Additions and Corrections

Physical Properties of Polymers Handbook, CD-ROM [*J. Am. Chem. Soc.* **1997**, *119*, 4096]. EDITED BY JAMES E. MARK (UNIVERSITY OF CINCINNATI), AMERICAN INSTITUTE OF PHYSICS PRESS: WOODBURY, NY. 1996. ISBN 1-56396-598-4. REVIEWED BY PATTY WISIAN-NEILSON.

The price should be $150.00.

JA975420B

S0002-7863(97)05420-6

Enzyme Catalysis in Organic Synthesis: A Comprehensive Handbook: Vol. 1 [*J. Am. Chem. Soc.* **1996**, *118*, 11340]. EDITED BY K. DRAUZ (R&D PHARMACEUTICALS/INTERMEDIATES, GERMANY) AND H. WALDMANN (UNIVERSITAT KARLSRUHE, GERMANY). VCH: NEW YORK. 1995. XXV + 504 PP. DM 498.00. ISBN 3-527-28479-6. REVIEWED BY SUSAN M. MILLER.

The price of DM498.00 is for Volumes 1 and 2 together.

JA975419C

S0002-7863(97)05419-X

Physical Properties of Polymers Handbook [*J. Am. Chem. Soc.* **1997**, *119*, 4096]. EDITED BY JAMES E. MARK (UNIVERSITY OF CINCINNATI), AMERICAN INSTITUTE OF PHYSICS PRESS: WOODBURY, NY. 1996. XV + 723 PP. ISBN 1-56396-295-0. REVIEWED BY PATTY WISIAN-NEILSON

The price should be $120.00.

JA975418K

S0002-7863(97)05418-8

Synthesis of Prostaglandin E_2 Methyl Ester on a Soluble-Polymer Support for the Construction of Prostanoid Libraries [*J. Am. Chem. Soc.* **1997**, *119*, 8724−8725]. SHAOQING CHEN AND KIM D. JANDA*

After author review and during the final printing process, Figure 2 (see below) was partially deleted from the published page. The paper, including a correct Figure 2, can be downloaded from the internet using http://pubs.acs.org/journals/jacset/index.html.

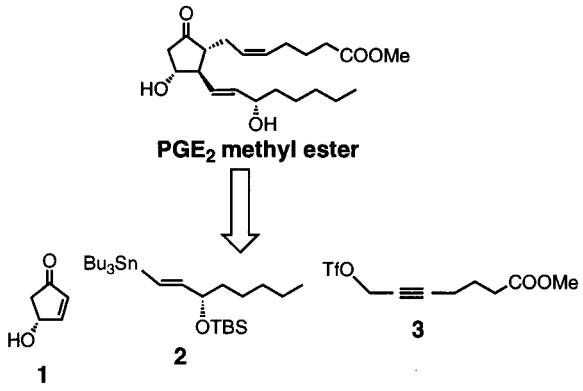

Figure 2. Chemical building blocks used in the construction of PGE_2 methyl ester.

JA975424G

S0002-7863(97)05424-3

Computer Software Reviews

The Mathematica Book, Third Edition. By Stephen Wolfram. Cambridge University Press: New York, 1996. 1395 pp. $59.95. ISBN 0-521-58889-8.

Mathematica, Third Edition, the book accompanies Mathematica 3.0, the program. The software is by far the most powerful and far reaching of the several advanced mathematical methods programs in use today. Mathematica's web pages (http://www.wolfram.com) detail the contents of the book, while giving numerous examples of specific applications of the software and an overview of the user base. This incredibly versatile program combines an enormous algebraic capability with vast libraries of routines that serve functions in calculus, graphics, discrete and numerical mathematics, number theory, and statistics. It offers a computing environment that integrates multistep programming and calls to complex functions with sophisticated graphical output. Improvements in version 3.0 enhance the ability of the software to perform algebraic and trigonometric operations, to manipulate numbers and symbols, evaluate integrals, and execute complex programs. Mathematica-based solutions are now commonplace in the scientific literature. Mathematica courses can be found on college campuses, and faculty increasingly use Mathematica in their teaching. However, in addition to its reputation for power and versatility, Mathematica is perceived by many as difficult to master. User-interface changes in version 3.0 confront these perceived difficulties with point-and-click pallets and traditional-form entry and display of equations.

