
Publications

Food Additives, by R.J. Taylor (John Wiley & Sons, Chichester, U.K., 126 pp., 1980, \$30).

This rather short text "has been prepared to provide an objective assessment of current practice in the use of food additives." The author begins the book with two short chapters developing the historical basis for the need for food additives. Then, each of the classes of food additives is briefly summarized. Included in this section are chemical structures of selected additives, some explanation of their need and uses in food systems, and their safety. The final chapters discuss legislative processes utilized in America, Britain and other countries; the activities of the FAO/WHO in development of guidelines for world use; and methods utilized for testing safety of food additives. The appendix includes a section of risks of natural foods and one on major food additive compilation publications. Although uneven in its coverage, the text is accurate and informative.

This is an interesting book and would be of interest to scientists peripheral to the food industry who desire a short monograph discussing the philosophy, chemistry and safety of food additives. It is not recommended for a non-chemist because knowledge of organic chemistry is needed to understand the text. Nor is it recommended for the working food chemist as it does not contain the necessary depth. It should also be pointed out that this book is written largely from the perspective of the British food industry.

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Practical Liquid Chromatography—An Introduction, by R.S. Yost, L.S. Ettre and R.D. Conlon (Perkin-Elmer Corp. Chromatography Division, Main Ave., Norwalk, CT 06856, Sept. 1980, 255 pp., paperback).

Equipment companies frequently publish or distribute notices describing the availability of free technical literature. In this day and age of escalating book prices, it comes as quite a shock to find that such giveaways can include a 250-page paperback. This book is, as the title proclaims, a relative elementary text and occasional references to Perkin-Elmer products are relatively unobtrusive. Varian Associates published a similar text in 1971, and an updated version, "Basic Liquid Chromatography," appeared in 1978 under the authorship of E.L. Johnson and R. Stevenson. This 354-page paperback is available from Varian at a nominal price and is frequently used as a text at HPLC courses.

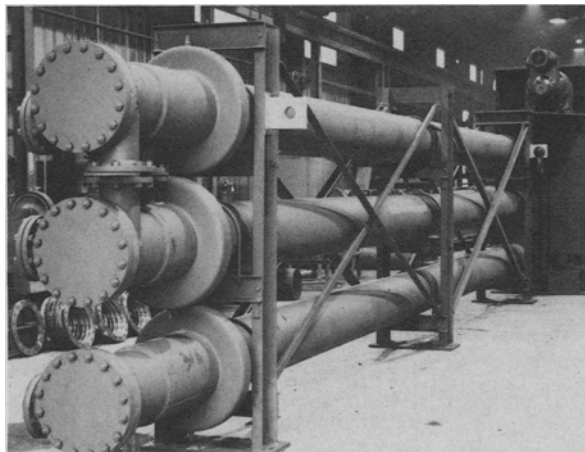
According to the preface, this book is not intended to function as a general LC textbook since theoretical aspects are not considered in depth. Instead, the authors have prepared a rather informal, almost chatty introduction to the field. All of the expected topics—nomenclature and general theory of the technique, pumps, columns, detectors, injectors, separation modes, mobile phases and ion pairing—are included. Separation modes covered include

normal and reversed-phase, size exclusion and ion-exchange. Reversed-phase separations are considered to represent 70% of actual usage. The last portion of the book deals with quantitation. In any fast-moving field it is inevitable that a book will be somewhat out-of-date the day it is published. The 3 and 5 micron spherical column packings are largely ignored. Polar bonded phases, amino, cyano and diol, are tabulated as normal phases although usable in the reversed-phase mode. Several statements regarding columns (p. 132 and p. 245) appear to reflect antiquated technology. Commercial columns are usually marked to indicate the direction of flow during packing. Generally the purchaser is advised to use the column with flow in this same direction, but any modern, well-packed column should be capable of being used with flow in either direction. For that matter, it is usually desirable to periodically (after every 400-500 samples) reverse the direction of flow to clear off minor contaminants which have accumulated at the head of the column. Similarly, removal of end fittings to change the frit at the injection end of the column should not, if carefully done, have any adverse effect on column performance. Minor criticisms aside, this is an easy-to-read, useful book. While not suitable as a college-level or graduate text, this book can be heartily recommended to anyone starting to work in liquid chromatography.

Lipid Biochemistry of Fungi and Other Organisms, by John D. Weete (Plenum Press, 227 W. 17th St., New York, NY, 1980, 388 pp., \$45).

