

**Functional Condensation Polymers.** Edited by Charles E. Carraher, Jr. (Florida Atlantic University, Boca Raton, FL and Florida Center for Environmental Studies, Palm Beach Gardens, FL) and Graham G. Swift (G.S.P.C., Chapel Hill, NC). Kluwer Academic/Plenum Publishers: New York. 2002. xxii + 316 pp. \$125.00. ISBN: 0-306-47245-7.

This book was developed from the presentations given at a symposium held in April 2001 in San Diego and sponsored by the Division of Polymeric Materials: Science and Engineering. Its 21 chapters are organized under the following topics: Nano Materials, Light and Energy, Bioactivity and Biomaterials, and Enhanced Physical Properties. Each chapter is supported with either references or suggestions for further reading. A subject index completes the book.

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**Progress in the Chemistry of Organic Natural Products, 83.** Edited by W. Herz (Florida State University), H. Falk (Johannes-Kepler-University, Linz, Austria), G. W. Kirby (University of Glasgow), and R. E. Moore (University of Hawaii at Manoa). Featuring the Chapter "The Naturally Occurring Coumarins" by R. D. H. Murray. Springer-Verlag: Wien and New York. 2002. viii + 674 pp. \$239.00. ISBN 3-211-83601-2.

This new edition on naturally occurring coumarins, which was written by the same author in the previous compendium (Herz, W.; Kirby, G.; Moore, R.; Steglich, W.; Tamm, C. *Progress in the Chemistry of Organic Natural Products*, 72; Springer-Verlag: Wien and New York, 1997), is a comprehensive review of plant coumarins from 1989–99. Although there have been two major literature reviews published on this topic during the past decade, the continued rapid discovery of new structures justifies the publication of an updated listing for this large and structurally diverse class of natural products. Many of the new metabolites isolated since the 1997 review are predictable coumarin derivatives, such as glycosides of a known aglycone with a sugar variation, alcohols acylated with a different acid, or side chains of different oxidation levels. However, a select group of new compounds having unexpected structures has been discovered, which includes japoangelone, a furanocoumarin that co-occurs with four faltarindiol furanocoumarin ethers and is the first coumarin to possess a carbonic ester moiety. Also interesting are the monakarins, a series of pigmented metabolites with conjugated pyrano-coumarin skeletons and monoamine oxidase inhibitory activity. The photosensitizing effects of many furanocoumarins, the anti-HIV activity of calanolide A, and the defensive role of 7-oxygenated coumarins against plant pathogens may partly explain the current

keen research interest in coumarins, although more than a brief statement of such studies is not within the purview of this text.

The present review begins with an abbreviated introduction to plant coumarins that includes selected references to studies of their biosynthesis, biological activity, and chemical synthesis. This is followed by 37 tables containing data on 1883 reported coumarins, organized by monomeric coumarins (1785), biscoumarins (77), triscoumarins (4), and 17 coumarin structures that the authors predict will require revisions in the future. Groups of compounds are presented according to the number of oxygen atoms attached to the structural nucleus, as explained in the Introduction. For each entry, the natural source from which the coumarin was first isolated is given, together with the year of isolation, trivial name, and the full molecular structure as well as the molecular formula. Where available, melting point and optical rotation are provided. For all compounds listed, one or more references that include the title of the article are provided.

This book offers a comprehensive list of coumarins with up-to-date chemical data and references, as well as formula, author, and subject indexes. As a reference, it serves as a valuable source for up-to-date information about previously reported structures in this rapidly expanding research area of coumarin chemistry.

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**Chlorosulfonic Acid: A Versatile Reagent.** By R. J. Cremllyn (University of Hertfordshire). Royal Society of Chemistry: Cambridge. 2002. xiv + 308 pp. \$189.00. ISBN 0-85404-498-1.