An important strength of Mathematica is its broad range of applicability. For some kinds of problems, one can implement a Mathematica solution as simply as typing an equation and hitting "enter". Thus, by mastering only a few straightforward commands, one can factor an algebraic equation, solve for roots, diagonalize a matrix, evaluate an integral, or plot an equation. For other tasks, which might require branched multistep processes with textual, notebook, or even web page presentation, users will need a deeper understanding of the program. Such users will turn first to Mathematica, 3rd ed. This review focuses on how well the book serves the needs of that community.

Individuals who come to Mathematica with specific problems will develop a command of the program as they devise solutions. These users will skip through the book to study the sections they need. The overall structure and organization of the text will not be of primary concern as long as it is adequately indexed and cross referenced. In this respect Mathematica 3.0 is an exceedingly complete reference text. It features more than 1300 pages of functions and examples, with an index that is more than 80 pages long.

Other users will wish to study the capabilities of the program more broadly to learn the software in advance of application. For such readers, the pedagogical organization of the book is much more important. To systematically build a general store of useful knowledge about a program with so many dimensions presents a significant challenge. The book-as-tutorial approaches this task in three parts preceded by a Tour. The Tour, which can be found in its entirety on the web, gives a graphical overview of the program's functions and capabilities. Part 1 of the text serves as a basic introduction. It provides practical information on the conventions of Mathematica and instructions on how to interactively solve numerical and algebraic problems, and to display the results. Like the Tour, Part 1 builds a sense of the possible. The intended pedagogy is clear in the deliberate way later examples make use of, and thereby reinforce, symbols and operations introduced in earlier sections. Part 2, which spans more than half of the text, describes the process by which Mathematica structures calculations. All of the working objects that Mathematica uses,

formulas, lists graphics, notebooks, etc., are represented internally as expressions. As expressions, these objects universally conform with a set of conventions that define their application. Applied to functions, the rules that govern expressions provide the core of a compact, powerful programming language, in which pattern and transformation rules govern the flow of information. Though best approached with a specific problem in mind, and perhaps with the accompaniment of one of the many specialized Mathematica books available that detail programs for various classes of problems, the presentation in Part 2 is extremely readable and provides sufficient detail and depth to lead the reader to mastery. Part 3 focuses on specific concepts from basic to advanced in the mathematics of numbers and functions, in the workings of algebra and calculus, and the manipulation of series. Command of the material in Part 2 will enable the reader to program basic tasks in the rule-based functional language of Mathematica. Extending this command to Part 3, the reader will be prepared to apply these programs to an important array of advanced mathematical problems.

Edward R. Grant, *Purdue University*

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Book Reviews

Surface Activity of Proteins. Chemical and Physicochemical Modifications. Edited by Shlomo Magdassi (The Hebrew University of Jerusalem). Dekker: New York, 1996. viii + 327 pp. $150.00. ISBN 0-8247-9532-6.

Purified proteins, protein preparations, or chemically modified proteins are widely used in the preparation of cosmetics, foods, and medical diagnostic products. The quality of these products may depend strongly on the behavior of the protein additives, especially with regard to the mostly noncovalent interactions of protein surfaces with their local molecular environments. This book describes theories of protein−environment interactions and practical aspects of protein chemical modifications that affect surface interactions.

The book is composed of nine review articles describing various aspects of protein surface activity: 1. Introduction: Surface Activity and Functional Properties of Proteins (Shlomo Magdassi and Alexander Kamyshny); 2. Enhanced Hydrophobicity: Formation and Properties of Surface-Active Proteins (Shlomo Magdassi and Ofer Toledano); 3. Increased Anionic Charge: Conformational and Functional Properties (K. D. Schwenke); 4. Deamidation and Phosphorylation for Food Protein Modification (Frederick F. Shih); 5. Preparation and Functional Properties of Protein-Polysaccharide Conjugates (Akio Kato); 6. Enzymatic Modification as a Tool for Alteration of Safety and Quality of Food Proteins (Gyöngyi Hajós); 7. Denaturation of Globular Proteins in Relation to Their Functional Properties (Jacques Lefebvre and Perla Relkin); 8. Protein-Surfactant Interactions (Malcolm N. Jones); and 9. Factors Affecting Applications of Native and Modified Proteins in Food Products (M. E. Mangino and W. James Harper).

