filterpure syringe filters are suitable for filtering solutions and solvent solutions, where it is necessary to have a low content of extractable substances. The membranes (Nylon, PTFE, PVDF, MCE, PES) have good chemical resistance and high strength.



CHS FilterPure

Description	Membrane	Diameter	Amount	Part number
CHS FilterPure MCE Syringe Filter Orange 13 mm 0.22 µm	MCE	13 mm	100 pcs	CHSF-MCE1322OR
CHS FilterPure MCE Syringe Filter Orange 13 mm 0.45 µm	MCE	13 mm	100 pcs	CHSF-MCE1345OR
CHS FilterPure MCE Syringe Filter Orange 25 mm 0.22 µm	MCE	25 mm	100 pcs	CHSF-MCE2522OR
CHS FilterPure MCE Syringe Filter Orange 25 mm 0.45 µm	MCE	25 mm	100 pcs	CHSF-MCE2545OR
CHS FilterPure MCE Syringe Filter Orange 33 mm 0.22 µm	MCE	33 mm	100 pcs	CHSF-MCE3322OR
CHS FilterPure MCE Syringe Filter Orange 33 mm 0.45 µm	MCE	33 mm	100 pcs	CHSF-MCE3345OR
CHS FilterPure Nylon Syringe Filter Green 13 mm 0.22 µm	Nylon	13 mm	100 pcs	CHSF-NY1322G
CHS FilterPure Nylon Syringe Filter 13 mm, 0.22 µm	Nylon	13 mm	100 pcs	CHSF-NY1322N
CHS FilterPure Nylon Syringe Filter Green 13 mm, 0.45 µm	Nylon	13 mm	100 pcs	CHSF-NY1345G
CHS FilterPure Nylon Syringe Filter 13 mm, 0.45 µm	Nylon	13 mm	100 pcs	CHSF-NY1345N
CHS FilterPure Nylon Syringe Filter, 17 mm, 0.45 µm	Nylon	17 mm	100 pcs	CHSF-NY1745N
CHS FilterPure Nylon Syringe Filter Green 25 mm, 0.22 µm	Nylon	25 mm	100 pcs	CHSF-NY2522G
CHS FilterPure Nylon Syringe Filters 25 mm, 0.22 µm	Nylon	25 mm	100 pcs	CHSF-NY2522N
CHS FilterPure Nylon Syringe Filter Green 25 mm, 0.45 µm	Nylon	25 mm	100 pcs	CHSF-NY2545G
CHS FilterPure Nylon Syringe Filters 25 mm, 0.45 µm	Nylon	25 mm	100 pcs	CHSF-NY2545N
CHS FilterPure Nylon Syringe Filters with Prefilter 25 mm, 0.22 µm	Nylon	25 mm	100 pcs	CHSF-NYP2522N
CHS FilterPure Nylon Syringe Filters with Prefilter 25 mm, 0.45 µm	Nylon	25 mm	100 pcs	CHSF-NYP2545N
CHS FilterPure Nylon Syringe Filter Green 33 mm, 0.22 µm	Nylon	33 mm	100 pcs	CHSF-NY3322G
CHS FilterPure Nylon Syringe Filter Green 33 mm, 0.45 µm	Nylon	33 mm	100 pcs	CHSF-NY3345G
CHS FilterPure PES Syringe Filter Yellow 13 mm, 0.22 µm	PES	13 mm	100 pcs	CHSF-PES1322Y
CHS FilterPure PES Syringe Filter Yellow 13 mm, 0.45 µm	PES	13 mm	100 pcs	CHSF-PES1345Y
CHS FilterPure PES Syringe Filter Yellow 25 mm, 0.22 µm	PES	25 mm	100 pcs	CHSF-PES2522Y
CHS FilterPure PES Syringe Filter Yellow 25 mm, 0.45 µm	PES	25 mm	100 pcs	CHSF-PES2545Y
CHS FilterPure PES Syringe Filter Yellow 33 mm, 0.22 µm	PES	33 mm	100 pcs	CHSF-PES3322Y
