NEW BOOKS

J. F. GERECHT, BOOK REVIEW EDITOR

Advances in Lipid Research, Vol. 13, Edited by R. Paoletti and D. Kritchevsky (Academic Press, New York, NY, 1975, 288 pages, $27.50).

This volume contains chapters on "Lipoprotein Metabolism," by S. Eisenberg and R.I. Levy; "Diabetes and Lipid Metabolism in Nonhuman Primates," C.F. Howard, Jr.; "Biliary Lipids and Cholesterol Gallstone Formation," O.W. Portman, T. Osciga, and N. Tunaka; and "The Composition and Biosynthesis of Milk Fat," S. Smith and S. Abraham. All of the chapters are excellent and timely, but I found the one on lipoproteins to be most useful because it nicely reviews this complex and rapidly expanding area. The chapter also contains a valuable discussion of lipoprotein lipases. In the chapter by Howard, the use of several species of monkeys in the study of diabetes, which is still a devastating disease of humans, is described in detail. Gallstone formation in both man and other animals is discussed by Portman et al. This chapter contains many excellent and sometimes startling photographs of gallstones. The chapter by Smith and Abraham concentrates on the biosynthesis of milk fat, another complex and burgeoning area. All who are interested in lipid biochemistry and lipids as related to disease should read this volume.

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Antioxidants: Syntheses and Applications, J.C. Johnson (Noyes Data Corporation, Park Ridge, NJ, 1975, 320 pages, $36.00).

The title of this book is a misnomer and is misleading to potential readers, as the volume is basically a compendium of patents issued on antioxidant in recent years, beginning in 1972.

The book is composed primarily of two sections (though not stated as such): chemical type and use. Under chemical type are listed "Phenolic," "Sulfur-Containing Phenolic," "Nitrogen-Containing Phenolic," "Amine and Imine," "Triazine and Cyanurate," "Phosphorus-Containing," and others. For use categories, sections are entitled "Antioxidants for Synthetic Lubricants and Functional Fluids," "Antioxidants for Elastomers," "Antioxidants for Other Polymers," and "Antioxidants for Foods."

For the purpose of relevance, my further comments are confined to applicability in the food industry. The section on food is composed of 15 pages and has two main shortcomings: 1) incorrect information, and 2) too limited a scope of coverage. Regarding the incorrect information, there are two main errors in the statement on page 294 which reads: "The most frequently employed antioxidants for fats and vitamin A are tocopherols such as x- and y-tocopherol and related compounds such as x-tocopheramine, N-methyl-y-tocopheramine, BHA, BHT, NDGA, gallates, especially those esters of gallic acid with alcohols having at least 3 carbons, for example, propyl gallate, octyl gallate, decyl gallate, dodecyl gallate, and 6-ethoxy-2,2,4-trimethyl-1,2-dihydroquinoline, as well as mixtures thereof." First, the most frequently employed antioxidants are BHA, BHT, propyl gallate, TBHQ—not NDGA, octyl gallate, decyl gallate, and dodecyl gallate, which are not even FDA approved for food use in the U.S. Second, utilization of the antioxidants discussed in the two fields which use the vast majority of antioxidants, namely, vegetable oils and animal fats, is not covered.

Perhaps this book has value to other fields of endeavor, but I see absolutely no value for members of AOCS.

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Benzene and Its Industrial Derivatives, Edited by E.G. Hancock (Halstead Press, a Division of John Wiley & Sons, Inc., New York, NY, 597 pages, 1975, $72.50).

This book serves as an excellent reference guide on benzene and as a good starting point for anything you will ever need to know about this basic chemical building block.

Like its predecessors on acetylene, ethylene, and propylene, the book is a well-organized series of chapters, each prepared by one or more of 25 contributors individually considered a leader in his field expertise. Many of the authors are Europeans, although the U.S. industry is well represented.

Chapter I begins with the history of benzene and advances to the early 1970s. Subsequent chapters cover first the sources of benzene supply—coal and petroleum (including pyrolysis gasoline from olefin-steam crackers)—followed by chapters on properties, analysis, and handling. Finally, a chapter is devoted to each of the benzene derivatives that ultimately flow into the world economy.

The chapter organization, references, and subject index lend themselves to establishing this book as a "dictionary on benzene." It is chock full of useful charts, flow diagrams for readily available processes, and formula and physical property information most useful in initial screening for specific benzene or benzene-related projects. The listed references are useful in following up a specific area.

The shortcomings of this book are related to the time involved in compiling works of this magnitude, involving 25 contributors and considerable detail. As noted in the references, some of the work can be considered not entirely up to date, incorporating few references beyond 1972. Further, the rapid escalations in crude and other energy values that resulted from the Arab oil embargo are not properly reflected, as discussed by the editor in the Preface. Finally, no apparent distinction in relative importance is made between the different sources of supply or the individual derivatives.

All in all, this book contains more information on benzene than one would need to know at any one time.

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Chemical Infrared Fourier Transform Spectroscopy, Peter F. Griffiths (John Wiley & Sons, New York, NY, 1975, 340 pages, $24.95).

