

Book Reviews

Second Supplements to the Second Edition of *Rodd's Chemistry of Carbon Compounds*. Volume IV: Heterocyclic Compounds. Part C: Five-Membered Heterocyclic Compounds with Two Hetero-Atoms in the Ring from Groups V and VI of the Periodic Table; Part D: Five-Membered Heterocyclic Compounds with More Than Two Hetero-Atoms in the Ring. Edited by M. Sainsbury. Elsevier, Amsterdam. 1998. xvi + 281 pp. 15.5 × 23 cm. ISBN-0-444-828702. \$187.00.

As was done in the first supplement to the second edition of *Rodd's Chemistry of Carbon Compounds*, Parts C and D are combined in a single volume for the second supplement. A deficiency of this volume is the absence of an update of the chemistry of five-membered ring compounds containing two nitrogen atoms (i.e., pyrazoles, imidazoles, and their reduced and benzo derivatives) since the first supplement appeared in 1994. This deficiency is, in part, compensated for by the inclusion of a summary of reviews of the subjects that should have been covered in Chapter 16. While it is suggested that the detailed survey of the chemistry of pyrazines, indazoles, imidazoles, and benzimidazoles that appears in *Comprehensive Heterocyclic Chemistry II* (which covers the literature from 1982 to 1995) "encompasses the period which this supplement should have dealt with", an unfortunate discontinuity of coverage nonetheless remains. Chapter 17 (by S. M. Fortt) updates the chemistry of five-membered heterocyclic compounds with two different hetero-atoms in the ring, including isoxazoles, oxazoles, thiazoles, isothiazoles, oxathioles, and selenazoles and their reduced and benzo derivatives to complete Part C.

The initial chapter of Part D (Chapter 18), covering five-membered heterocyclic compounds with three hetero-atoms in the ring, has been divided into two sub-chapters in the second supplement. Chapter 18a (by S. B. Bedford) reviews the chemistry of triazoles, while Chapter 18b (by the editor, M. Sainsbury) updates oxadiazoles and thiadiazoles. Chapter 19 (by J. H. Little) reviews the chemistry of five-membered heterocyclic compounds with four hetero-atoms in the ring, including tetrazoles, oxatriazoles, thiatriazoles, oxathiadiazoles, dithiadiazoles, and phosphorus-containing heterocycles with varying numbers of nitrogen, oxygen, and sulfur atoms to complete Part D. Key literature citations and important reviews are provided throughout the narrative of each chapter to guide the reader to additional information on each topic. A comprehensive subject index for parts C and D is included as the end of the volume.

Organic and medicinal chemists interested in the properties, synthesis, and reactions of heterocyclic compounds should benefit from consulting this volume. Library access to this supplement together with the

complete series of *Rodd's Chemistry of Carbon Compounds* is highly recommended.

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A Practical Guide to Combinatorial Chemistry. Edited by A. W. Czarnik and S. H. DeWitt. American Chemical Society, Washington, D.C. 1997. xiv + 450 pp. 15.5 × 23.5 cm. ISBN 0-8412-3485. \$89.95.

This 450-page text is divided into four major sections that include (1) solid-phase strategies, (2) solution-phase strategies, (3) equipment and automation, and (4) information management and biological applications. These four sections are each covered by three to four chapters.

The first section is a heavily referenced compilation of resins, linkers, cleavage conditions, etc., similar to many other recent review articles and chapters. The highlight of the section is Chapter 5 which presents a variety of analytical methods for on-bead analysis of combinatorial libraries. Several good examples are presented which illustrate the use of magic angle spinning NMR techniques and single-bead FTIR microscopy for monitoring reactions and structure proof. Spectra are shown for each method, and they are explained in detail.

The title of the second section, "Solution Phase Strategies", is misleading in that no synthetic chemistry is presented. Instead, several chapters describing methods for the *analysis* of solution-phase libraries are presented. Chapter 8 is quite robust and describes a range of techniques including MS, LC-MS, and NMR.

The equipment and automation section is similar to other texts in that each manufacturer of robotics equipment is given a few pages of text and a picture. Subsequently, examples of the types of chemistry run on selected machines are presented. Not surprisingly, the syntheses of benzodiazepines and *N*-benzylglycines are included in this discussion.