CHS FilterPure PES Syringe Filter Yellow 33 mm, 0.45 µm	PES	33 mm	100 pcs	CHSF-PES3345Y
CHS FilterPure Hydrophilic PVDF Syringe Filter Blue 13 mm, 0.22 µm	PVDF	13 mm	100 pcs	CHSF-PVDF1322BL
CHS FilterPure Hydrophilic PVDF Syringe Filter Blue 13 mm, 0.45 µm	PVDF	13 mm	100 pcs	CHSF-PVDF1345BL
CHS FilterPure Hydrophilic PVDF Syringe Filter Blue 25 mm, 0.22 µm	PVDF	25 mm	100 pcs	CHSF-PVDF2522BL
CHS FilterPure Hydrophilic PVDF Syringe Filter Blue 25 mm, 0.45 µm	PVDF	25 mm	100 pcs	CHSF-PVDF2545BL
CHS FilterPure Hydrophilic PVDF Syringe Filter Blue 33 mm, 0.22 µm	PVDF	33 mm	100 pcs	CHSF-PVDF3322BL
CHS FilterPure Hydrophilic PVDF Syringe Filter Blue 33 mm, 0.45 µm	PVDF	33 mm	100 pcs	CHSF-PVDF3345BL
CHS FilterPure Hydrophilic PTFE Syringe Filter Red 13 mm, 0.22 µm	PTFE hydrophilic	13 mm	100 pcs	CHSF-PTFE1322RL
CHS FilterPure Hydrophilic PTFE Syringe Filter Red 13 mm, 0.45 µm	PTFE hydrophilic	13 mm	100 pcs	CHSF-PTFE1345RL
CHS FilterPure Hydrophilic PTFE Syringe Filter Red 25 mm, 0.22 µm	PTFE hydrophilic	25 mm	100 pcs	CHSF-PTFE2522RL
CHS FilterPure Hydrophilic PTFE Syringe Filter Red 25 mm, 0.45 µm	PTFE hydrophilic	25 mm	100 pcs	CHSF-PTFE2545RL
CHS FilterPure Hydrophilic PTFE Syringe Filter Red 33 mm, 0.22 µm	PTFE hydrophilic	33 mm	100 pcs	CHSF-PTFE3322RL
CHS FilterPure Hydrophilic PTFE Syringe Filter Red 33 mm, 0.45 µm	PTFE hydrophilic	33 mm	100 pcs	CHSF-PTFE3345RL
CHS FilterPure Hydrophobic PTFE Syringe Filter 13 mm, 0.22 µm	PTFE hydrophobic	13 mm	100 pcs	CHSF-PTFE1322NB
CHS FilterPure Hydrophobic PTFE Syringe Filter Red 13 mm, 0.22 µm	PTFE hydrophobic	13 mm	100 pcs	CHSF-PTFE1322RB
CHS FilterPure Hydrophobic PTFE Syringe Filter 13 mm, 0.45 µm	PTFE hydrophobic	13 mm	100 pcs	CHSF-PTFE1345NB
CHS FilterPure Hydrophobic PTFE Syringe Filter Red 13 mm, 0.45 µm	PTFE hydrophobic	13 mm	100 pcs	CHSF-PTFE1345RB
CHS FilterPure Hydrophobic PTFE Syringe Filters 25 mm, 0.22 µm	PTFE hydrophobic	25 mm	100 pcs	CHSF-PTFE2522NB
CHS FilterPure Hydrophobic PTFE Syringe Filter Red 25 mm, 0.22 µm	PTFE hydrophobic	25 mm	100 pcs	CHSF-PTFE2522RB
CHS FilterPure Hydrophobic PTFE Syringe Filter 25 mm, 0.45 µm	PTFE hydrophobic	25 mm	100 pcs	CHSF-PTFE2545NB
CHS FilterPure Hydrophobic PTFE Syringe Filter Red 25 mm, 0.45 µm	PTFE hydrophobic	25 mm	100 pcs	CHSF-PTFE2545RB
CHS FilterPure Hydrophobic PTFE Syringe Filter Red 33 mm, 0.22 µm	PTFE hydrophobic	33 mm	100 pcs	CHSF-PTFE3322RB
CHS FilterPure Hydrophobic PTFE Syringe Filter Red 33 mm, 0.45 µm	PTFE hydrophobic	33 mm	100 pcs	CHSF-PTFE3345RB

