

SweetSep™ Columns

The New Benchmark for Carbohydrate Analysis

- New columns for reliable HPAEC-PAD and MS
- Superior and fast separations
- Works for all classes of carbohydrates



F&B



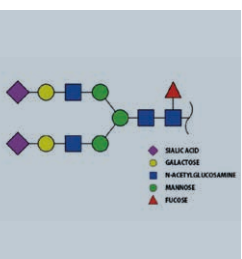
Prebiotics



Plants



Sweeteners



Glycans



High-Performance Anion Exchange (HPAE) columns for the separation of mono-, oligo- and polysaccharides using PAD or MS detection.

Why HPAEC?

High Performance Anion-Exchange Chromatography (HPAEC) is the most powerful analytical technique for carbohydrate analysis due to its ability to separate all classes of alditols (polyols), aminosugars, mono-, oligo- and polysaccharides including glycans, according to structural features such as size, composition, anomericity and linkage isomerism.

Highly Monodisperse Particles

Antec Scientific developed a novel pellicular anion-exchange stationary phase called SweetSep AEX. The phase is based on highly uniform monodisperse 5 μm resin particles of crosslinked poly(divinylbenzene-co-ethylvinylbenzene) copolymer. The particles are furthermore coated with quaternary amine functionalized nanoparticles.



SEM image of 5 μm SweetSep particles

High Efficiency with Low Backpressure

The resin particles packed in inert, metal-free HPLC columns result in exceptional column efficiencies with typical reduced plate height close to 2.0 with only moderate column back pressure. SweetSep AEX columns allow for rapid, high-resolution separations of carbohydrates that rival the performance of existing phases based on smaller particle size but operates with significantly lower system back pressures. The size and exchange capacity of the latex nanoparticles is optimized to enable the analysis of a wide variety of carbohydrates samples ranging from monosaccharides present in food, plants and glycoproteins up to oligosaccharides such as FOS (fructo-oligosaccharides) and N-linked glycans.

Instrumental Requirements

1. HPAEC-PAD

SweetSep columns can be used with any High Performance Anion Exchange Chromatography (HPAEC) system such as the IC systems of Metrohm or Thermo Fisher Scientific. Several bioinert HPLC systems are also suitable for use with HPAEC when equipped with a Pulsed Amperometric Detector (PAD) such as the Decade™ Elite (Antec Scientific). For consistent results, ease of use, and highest reproducibility, the Antec Scientific ALEXYS™ Carbohydrate Analyzer is the best choice.

2. Borate Ion Trap

In all cases the use of a Borate Ion Trap (BIT) column installed between the pump and the autosampler is highly recommended.

3. HPAEC-MS

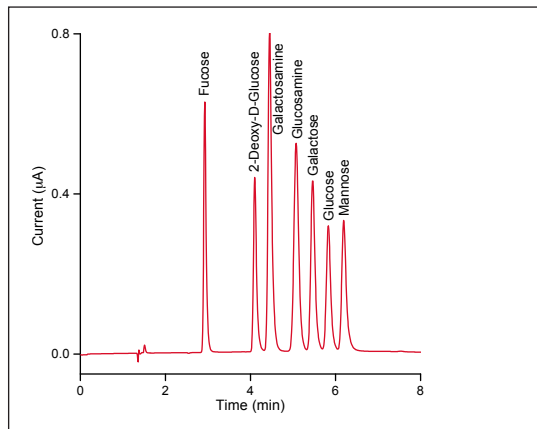
Depending on the volatility of the buffer systems used, for the on-line coupling with MS, the installation of a desalter (ion suppressor) becomes necessary. Basically, any type of (ESI)-MS can be used for detection.

