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Novel stationary phase for the separation of all classes of carbohydrates in F&B

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Statement of the Problem: 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.We 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. he resin particles packed in inert, PPEK 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. The size and exchange capacity of the latex nanoparticles is optimized to enable the analysis of a wide variety of carbohydrates samples in complex mixtures ranging from monosaccharides present in food, plants and glycoproteins up to oligosaccharides such as FOS (fructo-oligosaccharides) and N-linked glycans.Examples will be presented using HPAEC-PAD for the ultra-sensitive analysis of oligo– and polysaccharides as fraud markers in honey down to 1% (honey adulteration and fingerprinting). In other examples new limits in the separation of oligosaccharides with a degree of polymerization (DP) up to 90 will be shown for superior analysis of fructans. Finally the analysis of lactose and it isomers in lactose free labelled products as well as the analysis of carbohydrates in different beer brands will be discussed.

Biography

Jean-Pierre is the CEO of Antec Scientific, a Netherlands-based company specializing in HPLC analyzers with electrochemical detection. Under his leadership, the ALEXYS™ Carbohydrate Analyzer and SweetSep™ HPAEC columns were developed. He holds an Engineering degree from the University of Basel, followed by a doctorate in Analytical Chemistry from the Free University of Amsterdam. With over 80 publications and 10 patents in HPLC and Electrochemistry-MS, he has delivered 200+ invited seminars globally. Jean-Pierre is on the Editorial Advisory Board of LCGC International and a member of the Swiss Chemical Society, British Society of Mass Spectrometry, and Royal Dutch Chemical Society. His research focuses on electrochemistry for chemical reactions and detection, as well as advancing chromatographic column technologies.

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