As a complete work, this book is similar to others that have recently been published. However, each section is well-written and well-referenced, and they mostly contain good schemes and tables. One distinguishing feature of this book, is perhaps, its tendency to focus on the analysis of libraries, rather than the synthesis of them. Chapter 13 is a good attempt to capture issues related to data management. Those just starting to build a collection of books on combinatorial chemistry might want to consider adding this to their shelves since it does contain a lot of useful information. However, those already holding a few books on this subject might find this book to be somewhat redundant, and they

might want to consider a brief scan through its pages prior to investing another \$89.95.

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Analytical Chemistry. Edited by R. Kellner, J.-M. Mermet, M. Otto, and H. M. Widmer. Wiley-VCH, New York, 1998. xxv + 916 pp. 21.5 × 30 cm. ISBN 3-527-286101. \$84.95.

Analytical Chemistry is designed to serve as an approved text for the FECS curriculum in analytical chemistry. As a text for a training course it includes problems, worked example problems, references, and learning objectives to guide students in their study of analytical chemistry. The excellently designed figures are well-drawn and complement the text, providing both practical and theoretical information concerning the analytical technique being discussed. The appendix includes items from statistical tables to dissociation constants arranged in a convenient and workable manner.

The well-organized chapters, which cover an extensive number of analytical techniques, are arranged so that material dealing with "The Analytical Process" and "Quality Assurance and Quality Control" precedes chapters dealing with analytical procedures. The range of topics is comprehensive, including chapters on computer interfacing of analytical instruments, LC-MS, GC-MS, and other hyphenated techniques as well as classical techniques of analytical chemistry. *Analytical Chemistry* will serve as an excellent text as well as a valued reference following completion of the student's course of study.

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High-Performance Capillary Electrophoresis. Edited by Morteza G. Kahaledi. John Wiley & Sons, New York, NY, 1998. xxxii + 1047 pp. 16 × 24 cm. ISBN 0-471-148512. \$150.00.

This is the most recent addition to *Chemical Analysis, a series of Monographs on Analytical Chemistry and its Applications*. This multiauthored book contains 31

chapters, organized into five sections on theory, detection systems, techniques, applications in chemical analysis, and determination of physicochemical parameters.

The first section on theory takes both beginner and expert reader through a detailed step-by-step description of capillary zone electrophoresis, micellar electrokinetic chromatography, capillary gel electrophoresis, capillary isoelectric focusing, capillary isotachopheresis, and capillary electrochromatography. Rigorous mathematical descriptions of the forces involved in separation are presented for the technically equipped reader. In addition, each chapter gives a brief, "layman's" version of the underlying separation theory for the novice.

The section on detection systems includes chapters discussing light-based detection, electrochemical detection, indirect detection, and mass spectrometric detection. The chapter on light-based methods, the most frequently used detection method in capillary electrophoresis, is particularly well-written. With this said, the other detection methods are newer, less developed, certainly difficult to review, and harder to accurately predict the future directions. The lack of more than a few commercial detectors makes this section of this book somewhat "expert"-oriented limiting its value to the beginner or the casual reader.

The techniques section includes chapters on sample introduction and stacking, coated capillaries, nonaqueous solvent systems, method validation, two-dimensional separations, and fabrication of microchips for separations. These techniques are all clearly written and should be of great interest to the expert and beginner alike.

The section on applications is excellent for those readers specifically interested in the analysis of peptides, proteins, carbohydrates, DNA, enantiomeric mixtures, inorganic ions, and pharmaceuticals. Also included are chapters covering on-line sample preconcentration, microbioanalysis and chemical analysis, and enzyme assays. The selection of these applications, while not all inclusive, clearly establishes the versatility of capillary electrophoresis.

The final section on physicochemical studies contains three short chapters on affinity capillary electrophoresis, determination of physicochemical parameters, and quantitative structure-activity relationships. These give the reader a completely different perspective in how capillary electrophoresis can be applied to obtain useful data about the physicochemical properties of macromolecules and their interactions.

The monograph is surprisingly well-edited and reads better than most multiauthored texts. This reader found only a few errors in individual chapters. While detailed experimental procedures are not presented in each chapter, the reader is directed to carefully selected primary literature; thus, this monograph serves as a helpful guide to those new to the field. The updates presented at the conclusion of many of the chapters are somewhat disconcerting, but the listings of recent publications make this monograph very current. The figures and schemes are of high quality, and the general index is both complete and useful. This reviewer recommends this monograph for all libraries and for any