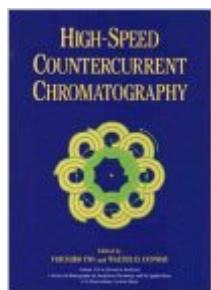


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# High-Speed Countercurrent Chromatography (Chemical Analysis: A Series Of Monographs On Analytical Chemistry And Its Applications)



## Synopsis

High-speed countercurrent chromatography, a technique used to separate substances into their individual components, was first developed in the late 1970s when it overshadowed other methods of chromatography with its superior capacity to achieve rapid and efficient separation. This newer system is now employed in a wide range of applications, most notably for extracting medicinal drugs from plants or purifying dyes. **High-Speed Countercurrent Chromatography** is the first book to provide a comprehensive and up-to-date treatment of this technique. It covers all the latest developments in equipment, theory, and applications, as well as many topics not previously published anywhere, such as the purification of recombinant proteins directly from a crude *E. coli* lysate, the development of instruments that produce highly concentrated pure fractions, and successful CCC/MS interfacing. Charting the remarkable progress high-speed CCC has made over the past five years, the book discusses the method's advantages over other forms of chromatography and shows how this versatile system permits the separations chemist to impose a number of variations upon the fundamental chromatographic process. The authors review a multitude of practical details involved in various procedures and manipulations, from dual CCC to hyphenated techniques. Finally, the book covers virtually all the fields in which CCC is particularly advantageous, including the extraction and/or purification of natural products, marine products, antibiotics, hormones, medicinal herbs, dyes, proteins and peptides, and inorganic materials such as rare earths. This book is both a practical guide for analytical chemists and lab workers, and a valuable reference for students taking courses in separation methods at the graduate level. It also opens a window on future developments in this rapidly advancing field.

**HIGH-SPEED COUNTERCURRENT CHROMATOGRAPHY** What every analytical chemist needs to know about this important new technique **High-Speed Countercurrent Chromatography** is the first book to be devoted entirely to this popular and fast-developing technique for separation and purification. It covers areas of particular interest to chemists who deal with both natural products and synthetic organic substances, and it is also extremely useful for those studying structure activity relationships. Assembled by well-known authorities in the field, this book:

- Presents both theory and practice of high-speed CCC
- Brings together information that has previously been scattered throughout journal articles, as well as information not previously published anywhere
- Provides a handy and time-saving reference on the use of CCC, specifying a variety of processes and separation methods
- Describes all the latest developments in the field, including state-of-the-art instrumentation and various applications
- Offers numerous examples, especially from pharmaceutical applications, throughout the text
- Reviews all the areas in which CCC has provided special advantages, such as

the extraction of medicinal drugs from plants or purifying dyes. For professional chemists and researchers in the pharmaceutical and medical industries, as well as cosmetics, agriculture, and other industrial and commercial pursuits, this book is an excellent practical guide, a helpful and easily accessible reference, and a watershed of ideas for further research and future applications.

## **Book Information**

Series: Chemical Analysis: A Series of Monographs on Analytical Chemistry and Its Applications (Book 198)

Hardcover: 454 pages

Publisher: Wiley-Interscience; 1st edition (December 1995)

Language: English

ISBN-10: 0471637491

ISBN-13: 978-0471637493

Product Dimensions: 6.3 x 1.1 x 9.3 inches

Shipping Weight: 1.9 pounds

Average Customer Review: Be the first to review this item

Best Sellers Rank: #1,853,707 in Books (See Top 100 in Books) #21 in Books > Science & Math > Chemistry > Chromatography #511 in Books > Science & Math > Chemistry > Analytic #4890 in Books > Textbooks > Science & Mathematics > Chemistry

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This contributed text describes the remarkable progress that has been made in the high speed CCC technique including purification of recombinant proteins directly from a crude *E. coli* lysate, development of pH-peak-focusing and pH-zone-refining CCC to produce highly concentrated pure fractions comparable to displacement chromatography and successful CCC/MS interfacing.

Contains a number of recent applications such as separation and purification of natural, marine and medicinal products, antibiotics, dyes and inorganic elements. Introduces the unique use of form CCC and liquid-liquid dual CCC.

YOICHIRO ITO is a research scientist in the Laboratory of Biophysical Chemistry, the National Heart, Lung, and Blood Institute, National Institutes of Health in Bethesda, Maryland. He invented the coil planet centrifuge, which is the basis for high-speed countercurrent chromatography. Dr. Ito has continued to develop CCC technology, introducing a variety of efficient systems such as droplet CCC, locular CCC, high-speed CCC, foam CCC, dual CCC, cross-axis CCC, and pH-zone-refining

CCC. He has published more than 200 articles in scientific journals and books, and holds 40 U.S. patents, mainly on CCC technology. WALTER D. CONWAY is an Associate Professor of Pharmaceutics and Medicinal Chemistry at the School of Pharmacy, State University of New York at Buffalo. His experience includes working at the Esso Research and Engineering Co., the National Cancer Institute, the National Heart Institute, and the Sterling-Winthrop Research Institute. He has served as chairman and board member for several societies, has received a number of distinguished service awards, and is currently a member of the governing board of the Northeast Regional Chromatography Discussion Group. His work in the area of countercurrent chromatography includes the development of advanced apparatus, its theoretical basis and application to separation and purification, and writing *Countercurrent Chromatography: Apparatus, Theory, and Applications*. More than one-third of his 60 scientific publications are on CCC, and he has delivered over 90 papers or lectures on the topic.

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