4. HPAEC/(PAD)-MS

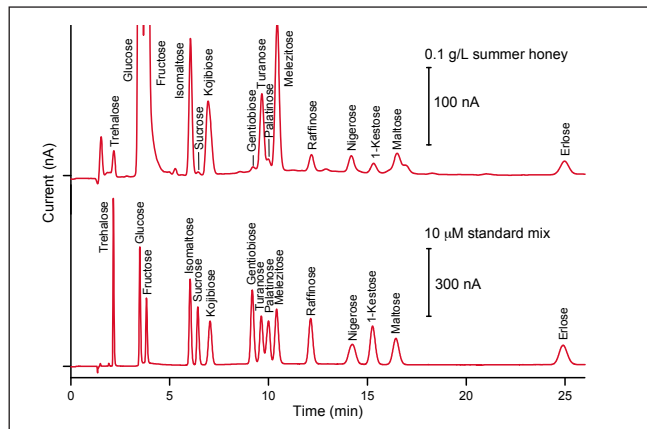
Parallel detection by PAD and MS to allow simultaneous identification and quantification of the carbohydrates can be done easily by using a simple T-piece flow split after the SweetSep column.

Examples

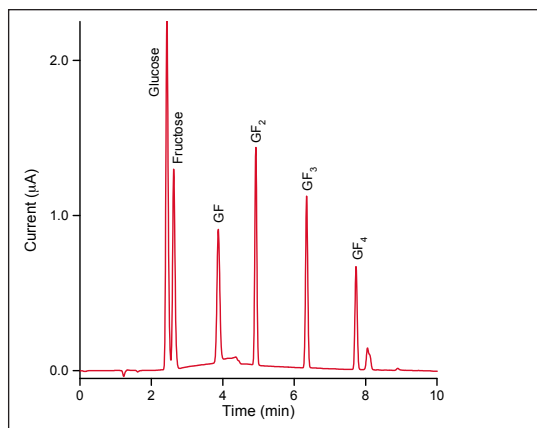
Mono- up to Pentasaccharides



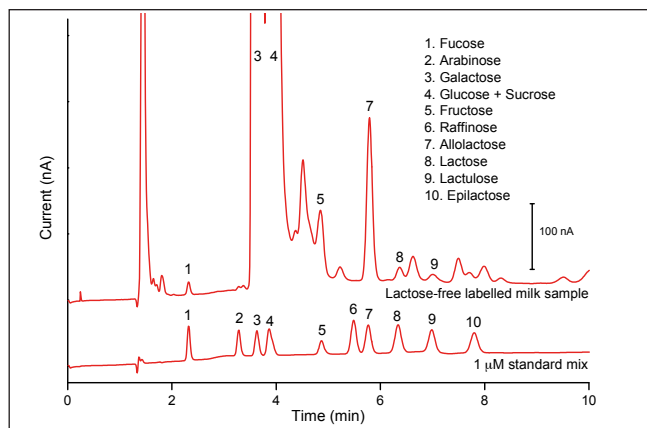
Isocratic separation of monosaccharides on a SweetSep™ AEX200 column, 4.0 mm ID × 200 mm. 10 μL inj. of a 10 μM mixtures of monosaccharides std in water (HPAEC-PAD).



HPAEC-PAD of honey on a SweetSep™ AEX200 column, 4.0 mm ID × 200 mm. Top: 10 μL inj. of a 0.1 g/L Swiss summer honey sample. Bottom: 10 μL inj. of a 10 μM standard of 15 sugars present in honey.

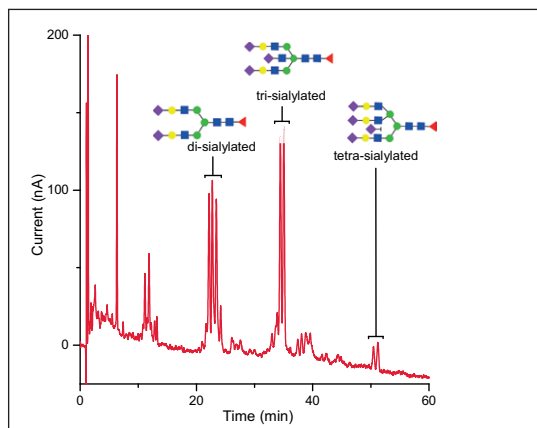


Separation of short-chain fructooligosaccharides up to DP5 by HPAEC-PAD. SweetSep™ AEX200 column, 4.0 mm ID × 200 mm. 10 μL inj. of 10 ppm mixtures GFs.