This book is the successor to *Fungal Lipid Biochemistry*, by the same author, published in 1974. After a brief introduction the content and distribution of lipids in structural elements and subcellular components are considered in terms of culture conditions and growth stage. Various lipids are then considered in separate chapters: fatty acids; phospholipids; sphingolipids; aliphatic hydrocarbons; and sterols, carotenoids and polyprenols. Noteworthy by its absence is a chapter on glycolipids. A chapter on "Acylglycerols and Related Lipids," however, includes the galactosyl diglycerides, sulfoquinovosyldiglyceride, sophorolipids and polyol esters. A final chapter by D.J. Weber considers lipid metabolism during sporulation and spore germination.

The chapters tend to follow the sequence: introduction; structure and nomenclature; occurrence in (1) Phycomyces, (2) Ascomycetes and Fungi Imperfecti and (3) Basidiomycetes; biosynthesis; and degradation. In general one has the impression that the author may have attempted too much with uneven results. The efforts to start at square one—lipid classification and nomenclature—lacks crispness, clarity and detail. In other cases the attempt at coverage may be premature. One finds for instance, discussion of certain biosynthetic pathways in mammalian and/or plant systems followed by the statement that the corresponding information on fungal systems is either sparse or not available. Similarly, it is never quite clear whether this publication is presented as a textbook or as a review volume. The text runs to 316 pages, followed by 41 pages of references (approximately 1,000 citations) and a 31-page



Continuous crystallizers for fractionation of fatty chemicals

Continuous cooling crystallizers are often used for fractionation of fatty chemicals. Typical uses include: fractionation of tallow and tall oil fatty acids, mono- and di-glycerides purification, winterization of some edible oils, palm/palm kernel oil fractionations, crystallization of salts of fatty acids, fatty alcohols fractionation, and similar processes.

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Chemtec, B.V.
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Scotland

Chemtec Pte. Ltd.
9-J Gul Ave.
Jurong Town
Singapore 2262

index. Some subjects are covered in detail, but other critical topics are dismissed with the statement that the subject has been reviewed elsewhere by so-and-so. Minor distractions are relatively frequent including for instance "Trace quantities have been detected in *S. cerevisiae* (Jollow et al., 1968); but others have been unable to detect them (Letters and Snell, 1965)," on p. 163; "Although all the details of the glyoxylate pathway and gluconeogenesis is not well-established in fungi, the subjects have been reviewed by Casselton (1976)," on p. 127; "17-hydroxyhexadecanoate" and "funti" on p. 119; and a missing year in the citation of Fayret et al. on p. 328. Literature citations extend into 1979 with perhaps 12% postdating Weete's 1974 book. The principal strength of this book would seem to be the extensive tables of fatty acid composition of various fungi and fungal lipids. The text and tables are prepared from camera ready copy. This results in tables frequently running to 3 or 4 pages in length.

This is a specialized volume which might have limited applicability as supplementary reading in a graduate level course in lipid biochemistry.

Advances in Chromatography, Vol. 19, edited by J.C. Giddings, E. Grushka, J. Cazes and P.R. Brown (Marcel Dekker, Inc., 270 Madison Ave., New York, NY, 1981, 312 pp., \$39.95).

This latest volume in a well-established series contains six reviews: "Role of HPLC in Nuclear Medicine," "Calibration of Separation Systems in GPC for Polymer Characterization," "Isomer Specific Assay of 2,4-D Herbicide Products by HPLC: Regulatory Methodology," "Hydrophobic

Interaction Chromatography," "Liquid Chromatography with Programmed Composition of the Mobile Phase" and "Chromatographic Separation of Aldosterone and Its Metabolites." Approximately 45% of the volume is taken up by the highly mathematical treatment of mobile phase design. While the emphasis of this series is chromatography, there are usually one or more chapters of interest to the lipid chemist. In the present case these may be the chapters on nuclear medicine, aldosterone and the herbicide, 2,4-D. Radioactive halogenated steroids have been used for adrenal imaging and have also been studied as prostate imaging agents. Labeled long-chain fatty acids have been used for myocardial imaging and fatty acid analogs have been used for hepatobiliary studies. HPLC is an important technique for purification of labeled materials, particularly those containing isotopes with short half-lives. The chapter on aldosterone is quite specialized. Most of the reported work was carried out on reversed-phase columns (C-18) developed with water-methanol phases. While much pesticide residue work is carried out by gas chromatography, HPLC seems to offer definite advantages for certain herbicides.

