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THE BOOK CORNER

CENTRIFUGAL PARTITION CHROMATOGRAPHY, Edited by A.P. Foucault, Chromatographic Science Series, Volume 68, Marcel Dekker, Inc., New York, 432 pages, 1994. Price: \$150.00.

Modern countercurrent chromatography (CCC) originates from the pioneering studies of Y. Ito et al., who first constructed, in Japan, an apparatus designed to differentiate particles in suspension or solutes in solution in a solvent system subjected to a centrifugal acceleration field. This first machine opened the way in two main directions: one, pursued by Y. Ito in the United States, is based on a wide variety of countercurrent chromatographic apparatuses most of the recent ones using a variable gravity field produced by a two-axis gyration mechanism and rotary seal-free arrangement for the column; the other, pursued by K. Nunogaki in Japan, is based on the "CPC apparatus" (centrifugal partition chromatographic apparatus) and uses a constant gravity field produced by a single-axis rotation mechanism, and two rotary seal joints for inlet and outlet of the mobile phase.

The historical linkage between countercurrent distribution (Jantzen, Watanabe, Van Dijek, Martin and Synge, Craig and others) and countercurrent chromatography is responsible for the name *countercurrent chromatography* in which a strong gravitational field is used to keep a liquid stationary phase in a steady immobilized state while the mobile phase is pumped through. With technological improvements, the performance of today's instruments is much closer to that of liquid-liquid chromatography using a solid support to hold the liquid stationary phase.

The goal of this volume is to provide a forum for scientists who are already using centrifugal partition chromatographs in their research to share with others their personal knowledge in this specific field of chromatography. This book is devoted exclusively to the CPC apparatus (single-axis rotation mechanism).

CPC and HPLC (high-performance liquid chromatography) are similar in several respects. They share the same fundamental mechanism (partitioning of solutes), the same goal (separation, purification), and the same ancillary equipment (pumps, injectors, detectors).

The book introduces centrifugal partition chromatography (CPC) for any biphasic system - offering in-depth coverage of instrumentation, theory, liquid-liquid partition coefficients, and CPC in organic and inorganic chemistry - and provides over 80 ternary phase

diagrams of three-solvent systems that can be applied to virtually all partitioning, separation, and purification situations.

The book is divided into 12 chapters written by international experts from North American, Europe, and Japan. It examines chromatographic properties, illustrates practical operations, and gives examples of CPC solutions to real experimental problems, highlights the distinction between CPC and high-performance liquid chromatography, explains hydrostatic, hydrodynamic, and overall pressure drops, discusses solvent systems, strategies for solvent selection, and the elution mode in CPC, shows how to design solvent systems for CPC of complex organic mixtures, describes carrier-aided CPC for preparative-scale separations and the use of CPC as a multistage liquid-membrane transport system, and much more.

With nearly 800 references, tables, equations, and figures, *Centrifugal Partition Chromatography* is a good resource for analytical and pharmaceutical chemists and biochemists, separation scientists, pharmacologists, and upper-level undergraduate and graduate students in these disciplines.

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CARBOHYDRATE ANALYSIS HIGH PERFORMANCE LIQUID CHROMATOGRAPHY AND CAPILLARY ELECTROPHORESIS, Edited by Z. El Rassi, *Journal of Chromatography Library* Volume 58, Elsevier, Amsterdam, The Netherlands, 668 pages, 1995. Price: \$242.75.

This book is an excellent reference for every one interested in carbohydrate analysis. The volume discusses all aspects of carbohydrate analysis from sample preparation to separation and detection in an easy to understand manner. The editor, Dr. Z. El Rassi is a leader in this field and should be commended for a job well done. The authors are leaders in their areas. The book is free of errors and well illustrated and referenced, and is a must for all those interested in carbohydrates and glycoconjugates analysis.

Carbohydrates and glycoconjugates are very important biological species involved in many life processes. Because of the structural diversities and the multilateral importance of carbohydrates, the analytical methodologies used to analyze them continue to evolve. High performance liquid chromatography (HPLC) has been extensively used in the separation and isolation of carbohydrate species. More recently, high performance capillary electrophoresis (HPCE), has been explored. The objective of this book is to provide a comprehensive review of carbohydrate analysis by HPLC and HPCE by covering the separation methods for all classes of carbohydrates including mono- and disaccharides; linear and cyclic oligosaccharides; branched oligosaccharides (e.g., glycans); polysaccharides; glycoconjugates (e.g., glycolipids, glycoproteins); carbohydrates in food and beverage; compositional carbohydrates of polysaccharides; carbohydrates in biomass degradation; etc.

The book is well balanced in terms of its content: covers the fundamental aspects of the various modes of HPLC and HPCE that are currently applied to the analysis of carbohydrates; discusses analytical and preparative separations; describes the principles of detection and quantitative determination of carbohydrates by HPLC and HPCE; reviews sample preparations; and provides an ample amount of important applications.

The book is divided into three major parts. The first part, Chapter 1, reviews enzymatic and chemical methods currently utilized in sample preparation.

The second part deals with Analytical and Preparative Separations, and encompasses a series of 8 chapters. Seven of these chapters, Chapters 2 through 8, describe, in detail, the different HPLC and HPCE systems currently used in analytical separations of carbohydrates and glycoconjugates. An additional chapter, Chapter 9, reviews the various aspects of semi-preparative and preparative HPLC for the isolation of small and large quantities, respectively, of intact and pure carbohydrates and glycoconjugates.

The third part is on The Detection, a topic as important as the separation part. In general, carbohydrates lack chromophores or fluorophores in their structures. This inherent property of carbohydrates causes difficulties in determining these species at low levels. This section contains a series of 8 chapters, Chapters 10 through 17, covering, in detail, the different direct and indirect detection methods that have been introduced for the sensitive detection of carbohydrates. The various detection topics include electrochemical, refractive index, mass spectrometry, light scattering, chiroptical, pre- and post-column derivatization reactions for optical detectors (UV, Vis and fluorescence), post-column enzyme reactors, indirect UV and

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