Book Reviews *

Bioorganic Chemistry of Biological Signal Transduction. Topics in Current Chemistry. Volume 211. Edited by H. Waldmann (Max-Planck-Institut für Molekulare Physiologie, Universität Dortmund). Springer-Verlag: Berlin, Heidelberg, New York. 2001. x + 230 pp. $139.00. ISBN 3-540-67746-1.

This volume continues in the same vein as previous volumes in this excellent series, which, as its name implies, focuses on contemporary issues in organic chemistry. Under discussion are several fields of research in which chemists have made a major contribution to the study of signal transduction cascades. Although not a complete overview of the chemist's signal transduction domain, the topics presented here cover some of the major pharmaceutical targets that process cellular information. As such, it provides a glimpse into the important contributions that chemists can make to the study of biological systems and is certainly a good introduction for the uninitiated.

At the core of this volume are reviews of protein tyrosine kinase inhibitors and farnesyltransferase inhibitors, as well as descriptions of some SH2 domain antagonists. These topics are presented along with informative discussions of various biophysical techniques, which may not be generally familiar to chemists, and a mechanistic discussion of a phospholipase C. All the articles are well written and convey their ideas with clarity.

The book begins brightly with a sharp review by Alexander Levitzki, one of the pioneers in the field of tyrosine kinase inhibitors (Chapter 1). An interesting discussion by G. Müller on the targeting of SH2 domains by peptidomimetic compounds (Chapter 2) is followed by a useful review on the biophysical characterization of the Ras protein (Chapter 3). This article by Jurgen Kuhlmann and Christian Herrmann not only provides an overview of Ras and related proteins, it also presents a useful, if somewhat simple, overview of various biophysical techniques. This chapter would serve as good background material for any graduate course dealing with the study of protein−protein interactions. Herbert Waldmann and Michael Thutewohl provide a very readable account of Ras-farnesyltransferase inhibitors (Chapter 4), while Paul Hergenrother and Stephen Martin review the mechanism of a phospholipase C with clarity (Chapter 5). Finally, G. Dorman gives us an interesting account of the use of photoaffinity labeling to delineate the important protein−protein interactions within signal transduction pathways (Chapter 6).

On the whole, the book is extremely readable and provides timely introductions to various aspects of biological signal transduction chemistry. Furthermore, it makes a strong claim for the need of future volumes to include contributions from leading investigators who work in other fascinating areas of what is a fairly expansive subject. I highly recommend this book to all chemists working at the interface of chemistry and biology.

Kevin Dalby, *University of Texas at Austin*

JA004862B

10.1021/ja004862b

Organic Electrochemistry, Fourth Edition, Revised and Expanded. Edited by Henning Lund (Aarhus University) and Ole Hammerich (University of Copenhagen). Marcel Dekker: New York and Basel. 2001. x + 1394 pp. $275.00. ISBN 0-8247-0430-4.

This fourth and latest edition of the most respected reference work in organic electrochemistry is particularly strong in the synthetic aspects of the science. The book consists of 32 chapters, each written by an expert in the area, on a wide variety of topics ranging from theoretical principles and experimental design to the electrochemistry of the most common organic structural types. About one-third of the chapters (11 by my count) have hardly changed, if at all, from the previous 1991 edition, but most have undergone major revision and include many references to recent work. Four chapters on emerging new research areas have been included: the electrochemistry of C_{60} and related compounds, electroenzymatic synthesis, the electrosynthesis of bioactive materials, and electrochemical partial fluorination (the latter two replace chapters by other authors that touched on the same topics). Despite this new material, the book is physically smaller than the previous edition (1394 pages now vs 1550 previously). This has been accomplished by elimination of the author index and a few chapters, such as those on biomass, photoelectrochemistry, and electrochemical polymerization, as well as the use of a new format and a slightly more compact typeface that is more attractive and easier to read. All practitioners of organic electrochemistry will wish to acquire this latest edition of this classic reference. It is highly recommended to libraries at institutions where synthetic research is being conducted.