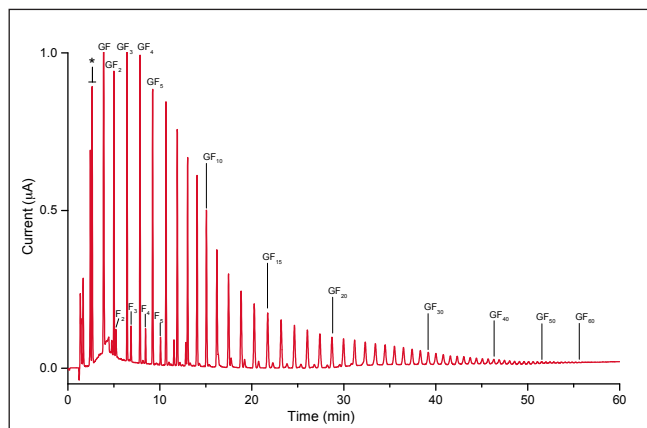


Lactose intolerance: Analysis of milk on a SweetSep™ AEX200 column, 4.0 mm ID × 200 mm. Top: 10 μL inj. of a 10 g/L lactose-free labelled milk. Bottom: 10 μL inj. of a 10 μM standard of 11 sugars commonly found in milk.

Oligosaccharides & N-Glycans



Separation of N-glycans standard containing di-, tri-, and tetra sialylated oligosaccharides by HPAEC-PAD on a SweetSep™ AEX200 column, 4.0 mm ID × 200 mm.



Gradient separation of inulin from chicory. 10 μL inj, 200 ppm. SweetSep™ AEX200 column, 4.0 mm ID × 200 mm using HPAEC-PAD.

Specifications / Ordering Information

Specifications SweetSep™ Anion Exchange Columns

Parameter		AEX200
Type		pellicular resin
Particle	Material	ethylvinylbenzene-divinylbenzene copolymer
	Diameter (µm)	5
	Crosslinking (%)	80 %
	Functionality	surface sulfonated
Latex	Material	vinylbenzylchloride-divinylbenzene
	Diameter (nm)	120
	Functionality	quaternary amine
Ion Exchange Capacity (µeq/column)		86 µeq per 4 x 200 mm column
Organic solvent limit		0-100% of any common solvent (cleaning)
T limit (°C)		5 - 60
Recommended T operating range (°C)		10-40
pH range		0-14
max (psi/bar)		4500/300

Specifications Borate Ion Trap (BIT) column

Parameter		SweetSep™ BIT borate ion trap (4 x 50 mm)
Type		Chemically derivatized polymeric resin
Particle	Material	Polyvinylbenzyl chloride
	Diameter (µm)	10
	Functionality	polyol
Trapping capacity (mg/column)		> 6 mg Borate per 4 x 50 mm column
Organic solvent limit		0-90% of any common solvent (cleaning)
T limit (°C)		5 - 60
Recommended T operating range (°C)		10-40
pH range		0-14
max (psi/bar)		4350/300

Ordering Information

Antec PN	Description	Additional info
260.0010	SweetSep AEX200, 4.0 mm ID x 200 mm column, 5 µm	Ideal for the analysis of carbohydrates ranging from mono- to tetrasaccharides present in food, plants and glycoproteins, up to oligosaccharides such as FOS (fructo-oligo-saccharides).
260.0015	SweetSep AEX200, 4.0 mm ID x 50 mm pre-column, 5 µm	Pre-column (guard column) for us with the AEX200 4.0 mm ID x 200 mm analytical column
260.0100	Pre-column inlet filter PEEK, 0.5 µm	Precolumn inlet filter with replaceable PEEK frits 0.5 µm porosity and small swept volume of 0.5 µL, for direct connection into the analytical or pre-column.
260.0110	Replacement filters PEEK, 0.5 µm, 1 pcs	Replacement filters for Pre-column filter PEEK
260.0030	Borate Ion Trap (BIT) 4 x 50 mm borate ion trap, 10 µm	Trap column installed between the pump and the injection valve (autosampler). Removal of borate contaminants from mobile phases. Significant improvement in peak shape of sugar alcohols (e.g., mannitol and sorbitol), fructose and mannose, etc.

SweetSep columns with other chemistries and dimension are currently under development and will be released shortly. For further information, please contact info@AntecScientific.com

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