The text and figures are clear and of good quality. Minor aberrations such as "... an etherish solution of the labeled progesterone was ..." (on p. 18) occur infrequently. This is a specialized series and recommendations to the lipid chemist vary from year to year based on the subject matter of the reviews. In any year, the volumes are worthwhile additions to the library of an analytical laboratory.

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Biochemical Applications of Mass Spectrometry (1st supplementary volume), edited by George R. Waller and Otis C. Dermer, (Wiley-Interscience, John Wiley & Sons, New York, Chichester, Brisbane, Toronto, 1981, 1279 pp., \$150).

This supplementary volume contains the same three main sections of instrumentation, interpretation of mass spectra, and applications as the original volume published in 1972. Chapters in the original volume on a historical survey of mass spectrometry, origin of mass spectra, vitamins and cofactors, the use of mass spectrometry in the detection of life on other planets, determination of the structures of organic molecules and quantitative analyses with the field ionization mass spectrometer and chemical ionization are not covered in this supplement. In keeping with the idea presented by the editors that this is a supplement, i.e., new material, the numbering of figures, tables, references, etc., on "continued chapters" is consecutive with the original chapters. Similarly, author and subject indices are cumulative.

Section I: Instrumentation consists of two chapters. Chapter 2 is a general treatment of mass spectrometry instrumentation dealing with such topics as atmospheric pressure ionization (API), negative-ion mass spectrometry, secondary-ion mass spectrometry (SIMS or MS/MS), gas chromatography-mass spectrometry (GC/MS), liquid chromatography-mass spectrometry (HPLC/MS), and selected ion monitoring (SIM) techniques. Chapter 3 is a sometimes detailed, sometimes general description of the hardware and software at ten mass spectrometer data acquisition and processing facilities by the facility developers and users

themselves. They include such mass spectrometer facilities as those at Baylor College of Medicine, Cornell University, Karolinska Institute, Massachusetts Institute of Technology and Michigan State University, to name a few.

Section II: Interpretation of mass spectra consists of chapters 5-7. These chapters cover such topics as metastable ions as an aid in the interpretation of mass spectra, compound identification by computer matching of mass spectra, and the use of a computer to identify unknown compounds, i.e., the automation of scientific inference.

Section III: The largest section of the book is on application. Chapters continued from the original volume include such topics as fatty acids and complex lipids, steroids, bile acids, and carbohydrates. The terpenes and terpenoids chapter has been subdivided by taking carotenoids out of it and expanding it. Further topics include amino acids and their sequencing in oligopeptides and proteins, nucleic acids and derivatives, antibiotics, hormones, drug metabolism, tetrapyrroles, respiratory mass spectrometry, and pesticides. The alkaloids section has been expanded and subdivided. Flavor components, pheromones and allelochemicals, use of stable isotopes, and negative ions topics round out the original 31 continued chapters. Additional chapters have been added dealing with toxic residues and pollutants, air pollutants, applications to clinical medicine, volatiles emitted by humans, flavonoids and related plant phenolics, separation/identification systems applicable to complex mixtures, quantitative mass spectrometry, and ^{252}Cf -plasma desorption mass spectrometry.

As enumerated above, this supplementary volume deals

Polyunsaturated Fatty Acids

A monograph edited by Wolf-H. Kunau and Ralph T. Holman, 258 p. Hardbound—\$15 for AOCS members and students, \$25 for nonmembers. This monograph records the contributions of twenty noted researchers who contributed to the 1975 AOCS symposium on unsaturated fatty acids. The symposium was premised on the increasing need to combine separate disciplines in lipid research. Speakers thus were invited who specialized in chemical, physical and biochemical properties of lipids. Topics included biosynthesis, oxidation and regulation of metabolism, analysis, chemistry/physicochemistry, and experimental and clinical data. Illustrations and references enhance this collection.

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Champaign, IL 61820

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with a wide range of biochemical topics involving applications of mass spectrometry by more than 70 authors. With this many authors, including many renowned specialists, it is no surprise that the chapters run the gamut between very general and quite specific treatment of a given topic. Other problems are redundancy of information and omissions. For example, several times authors have referred the reader to Chapters 31, 2 and 15 where they say a topic will be covered more comprehensively. Unfortunately, these three chapters were omitted from the supplementary volume. The editors make no claims as to comprehensively covering each topic and its related literature. According to the preface, authors were charged only to pick out the most appropriate examples from the recent literature in their discussions.

