



NEW BOOKS

edited by f w quackenbush

ADVANCES IN CHROMATOGRAPHY, Vol. 4, edited by J. C. Giddings and R. A. Keller (Marcel Dekker, Inc., 373 p., 1967, \$16.50).

The series *Advances in Chromatography* represents authoritative articles on recent major developments in special areas of chromatography; the emphasis is placed on the authors' own work and their opinions of current trends instead of reflecting an exhaustive review of the literature. The subject chosen for Volume 4 are timely because of the recent escalation of work in these areas. Over two-thirds of the volume is devoted to gas chromatography; in this section, adsorbent, packed capillary columns, stationary liquid phases, and the application of mass spectrometry to gas-liquid chromatography are discussed. Other articles pertain to R_f values in thin-layer chromatography, separation and analysis of steroids, and the application of ion-exchange-cellulose chromatography to biochemistry.

The contributors to Volume 4 are I. Holasz, E. Heine, A. V. Kiselev, C. S. Knight, W. H. McFadden, R. Neher, L. Rohrschneider, and L. R. Snyder. In general, the articles are well written; all start with an outline, a desirable aid when looking for specific information. The book should be particularly helpful to all scientists in fields where chromatography must be applied, and its styling format also makes it useful for specialized topics in graduate courses.

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ORGANIC CHEMISTRY OF MACROMOLECULES, by Dr. A. Ravve, (Marcel Dekker, Inc., New York, 498 p., 1967, \$18.75).

Dr. Ravve's introductory textbook on the organic chemistry of polymers is divided into six parts. The introduction touches on the historical background and general physical properties of macromolecules, including a chapter on the molecular weight of polymers. Part II is primarily concerned with the mechanism of various types of polymerizations, including addition, ionic, bulk, solutions, suspension, and emulsion polymerization reactions with chapters included on stereospecific polymerization and the use of complex catalysts. The third section of the book deals with common addition polymers, which includes treatments of the polyolefins, polymers and copolymers of polymers, styrene and styrene-like polymers, polyacrylics, and the well-known series of halogenated addition polymers and related vinyl esters and ethers. Part IV, the longest section of the book, is devoted to condensation polymers, including polyesters, polyamides, urethanes, phenolics, and urea- and melamine-formaldehyde resins. Included in this section is a chapter on ladder and semiladder polymers. The organic chemistry of naturally occurring polymers is given a cursory treatment in Part V. General reactions of polymers are treated in Part VI, which includes chapters on graft and block copolymers, reactions of the polymer molecules themselves, and degradation reactions.

All of the chapters are well documented with references and cross references which are up-to-date. Although the author index is quite complete, the subject index is quite

brief for this type of text, and the reader would have appreciated more entries. On the other hand, the table of contents is excellent and useful.

There is little doubt that the book is intended for use as a textbook on the organic chemistry of high polymers, primarily oriented toward an introductory course. Any student or professional chemist with a background in organic chemistry will find the text quite helpful in reviewing the extensive types of organic chemical reactions in the chemistry of polymers. The emphasis is placed on synthetic polymers, although there is a short treatment on natural occurring macromolecules. The book brings the reader up-to-date on the most recent developments in the polymer field.

In general, the reviewer finds the format to be good and the numerous structures and tables are of excellent quality and quite legible. There are a few minor typographical errors in both the text and structural formulas.

The treatment of several topics varies in regards to depth and scope. For example, the reviewer feels that polyvinyl chloride is glossed over, whereas, the discussion on phenolic resins is quite extensive. The section on the reaction of polymers is somewhat weak. In the introduction section, the discussion of physical properties of macromolecules is ample, but somewhat brief, whereas one entire chapter is devoted to the determination of molecular weight of polymers. Some of the discussions on mechanisms are quite detailed and complete.

In summary, the book is quite useful as an introductory textbook for a course covering the organic chemistry of macromolecules, and complements standard classical texts on the physico-chemical aspects of polymers. The book is also to be recommended to anyone desiring a general background on the chemistry of macromolecules or requiring leading references for more penetrating studies.

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THE PETROLEUM CHEMICALS INDUSTRY, third edition, by F. R. Goldstein and A. L. Waddams (E. & F.N. Spon, Ltd., London, distributed in the United States by Barnes and Noble, Inc., New York, July, 1967, 523 p, \$22).

Like the earlier editions published in 1949 and 1958, this book presents short reviews (often in a few sentences) of the more significant methods for the preparation of industrial chemicals and of their physical properties and uses. Unlike the classic two volumes (1934 and 1937) by Carleton Ellis, "The Chemistry of Petroleum Derivatives," it is not an encyclopedic collection of all the references of which the authors were aware. Instead it is a fairly extensive, very readable, critical account of the subject. Dr. Goldstein (who died before the publication of this edition) and Mr. Waddams have continued the objective of the first edition: "to set down the major routes to the important petroleum chemicals and to explain their end uses."