This book covers the many uses of chlorosulfonic acid in synthetic organic chemistry. For example, it contains chapters on the reactions of chlorosulfonic acid with aliphatic, aromatic, and heterocyclic compounds as well as with elements and inorganic compounds, reviews the use of chlorosulfonic acid as an acid catalyst and a halogenation and dehydrating agent, and covers the commercial uses of this reagent. The preparation and manufacture of chlorosulfonic acid are also discussed. An appendix entitled "Recent References to Chlorosulfonic Acid" and a subject index complete the book.

JA025296I

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**Methodologies for Soil and Sediment Fractionation Studies.** Edited by Ph. Quevauviller (European Commission, DG Research, Brussels). Royal Society of Chemistry: Cambridge. 2002. xvi + 180 pp. \$118.00. ISBN 0-85404-453-1.

The goal of this book, according to the Editor, is "to serve as a practical reference for environmental chemists (and

postgraduate students) who need in-depth information on the use of operationally defined procedures for soil and sediment studies". It brings together the work of a number of different laboratories, many under the auspices of the European Commission, to define and review the application, harmonization, and standardization of leaching and extraction schemes for contaminated soils. A subject index and a list of the laboratories that participated in the various reference material certification studies complete the book.

JA025299V

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**Clean Solvents. Alternative Media for Chemical Reactions and Processing.** Edited by Martin A. Abraham (University of Toledo) and Luc Moens (National Renewable Energy Laboratory). American Chemical Society (Distributed by Oxford University Press): Washington, DC. 2002. xiv + 274 pp. \$135.00. ISBN 0-8412-3779-4.

This book was developed from a symposium on clean solvents held in Washington, DC in August 2000. It covers a range of different clean solvent systems for industrial purposes and provides information about the selection of clean solvents, their uses in industrial systems, as well as their benefits as compared to more conventional technologies. Author and subject indices complete the book.

JA0252983

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**Fundamental Aspects of Electrometallurgy.** By Konstantin I. Popov (University of Belgrade), Stojan S. Djokić (Westaim Corporation, Fort Saskatchewan, Canada), and Branimir N. Grgur (University of Belgrade). Kluwer Academic/Plenum Publishers: New York, Boston, Dordrecht, London, and Moscow. 2002. xviii + 305 pp. \$135.00. ISBN 0-306-47269-4.

To paraphrase slightly the authors' preface, the purpose of this book is to provide a bridge between the theory and the practice of electrometallurgical technologies. The first half of the book is devoted to electrochemical fundamentals and mechanisms of metal deposition, followed by separate chapters on electrowinning, electrorefining, electroplating and related technologies, electroless deposition, molten salts, and environmental considerations. Readers are assumed to have some prior knowledge of electrochemical fundamentals.

Unfortunately, the chapters on specific technologies are too brief and too general to be of much value to practitioners in industry. For example, production of aluminum is covered in 13 pages that include four half-page figures. Basic process chemistry is emphasized throughout, with very limited coverage of unit operations, materials selection, or process economics. The earlier background chapters duplicate much basic material from standard references but have gaps that would pose difficulties for a beginner.

The strong point of the book is its coverage of the research of the authors and their associates. Much of their work has appeared in journals that are not well known in the U.S. or

Western Europe, and the citations are both numerous and up-to-date, extending through 2001. A large number of their SEM photos are reprinted, especially in Chapter 3, entitled "Surface Morphology of Metal Electrodeposits". For those interested in  $\mu\text{m}$ -scale surface features, this chapter summarizes much of the authors' work from the 1960s to the present. Regrettably, there is little discussion of surface processes on the nanometer scale.

The book is plagued with production problems. A frequent misspelling is "aqueous," something that should have been easy to find and correct with a simple spell check. The number of typographical errors, grammatical and spelling mistakes, incorrect citations of primary literature, and the like is, or should be, unacceptable in a technical monograph. A further weakness is that some graphs are fuzzy (electronic processing?) and have very faint tick marks and symbols (e.g., those in Chapter 9 on Ni-Fe alloys).