VIALS and CAPS

2mL crimp vials

Description	Qty	Part number
Crimp vials		
2mL crimp vials, 12 × 32 mm, clear	100 pcs	CHS-2-CC
2mL crimp vials, 12 × 32 mm, clear with label	100 pcs	CHS-2-CCL
2mL crimp vials, 12 × 32 mm, amber with label	100 pcs	CHS-2-CAL

Description	Qty	Part number
Caps for 2mL crimp vials		
11mm Al crimp caps with septa rubber/PTFE	100 pcs	CHS-AL11-RBT-C
11mm Al crimp caps with septa silicone/PTFE	100 pcs	CHS-AL11-ST-C
11mm Al crimp caps with septa silicone/PTFE	1000 pcs	CHS-AL11-ST-M
11mm Al crimp caps with septa orange silicone/PTFE	100 pcs	CHS-AL11-ORST-C
11mm Al crimp caps with septa orange silicone/PTFE	1000 pcs	CHS-AL11-ORST-M
11mm Al crimp caps with pre-slit septa silicone/PTFE	100 pcs	CHS-AL11-PSST-C
11mm Al crimp caps with pre-slit septa silicone/PTFE	1000 pcs	CHS-AL11-PSST-M
11mm Al crimp caps with septa PTFE/silikon/PTFE	100 pcs	CHS-AL11-TST-C
11mm Al crimp caps with septa PTFE/silikon/PTFE	1000 pcs	CHS-AL11-TST-M

Description	Qty	Part number
Combo pack sets crimp vials + caps with septa		
2mL crimp vials, 12 × 32 mm, clear and 11mm Al crimp caps with septa orange silicone/PTFE	1000 pcs	CHS-2-CC-SET CL
2mL crimp vials, 12 × 32 mm, clear and 11mm Al crimp caps with pre-slit septa silicone/PTFE	1000 pcs	CHS-2-CC-SET PS
2mL crimp vials, 12 × 32 mm, clear and 11mm Al crimp caps with septa rubber/PTFE	1000 pcs	CHS-2-CC-SET RB
2mL crimp vials, 12 × 32 mm, clear and 11mm Al crimp caps with septa silicone/PTFE	1000 pcs	CHS-2-CC-SET SIL
2mL crimp vials, 12 × 32 mm, amber with label and 11mm Al crimp caps with septa orange silicone/PTFE	1000 pcs	CHS-2-CAL-SET CL
2mL crimp vials, 12 × 32 mm, amber with label and 11mm Al crimp caps with pre-slit septa silicone/PTFE	1000 pcs	CHS-2-CAL-SET PS
2mL crimp vials, 12 × 32 mm, amber with label and 11mm Al crimp caps with septa rubber/PTFE	1000 pcs	CHS-2-CAL-SET RB
2mL crimp vials, 12 × 32 mm, amber with label and 11mm Al crimp caps with septa silicone/PTFE	1000 pcs	CHS-2-CAL-SET SIL

2mL crimp vials

Description	Qty	Part number
Inserts for crimp vials and for short thread robotic vials		
250 µL, 5.8 × 29 mm, conical glass inserts with plastic feets	100 pcs	CHS-INS-630
250 µL, 5.8 × 31 mm, conical glass inserts without plastic feets	1000 pcs	02-MTVWG
250 µL, 5.8 × 29 mm, conical plastic inserts with plastic feets	100 pcs	CHS-INS-630P
400 µL, 5.8 × 31 mm, glass inserts with flat bottom	500 pcs	C4011-631



Crimp vials



250 µL insert CHS-INS-630

VIALS and CAPS

2mL screw robotic vials

Description	Qty	Part number
Short thread 2mL robotic screw vials		
2mL short thread robotic screw vials, 12 × 32 mm, clear without label	100 pcs	CHS-2-S9C
2mL short thread robotic screw vials, 12 × 32 mm, clear with label	100 pcs	CHS-2-S9CL
2mL short thread robotic screw vials, 12 × 32 mm, amber with label	100 pcs	CHS-2-S9AL

