

- **High borate trapping capacity**
- **Easy installation between pump and injector**
- **4 x 50 mm column, 10 μm resin**

In carbohydrate analysis, the peak shape of certain sugars, such as mannose, fructose, and sugar alcohols are deteriorated when traces of borate are present in the mobile phase. To eliminate these borate ions and to assure optimal performance of your HPAEC-PAD carbohydrate analysis, Antec Scientific introduced the borate ion trap (BIT) column. The column is based on a 10 μm polymeric resin functionalized with polyol groups with a high borate trapping capacity. The trap is available as 4.0 mm ID x 50 mm column and is installed inline in the HPAEC-PAD system between pump and injector. Maximum pressure limit 300 bar/ 4350 psi.



The performance of BIT column is demonstrated in figure 1. Trace amounts of borate of 10 ppb were added to the mobile phase. Without a BIT column, significant tailing of the mannose peak occurs, meanwhile with the trap column borate-induced tailing is reduced significantly.

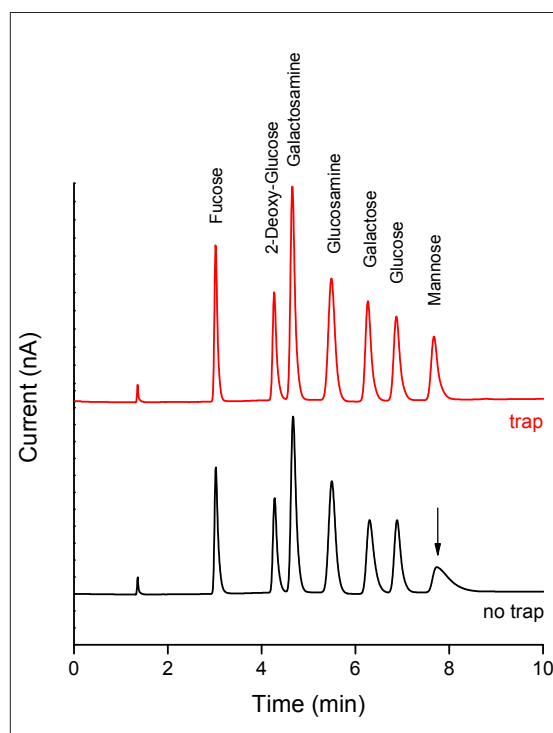


Figure 1: Analysis of carbohydrates with and without trap column. Without trap, the mannose peaks shows significant tailing, see arrow in lower trace.

Conditions: Monosaccharides are separated on a SweetSep™ AEX20 column using a 12 mM NaOH eluent containing 10 ppb borate (30°C, 0.7 mL/min). Injected sample: 10 μL of a 10 μM monosaccharides mix in DI water (fucose, 2-deoxy-glucose, galactosamine, glucosamine, galactose, glucose and mannose).

Borate Ion Trap (BIT) column

Origin of Borate Ions

One of the main sources of borate contaminants in hydroxide mobile phases is the water from the laboratory deionized (DI) water system. During the production of DI water, boron and silica are the first ions to breakthrough into purified water when the ion-exchange cartridge reaches expiry date and/or its exchange capacity.

The majority of boron is present as boric acid at neutral pH. Borate is not very conductive in the form of boric acid, therefore small traces of borate in the low ppb range will not significantly increase the resistivity of the deionized water. For that reason, the operator of the deionized water system may be unaware of the fact that borate is in the deionized water.

In addition, the use of borosilicate glass bottles should be avoided at all time in HPAEC-PAD analysis, because borate can leach out of the glassware at high pH. For that reason, the ALEXYS Carbohydrate Analyzer is equipped with polypropylene copolymer (PPCO) eluent bottles. These PPCO plastic bottles are inert at high pH.

Specifications Borate Ion Trap (BIT) column

Parameter		Specifications
Type		Chemically derivatized polymeric resin
Particle	Material	Polyvinylbenzyl chloride
	Diameter (μm)	10
	Pore size (\AA)	n.d.
	Crosslinking (%)	12%
	Functionality	polyol
Organic solvent limit		0-90% ACN or MeOH for cleaning
T operating range ($^{\circ}\text{C}$)		10-40
pH range		0-14
max (psi/bar)		4350/300

Part no | Description

260.0030	Borate ion trap, 4.0 mm ID x 50mm. Traps borate contaminants from mobile phase
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Antec Scientific (USA)
info@AntecScientific.com
www.AntecScientific.com
T 888 572 0012

Antec Scientific (worldwide)
info@AntecScientific.com
www.AntecScientific.com
T +31 71 5813333

