ASTRA® Sugar K(S) column Manual

Overview

ASTRA® Sugar K(S) columns have been developed for fast separation of carbohydrates, oligosaccharides and sugar alcohols. The ASTRA® Sugar K(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 potassium 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 K(S) technical specification

Product line	**Astra Sugar Series**
Particle type	Phenyl-resin-SO_3
Ionic form	K^+
Crosslinking	Proprietary
Particle size	10 µm
Max. Flow rate	1.5 mL/min
Optimum Flow rate	1.0 mL/min
Max. pressure	60 bar
Max. temperature	90 °C
Optimum temperature	60 to 85 °C
pH range	7 to 12
Storage solvent	UPW
Storage temperature	4 °C
Mobile phase	UPW
USP Code	-

UPW = Ultra-Pure-Water

ASTRA® Sugar K(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

- 0.05M KNO_3 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 alcohols

Flow rate	**1.0 mL/min**	**Flow rate**	**0.5 mL/min**
Ethanol	10.004	Ethanol	20.004
Fructose	7.779	Fructose	15.576
Galactose	7.682	Galactose	15.371
Glucose	7.243	Glucose	14.482
Glycerol	8.006	Glycerol	16.008
Lactose	6.008	Lactose	12.005
Maltitol	5.817	Maltitol	11.631
Maltose	5.976	Maltose	11.951
Mannitol	6.861	Mannitol	13.711
Mannose	7.923	Mannose	15.860
Melezitose	5.184	Melezitose	10.353
Sorbitol	7.167	Sorbitol	14.341
Sucrose	5.763	Sucrose	11.519
Xylitol	7.563	Xylitol	15.133
Xylose	7.837	Xylose	15.666

Conditions

Dimensions	300 × 8.0 mm
Mobile phase	UPW
Flow rate	1.0 mL/min or 0.5 mL/min
Temperature	80 °C
Detection	RID @ 55 °C