Description	Qty	Part number
Caps for short thread 2mL robotic screw vials		
Blue plastic caps for robotic vials with septa rubber/PTFE	100 pcs	CHS-P9-RBT-C
Blue plastic caps for robotic vials with septa silicone/PTFE	100 pcs	CHS-P9-ST-C
Blue plastic caps for robotic vials with septa silicone/PTFE	1000 pcs	CHS-P9-ST-M
Blue plastic caps for robotic vials with bonded septa silicone/PTFE	100 pcs	CHS-P9-BST-C
Blue plastic caps for robotic vials with bonded septa silicone/PTFE	1000 pcs	CHS-P9-BST-M
Blue plastic caps for robotic vials with bonded ULB septa silicone/PTFE	100 pcs	CHS-P9-BST-ULB-C
Blue plastic caps for robotic vials with pre-slit septa silicone/PTFE	100 pcs	CHS-P9-PSST-C
Blue plastic caps for robotic vials with pre-slit septa silicone/PTFE	1000 pcs	CHS-P9-PSST-M
Blue plastic caps for robotic vials with bonded pre-slit ULB septa silicone/PTFE	100 pcs	CHS-P9-BPSST-ULB-C

Description	Qty	Part number
Spare septa 9 mm for caps for short thread robotic screw vials		
9mm septa silicone/PTFE	100 pcs	CHS-9-ST-C
9mm septa silicone/PTFE	1000 pcs	CHS-9-ST-M
9mm septa PTFE/silicone/PTFE	100 pcs	CHS-9-TST-C
9mm septa PTFE/silicone/PTFE	1000 pcs	CHS-9-TST-M

Description	Qty	Part number
Combo pack sets short thread robotic vials + caps with septa		
Short thread 2mL robotic screw vials, 12 × 32 mm, clear with label and blue plastic caps with septa silicone/PTFE	1000 pcs	CHS-2-S9CL-BLUESET CL
Short thread 2mL robotic screw vials, 12 × 32 mm, clear with label and blue plastic caps with bonded septa silicone/PTFE	1000 pcs	CHS-2-S9CL-BLUESET BND
Short thread 2mL robotic screw vials, 12 × 32 mm, clear with label and blue plastic caps with pre-slit septa silicone/PTFE	1000 pcs	CHS-2-S9CL-BLUESET PS
Short thread 2mL robotic screw vials, 12 × 32 mm, amber with label and blue plastic caps with septa silicone/PTFE	1000 pcs	CHS-2-S9AL-BLUESET CL
Short thread 2mL robotic screw vials, 12 × 32 mm, amber with label and blue plastic caps with pre-slit septa silicone/PTFE	1000 pcs	CHS-2-S9AL-BLUESET PS

Note: Robotic short thread vials fit to all frequent GC and LC samplers, caps with pre-slit septa are right for Waters LC systems.

VIALS and CAPS

4mL screw vials

Description	Qty	Part number
Screw vials 4 mL, 13-425 thread		
4mL screw vials, 15 × 45 mm, clear without label	100 pcs	CHS-4-S13C
4mL screw vials, 15 × 45 mm, clear with label	100 pcs	CHS-4-S13CL
4mL screw vials, 15 × 45 mm, amber with label	100 pcs	CHS-4-S13AL

Description	Qty	Part number
Caps for 4mL screw vials, 13-425 thread		
13-425 thread plastic caps with septa silicone/PTFE	100 pcs	1076-1302-C
13-425 thread plastic caps with septa silicone/PTFE	1000 pcs	1076-1302-M
13-425 thread plastic caps with pre-slit septa silicone/PTFE	100 pcs	1076-13021-C

Description	Qty	Part number
Spare septa 12 mm for caps 13-425 thread		
12mm septa silicone/PTFE	100 pcs	1076-0465-C
12mm septa silicone/PTFE	1000 pcs	1076-0465-M