Overall, then, this book left me with a mixed impression. Specialists interested in surface morphology will find much of value in Chapters 3, 4, and 5 (the latter two covering current distribution and deposition at a periodically varying rate). Others may find the contents unsuited to their immediate needs and be put off by the numerous small errors.

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**Handbook of Organopalladium Chemistry for Organic Synthesis. Two Volume Set.** Edited by Ei-ichi Negishi (Purdue University). John Wiley & Sons, Inc.: Hoboken. 2002. 3424 pp. \$595.00. ISBN 0-471-31506-0.

This reference book assembles the contributions of more than 124 authorities on the use of organopalladium reagents and catalysts in organic synthesis. All relevant organopalladium reactions are listed and defined, and the book is organized according to reaction type, for example, reactions involving reductive elimination, carbopalladation and related reactions, etc. Other topics covered include the history and technological development of organopalladium chemistry; the fundamental, chemical, and physical properties of palladium and palladium compounds; reaction patterns of palladium and its complexes; and the stoichiometric preparation and in situ generation of palladium compounds. An extensive reference section and a subject index complete the set.

JA025310R

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**The Chemistry of Medical and Dental Materials.** By John W. Nicholson (University of Greenwich, U.K.). Royal Society of Chemistry: Cambridge. 2002. xii + 242 pp. \$108.00. ISBN 0-85404-572-4.

This book covers the chemistry of synthetic materials used in medicine and dentistry. It begins with an introduction to biomaterials and their surgical uses and then provides discussions about the specific types of materials in use: for example, polymers, ceramics, metals, and dental materials; dental

materials are dealt with separately because of their complex natures and their many variable uses. The remaining two chapters review biological responses to these materials and cover, briefly, tissue engineering. Each chapter contains an extensive reference section, and a subject index completes the book.

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**Metallization of Polymers 2.** Edited by Edward Sacher (École Polytechnique, Montréal, Québec). Kluwer Academic/Plenum Publishers: New York. 2002. viii + 208 pp. \$130.00. ISBN 0-306-47253-8.

This book was developed from the Workshop on Polymer Metallization held in Montréal in June 2001. The 16 chapters address polymer metallization under the following headings: New Instrumentation; Low Permittivity Materials; Polymer Metallization; Barrier Layers; and Adhesion Enhancement. There is a subject index.

JA025312B

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**Nanoporous Materials III.** Edited by Abdel Sayari (University of Ottawa) and Mietek Jaroniec (Kent State University). From the Series: Studies in Surface Science and Catalysis 141. Elsevier: Amsterdam. 2002. xviii + 692 pp. \$210.00. ISBN 0-444-51113-X.

This book contains a sampling of the papers that were presented at the Symposium on Nanoporous Materials III in Ottawa in June 2002. It covers three main areas in this field: synthesis of mesoporous silicas and related materials; synthesis of other nanoporous and nanostructured materials; and characterization and applications of nanoporous materials. An author and a subject index complete the book.

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**Recent Advances in Quantum Monte Carlo Methods. Part II.** Edited by William A. Lester, Jr. (University of California, Berkeley), Stuart M. Rothstein (Brock University, Canada), and Shigenori Tanaka (Toshiba Corporation, Japan). From the Series: Recent Advances in Computational Chemistry, Volume 2. World Scientific: New Jersey, London, Singapore, Hong Kong. 2002. xii + 316 pp. \$72.00. ISBN 981-02-4945-4.

This book contains 16 chapters by participants in the Advances in Quantum Monte Carlo symposium held in Honolulu in December 2000, although according to the editors, "the chapters go beyond what was presented there, with some resulting from collaborations and exchanges of ideas facilitated by the meeting." They are organized under the following topics: "Theory/Algorithm Development", "Properties of Ground State Atoms and Molecules", "Excited Electronic States", "Large

Systems and Clusters", and "Condensed Matter". A subject index completes the book.