The information contained in Chapter 3 on mass spectrometer data acquisition and processing systems could be much reduced had the editors summarized the information contained therein. It is important to mention in what ways these laboratories are on the frontiers of mass spectrometry research and development, but I disagree with the format chosen to have each laboratory write up a description, some of which are very detailed, others not, about the unique instrumentation, hardware and/or software, or avenues of research which they are undertaking. This information, when given freely and in great detail, or more obviously when given sketchily, is of little or no help to the average reader. A reader who is trying to duplicate such a facility's unique approach cannot do it from the information given and must go to the individual laboratories, authors, and the literature. Such a reader would also require hardware and software skills or facilities to name just a few things necessary to "duplicate" such a facility's system. The average reader will have to wait until these unique acquisition and processing systems become available from manufacturers of mass spectrometers.

Of special interest to "oil" chemists is Chapter 8 on fatty acids. Acylpyrrolidines, benzyl esters and TMS derivative techniques have been added to that of methyl esters covered in the first edition for fatty acid structure determinations. This chapter also reflects the application of chemical ionization (CI), field ionization (FI), and negative ion (NI) techniques to fatty acids. There also are sections dealing with quantitative determination of fatty acids and esters and medical applications dealing with the diagnosis of metabolic disorders and infections.

Complex lipids are dealt with in Chapter 9. Some of the earlier fragmentation patterns of mono- and diglycerides occurring in the mass spectrometer shown in the original volume have been confirmed and further defined because of the cleaner spectra obtained by GC/MS versus the direct probe method used earlier. Chemical ionization mass spectra of triglycerides is giving quantitative as well as qualitative information. Other complex lipids are yielding their secrets to techniques utilizing field desorption, metastable ion and TMS derivative techniques.

There is a great deal of excellent information in the book. If only one or two chapters would be of interest it might be hard to justify the high purchase price, unless the material of interest is not covered in another book. I feel the book would be very useful at colleges and universities to expose students to the broad applications and utility of mass spectrometry. Mass spectrometry service facilities, be they in the private sector or academic, which because of their very nature might encounter very different types of

samples, would also find the book useful. In my opinion, if you need this book it does not necessarily follow that you need the original volume.

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Characterization of Catalysts, edited by J.M. Thomas and R.M. Lambert (John Wiley and Sons, New York, NY, 1981, 283 pp., \$49).

This monograph, which grew out of a short course organized by the editors in 1979 at King's College, Cambridge, is a collection of 16 papers by recognized experts in the field of catalysis and catalyst characterization. While some emphasis is given to traditional characterization techniques, with chapters on the determination of surface area and pore size distribution, transmission electron microscopy, optical and electron microscopy, and radioisotope techniques, the main thrust of the work is toward new or emerging methods of characterization. There are chapters covering X-ray photoelectron spectroscopy (XPS or ESCA); Mössbauer, temperature and voltage programming; neutron and ion beam techniques; and three chapters on extended X-ray absorption fine structure (EXAFS). Also included are several chapters dealing with catalyst characterization in a general way from the viewpoint of an industrial user, a catalyst manufacturer, a chemical engineer and a physical chemist.

The main slant of the introductory sections is that while a number of the newer techniques have permitted great strides to be made in catalyst design and development most are still limited to post-mortem or pre-natal catalyst study under conditions far removed from those used in commercial reactors. Other emerging procedures, such as those employing neutron beams or intense X-ray sources, for example, are far superior because they offer the potential for in situ characterization. These techniques, therefore, can be expected to provide information on the actual catalyst in operation and should lead to even greater progress. The editors are also primarily interested in practical catalyst systems and emphasize the importance of bringing advances in academically oriented surface science techniques to the study of real world catalysts.

The presentation of the various techniques is oriented toward the reader with little prior knowledge of the subject. The discussions of the principles of the techniques are introductory in nature with references provided for more in-depth study. Examples of the successful application of the various techniques are provided and are also well footnoted. The examples emphasize real commercial catalysts and are drawn generally from the chemical, petroleum and fats and oils industries (Chapter IV discusses the interaction of process development and physical characterization in the development of a novel palladium catalyst for fat hardening). The knowledgeable discussions provide insight into a number of different catalyst problems and should be of general interest to the student of catalysis.

As stated previously, the book's major emphasis is on a few new techniques and therein lies the work's major liability as a basic reference. Those techniques which are more established and documented elsewhere have been excluded. No more than a brief discussion has been included for such techniques as mercury porosimetry, TGA/

DTA/DSC, IR, Raman, X-ray diffraction and fluorescence, Auger, SEM, LEED, SIMS, etc. Moreover, the presentation tends to make the use of such techniques as particle beam procedures and EXAFS sound commonplace when in fact they are not among the principal tools used to characterize industrial catalysts. In summary, the book is useful because it elucidates certain new techniques but is not a complete reference for catalyst characterization as it is currently practiced.