VIALS and CAPS

Headspace crimp vials

Description	Qty	Part number
Headspace crimp vials		
10mL headspace crimp vials, 23 × 46 mm, clear, rounded bottom	100 pcs	CHS-10-CCL-RB
10mL headspace crimp vials, 23 × 46 mm, clear, flat bottom	100 pcs	CHS-10-CCL-FB
20mL headspace crimp vials, 23 × 75 mm, clear, rounded bottom	100 pcs	CHS-20-CCL-RB
20mL headspace crimp vials, 23 × 75 mm, clear, flat bottom	100 pcs	HS 20 0236
20mL headspace crimp vials, 23 × 75 mm, amber, rounded bottom	125 pcs	20-CV(A)

Description	Qty	Part number
20mm bimetallic crimp caps for headspace vials		
20mm bimetallic crimp caps with septa silicone/PTFE	100 pcs	CHS-BM20-ST-C
20mm bimetallic crimp caps with septa silicone/PTFE	1000 pcs	CHS-BM20-ST-M
20mm bimetallic crimp caps with septa silicone translucent (soft)/PTFE	100 pcs	CHS-BM20-ST-TRL-C
20mm bimetallic crimp caps with septa silicone translucent (soft)/PTFE	1000 pcs	CHS-BM20-ST-TRL-M

Description	Qty	Part number
20mm magnetic steel crimp caps for headspace vials		
20mm magnetic steel crimp caps with septa silicone/PTFE	100 pcs	CHS-MG20-ST-C
20mm magnetic steel crimp caps with septa silicone/PTFE	1000 pcs	CHS-MG20-ST-M
20mm magnetic steel crimp caps with ULB septa silicone/PTFE	100 pcs	CHS-MG20-ST-ULB-C
20mm magnetic steel crimp caps with ULB septa silicone/PTFE	1000 pcs	CHS-MG20-ST-ULB-M

Description	Qty	Part number
20mm aluminium crimp caps for headspace vials		
20mm aluminium crimp caps with septa silicone/PTFE	100 pcs	CHS-AL20-ST-C
20mm aluminium crimp caps with septa silicone/PTFE	1000 pcs	CHS-AL20-ST-M
20mm aluminium crimp caps with ULB septa silicone/PTFE	100 pcs	CHS-AL20-ST-ULB-C
20mm aluminium crimp caps with ULB septa silicone/PTFE	1000 pcs	CHS-AL20-ST-ULB-M
20mm aluminium crimp caps with septa silicone translucent (soft)/PTFE	100 pcs	CHS-AL20-ST-TRL-C
20mm aluminium crimp caps with septa silicone translucent (soft)/PTFE	1000 pcs	CHS-AL20-ST-TRL-M

Description	Qty	Part number
Spare septa 20 mm for crimp headspace vials		
20mm septa silicone/PTFE, thickness 3 mm	100 pcs	CHS-20-ST-C
20mm septa silicone/PTFE, thickness 3 mm	1000 pcs	CHS-20-ST-M
20mm septa silicone translucent (soft)/PTFE, thickness 3 mm	100 pcs	CHS-20-ST-TRL-C
20mm septa silicone translucent (soft)/PTFE, thickness 3 mm	1000 pcs	CHS-20-ST-TRL-M

Note: Headspace vials with rounded bottom fit to CTC and other frequent modern samplers, headspace vials with flat bottom fit to Agilent headspace and Dani headspace systems.



Headspace vials

VIALS and CAPS

Headspace screw vials

Description	Qty	Part number
Headspace screw vials		
10mL headspace screw vials, 22 × 45 mm, clear, rounded bottom	100 pcs	CHS-10-SC-RB
20mL headspace screw vials, 22 × 75 mm, clear, rounded bottom	100 pcs	CHS-20-SC-RB

Description	Qty	Part number
Magnetic caps with septa for screw headspace vials		
Magnetic caps with silicone/PTFE septa for screw headspace vials, thickness 2 mm	100 pcs	CHR-1414
Magnetic caps with silicone/PTFE septa for screw headspace vials, thickness 1.5 mm	100 pcs	CHR-1309

Description	Qty	Part number
Spare septa 18 mm for screw headspace vials		
18mm septa silicone/PTFE for screw headspace vials, thickness 3 mm	100 pcs	0900-0691-C
18mm septa silicone/PTFE for screw headspace vials, thickness 3 mm	1000 pcs	0900-0691-M
18mm septa silicone/PTFE for screw headspace vials, thickness 1.3 mm	100 pcs	0905-0691-C
18mm septa silicone/PTFE for screw headspace vials, thickness 1.3 mm	1000 pcs	0905-0691-M

Description	Qty	Part number
Spare magnetic caps for screw headspace vials		
Magnetic caps for screw headspace vials	125 pcs	18-MS-C



Screw headspace caps with septa

VIALS and CAPS

Crimping and decapping tools

Manual Crimpers and Decappers

- Easily-viewed adjustment knob.
- Strong light-weight plastic body.
- Bottom-pull handle design prevents wobbling.

High Power Crimping Tool

Fastest and most powerful CRS crimping tool

- Strong enough for all steel and magnetic caps.
- Designed with external power source and cord (no battery).
- Uses interchangeable jaw sets (ordered separately).

Manual crimpers	Qty	Part number
8mm Crimper	1 pc	C*308990
11mm Crimper	1 pc	C*311990
13mm Crimper	1 pc	C*313990
13mm Crimper for Flip Off Caps*	1 pc	C*313992
20mm Crimper	1 pc	C*320990
20mm Crimper for Flip Off Caps*	1 pc	C*320992

* Not for use with Flip-Up Caps.

Manual decappers	Qty	Part number
11mm Decapper	1 pc	C*311991
13mm Decapper	1 pc	C*313991
20mm Decapper	1 pc	C*320991

High power electronic tool	Qty	Part number
High Power Electronic Crimping Tool**	1 pc	C*6AHPS0
8mm Crimper Jaw	1 pc	C*308955
11mm Crimper Jaw	1 pc	C*311955
13mm Crimper Jaw	1 pc	C*313955
13mm Crimper Jaw for Flip Off Caps*	1 pc	C*313956
20mm Crimper Jaw	1 pc	C*320955
20mm Crimper Jaw for Flip Off Caps*	1 pc	C*320956
11mm Decapper Jaw	1 pc	C*311965
13mm Decapper Jaw	1 pc	C*313965
20mm Decapper Jaw	1 pc	C*320965

* Not for use with Flip-Up Caps.

**Jaws have to be ordered separately.



Manual crimper



High power electric crimper

CONTENTS

Chromservis HPLC columns corresponding to Pharmacopoeia methods

USP Code	Description	Corresponding column
L1	Octadecyl silane chemically bonded to porous or nonporous silica particles or superficially porous particles or ceramic micro-particles, 1.5–10 µm in diameter, or a monolithic rod.	ARION® Plus C18 ARION® Polar C18 ASTRA® C18-AQ ASTRA® C18-BDS ASTRA® C18-HE CHROMSHELL® C18 Plus CHROMSHELL® C18-XB CHROMSHELL® C18 Polar
L3	Porous silica particles or superficially porous particles, 1.5–10 µm in diameter, or a monolithic rod.	ARION® HILIC Plus ARION® Si ASTRA® Si
L7	Octylsilane chemically bonded to totally porous or superficially porous silica particles 1.5–10 µm in diameter, or a monolithic rod.	ARION® C8 ASTRA® C8-HE ASTRA® C8-BDS
L8	An essentially monomolecular layer of aminopropylsilane chemically bonded to totally porous silica gel support, 1.5–10 µm in diameter, or a monolithic silica rod.	ARION® NH ₂
L9	Irregular or spherical, totally porous silica gel having a chemically bonded, strongly acidic cation-exchange coating, 3 to 10 µm in diameter.	ARION® SCX
L10	Nitrile groups chemically bonded to porous silica particles or superficially porous particles, 1.5–10 µm in diameter, or a monolithic silica rod.	ARION® CN
L11	Phenyl groups chemically bonded to porous or superficially porous silica particles, 1.5–10 µm in diameter, or a monolithic silica rod.	ARION® Biphenyl ARION® Phenyl-Butyl ASTRA® Phenyl-Hexyl-HE
L14	Silica gel having a chemically bonded, strongly basic quaternary ammonium anion-exchange coating, 5–10 µm in diameter.	ARION® SAX
L17	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the hydrogen form, 6–12 µm in diameter.	ASTRA® Sugar H(S)
L19	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the calcium form, 5–15 µm in diameter.	ASTRA® Sugar Ca(S)
L20	Dihydropropane groups chemically bonded to porous silica particles, 1.5–10 µm in diameter, or a monolithic silica rod.	ASTRA® Diol
L43	Pentafluorophenyl groups chemically bonded to porous or superficially porous silica particles by a propyl spacer, 1.5–10 µm in diameter.	ARION® PFP
L50	Multifunction resin with reversed-phase retention and strong anion-exchange functionalities. The resin consists of ethylvinylbenzene, 55 % cross-linked with divinylbenzene copolymer, 3–15 µm in diameter, and a surface area not less than 350 m ² per g. Substrate is coated with quaternary ammonium functionalized latex particles consisting of styrene cross-linked with divinylbenzene.	ARION® SCX