JA025314W

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**Glycoscience: Chemistry and Chemical Biology. Volumes I–III.** Edited by Bertram Fraser-Reid (Natural Products & Glycotechnology Research Institute, Durham, NC), Kuniaki Tatsuta (Waseda University, Japan), and Joachim Thiem (University of Hamburg, Germany). Springer-Verlag: Berlin, Heidelberg, New York. 2001. 2970 pp. \$995.00 (Set). ISBN 3-540-67764-X (Set).

Carbohydrates are the focus of growing attention among biological molecules in recent years due to the increased appreciation of their vital roles in many physiological processes. The sheer scope of this topic is fascinating in and of itself. Carbohydrates constitute many cellular structures, mediate cell–cell interactions and immune responses, and code and store the genome, to name a few of their known tasks. They are also indispensable for the function of a long list of glycoconjugates, such as glycoproteins and glycolipids. Last, numerous secondary metabolites also contain carbohydrate moieties that are important for their biological activities. Despite the overwhelming importance of carbohydrates to biological systems, our understanding of their roles lags behind those of protein and DNA functions. This three-volume set should foster research in the ongoing effort to increase understanding in this field.

Volume I contains some general comments about sugar chemistry. There is an extensive discussion of structure and conformation, with the bulk of it focusing on NMR studies. In addition, the physical properties of carbohydrates and their separation and purification are presented in separate chapters. The final part of the first section provides a biological perspective on the occurrence of carbohydrates. Volume I also covers general synthetic methods for reactions at nonanomeric and anomeric centers. Sugar reactions from oxidation and reduction, deoxygenation, heteroatom exchange, anhydrosugars, and carbon–carbon bond formation are all addressed. A good summary of protecting group chemistry is also included, with many practical examples presented throughout the three volumes.

Volume II reviews the chemistry and biochemistry of monosaccharides and oligosaccharides. The section on monosaccharides contains two comprehensive chapters on their de novo synthesis and their biosynthesis and degradation. Other topics interspersed in this section include the synthesis of biologically important monosaccharides and the synthesis of complex natural products using monosaccharides as starting materials. The second section deals with oligosaccharides. As expected several chapters are devoted to the problem of forming glycosidic linkages in a regio- and stereoselective manner. Numerous examples of different donors and acceptors are provided as well as a plethora of coupling methodologies. Also of importance are the chapters detailing the use of enzymatic glycosylation and combinatorial/solid-phase methods. Volume II ends with chapters discussing the importance of protein–carbohydrate interactions.

In Volume III, the importance of polysaccharides in the mediation of biological phenomena is expanded upon in detail. Specific occurrences of carbohydrates are presented in separate chapters, including complex polysaccharides, glycolipids, glycoproteins, and glycomimetics. These chapters include sections on chemical and biochemical syntheses as well as related chemical biology and biomedical topics. General information is presented about the characteristics of these sugar-containing structures as well as details of specific systems such as mycobacterial cell wall and enediyne antibiotic oligosaccharides. Volume III also contains the IUPAC 1996 Recommendations on nomenclature of carbohydrates and a subject index.

This set is certainly the most comprehensive to date in the fields of carbohydrate chemistry and chemical biology. The strengths of this resource are in the range of topics covered, the well-organized and detailed presentations, and the selection of contributing authors, all of whom are experts in their fields.

The relevant organic chemistry in particular is made easily accessible to carbohydrate researchers who are not entirely familiar with this literature. Chemists may also use these books as a resource to grasp specific biological questions that remain to be answered. The usefulness of this set is further enhanced by the inclusion of a CD-ROM containing all three volumes. In addition to the PDF text files on the CD, the user may search a database that includes all structures and reactions described in the books. Unfortunately, a limitation for many interested scientists will be the cost, which is decidedly too pricey for most budgets except those of libraries. Overall, the set will be a useful reference for seasoned veterans as well as novices in carbohydrate research.

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