Despite an attempt to keep the size of this edition the same as its predecessors by "eliminating obsolete information or unsuccessful processes," it contains about 15% more pages due largely to the greater availability of technical papers, rather than merely patents, describing the processes. Many are new, for example the production of acrylonitrile from propene by reaction with ammonia and oxygen (air), of benzene and naphthalene from alkyl

derivatives by hydroalkylation, and of acetaldehyde and ketones from ethylene and higher alkenes by use of palladium chloride and cupric chloride.

The book is logically and concisely organized. The Introduction is concerned with the pertinent organic nomenclature, physical data abbreviations, and thermodynamic symbols and methods. Chapter 1 describes the history of the petrochemical industry and Chapter 2 the sources (crude petroleum or refinery processes) of petroleum hydrocarbons used by the industry. Chapter 3 is devoted to the synthesis and reactions of carbon monoxide and hydrogen and Chapters 4-6, to the oxidation, chlorination, and nitration and other reactions of paraffins. The next five chapters discuss the manufacture of olefins and their derivatives (including products of hydration, oxidation, and reactions with a variety of materials, such as halogens, carbon monoxide, ammonia, and halogen-, sulfur-, and nitrogen-containing compounds). Chapters 12-15 deal with the manufacture and reactions of the other major hydrocarbon classes: diolefins, naphthenes, aromatics and acetylenes. Chapters 16-20 are concerned with some of the chief classes of petrochemicals: aldehydes, ketones, acids (and anhydrides and esters), olefin oxides, and nitriles and amines. Chapter 21 describes the non-hydrocarbon by-products of petroleum refining (for example, sulfur and naphthenic acids) and Chapter 22, economics and statistics of the petrochemical industry (a subject which is frequently mentioned in the earlier chapters and the Appendix). The Appendix also contains charts showing the more significant routes to petrochemicals, particularly from ethylene, propene, and acetylene.

The Subject Index of the third edition has been improved over those of the preceding editions. Its use is expedited because the more important of numerous references for a single item are printed in bold-face type. On the other hand, use of the Name Index (which lists only surnames of authors) has been made less effective because the references no longer appear as footnotes on the page where they are first mentioned. Instead, they are presented in numerical order at the end of the chapters. Hence, the index gives only the page number of the list of references at the end of the chapter because names are usually omitted from the text. Consequently, a reader who desires to find the discussion of the work of a particular author must spend time paging thru one or more chapters until he finds the sought-for reference number(s) which he learned by turning to pages(s) he found in the Name Index. Furthermore, having the references at the end of the chapter makes it less convenient for the reader to learn who carried out the work about which he is reading.

American readers are warned not to be confused by the use of such names as 1-ethylhexaldehyde (p. 359) and 1-ethylhexoic acid (p. 380). The confusion arises because the authors use the nomenclature of the Heilbron-Bunbury "Dictionary of Organic Compounds" rather than the Geneva-I.U.C. rules for enumerating aldehydes and carboxylic acids which are followed by Chemical Abstracts and even the British Journal of the Chemical Society (since 1950). According to the Geneva-I.U.C. rules the compounds are named 2-ethylhexaldehyde and 2-ethylhexanoic acid.

While the book seems to be quite free of errors, it does contain one which has been carried thru all three editions, namely the equation showing the formation of acrolein by the pyrolysis of diallyl ether (p. 344). The proper accompanying product, propene, is shown. Unfortunately, however, the formula, $(\text{CH}_3\text{CH}=\text{CH}_2)_2\text{O}$, given for the ether is almost that of dipropenyl ether, except that it contains a pentavalent carbon atom. Hence, in order to balance the equation, molecular hydrogen is erroneously indicated as a third reaction product.

This book is recommended as providing a satisfactory quick survey of its field. It serves admirably as a point of initiation of a literature search interested in more detailed information on manufacture and use of a particular petrochemical or class of petrochemicals.

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PROTECTIVE COATINGS FOR METALS, THIRD EDITION, by R. M. Burns and W. W. Bradley (Reinhold Publishing Company, 735 p, 1967, \$25).

The book is ACS Monograph No. 163. The general format is similar to the other ACS Monographs and comes up to their high standard of appearance. The third edition is 92 pages larger than the second which was published in 1955 (same authors). The chapter headings are identical and the expansion has been made in general by the addition of new material while still maintaining the older information and discussions.