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New publications

Food Questions and Answers, more than 100 questions answered by a panel of food and nutrition experts for the Council for Agricultural Science and Technology "Dialogue" on March 20-21, 1980. Questions were answered by telephone in connection with Agriculture Day observances. Publication consists of 54 pages, single copies available free from CAST, 250 Memorial Union, Ames, IA 50011 (515-294-2036).

Essential Fatty Acids and Prostaglandins, edited by Ralph T. Holman, Pergamon Press, Fairview Park, Elmsford, NY 10523 (or your nearest Pergamon Press office), 880 p., 1981, \$135. Proceedings of the 1980 Golden Jubilee International Congress held at the University of Minnesota to commemorate the discovery of essential fatty acids by George O. and Mildred Burr and of prostaglandins by Ulf S. Von Euler.

Soy Oil Bibliography: Processing, Composition, Reactions, and Edible and Related Uses, compiled by John C. Cowan, American Soybean Association, PO Box 27300, St. Louis, MO 63141. A 172-page bibliography for persons involved in soybean oil research, emphasizing publications from 1966 to 1979, includes subject index. Single copies available at no charge by writing to Dr. David R. Erickson, director, soy oil program, at the ASA office in St. Louis.

Textbook of Pediatric Nutrition, edited by Robert M. Suskind, Raven Press, 1140 Ave. of the Americas, New York, NY 10036, 1981, approx. 650 pp., \$55.

Textbook of Gastroenterology and Nutrition in Infancy, Volume 1—Gastrointestinal Development and Perinatal Nutrition, Volume 2—Gastrointestinal Disease and Nutritional Inadequacies, edited by Emanuel Lebenthal, Raven Press, 1140 Ave. of the Americas, New York, NY 10036, 1981, 1200 pp., \$98.

Regulation of Potential Carcinogens in the Food Supply: The Delaney Clause and Food Questions and Answers: Environmental Issues, Production, Processing, Safety, Nutrition, Diet, Beverages, Drugs, Economic Issues, World Food Issues, two free publications from the Council for Agricultural Science and Technology, 250 Memorial Union, Ames, IA 50011, June 1981.

Advances in Nutritional Research, Volume 3, edited by Harold H. Draper, Plenum Publishing Corp., 233 Spring St., New York, NY 10013, 1980, 378 pp., \$32.50.

A Theoretical Approach to the Preselection of Carcinogens and Chemical Carcinogenesis, by Veljko Veljkovic, Gordon and Breach, Science Publishers Inc., 1981, 114 pp., \$36.50.

Standards in Absorption Spectrometry, Ultraviolet Spectrometry Group, edited by C. Burgess and A. Knowles, Chapman and Hall, 733 3rd Ave., New York, NY 10017, 1981, 142 pp., \$24.

Latest in Lipids

Scheduled for September 1981

Effect of the Environment and Fasting on the Lipid and Fatty Acid Composition of *Diplodom patagonicus*
Phospholipid Studies of Marine Organisms: 2. Phospholipids, Phospholipid-Bound Fatty Acids and Free Sterols of the Sponge *Aplysina fistularis* (Pallas) forma *fulva* (Pallas) (= *Verongia thiona*). Isolation and Structure Elucidation of Unprecedented Branched Fatty Acids Incorporation into Lipid Classes of Products from Microsomal Desaturation of Isomeric *trans*-Octadecenoic Acids

Ketone Bodies, Glucose and Glutamine as Lipogenic Precursors in Human Diploid Fibroblasts

Phospholipid Synthesis in Human Embryo Fibroblasts Infected with Herpes Simplex Virus Type 2

Biohydrogenation of Cholesterol as an Index of Bacterial 7 α -Dehydroxylase Activity

Communications

Phospholipids and Component Fatty Acids of the Pigeon Liver

Alkane Contamination of Lipids Extracted from *Lagenidium giganteum* and *Lagenidium callinectes*

Methods

Effect of Ca⁺⁺ on Triphosphoinositide Extraction in Fusing Myoblasts

AOCS needs copies of the January 1980 issue of Journal of the American Oil Chemists' Society (JAOCS) and copies of LIPIDS, volume 12 (1977), January and February, and volume 14 (1979), February.

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