



ASTRA® Sugar H(S) column Manual

Overview

ASTRA® Sugar H(S) columns have been developed for fast separation of carbohydrates, oligosaccharides, organic acids and sugar alcohols. The ASTRA® Sugar H(S) columns are delivered in dimensions of 300 × 8 mm (ID) and they are packed with carefully selected ion-exchange polymer, cross-linked sulfonated styrene-divinyl benzene (SDVB) with hydrogen ionic form. To obtain the best performance, certain procedures regarding installation, operation, handling and storage should be followed carefully as explained in this Manual.

ASTRA® Sugar H(S) technical specification

Product line	Astra Sugar Series
Particle type	Phenyl-resin-SO ₃
Ionic form	H ⁺
Crosslinking	Proprietary
Particle size	10 µm
Max. Flow rate	1.5 mL/min
Optimum Flow rate	0.5 – 1.0 mL/min
Max. pressure	60 bar
Max. temperature	90 °C
Optimum temperature	30 to 85 °C
pH range	1 to 7
Storage solvent	UPW
Storage temperature	4 °C
Mobile phase	UPW or ~0.1% H ₂ SO ₄ or ~0.1% HClO ₄
USP Code	L17

UPW = Ultra-Pure-Water

ASTRA® Sugar H(S) use and storage

Attention

Please ensure that you change the ion free water regularly to prevent bacterial growth. Changing of the column temperature should be done very slowly, e.g. 10 °C in 20 minutes. Do not exceed the maximum allowable pressure.

Start the column use

Set the flow rate at 0.05 mL/min. Keep heating the column slowly, until it reaches required temperature. After that temperature is attained and satisfactory baseline is achieved, gradually set the flow rate at the prescribed level.

Recommended storage

If column is not used for 1-3 days: Keep temperature of the column as it was and reduce the flow rate to 0.05 mL/min for standby mode. Do not cool the column.

If column is not used for 4 days and more: Reduce the flow rate to 0.05 mL/min. Switch of column oven and let system cool down to about 20 °C while pumping eluent. Switch off eluent pump, remove the column and use delivered plastic plugs (plastic plugs have to be “long enough” to fit stably into the thread). Put the column into a refrigerator (cold dark place at 4 °C, do not freeze). After 1–4 hours, check the plastic plugs for tightness and make sure no water can evaporate from column. Store the column for the time you need in the refrigerator.

Recommended cleaning procedure

Run the column at standby mode (0.05 mL/min, UPW, 80 °C) within several hours to reach a satisfactory baseline.

Regeneration

Regeneration can be done by using

- 0.025M H₂SO₄ solution in water
- With flow rate 0.15 mL/min and temperature 80 °C for approx. 6 hours
- Followed by rinsing with 0.3 mL/min with UPW for a further 6–8 h

The success of the regeneration is checked by comparing with the initial selectivity.

Retention times for some saccharides, sugar alcohols and organic acids

Flow rate	1.0 mL/min	Flow rate	0.5 mL/min
Ethanol	14.406	Ethanol	28.837
Fructose	6.577	Fructose	13.099
Galactose	6.472	Galactose	12.876
Glucose	6.177	Glucose	12.282
Glycerol	8.585	Glycerol	17.113
Isopropanol	16.742	Isopropanol	33.603
Lactose	5.428	Lactose	10.799
Maltitol	5.601	Maltitol	11.152
Maltose	5.331	Maltose	10.616
Mannitol	6.839	Mannitol	13.614
Mannose	6.476	Mannose	12.883
Melezitose	xx	Melezitose	10.014 (30 °C)
Methanol	12.185	Methanol	24.327
Sorbitol	7.001	Sorbitol	13.952
Sucrose	xx	Sucrose	10.763 (30 °C)
Xylitol	7.489	Xylitol	14.939
Xylose	6.537	Xylose	12.995
Acetic acid	9.492	Acetic acid	19.028
Citric acid	5.641	Citric acid	11.260
Formic acid	8.744	Formic acid	17.480
Lactic acid	8.387	Lactic acid	16.775
Malic acid	xx	Malic acid	12.837
Shikimic acid	xx	Shikimic acid	14.928
Succinic acid	xx	Succinic acid	14.903
Tartaric acid	5.954	Tartaric acid	11.879

Conditions

Dimensions	300 × 8.0 mm
Mobile phase	0.1% H ₂ SO ₄
Flow rate	1.0 mL/min or 0.5 mL/min
Temperature	80 °C
Detection	RID @ 55 °C