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Chiral Separations, Applications and Technology

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Reviewed by
Haleem J. Issaq, Ph.D.
Book Corner Editor

CHIRAL SEPARATIONS, APPLICATIONS AND TECHNOLOGY, S. Ahuja, ed., American Chemical Society, Washington, DC, 1997, 349 pp., \$99.95.

The separation of a racemic mixture into its enantiomers has gained a tremendous momentum in the last two decades. Enantiomers are compounds that have the same physical properties and chemical structures which are not

superimposable. As such, they are very difficult to separate and require, for their separation, specially fabricated chiral or discriminating materials or derivatization of the enantiomers to give stereoisomers which can be resolved easily. The present book presents the reader with state-of-the-art approaches to the resolution of a racemic mixture.

Chiral separation methods are extensively discussed in this book, and numerous examples from fields such as pharmaceuticals, agriculture, and food have been included (Chapters 5-9).

Chapter 1 is an overview. Chemical synthesis is a favorite route of preparation of enantiomers, especially when a large amount of a given enantiomer is required. E. J. Corey discusses catalytic enantioselective Diels-Alder reactions and enantioselective additions of carbon to carbonyl groups in Chapter 3. Other examples are discussed in Chapter 2. Enzyme-catalyzed reactions are ideally suited to production of single enantiomers because the interaction of proteins with small chiral molecules, in general, is highly stereospecific and shows clear preference for single enantiomers (Chapter 4).

Chapter 5 deals with stereoselective analysis in crop protection and discusses weed, disease, and insect control. Chapter 6, Chiral Separation Methods, is a chapter which should have been placed at the beginning of the book, and not in between crop protection and development of chiral methods (Chapter 7). Chapter 8 discusses renal elimination of drugs while Chapter 9 deals with analyses of food components and Chapter 10 with chromatography as a separation tool.

I feel that the editor selected good topics and good authors, but the organization of the book, i.e., order of chapters, flow of topics, is not the best. The book ends with Chapter 11, which is a discussion of enantioseparation using liquid membranes, an interesting topic. Overall the book is well written with a wealth of information and should be of help to analytical chemists in different fields.

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HANDBOOK OF DRUG ANALYSIS, Applications in Forensic and Clinical Laboratories, R. H. Liu, D. E. Gadzala, American Chemical Society, Washington, DC, 1997, 367 pp., \$129.95.

This book deals with a timely topic which is drawing great attention these days. The analysis of drugs of abuse has progressed in the last two decades. As stated in the Foreword of the book written by Benjamin A. Perillo, Associate Deputy Assistant Administrator, Office of Science and Technology, Drug Enforcement Administration, U.S. Department of Justice, "From the early days of the analyst identifying controlled substances by using color tests, a microscope, and thin-layer chromatography, the profession has progressed to meet the requirements of timeliness and absolute specificity. Ultraviolet (UV) spectrophotometry and then infrared spectrophotometry (IR) became the norms in the middle to late 1970's. In the 1980's, gas chromatography-mass