The contents could be divided into two distinct categories. The first would be Metallic Protective Coatings for Metals, and the second, Organic Protective Coatings for Metals. Most of the readers of the *Journal* would be primarily interested in the section on Organic Coatings. This is considerably less than one-half of the book (28%) and in the reviewer's opinion, is too elementary and out of date to be of particular interest. Organic Coatings are covered by a number of standard texts in a more complete manner. On the other hand, the sections on Metallic Coatings for Metals seem to be quite authoritative. If the book were devoted only to this subject, it would have been highly recommended. Accordingly, the book should be most useful to those interested in Metallic Coatings for Metals.

There are instances of careless editing. To locate "Urethanes" in the index, one must be clever enough to look under "Polyurethanes." Then on page 418, under "Polyurethane Resins," there is given not only polyurethane resins but also polyamides, titanium esters, and furan resins. It was also confusing to find listed under the heading "Styrene-Butadiene Resins" (p 415) such diverse materials as vinyl-toluene, coumarone, isobutylene, isoprene, chlorinated rubber, polysulfide polymers and fluorinated hydrocarbons.

The jacket of the text book claims that this "revised Third Edition, provides . . . the latest information on all types of metallic and organic coatings—their composition, structure, application, and evaluation. It also states that in 1963 the dollar volume of paint consumed in coil coatings was one-fourth of that used in the manufacture of automobiles. If this is so, coil coatings deserve a more extensive treatment than the few scattered lines given in this text. The heading "Electroplated Coatings" deals only with metal deposition. There is brief mention of the Ford Electrocoating Process and only 17 lines devoted to a cursory review of the electrocoating of organic coatings; these are not indexed. Although a major development in organic coatings is the use of water base paints, the monograph includes only one page on water base coatings and some casual comments under latex paints. These subjects merit a more extensive treatment if such claims are to be valid.

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PROGRESS IN THE CHEMISTRY OF FATS AND OTHER LIPIDS, Vol. 8, Ed. R. T. Holman, (Pergamon Press, Ltd., London, 1966, 436 p, \$16.50).

Volume Eight of the series is dedicated to Professor T. P. Hildieh (1968-1965) and bears his photograph. This volume meets the usual high standards of the series with seven excellent articles: Phospholipids and Biomembranes by L. L. N. VanDeenen; Carotenoid Chemistry, by S. L. Jensen and A. Jensen; Nuclear Magnetic Resonance in Fatty Acids and Glycerides, by C. Y. Hopkins; Conformational Effects, Hydrogen Bonding and Polarized Infrared Spectra, by J. S. Showell; Thin-Layer Chromatography of Lipids, by D. C. Malins; Paper Chromatography, by J. G. Hamilton; and Column Chromatography, by R. A. Stein and V. Slawson. The only serious criticism of the volume is the evident delay in publication. Copyrighted in 1966, the literature references reveal that six of the seven authors had completed their manuscripts in 1964. This is unfortunate especially for rapidly developing fields such as the biomembranes.

The section on phospholipids and biomembranes (127 pages, 528 references) is well illustrated with nine schemes showing chemical pathways and 38 figures which includes 16 electron micrographs. With the aid of these illustrations, the author discusses four theories of membrane structure: the bimolecular lipid leaflet, the mosaic structure, the flexible membrane, and globular structures and mitochondria. The older theories are covered adequately; the discussion of mitochondrial membranes hardly does justice to current thinking. Much of the section is devoted to biosynthesis of the phospholipids and their constituent fatty acids; this is well handled.

The carotenoid chemistry section is also well illustrated with 15 tables, 14 figures and, in addition, numerous structural illustrations. Emphasis is on the relation of spectral characteristics and group reactions to organic structure. A few final pages discuss chemical synthesis and biosynthesis.

Nuclear magnetic resonance, its principles and applications to fatty acid and glycerides is presented clearly in a 37-page section. Figures show responses to specific organic structural groups found in different fatty acids. This section should be most useful to all who are interested in fatty acid and glyceride structure. The section on conformational effects of long carbon chains is a more theoretical treatment which requires concentration on physical chemical relationships.

Chromatography of virtually all types useful to the lipid chemist and biochemist is covered in the three sections on thin-layer, paper and column techniques. Tabular listings of adsorbent-solvent combinations for numerous compounds are supplemented liberally with figures showing equipment and separation which can be achieved.

No lipids laboratory or library can be without this volume.

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LIPID METABOLISM IN TISSUE CULTURE CELLS, edited by G. H. Rothblat and David Kritevsky (The Wistar Institute Press, Philadelphia, Pa., 164 p, 1967, \$5).

This book is a collection of the papers and the appended discussions presented at a symposium held at The Wistar Institute of Anatomy and Biology, Philadelphia, Pa., on May 16, 1966. Papers included: Nutrition of Cells in Culture—A Review, H. E. Swim; Fatty Acid Metabolism and Function in Cultured Heart and HeLa Cells, Isaac Harary, L. E. