

FAST SEPARATION of CARBOHYDRATES OLIGOSACCHARIDES FOOD SUPPLEMENTS ORGANIC ACIDS CONTAMINANTS VITAMINS



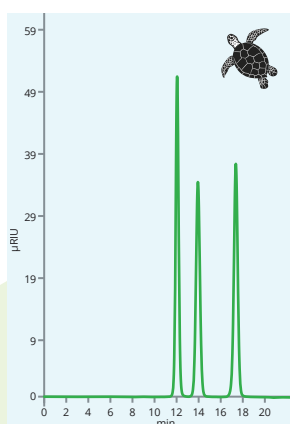
benefits

- Fast analysis
- High efficiency
- Low back pressure
- Column-to-column reproducibility

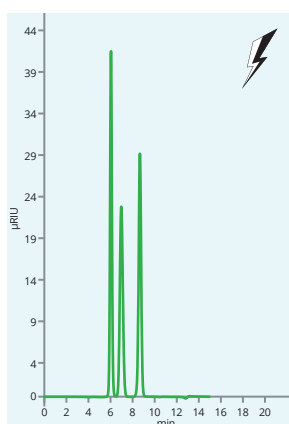
Introduction

Sugar analysis is a vital process in both the food and beverage industries as well as in scientific research, enabling the identification and quantification of sugar compounds in various samples. This analysis is crucial for quality control, nutritional labeling, product development, and ensuring compliance with regulatory standards. A common method used in sugar analysis includes chromatography, which allows for precise measurements of simple sugars, such as glucose and fructose, as well as complex carbohydrates. Understanding sugar profiles not only informs consumers about dietary choices but also aids manufacturers in formulating products to meet consumer demands for taste, texture, and health considerations.

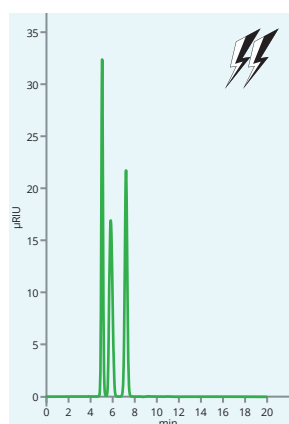
SPEED UP YOUR ANALYSIS



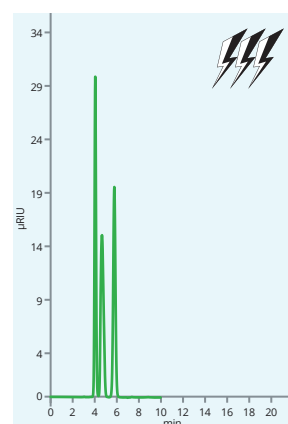
17.4 min; 0.5 mL/min



8.7 min; 1.0 mL/min



7.2 min; 1.2 mL/min



5.8 min; 1.5 mL/min



"We are pleased to share our experience of using the Chromservis Astra Sugar column in our laboratory. This column has significantly enhanced our ability to separate and analyse key components in our samples, including sucrose, glucose, fructose, and sorbitol.

One of the standout features of the Astra Sugar column is its impressive separation efficiency. The results we've achieved are not only reliable but also remarkably precise, allowing us to obtain accurate quantitative data for each sugar component."

Associate Professor Vladimír Štefuca, Slovak University of Technology in Bratislava

Column selection guide

	Separation mode	Column
Mono-, di-saccharides, and sugar alcohols Saccharides and sugar alcohols	Ligand exchange	ASTRA® Sugar K(S)
		ASTRA® Sugar Ca(S)
		ASTRA® Sugar Na(S)
	HILIC	ARION® NH2
Sugar alcohols	Ligand exchange	ASTRA® Sugar Ca(S)
		ASTRA® Sugar H(S)
Oligosaccharides and sugar alcohols	Ligand exchange	ASTRA® Sugar Na(S)
Amino sugars	HILIC	ARION® NH2
	Ion exchange	ASTRA® Sugar Ca(S)
Acidic sugars	Ion exclusion	ASTRA® Sugar H(S)
	Ion exchange	ARION® NH2
Saccharides and organic acids	Ion exclusion	ASTRA® Sugar H(S)
Sweeteners and organic acids	Reversed phase	ASTRA® C18-HE
		ARION® Plus C18
Organic acids	Reversed phase	ASTRA® C18-AQ
		ARION® Polar C18
		ASTRA® Sugar H(S)
Preservatives	Reversed phase	ASTRA® C18-HE
Food supplements/Additives	Reversed phase	ASTRA® C18-AQ
		ARION® Polar C18
		ASTRA® C18-HE
Vitamins	Reversed phase	ASTRA® C18-HE
		ARION® Plus C18
Mycotoxins	Reversed phase	ASTRA® C18-AQ
		ARION® Polar C18

Retention times for some saccharides, sugar alcohols and organic acids

1.0 mL/min	Retention Time [min]			
Counter Ion	Ca ²⁺	H ⁺	Na ⁺	K ⁺
Erythritol	9.98	n/a	n/a	n/a
Ethanol	10.84	14.41	10.30	10.00
Fructose	8.52	6.58	7.37	7.78
Galactose	7.71	6.47	7.23	7.68
Glucose	7.10	6.18	6.86	7.24
Glycerol	10.05	8.59	8.18	8.01
Isopropanol	12.40	16.74	n/a	n/a
Lactose	6.38	5.43	5.76	6.01
Lactulosa	7.03	n/a	n/a	n/a
Maltitol	7.74	5.60	5.81	5.82
Maltose	6.26	5.33	5.74	5.98
Mannitol	10.20	6.84	6.88	6.86
Mannose	8.09	6.48	7.30	7.92
Melezitose	5.76	n/a	5.13	5.18
Methanol	10.66	12.19	n/a	n/a
Sorbitol	12.18	7.00	7.15	7.17
Sucrose	6.17	n/a	5.67	5.76
Xylitol	12.22	7.50	7.59	7.56
Xylose	7.67	6.54	7.40	7.84
Acetic acid	n/a	9.49	n/a	n/a
Citric acid	n/a	5.64	n/a	n/a
Formic acid	n/a	8.74	n/a	n/a
Lactic acid	n/a	8.39	n/a	n/a
Malic acid	n/a	n/a	n/a	n/a
Shikimic acid	n/a	n/a	n/a	n/a
Succinic acid	n/a	n/a	n/a	n/a
Tartaric acid	n/a	5.95	n/a	n/a

Conditions

Dimensions	300 mm × 8 mm
Mobile phase	UPW (0.1% H ₂ SO ₄ for H ⁺ form)
Flow rate	1.0 mL/min
Temperature	80 °C (70 °C for Ca ²⁺)
Detection	RID @ 55 °C



Retention times for some saccharides, sugar alcohols and organic acids

0.5 mL/min	Retention Time [min]			
Counter Ion	Ca ²⁺	H ⁺	Na ⁺	K ⁺
Erythritol	19.77	n/a	n/a	n/a
Ethanol	21.66	28.84	20.57	20
Fructose	16.68	13.10	14.72	15.58
Galactose	15.19	12.88	14.43	15.37
Glucose	13.99	12.28	13.68	14.48
Glycerol	20.10	17.11	16.34	16.01
Isopropanol	24.79	33.60	n/a	n/a
Lactose	12.55	10.80	11.51	12.01
Maltitol	15.15	11.15	11.61	11.63
Maltose	12.34	10.62	11.46	11.95
Mannitol	19.80	13.61	13.75	13.71
Mannose	16.21	12.88	14.58	15.86
Melezitose	11.38	10.01 (30 °C)	10.23	10.35
Methanol	21.30	24.33	n/a	n/a
Sorbitol	23.45	13.95	14.28	14.34
Sucrose	12.19	10.76 (30 °C)	11.32	11.52
Xylitol	23.70	14.94	15.15	15.13
Xylose	15.15	13.00	14.77	15.67
Acetic acid	n/a	19.03	n/a	n/a
Citric acid	n/a	11.26	n/a	n/a
Formic acid	n/a	17.48	n/a	n/a
Lactic acid	n/a	16.78	n/a	n/a
Malic acid	n/a	12.84	n/a	n/a
Shikimic acid	n/a	14.93	n/a	n/a
Succinic acid	n/a	14.90	n/a	n/a
Tartaric acid	n/a	11.88	n/a	n/a

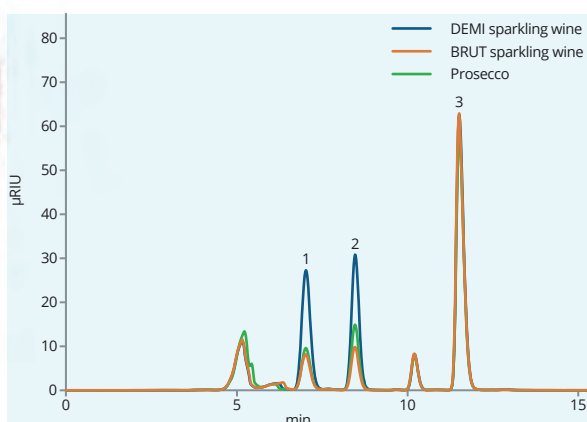
Conditions

Dimensions	300 mm × 8 mm
Mobile phase	UPW (0.1% H ₂ SO ₄ for H ⁺ form)
Flow rate	0.5 mL/min
Temperature	80 °C (70 °C for Ca ²⁺)
Detection	RID @ 55 °C



SUGARS

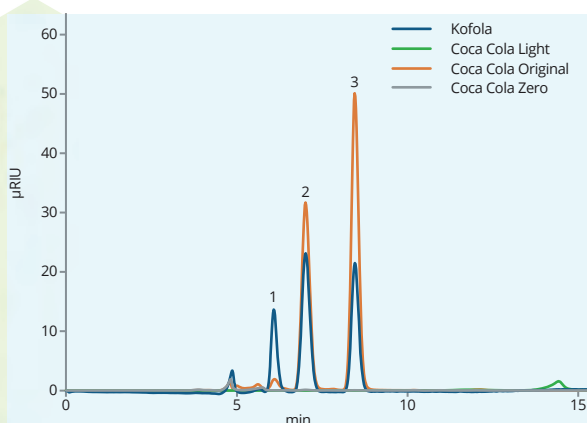
Sugars in sparkling wines



Sugars profile in sparkling wines on 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. Glucose 2. Fructose 3. Ethanol

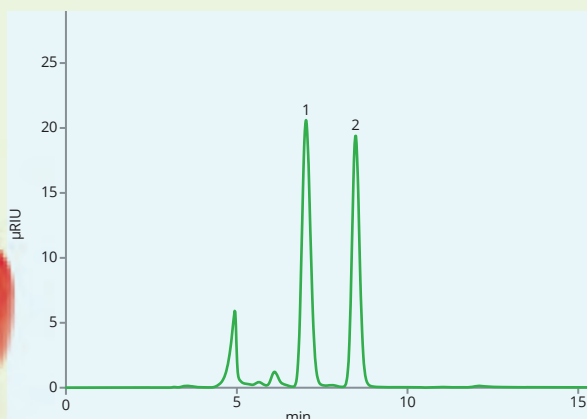
Sugars in non-alcoholic beverages



Coke-type drinks on 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 in apple juice

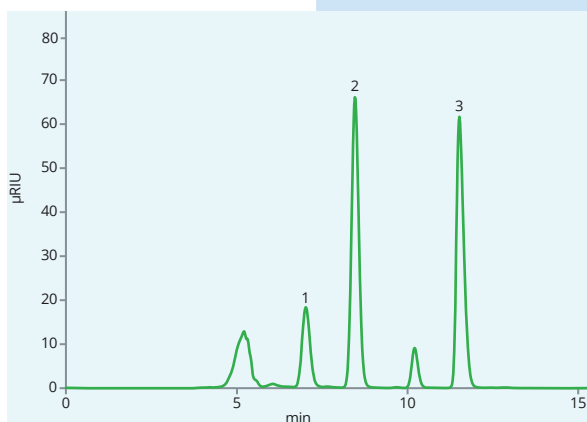


Apple juice on ASTRA® Sugar Ca column

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. Glucose 2. Fructose

SUGARS

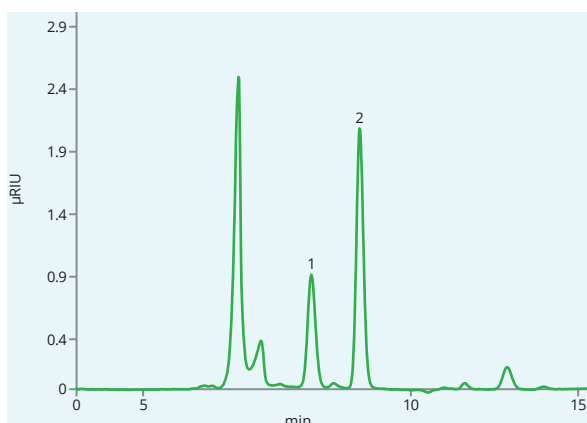
Sugars in half-fermented wine



Half-fermented wine profile on 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. Glucose 2. Fructose 3. Ethanol

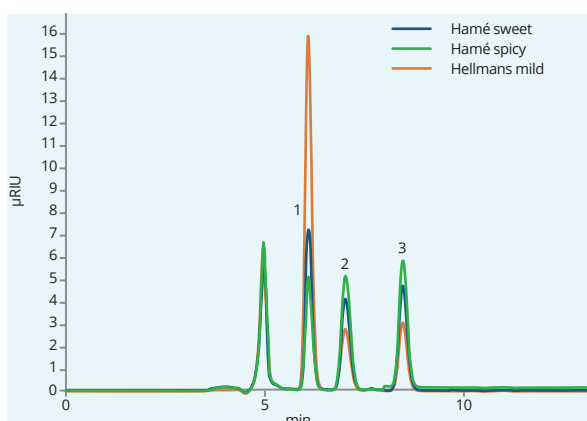
Sugars analysis in tomatoes



Sugars profile in small red tomatoes on 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. Glucose 2. Fructose

Sugar control in ketchups

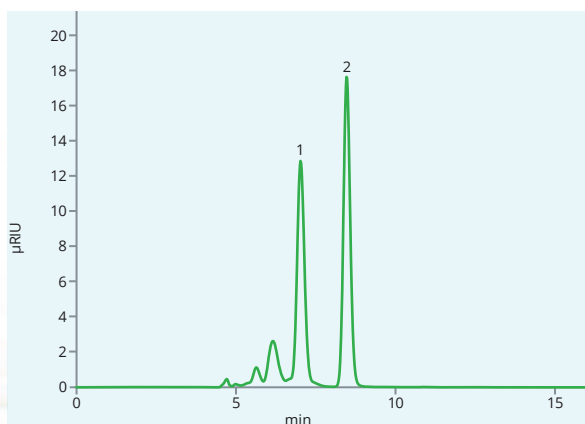


Ketchup analysis on ASTRA® Sugar Ca column

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
Detection	RID (55 °C)
Injection volume	3 μL
Analytes	1. Sucrose 2. Glucose 3. Fructose

SUGARS AND ORGANIC ACIDS

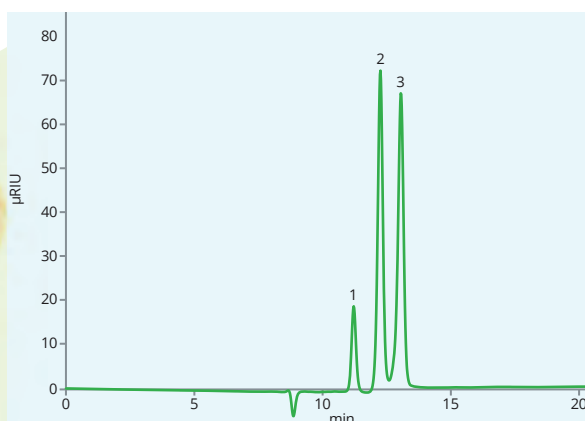
Sugars in honey



Honey profile on 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. Glucose 2. Fructose

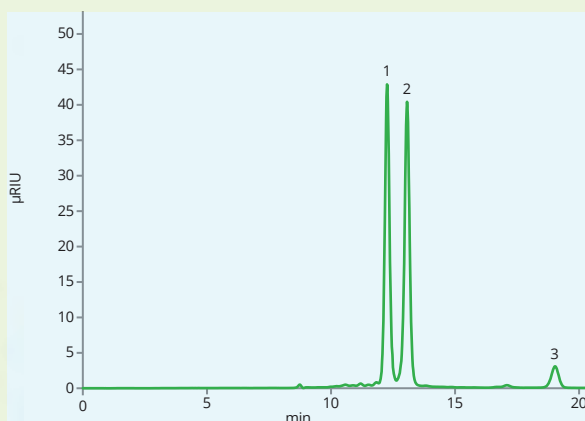
Sugars and citric acid in grapefruit juice



Grapefruit analysis on ASTRA® Sugar H column

Column	ASTRA® Sugar H(S), 10 μm
Dimensions	300 mm × 8 mm
Part number	AST-5927-VN80
Mobile phase	0.1% H ₂ SO ₄
Flow rate	0.5 mL/min
Temperature	80 °C
Injection volume	3 μL
Detection	RID (55 °C)
Analytes	1. Citric acid 2. Glucose 3. Fructose

Sugars and acetic acid in balsamic vinegar

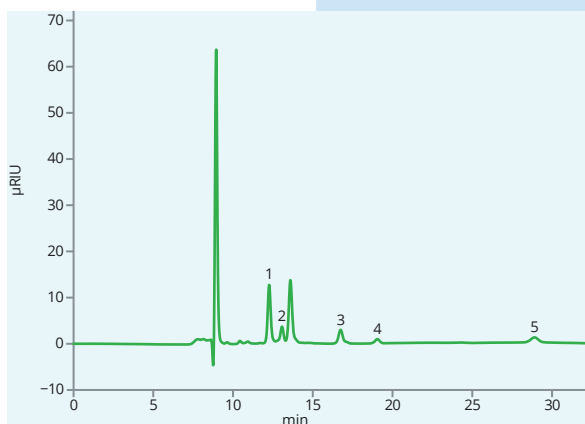


Balsamic vinegar on ASTRA® Sugar H column

Column	ASTRA® Sugar H(S), 10 μm
Dimensions	300 mm × 8 mm
Part number	AST-5927-VN80
Mobile phase	0.1% H ₂ SO ₄
Flow rate	0.5 mL/min
Temperature	80 °C
Injection volume	3 μL
Detection	RID (55 °C)
Analytes	1. Glucose 2. Fructose 3. Acetic acid

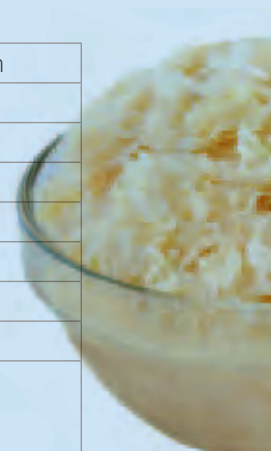
SUGARS AND ORGANIC ACIDS

Cabbage juice

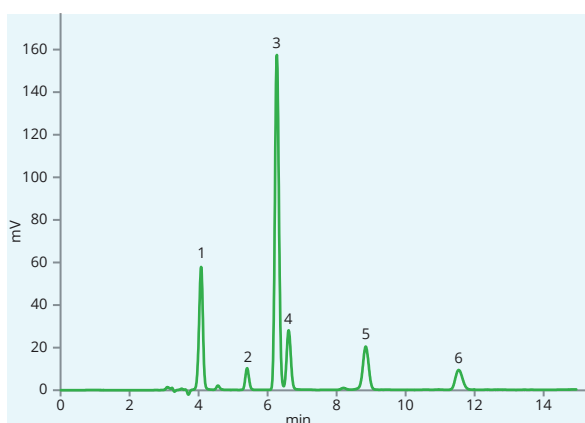


Cabbage juice profile on ASTRA® Sugar H column

Column	ASTRA® Sugar H(S), 10 µm
Dimensions	300 mm × 8 mm
Part number	AST-5927-VN80
Mobile phase	0.1% H ₂ SO ₄
Flow rate	0.5 mL/min
Temperature	80 °C
Injection volume	3 µL
Detection	RID (55 °C)
Analytes	1. Glucose 2. Fructose 3. Lactic acid 4. Acetic acid 5. Ethanol



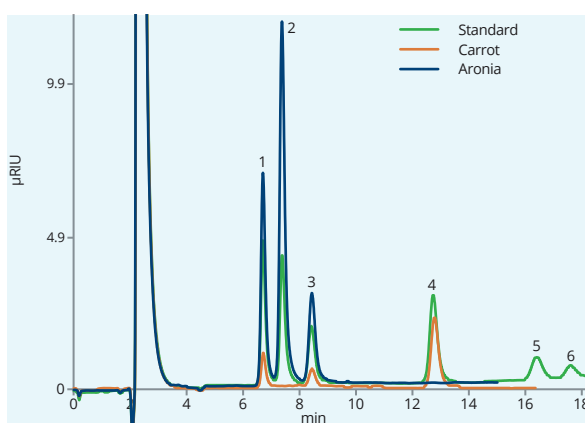
Organic acids



Test solution on ASTRA® C18-AQ column

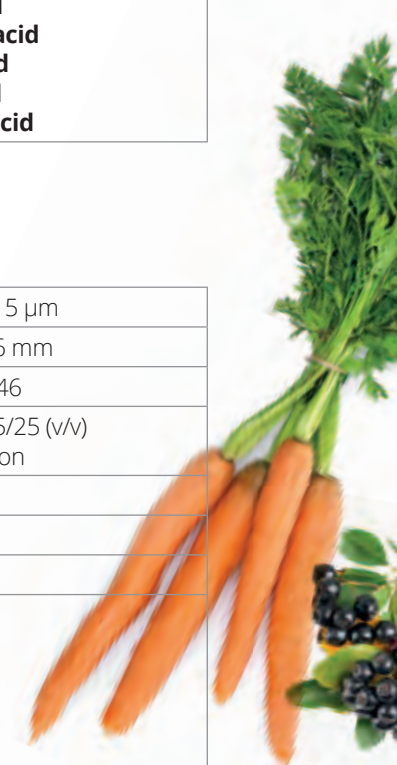
Column	ASTRA® C18-AQ, 3 µm
Dimensions	150 mm × 4.6 mm
Part number	AST-5832-IK46
Mobile phase	25mM KH ₂ PO ₄ (pH = 2.71) Isocratic elution
Flow rate	1.0 mL/min
Temperature	30 °C
Detection	DAD at 204 nm
Injection volume	10 µL
Analytes	1. Tartaric acid 2. Malic acid 3. Shikimic acid 4. Lactic acid 5. Citric acid 6. Succinic acid

Mono- and disaccharides and sugar alcohol



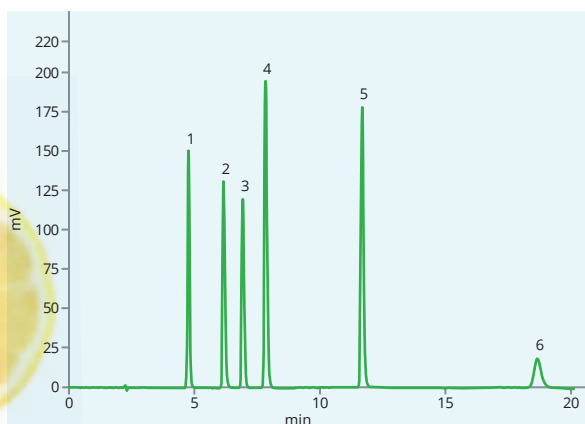
Analysis on ARION® NH2 column

Column	ARION® NH2, 5 µm
Dimensions	250 mm × 4.6 mm
Part number	ARI-5736-LM46
Mobile phase	ACN/water 75/25 (v/v) Isocratic elution
Flow rate	1.5 mL/min
Temperature	35 °C
Detection	RID
Analytes	1. Fructose 2. Sorbitol 3. Glucose 4. Sucrose 5. Maltose 6. Lactose



SWEETENERS AND ORGANIC ACIDS

Sweeteners & organic acids



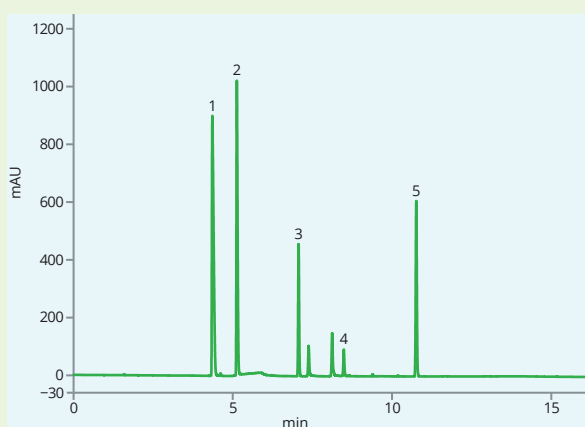
Standard mixture on ARION® Plus C18 column

Column	ARION® Plus C18, 5 µm
Dimensions	150 mm × 4.6 mm
Part number	ARI-5720-LK46
Mobile phase	Acetonitrile : methanol : 17.5mM KH ₂ PO ₄ 0.1 mol/L NaOH > pH = 6.0 Gradient *according table below
Flow rate	1.3 to 1.5 mL/min
Temperature	Ambient
Detection	UV @214 & 230 nm
Sample	Supelco 37 FAME mix in DCM (dilution 1:10)
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 (%) 17.5mM 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

Sweeteners

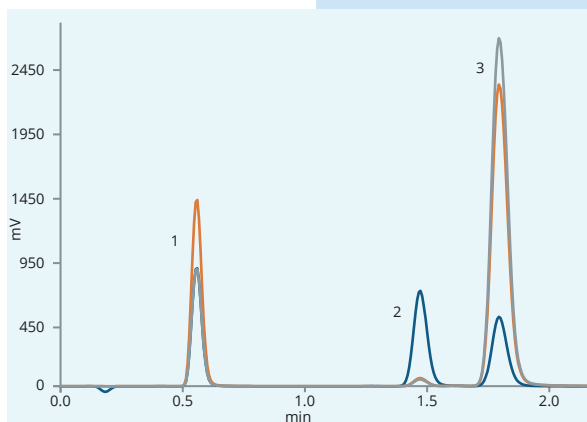


Standard on ASTRA® C18-HE column

Column	ASTRA® C18-HE, 3 µm
Dimensions	150 mm × 4.6 mm
Part number	AST-5732-IK46
Mobile phase	12.5mM KH ₂ PO ₄ pH 3.5 / ACN, grad. ACN: 5% 0 min, 60% 12 min.
Flow rate	1.0 mL/min
Temperature	30 °C
Injection volume	3 µL
Detection	UV @214 nm
Analytes	1. Acesulfame-K 2. Saccharin 3. Aspartame 4. Neohesperidin DC 5. Neotame

FOOD SUPPLEMENTS AND PRESERVATIVES

Preservatives in caffeinated beverages

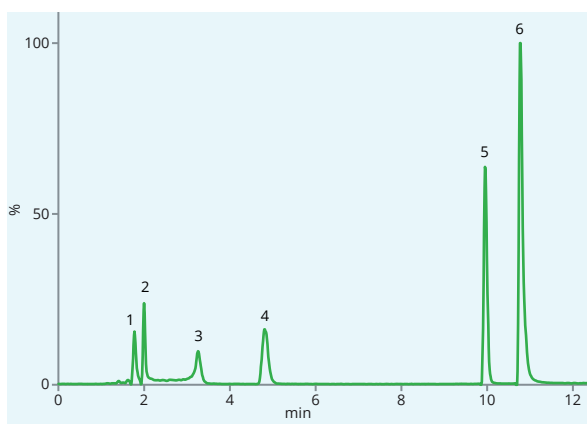


Standard on ASTRA® C18-HE HPLC column

Column	ASTRA® C18-HE, 3 µm
Dimensions	50 mm × 2.1 mm
Part number	AST-5732-IG21
Mobile phase	51.4mM Sodium acetate trihydrate (pH 3.8) / ACN 90/10 (v/v) Isocratic elution
Flow rate	1.3 mL/min
Temperature	50 °C
Detection	UV @226 nm (Sodium benzoate), 272 nm (Caffeine), 259 nm (Potassium sorbate)
Sample	Supelco 37 FAME mix in DCM (dilution 1:10)
Analytes	1. Caffeine 2. Sodium benzoate 3. Potassium sorbate



Food supplements



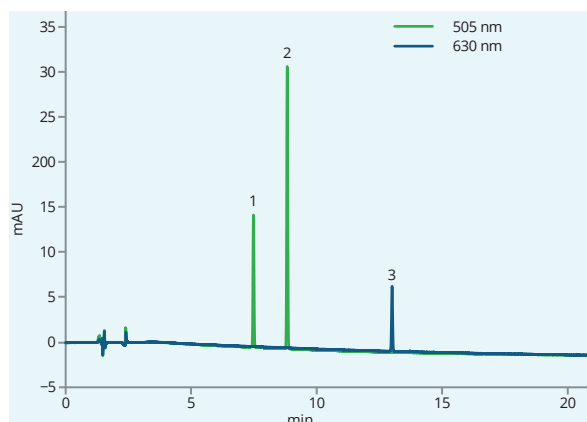
Analysis of standard solution on ARION® Polar C18 column

Column	ARION® Polar C18, 5 µm		
Dimensions	250 mm × 4.6 mm		
Part number	ARI-5721-LM46		
Mobile phase	A: ACN B: 5mM formic acid		
Gradient elution	Time (min)	%A	%B
	0	5	95
	5	5	95
	12	35	65
	17	70	30
Flow rate	0.25 mL/min		
Temperature	30 °C		
Detection	TOF MS		
Injection volume	3 µL		
Analytes	1. Malic acid 2. Citric acid 3. cAMP 4. L-phenylalanine 5. L-tryptophan 6. Flavin adenine dinucleotide		



FOOD SUPPLEMENTS AND PRESERVATIVES

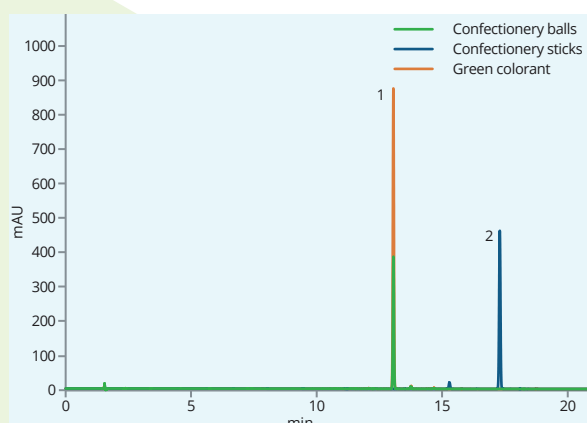
Additives in energy drinks



Energy drink sample on ASTRA® C18-HE HPLC column

Column	ASTRA® C18-HE, 3 µm
Dimensions	150 mm × 4.6 mm
Part number	AST-5732-IK46
Mobile phase	A: 50mM Ammonium Acetate B: ACN Gradient A: 0 min 95 %, 20 min 50 %
Flow rate	1 mL/min
Temperature	45 °C
Detection	630 & 505 nm
Sample	Monster Ultra Strawberry Dreams drink
Analytes	1. E110 Sunset Yellow FCF / Orange Yellow S 2. E129 Allura Red AC 3. E133 Brilliant Blue FCF

Additives in confectionery for decorating



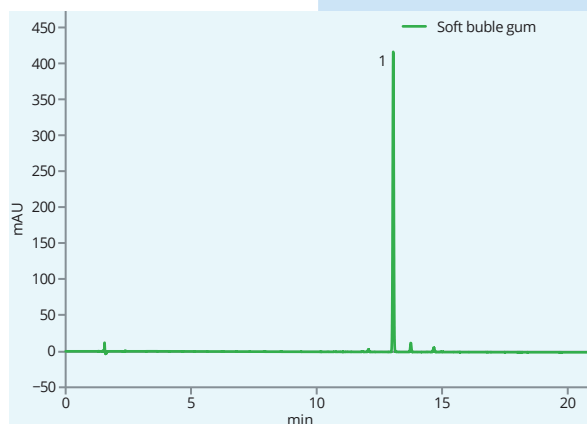
Food samples on ASTRA® C18-HE column

Column	ASTRA® C18-HE, 3 µm
Dimensions	150 mm × 4.6 mm
Part number	AST-5732-IK46
Mobile phase	A: 50mM Ammonium Acetate B: ACN Gradient A: 0 min 95 %, 20 min 50 %
Flow rate	1 mL/min
Temperature	45 °C
Detection	630 nm
Sample	Confectionery balls Confectionery sticks Green colorant
Analytes	1. E133 Brilliant Blue FCF 2. E131 Patent blue V



FOOD SUPPLEMENTS AND PRESERVATIVES

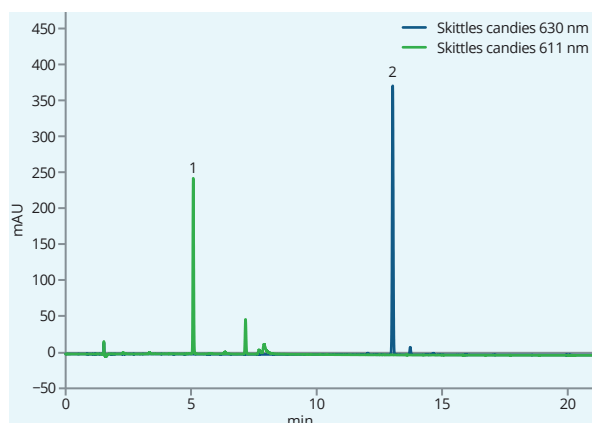
Additives in bubble gum



Real samples on ASTRA® C18-HE HPLC column

Column	ASTRA® C18-HE, 3 µm
Dimensions	150 mm × 4.6 mm
Part number	AST-5732-IK46
Mobile phase	A: 50mM Ammonium Acetate B: ACN Gradient A: 0 min 95 %, 20 min 50 %
Flow rate	1 mL/min
Temperature	45 °C
Detection	630 nm
Sample	Soft bubble gum
Analytes	1. E133 Brilliant Blue FCF

Additives in candies



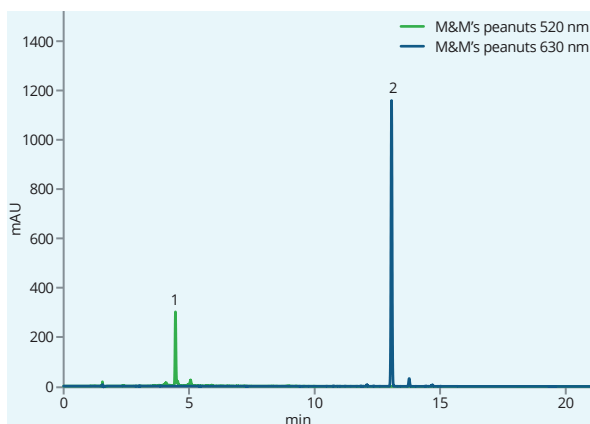
Real samples on ASTRA® C18-HE HPLC column

Column	ASTRA® C18-HE, 3 µm
Dimensions	150 mm × 4.6 mm
Part number	AST-5732-IK46
Mobile phase	A: 50mM Ammonium Acetate B: ACN Gradient A: 0 min 95 %, 20 min 50 %
Flow rate	1 mL/min
Temperature	45 °C
Detection	611 & 630 nm
Sample	Skittles candies
Analytes	1. E132 Indigotine, Indigo carmine 2. E133 Brilliant Blue FCF



FOOD SUPPLEMENTS AND PRESERVATIVES

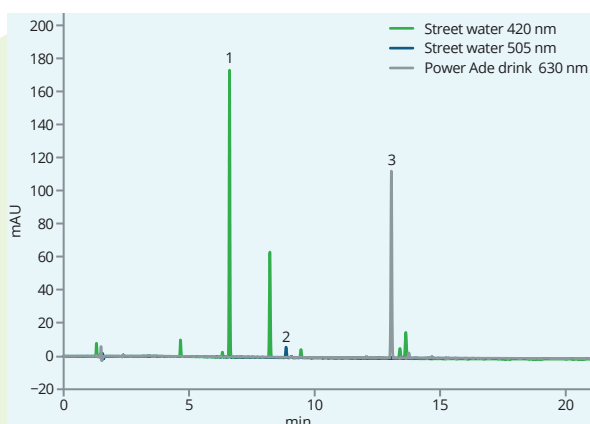
Additives in M&M's peanuts



Real samples on ASTRA® C18-HE HPLC column

Column	ASTRA® C18-HE, 3 µm
Dimensions	150 mm × 4.6 mm
Part number	AST-5732-IK46
Mobile phase	A: 50mM Ammonium Acetate B: ACN Gradient A: 0 min 95 %, 20 min 50 %
Flow rate	1 mL/min
Temperature	45 °C
Detection	520 & 630 nm
Sample	M&M's peanuts
Analytes	1. E120 Carminic acid / Carmines 2. E133 Brilliant Blue FCF

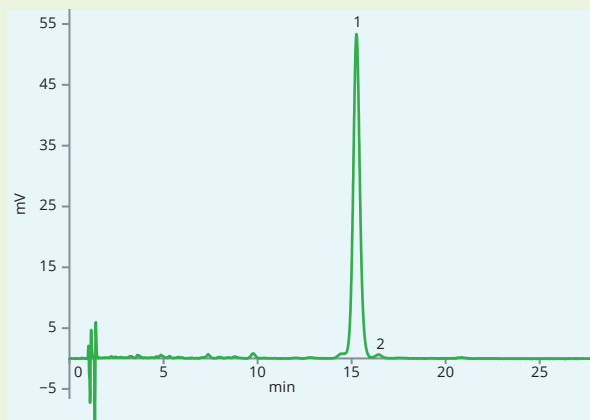
Additives in drinks



Various drinks on ASTRA® C18-HE column

Column	ASTRA® C18-HE, 3 µm
Dimensions	150 mm × 4.6 mm
Part number	AST-5732-IK46
Mobile phase	A: 50mM Ammonium Acetate B: ACN Gradient A: 0 min 95 %, 20 min 50 %
Flow rate	1 mL/min
Temperature	45 °C
Detection	420, 505 & 630 nm
Sample	Street water Power Ade drink
Analytes	1. E104 Quinoline Yellow 2. E129 Allura Red AC 3. E133 Brilliant Blue FCF

Lutein in food supplements



Lutein standard on ASTRA® HPLC C18-HE column

Column	ASTRA® C18-HE, 5 µm
Dimensions	150 mm × 4.6 mm
Part number	AST-5732-LK46
Mobile phase	ACN / Milli-Q water 90 / 10 (v/v) Isocratic elution
Flow rate	1.0 mL/min
Temperature	30 °C
Injection volume	10 µL
Detection	UV @450 nm
Analytes	1. Lutein 2. Zeaxanthin

ADDITIVES

Food additives list

Additive Code	Name	CAS	Ret. Time [min]	Wavelength [nm]
E102	Tartrazine	1934-21-0	3.75	420
E104	Quinoline Yellow	8004-92-0	more peakes detected	420
E110	Sunset Yellow FCF / Orange Yellow S	2783-94-0	7.52	505
E120	Carminic acid	1260-17-9	more peakes detected	520
E122	Azorubine, Carmoisine	3567-69-9	11.79	520
E123	Amaranth	915-67-3	4.71	520
E124	Ponceau 4R, Cochineal Red A	2611-82-7	6.92	505
E127	Erythrosine	16423-68-0	15.21	520
E128	RED 2G	3734-67-6	9.82	520
E129	Allura Red AC	25956-17-6	8.81	505
E131	Patent blue V	3536-49-0	17.29	630
E132	Indigotine, Indigo carmine	860-22-0	5.06	611
E133	Brilliant Blue FCF	3844-45-9	13.13	630
E142	Green S	3087-16-9	12.46	630
E151	Brilliant Black PN	2519-30-4	7.04	570
E161b	Lutein	127-40-2	2.49*	450

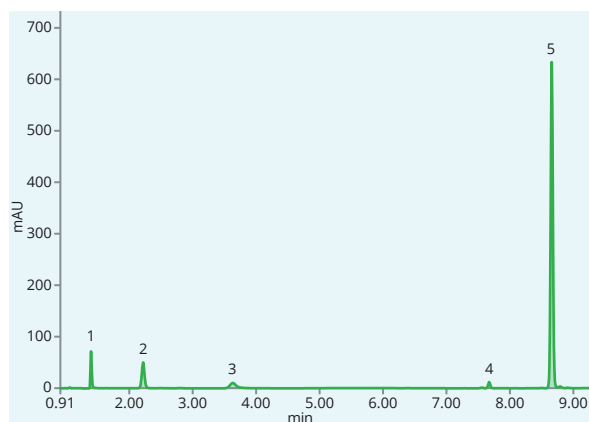
Column	ASTRA® C18-HE, 3 µm
Dimensions	150 mm × 4.6 mm
Part number	AST-5732-IK46
Mobile phase	A: 50mM Ammonium Acetate B: ACN Gradient A: 0 min 95 %, 20 min 50 %
Flow rate	1 mL/min
Temperature	45 °C
Detection	See the list of additives

Note: * Lutein method – see the application on page 14.



VITAMINS

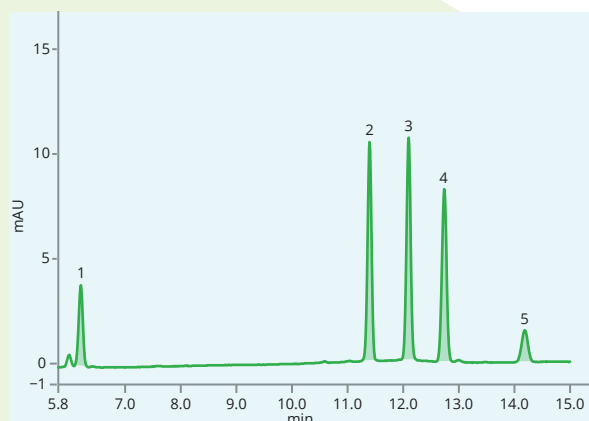
Vitamins B



Standard on ARION® Plus C18 column

Column	ARION® Plus C18, 3 µm		
Dimensions	100 mm × 4.6 mm		
Part number	ARI-5720-II46		
Mobile phase	A: 0.0125M phosphate buffer (pH 3.5), B: Methanol		
Gradient elution	Time	A (%)	B (%)
	0	95	5
	3	95	5
	10	30	70
	10.5	30	70
Flow rate	1.0 mL/min		
Temperature	40 °C		
Injection volume	5.0 µL		
Detection	UV @280 nm		
Analytes	1. Thiamine (Vitamin B1) 2. Pyridoxine (Vitamin B6) 3. Nicotinamide (Vitamin B3, Niacinamide, NAM) 4. Cyanocobolamin (Vitamin B12) 5. Riboflavin (Vitamin B2)		

Vitamins A and E



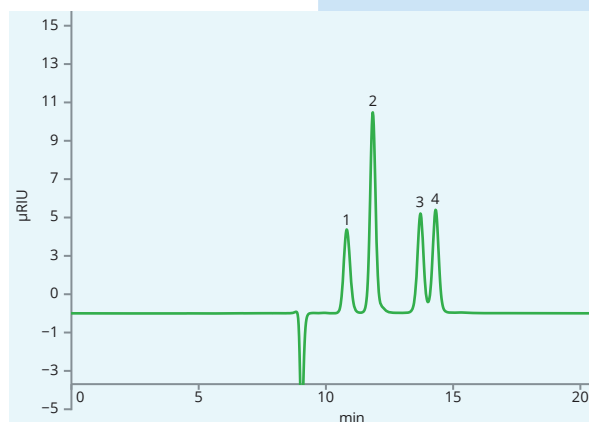
Standard on ARION® Plus C18 column

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

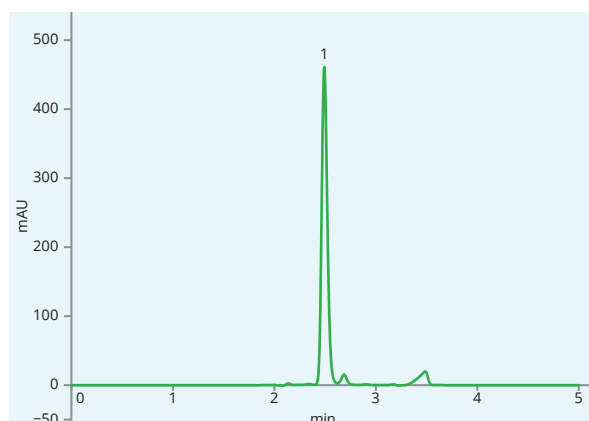
Celaskon tablets



Celaskon sample on ASTRA® Sugar H(S) column

Column	ASTRA® Sugar H(S), 10 μm
Dimensions	300 mm × 8 mm
Part number	AST-5927-VN80
Mobile phase	0.1% H ₂ SO ₄
Flow rate	0.5 mL/min
Temperature	30 °C
Injection volume	3 μL
Detection	RID 35°C
Analytes	1. Lactose 2. Citric acid 3. Vitamin C 4. Sorbitol

Vitamin C in syrup



Syrup sample on ASTRA® C18-HE column

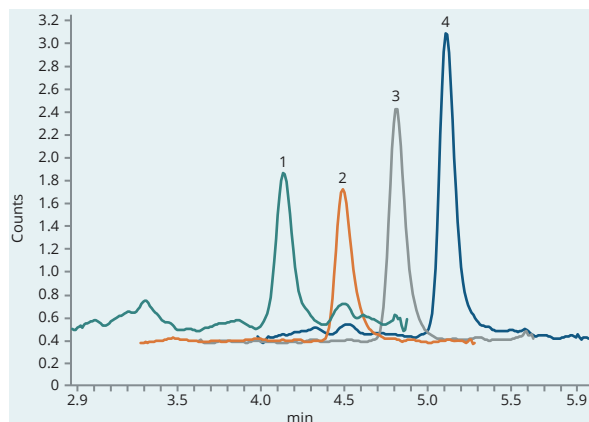
Column	ASTRA® C18-HE, 3 μm
Dimensions	150 mm × 4.6 mm
Part number	AST-5732-IK46
Mobile phase	25mM phosphate buffer (pH 2.5) / acetonitrile (90/10)
Flow rate	0.7 mL/min
Temperature	25 °C
Injection volume	10 μL
Detection	245 nm
Analytes	1. Vitamin C

References

- (1) Regulation (EC) No 1333/2008 of the European Parliament and of the Council of 16 December 2008 on food additives
- (2) Directive 2002/46/EC of the European Parliament and of the Council of 10 June 2002 on the approximation of the laws of the Member States relating to food supplements
- (3) Vitamin and Mineral Supplement Fact Sheets (NIH Office of Dietary Supplements)

CONTAMINANTS

Aflatoxins by LC/MS



Stress test – test mixture on ARION® Plus C18 column

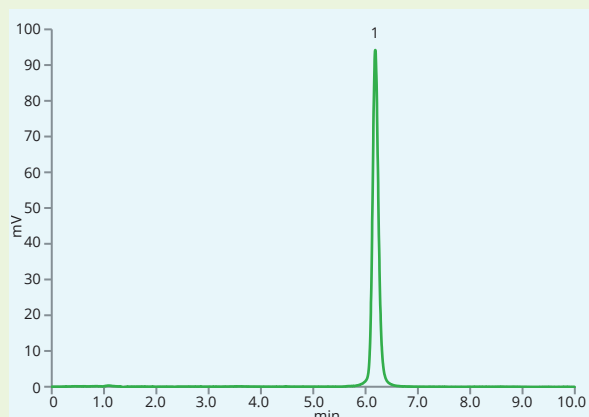


Column	ARION® Plus C18, 2.2 µm	
Dimensions	100 mm × 2.1 mm	
Part number	ARI-5720-EI21	
Mobile phase	A: 5mM ammonium formate / 0.2% formic acid B: Methanol / 0.2% formic acid	
Gradient elution	Time	A (%)
	0.0	70
	0.5	70
	8.0	0
	10.5	0
	10.6	70
Flow rate	0.35 mL/min	
Temperature	40 °C	
Analytes	1. Aflatoxin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

HMF in syrup

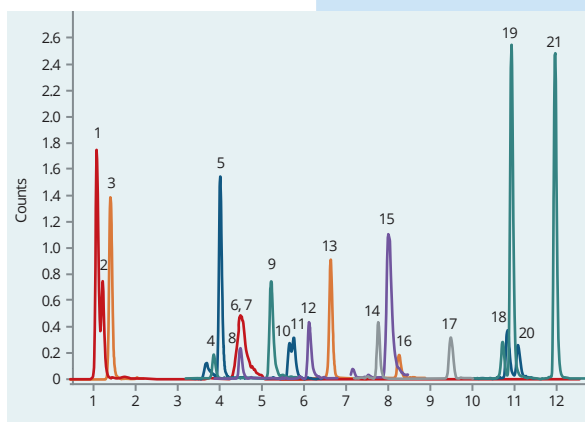


Standard mixture on ARION® Plus C18 column

Column	ARION® Plus C18, 5 µm	
Dimensions	250 mm × 4.6 mm	
Part number	ARI-5720-LM46	
Mobile phase	Methanol/water 10/90 (v/v) Isocratic elution	
Flow rate	1.5 mL/min	
Temperature	30 °C	
Injection volume	5.0 µL	
Detection	UV @285 nm	
Analytes	1. Hydroxymethylfurfural	

CONTAMINANTS

Pyrrolizidine alkaloids in herbal tea

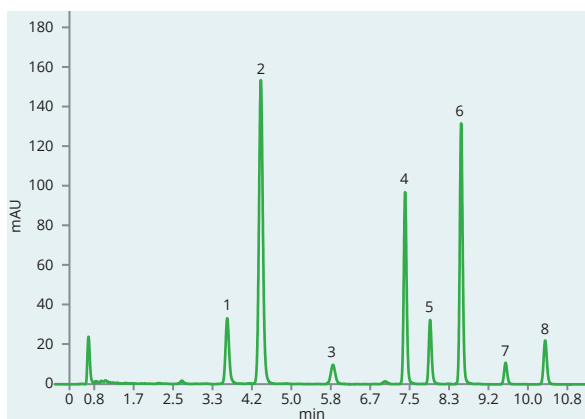


Test mixture on ARION® Plus C18 column

Column	ARION® Plus C18, 2.2 µm
Dimensions	100 mm × 2.1 mm
Part number	ARI-5720-EI21
Mobile phase	10mM ammonium carbonate in water/ACN (LC-MS grade) (v/v) Isocratic elution
Flow rate	0.4 mL/min
Temperature	40 °C
Detection	LC-MS/MS

Analytes	1. Lycopsamine N-oxide 2. Intermedine N-oxide 3. Europine N-oxide 4. Retrorsine N-oxide (Isatidine) 5. Heliotrine N-oxide 6. Lycopsamine 7. Intermedine (Indicine)	8. Seneciphylline N-oxide 9. Europine 10. Senecivernine N-oxide 11. Senecionine N-oxide 12. Senkirkine (Renardine) 13. Echimidine N-oxide 14. Lasiocarpine N-oxide	15. Heliotrine 16. Retrorsine 17. Seneciphylline 18. Senecivernine 19. Echimidine 20. Senecionine (Aureine) 21. Lasiocarpine
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Ergot alkaloids



Test solution on ASTRA® C18-HE column

Column	ASTRA® C18-HE, 3 µm		
Dimensions	100 mm × 3 mm		
Part number	AST-5732-II30		
Mobile phase	A: 10mM Buffer (pH = 7.0) B: ACN		
Gradient elution	Time	A (%)	B (%)
	0.0	59	41
	4.0	55	45
	6.0	40	60
	15.0	15	85
Flow rate	0.75 mL/min		
Temperature	30 °C		
Detection	UV at 310 nm		
Injection volume	3 µL		
Analytes	1. Ergosine 2. Ergotamine 3. Ergosinine 4. Ergocristine 5. Ergostine 6. Ergotaminine 7. Ergostinine 8. Ergocristinine		

HPLC AND LC-MS/MS SUPPORT

ASTRA® Sugar technical guide

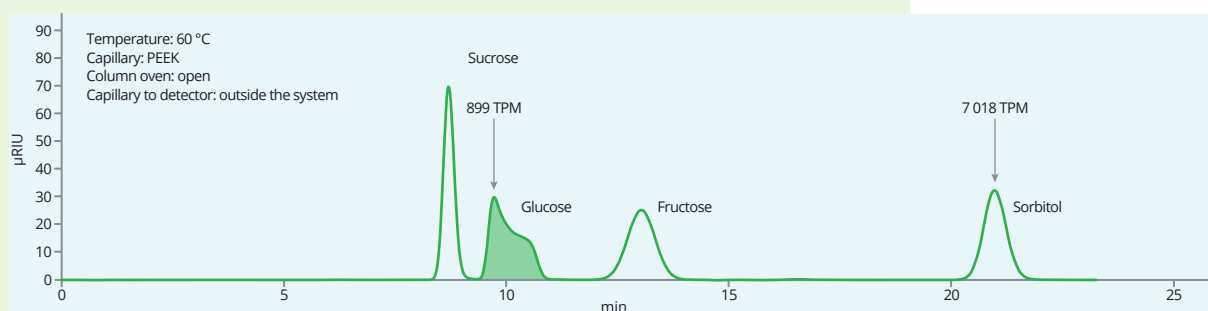
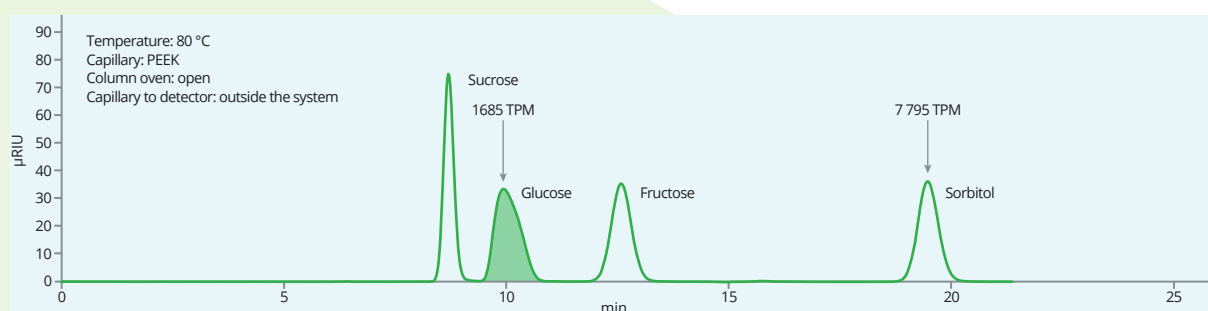
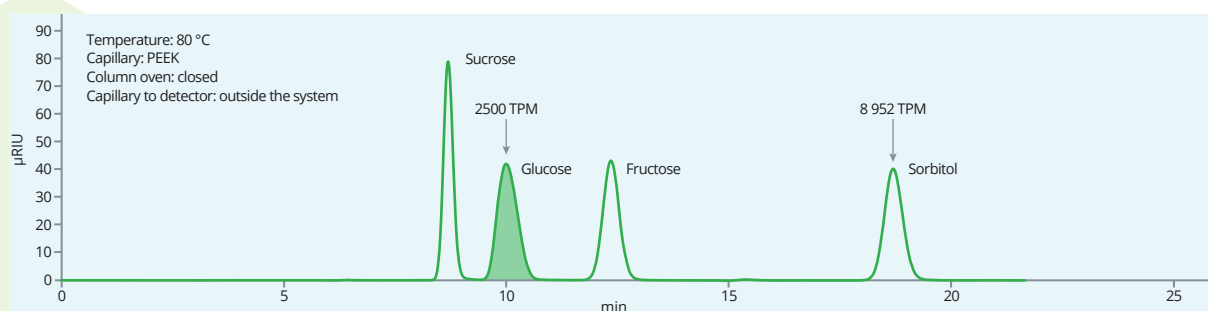
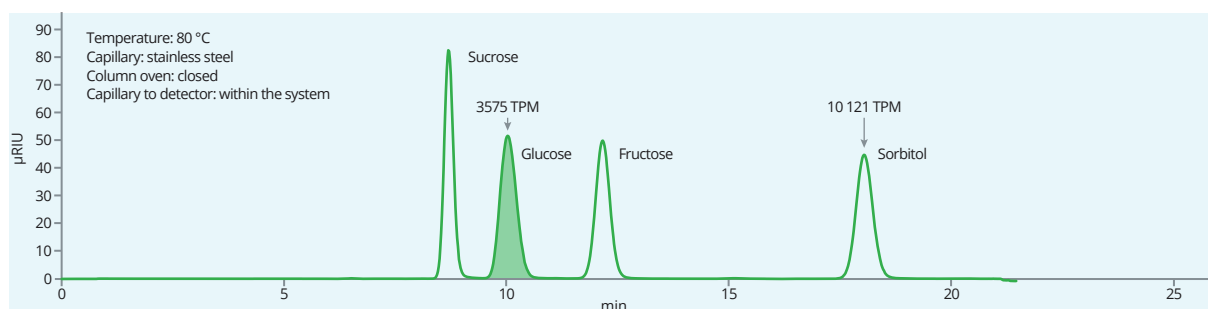
Work with right temperature

Working with Ca(2+), Na(+) and K(+) ionic form

It is necessary to keep all critical parts (column, pre-column and capillaries) at an elevated temperature. If you have cold spots, the efficiency will decrease. The most significant effect is in glucose peak, where it can even appear to be a split peak.

Working with H(+) ionic form

Sucrose will decompose at higher temperatures to glucose and fructose under acidic conditions.



HPLC AND LC-MS/MS SUPPORT

ASTRA® Sugar technical guide

Use of organic solvents

ASTRA® Sugar columns are intended to be used in the 100% aqueous mobile phase. Using the organic solvent may lead to polymer swelling. In rare cases, acetonitrile can be used up to a maximum of 10% (v/v).

Correct plug tightening

When putting your column in a refrigerator for long-term storage, check the column plugs after 1 to 4 hours. It may be necessary to tighten the plugs due to thermal expansion.

Column regeneration

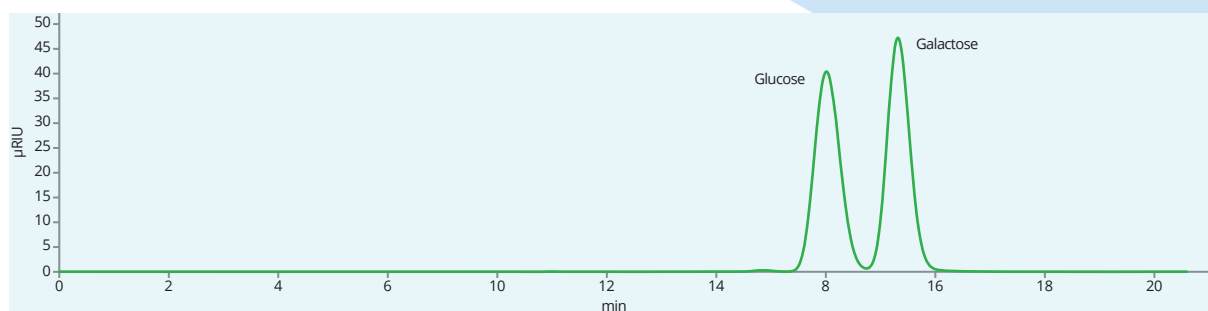
Regeneration of **Calcium form** can be done by using

- 0.05M CaCl_2 or $\text{Ca}(\text{NO}_3)_2$ solution in water
- With flow rate of 0.15 mL/min approx. 6 h
- Followed by rinsing with 0.3 mL/min of pure water for a further 6–8 h

The success of the regeneration may be checked by comparing it with the initial selectivity.

Do you have a glucose and galactose separation issue?

ASTRA® Sugar Ca(S) solves the separation at flow rate of 0.5 mL/min with a resolution of 1.56.



Glucose and galactose separation on ASTRA® Sugar Ca(S) column

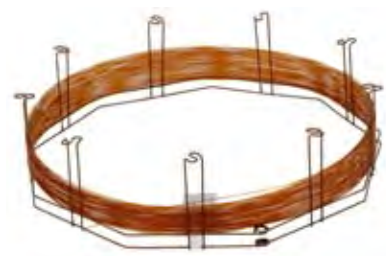
The laboratory offers HPLC, UHPLC and LC-MS/MS analyses.



OTHER PRODUCTS

GC columns

The family of LION™ GC column 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. LION™ GC columns are available in standard dimensions. We also offer atypical dimensions on request.



MSPE columns

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 analyses than with conventional SPE columns.



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.).



Chromatography vials

In the world of analytical chemistry, precision and reliability are key to successful sample analysis. Our chromatography vial offer provides top-quality 2mL and headspace vials designed to meet the stringent needs of laboratory professionals across various applications.

Headspace vials



2mL screw robotic vials



OTHER PRODUCTS

MetAmino® 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.



Laboratory sensors

Chromservis s.r.o. manufactures laboratory and process sensors for pH, dissolved oxygen and conductivity measurement as well as for ORP measurement. The sensor offer includes sensors with various electrical connections (S7, S8, VP6, VP8, K8) and fixed cable option with free end, BNC, Lemo and DIN connectors.



ORDERING INFORMATION

Ligand exchange columns

Description	Ionic form	Size (mm)	USP code	Part No.
ASTRA® Sugar Ca(S) HPLC column, 10 µm	Calcium	300 × 8	L19	AST-5906-VN80
ASTRA® Sugar H(S) HPLC column, 10 µm	Hydrogen	300 × 8	L17	AST-5927-VN80
ASTRA® Sugar K(S) HPLC column, 10 µm	Potassium	300 × 8	–	On request
ASTRA® Sugar Na(S) HPLC column, 10 µm	Sodium	300 × 8	L58	On request

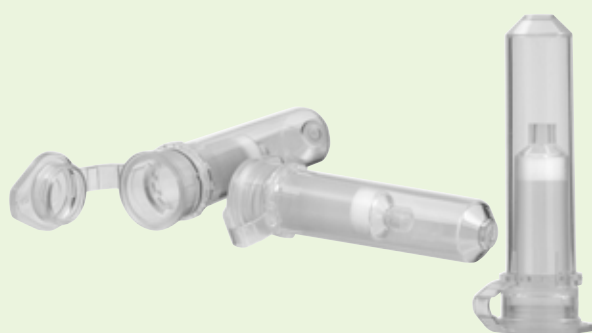
Silica based columns

Description	Separation mode	Size (mm)	USP code	Part No.
ASTRA® C18 HE, 3 µm	RP	50 × 2.1	L1	AST-5732-IG21
ASTRA® C18 HE, 3 µm	RP	100 × 3	L1	AST-5732-II30
ASTRA® C18-HE, 3 µm	RP	150 × 4.6	L1	AST-5732-IK46
ASTRA® C18-HE, 5 µm	RP	150 × 4.6	L1	AST-5732-LK46
ARION® C18-AQ, 3 µm	RP	150 × 4.6	L1	AST-5832-IK46
ARION® Polar C18, 5 µm	RP	250 × 4.6	L1	ARI-5721-LM46
ARION® Plus C18, 2.2 µm	RP	100 × 2.1	L1	ARI-5720-EI21
ARION® Plus C18, 3 µm	RP	100 × 4.6	L1	ARI-5720-II46
ARION® Plus C18, 5 µm	RP	150 × 4.6	L1	ARI-5720-LK46
ARION® Plus C18, 5 µm	RP	250 × 4.6	L1	ARI-5720-LM46
ARION® NH2, 5 µm	RP	250 × 4.6	L8	ARI-5736-LM46

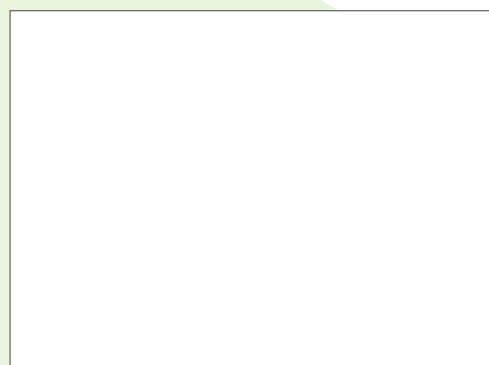
Note: The table includes HPLC columns, which are listed in the applications. If you need other dimensions/selectivities of ASTRA® or ARION® column, please, contact us. ASTRA® Sugar Ca(S) is available with 9µm particle size.

Have you ever heard about Micro-Solid-Phase-Extraction?
Visit our website for more information.

Distributor



MSPE columns



Ver. 25.3