These articles attempt with varying success to provide overviews of their respective topics, rather than concentrate on research emanating from the authors' own labs. The authors are recognized authorities in their areas, having in several cases published reviews on similar topics in ACS Symposium Series or elsewhere. The articles are well documented: about 1150 bibliographic citations through 1994 are provided. Charts and graphs are mostly reproduced from the literature, with quality varying according to the source. A brief subject index (4.5 pages) is included.

For this chemistry-oriented reader, the book's highlights were the chapters on protein−surfactant interactions and protein denaturation. Malcolm N. Jones's essay clearly presents the basic physical chemistry and quantitative aspects of protein−surfactant interactions and includes a lucid discussion of the use and limitations of Scatchard plots in the context of sodium dodecyl sulfate binding to proteins. Too often the subject of protein−surfactant interactions is treated incorrectly or is completely missing from modern biochemistry texts, although such interactions form the basis of many biochemical analyses. Another satisfying article, though not as quantitative as the one by Jones, was the review of protein denaturation by Jaques Lefebvre and Perla Relkin. The thermodynamics and kinetics of unfolding, experimental techniques including differential scanning calorimetry, and the theoretical and practical complications arising from the microheterogeneity of partially denatured proteins are discussed in a brief, but well-documented and illustrated, fashion. These portions of the book are presented at the level of advanced undergraduates or beginning graduate students and could be used to augment advanced biochemistry courses.

Chemical modification of proteins is commonly viewed as a way to find out more about the structure and function of native proteins. Several chapters in this book emphasize the more practical goal of such modifications, namely the conversion of native proteins into larger molecules that have enhanced thermal stability, low- or no-toxicity, and agreeable surface properties. Covalently modified proteins can be important additives to food, cosmetics, and other commercial products. K. D. Schwenke describes how succinylation and other acylations that introduce extra negative charge can affect the physical properties of proteins and includes a discussion of foaming and its relation to protein structure. The chapter by Shlomo Magdassi and Ofer Toledano describes various methods of attaching long-chain fatty acyl groups to proteins and the macromolecular results therefrom. Akio Kato describes chemical and biological approaches to attaching polysaccharides such as dextran and galactomannan to proteins. Some of the glycoproteins resulting from such reactions have much enhanced thermal stability and emulsifying properties compared to the underivatized proteins.

Multiauthored books almost inevitably vary from one chapter to another in the quality and style of writing. In a large book, such variations would perhaps go unnoticed, but in this rather small book, they are more noticeable. In addition, misspelled words and unclear figures crop up in several places.

This book would be a reasonable addition to a chemistry or biochemistry library because of its coverage of subjects that may be missing from the usual biochemistry journals and texts. The wide range of subjects is revealed by the many literature citations to journals in the areas of food science, agricultural chemistry, and colloid and surface chemistry. On the other hand, given its shortness, uneven quality, and high price, I cannot recommend this book for an individual library.

John W. Keller, *University of Alaska, Fairbanks*

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S0002-7863(96)05774-5

Principles of Polymer Systems. By Ferdinand Rodriguez (Cornell University). Taylor and Francis: Washington, DC, 1996. xiv + 732 pp. ISBN 1-56032-325-6.

This is the fourth edition of a fine textbook on polymers for chemical engineering students. Its considerable strengths remain as great as ever, and it will continue to be an excellent way to learn what polymeric compounds are and how they are synthesized and produced, processed, fabricated, and used. It achieves its objective of providing polymer chemistry, process engineering, and property measurement for engineering students in an extensive and practical way.

While the fourth edition is not dramatically different from the third, particularly in production values and some aspects of referencing, it has an extensive new chapter on Recycling and Resource Recovery and several other updates and additions in such key areas as metallocene-based polyolefin catalysts. The main drawback of all texts is that they can't be all things to all audiences. This is not an exception, since some will hope for more chemical detail, more on the analysis and molecular characterization of polymers, and, especially, more on the morphology of polymers.

Overall, this is an excellent text.

William M. Risen, Jr., *Brown University*

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