Albert J. Fry, *Wesleyan University*

JA015214A

10.1021/ja015214a

Stimuli-Responsive Water Soluble and Amphiphilic Polymers. Edited by Charles L. McCormick (University of Southern Mississippi). American Chemical Society: Washington, DC (Distributed by Oxford University Press). 2001. xii + 352 pp. $125.00. ISBN 0-8412-3725-5.

This book, derived from the presentations given at the symposium of the same name held in 1999 in New Orleans, features contributions from an international group of scientists on new developments in synthetic and analytical procedures and applications in water-soluble polymer research. A sampling of the topics covered include "Micellar Polymerization for the Design of Responsive Amphiphilic Polymers", "Controlled Polymerization of Acrylamides", and "Dilute Polymer Solutions in Extensional Flow through Porous Media".

JA0152714

10.1021/ja0152714

Green Chemical Syntheses and Processes. Edited by Paul T. Anastas (White House Office of Science), Lauren G. Heine (International Sustainable Development Foundation), and Tracy C. Williamson (U.S. Environmental Protection Agency). American Chemical Society: Washington, DC (Distributed by Oxford University Press). 2000. xii + 354 pp. $115.00. ISBN 0-8412-3678-X.

This book, which grew out of the presentations made at the Green Chemistry and Engineering Conference in Washington, DC, features the latest research from scientists and engineers of a variety of disciplines on green chemistry. The chapters are categorized under the following sections: Designing Safer Chemicals; Green Chemical Synthesis; Biocatalysis and Biosynthesis; Environmentally Benign Catalysis; and Green Solvent Systems. References as recent as 1999 are provided.

JA015263N

10.1021/ja015263n

Wood and Cellulosic Chemistry. Second Edition, Revised and Expanded. Edited by David N.-S. Hon (Clemson University) and Nubuo Shiraishi (Kyoto University). Marcel Dekker: New York and Basel. 2001. vii + 914 pp. $250.00. ISBN 0-8247-0024-4.

This book represents the second concerted effort of 26 individuals (including the editors) to cover the diverse field of wood and cellulosic chemistry. The first edition established this book as a classic in the field, and this edition, which is an extensively revised and updated version of its predecessor, continues that tradition.

Logically, the book begins with a chapter on the ultrastructure and formation of the wood cell wall, documenting early research efforts with extensive accounts of recent developments. The strength of this chapter is the extensive compilation of photomicrographs, which nicely demonstrate a myriad of features, and the accumulated findings of

*Unsigned book reviews are by the Book Review Editor.

generations of wood scientists. In this respect, the availability of color or glossy photographs would contribute tremendously to the clarity of the material, but possibly would make the book prohibitively expensive.

The chemical composition of wood and the structure of cellulose are then described in the ensuing two chapters, resting mainly on the expertise of the individual authors. The chapter on the structure of cellulose, for example, describing the latest efforts toward its characterization, reviews the work of the author's group over the past decade.

The chemistry of lignin is described in the next chapter, which occupies 64 pages. This is, however, a somewhat disappointing contribution since the material is seriously lacking in new developments and a modern understanding of this intricate biopolymer. It is unfortunate that no reference is made to the current state of our knowledge of the various biosynthetic possibilities for lignin formation, as exemplified in the work of Lewis and Sarkanen and refuted in the work of Ralph. Furthermore, the elegant work of G. Brunow's team in discovering the new dibenzodioxocin bonding patterns in lignin is seriously overlooked. To the defense of the authors, one must admit that the title presents a rather formidable task, since the topic could easily be (and has been) the subject of voluminous books.

The chemistry of the various cell wall polysaccharides is then described, followed by chapters on the chemistry of extractives and bark. These three chapters provide an excellent summary of all pertinent concepts in such an intricate compilation of components and provide an abundance of literature citations that may be an excellent point of embarkation to the novice as well as the seasoned practitioner.

The next chapter, which is an excellent, extensive, and thorough contribution, explores the techniques and the concepts for chemically characterizing wood and its components. In it the authors offer a glimpse of the delicate balance that exists between old established methodologies and novel modern approaches resting on advances in instrumentation.