Use our application database. The Chromservis website has a search engine to find an application based on different keywords, e.g. compound name, trivial name, formula etc.

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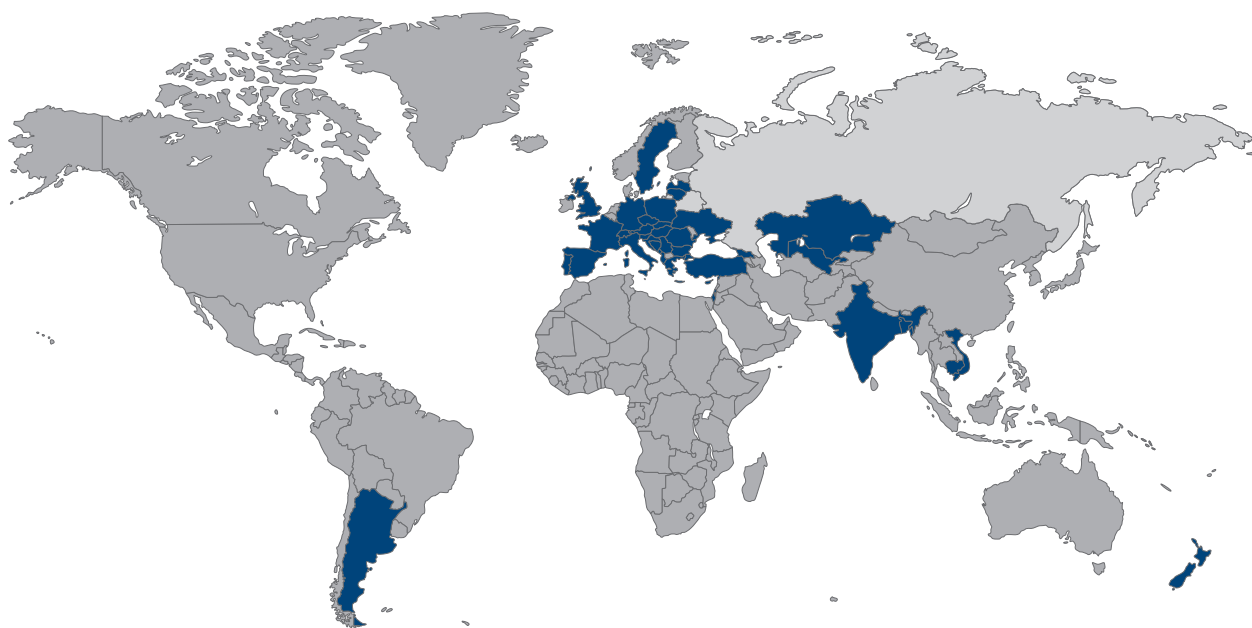
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