To this reviewer's knowledge, this is the first book dedicated to the burgeoning field of chemical applications of Fourier transform spectroscopy. The author became involved with the chemical applications of FTS early in its development into the highly usable form it has reached

today. He has grown with the field, and through this text has communicated his in-depth knowledge of FTS. The book is done very well and should be considered a first reference by anyone working in FTS, or anyone seriously interested in present developments in infrared Fourier transform spectroscopic instrumentation. Not only is the text itself useful, but the extensive use of references for each chapter certainly improves the usefulness of the text.

The book is divided into two large sections, the first dealing with theory and instrumentation, which occupies about two-thirds of the book, and the second with applications. In Part A, the reader is introduced to the Michelson interferometer, the reasons for the sudden growth in FTS, the problems of sampling the interferogram, and the types of data systems which might be used. Where applicable, a worthwhile consideration of the sources of errors is presented. In addition, the rules for operating a Fourier transform spectrometer are considered in detail. Finally, within the last chapter of this part an interesting comparison between interferometers and grating spectrometers is given. The author quite clearly draws the conclusion that the speed of data acquisition obtained from the multiplex advantage significantly favors the interferometer. However, he also notes that this advantage is reduced, and sometimes lost, during the production of a hard copy of the spectrum.

In part B, applications in the far- and mid-infrared are presented which in most cases are associated with molecular spectroscopy applications, many of which had been done previously with dispersive instruments. However, some attention is given to studies which require the speed or multiplex advantages, or both of the modern Fourier transform instruments. Such applications include the spectroscopy of transient species, GC-IR, emission spectroscopy, and time-resolved emission spectroscopy. The final chapter on the future of FTS allows the author to do a little stargazing, but with his knowledge of the field he is not only entitled to his predictions but almost obligated to make them.

If there is a significant failing in the book, it lies in the apparent carelessness with which some of the figures have been handled. The meaning of RT.I in Figure 4.10 is not clear. In Figure 4.2C, the mirror referred to as A in the text is labeled C in the figure, Figure 5.2 has the Golay detector labeled as G while the caption notes it as D; and the labels of curves b and c in Figure 12.7 are inverted. These are indeed unfortunate errors since they will cause some readers appreciable difficulty.

One other note of criticism must be made, and that refers to the use of extrapolated sensitivities in the discussion on page 283. In this reviewer's experience, the use of extrapolated sensitivities, no matter how well considered in terms of assumptions, inevitably leads to significant errors in specifying limits of detection, a calculation which is all too often performed.

In spite of these latter considerations, which note minor errors or differences of opinion, the book is well worth the cost. It is highly recommended.

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Lipid Biochemistry: An Introduction, 2nd Edition, M.I. Gurr and A.T. James (Halsted Press, Division of John Wiley & Sons, Inc., New York, NY, Department LS, 1975, 244 pages, $19.50 cloth, $10.00 paper).

In this book are chapters entitled "Lipids: What They Are and How the Biochemist Deals with Them," "Fatty Acids," "Neutral Lipids," "Phospholipids," "Glycolipids and Sulpholipids," "Lipids as Components of Macromolecules," and "Lipids in Foods." In my opinion, it provides the best general overview of lipids that is presently available. I used the first edition as a text for a graduate course in lipids, and it was well received by the students. Many of the sections in the second edition have been rewritten, and the chapter on lipids in foods is new. As an illustration of the author's style, one of the paragraphs in the section on analytical techniques is entitled "First catch your lipid," and this approach is continued throughout. The book will be useful not only to students and their professors, but also to biochemists, nutritionists, engineers, medical scientists, and all others who need a convenient source of information on the biochemistry of lipids.

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The Milk Fat Globule: Emulsion Science as Applied to Milk Products and Comparable Foods, H. Mulder and P. Waldstra (ISBS, Inc., 10300 S.W. Allen Blvd., Beaverton, OR, 97005, 1975, 296 pages, $18.00).

Books dealing with both the scientific and applied aspects of emulsions in milk products and related foods are almost nonexistent, but Drs. Mulder and Waldstra, of the Department of Food Science, Agricultural University, Wageningen, The Netherlands, have remedied the need with this book. The book contains chapters on the chemistry and physics of milk fat, the fat globule membrane, the milk fat emulsion, and emulsions in other dairy products, including butter. Each chapter has a list of references. The authors have proceeded when possible from theory in physical chemistry and colloid science toward a basic understanding of fundamentals in food processing, and they have succeeded admirably. All who study, prepare, or disrupt food emulsions will profit from reading and contemplating this book.

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Statistical Methods for Engineers and Scientists, R.M. Bethea, B.S. Duran, and T.L. Boullion (Marcel Dekker, Inc., New York, NY, 1975, 608 pages, $25.50).

This book is intended as a basic introductory text in applied statistical techniques for undergraduate students. It is an ambitious attempt to cover a wide range of subject matter, from an initial chapter on probability theory to a final chapter on experimental design. However, the constraint of a single volume limits the amount of detail and discussion available for easy reading and understanding. The book is more suited to classroom use where an instructor is available to aid comprehension than it is to a home-study program for an individual seeking an introductory knowledge. In places, the authors' interpretations and conclusions are either misleading or insufficiently explained.

The numerous examples of statistical applications to a variety of industrial problems are a good feature of this book, along with the problems given at the end of each chapter. One appendix provides solutions for many of these problems, while another includes the required statistical tables.

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