The color, discoloration, and weathering of wood are also described in two chapters that are highly informative and rich in technical details. Once again, however, the need to reproduce clear, high-quality, glossy photographs in scientific books is apparent in this chapter. Although the textual effort of the authors in disseminating the information is superb, the quality of the pictures does it no justice. An additional point that deserves mentioning here is the lack of citations and awareness of the "ketyl" pathway that represents the current state of our knowledge in relation to the mechanism of the photoyellowing process.

Chapter 12 is a brief overview of the concepts of lignin biodegradation research with a focus on microbial enzymatic and biomimetic efforts, and Chapters 13 and 14 offer two accounts on the technology and chemistry surrounding the chemical modification of wood and cellulose. The book continues with an account of the chemical synthesis of cellulose written by Dr. Nakatsubo, who has pioneered the reaction schemes involved.

Beyond this point, the book offers a series of highly informative and technologically rich, specialized chapters on wood plasticization, wood polymer composites (including inorganic composites), adhesion, and adhesives and, of course, chapters dealing with wood preservation chemistry and technology. Most of these chapters contain a wealth of highly specific, scientific, engineering and sometimes empirical information that is compiled for the benefit of the practitioner. In several chapters, one finds a welcome collection of tables citing and correlating trade names to chemical names and structures.

The issues of environmental sustainability are then addressed as the subjects of biodegradable plastics from lignocellulosics and recycling of wood and fiber products are considered. These chapters are also highly specialized and rich in consideration of the engineering issues associated with these subjects.

The closing chapter of the book, on pulping chemistry, attempts to introduce the reader to the pulp and paper industry's use of wood. This objective is accomplished well, despite the fact that the account is somewhat limited, describing mainly the research efforts of Scandinavian teams with emphasis on the author's own work.

Overall, this is a useful handbook that covers practically all aspects of a rather diverse field. Because of its vast scope, it should be of interest to a wide audience.

Dimitris S. Argyropoulos, *Department of Chemistry McGill University*

JA015237P

10.1021/ja015237p

Enzymes in Nonaqueous Solvents: Methods and Protocols. Edited by Evgeny N. Vulfson (Institute of Food Research, Norwich, UK), Peter J. Halling (University of Strathclyde, Glasgow, UK), and Herbert L. Holland (Brock University, St. Catharines, Ontario, Canada). Humana Press: Totowa, NJ. 2001. xx + 680 pp. $139.50. ISBN 0-89603-929-3.

This handbook provides detailed descriptions of a variety of methods used for performing enzymatic reactions in nonaqueous media. As is characteristic of the Methods in Biotechnology series, the chapters provide step-by-step instructions for a particular method, a list of materials, and a notes section that provides additional details about the methods used and troubleshooting tips. Each chapter also ends with an extensive list of references. The topics are organized under the following three sections: Control of Enzyme Activitiy in Nonaqueous Solvents; Synthetic Applications; and Reaction Systems and Bioreactor Design.

JA015279D

10.1021/ja015279d

Agrochemical Discovery: Insect, Weed, and Fungal Control. Edited by Don R. Baker (Berkeley Discovery) and Noriharu Ken Umetsu (Otsuka Chemical Co.). American Chemical Society: Washington, DC (Distributed by Oxford University Press). 2001. x + 318 pp. $135.00. ISBN 0-8412-3724-7.

This book, derived from the 2nd Pan-Pacific Conference on Pesticide Science held in October 1999 in Honolulu, addresses some of the latest developments in the field of crop protection, ranging from the use of natural products as crop control agents to the application of combinatorial chemistry to identify compounds that may be used to replace substances to which pests have developed resistance. The 24 chapters are organized under following headings: Synthesis and Chemistry; Natural Products; Agricultural Biotechnology; Combinatorial Chemistry; and Mode of Action Studies.

JA0152761

10.1021/ja0152761

Interfacial Properties on the Submicrometer Scale. Edited by Jane Frommer (IBM Research Division) and Rene M. Overney (University of Washington). American Chemical Society: Washington, DC (Distributed by Oxford University Press). 2001. xii + 344 pp. $130.00. ISBN 0-8412-3691-7.

This book, the Volume 781 in the ACS Symposium Series, contains 19 chapters written on the general topic of interfacial properties at the submicrometer level. The authors are researchers having diverse backgrounds in chemistry, physics, biology, and materials and surfaces sciences. The topics are organized under the following headings: Kinetics of Constrained Systems; Finite Size Systems; Dissipation at Interfaces; Nanomechanical Properties; and Surfaces and Coatings. References as recent as 2000 are provided.

JA015268K

10.1021/ja015268k

Statistical Methods in Analytical Chemistry. 2nd Edition. By Peter C. Meier (Cilag A.G.) and Richard F. Zünd (Teranol A.G.). Wiley-Interscience: New York. 2000. xxvi + 424 pp. $99.95. ISBN 0-471-29363-6

Most chemists' exposure to data analysis techniques is limited to basic descriptive statistics as used in classical and instrumental laboratory courses. When the opportunity comes for full analysis of a set of chemical data with modern statistical tools, those with the traditional preparation often find the cognitive and calculational leaps required to perform statistical analyses beyond them. The new edition of Meier and Zünd's book bridges this considerable gap concisely and elegantly.

The book is organized into four chapters and an appendix. The first chapter details basic descriptive statistics of univariate data and statistical tests useful in evaluating quality parameters. Starting from the basics, the authors go into distributions, descriptive statistics, and confidence intervals and then into testing of hypotheses. While this

same sequence of topics is present in almost all books on introductory statistics, few statistics textbooks take the approach selected here: the methods are introduced and linked by an appeal to logic rather than mathematics and theory. The usual mathematics is not neglected, but the formulas are placed in the background and given emphasis only to aid the understanding of the logic behind the application of the formula for resolution of the questions central to the data analysis. The second chapter extends the coverage to bivariate data. Here, a good introduction to ANOVA and regression methods is presented with an emphasis on the use of regression diagnostics for calibrations, evaluation of limit of detection, and a range of other applications seldom covered in introductory statistical texts. The 38-page third chapter is less focused than the others, but here again, the topics go well beyond those found in introductory statistics. In addition to very brief coverage of GMP protocols and analytical figures of merit, the authors provide brief summaries of data optimization by factorial design and simplex optimization, simulation and Monte Carlo techniques for testing "What if" questions, and noise filtering, error propagation, and round-off artifacts. Fortunately, these brief introductions are accompanied by a number of references to chemical literature, so the beginner can take a study one step farther if desired.

The fourth chapter is the heart of this book. Here, the authors distill their 30-plus years of experience with statistical data analysis and quality assurance in the chemical industry into 65 examples that illustrate the material presented in the first three chapters by showing real-world applications. Their distillation is done with great focus on their goals of teaching the principles of data analysis and with a surprising amount of wry humor. Many of the examples are accompanied by the original data sets, so those with an interest can try to duplicate the analyses set forth in summary fashion in the book. This chapter is much improved from the first edition of the book; it is clear that the authors have learned a great deal from their time as quality analysts and have put what they learned into the book for others' benefit.

The Second Edition has expanded on the instruction in basic statistics and significantly increased the number and the treatment of the example "case studies", but it is in the software that many of the changes have been made. The software for the new edition is available directly from John Wiley, at a web site indicated in the text. Some of the data are provided in the form of Excel97 data sheets. A full description of the software is provided in the 70-page Appendix.

The book provides a very intensive introduction to basic data analysis commonly used in the chemical industry today. This is not a book that can easily be skimmed; indeed the authors have made a conscious effort to provide a large amount of information in as small a space as possible. The authors often refer to later material in their discussions, something avoided in elementary statistics books, but often at the cost of a loss of clarity. Because of the presentation, readers will benefit from reading the book twice, then doing a set of the problems from Chapter Four. This is also not the book for instruction in more advanced methods involving multivariate data analysis of chemical data sets. The authors' approach is decidedly classical; even the multivariate visualization steers well clear of principal components analysis visualization methods routine in the simplest chemometrics methods in use today. However, this book provides the material and the training to bridge the gap between exposure to statistics and actual use of statistics on chemical data and offers a good foundation for instruction in more advanced subjects. Its clarity, focus and logical approach to statistical analysis of chemical data make it a book that should appear on the bookshelf of most analytical chemists.

Steven D. Brown, *University of Delaware*

JA015227O

10.1021/ja015227o

Biocatalysis. Edited by H. Griengl (Technical University of Graz). Springer-Verlag: Wein, New York. 2000. viii + 180 pp. $119.00. ISBN 3-211-83527-X.

The first half of this short monograph consists of four "invited" and useful reviews on the somewhat random topics of modeling of enzyme properties in organic solvents, lipase-catalyzed synthesis of carboxylic amides, chemoenzymatic synthesis of lipidated peptides, and chemoenzymatic transformations in nucleoside chemistry. The remainder of the book is a truly miscellaneous collection of 10 articles (with experimental details) involving biocatalysis. The book is a reprint of *Monatshefte für Chemie*, Vol. 131, No. 6 (2000), offered in hard-cover format by the publisher at the cost of $0.66 per page.

Carl R. Johnson, *Wayne State University*

JA015232S

10.1021/ja015232s

Fluorinated Surfactants and Repellents: Second Edition, Revised and Expanded. Surfactant Science Series. Volume 97. By Erik Kissa (Consultant, Wilmington, DE). Marcel Dekker: New York. 2001. xiv + 616 pp. $195.00. ISBN 0-8247-0472-X.

Volume 97 of the Surfactant Science Series focuses on fluorinated surfactants and repellent coatings. The author, who also wrote the first edition of this book, is obviously well-versed in the subject and up-to-date on research in the area of fluorinated surfactants and repellent coatings.

Where the author appears to fall short is in the revamping of the text (Chapters 1−10) from the first edition. The author indicates in the preface that "a substantial amount of new material has been added" to these chapters. There are 32 additional pages added to this portion of the text and more than 350 additional references. Unfortunately, many of these additional references actually predate the first edition. Several references are repeated in multiple chapters, as is a restatement of the results to fit into the topic of that particular chapter. However, some recent information has been added: for example, the multiple references to 3M Company's announcement (May 2000) to phase out perfluorooctanyl chemistry used to produce certain repellents and surfactant products.

The first 10 chapters are useful and informative. Much of the new information updates the reader on fluorinated and fluorinated/hydrocarbon hybrid surfactants in solution (Chapter 6), micelles and mesophases (Chapter 7), and the analysis of fluorinated surfactants (Chapter 9), which are the more pertinent chapters in this section of the book. In Chapter 8 (Applications), the author retains sections on the use of fluorochemical repellent coatings, even though the newly added Chapters 11−14 cover this subject in depth. The author has done a commendable job of making the surfactant chapters more coherent and for augmenting sections on, for instance, the synthesis of fluorinated surfactants and surface tension theory.

The final four chapters covering repellency are new and cover the topic in depth. The author has done an excellent job providing information on the history and physical aspects of repellency, as well as providing "real life" examples of the chemistry used by both DuPont and 3M Company. However, since much of this information is proprietary, a majority of the references are dated earlier than 1990. Only about one-quarter of the references in these four chapters are newer than 1990, and many of these are either patents or test methods.

Finally, there are numerous misspellings (some remaining from the first edition). Also present are some intriguing statements, such as "In general, soils are colored or colorless." (p 557) and "...(3M) has phased out...Zonyl surfactants" (p 466).

In summary, the author has done an outstanding job of assembling this information into one reference, and the monograph is more exhaustive than the previous edition. The volume will serve as a good reference to those not familiar with fluorinated surfactants and repellent coatings.

Jimmie R. Baran, Jr., *3M Company*

JA015260A

10.1021/ja015260a

Organoboranes for Syntheses. Edited by P. V. Ramachandran and Herbert C. Brown (Purdue University). American Chemical Society (Distributed by Oxford University Press): Washington, DC. 2001. x +254 pp. $115.00. ISBN 0-8412-3708-5.

This book, derived from the symposium "Inorganic and Organic Syntheses via Boranes" held in New Orleans in 1999, covers the state-of-the-art in organoborane synthesis at that time. The 16 chapters are organized under the following subject areas: Stoichiometric Methods; Catalytic Methods; and Asymmetric Methods and Synthesis.

JA015274G

10.1021/ja015274g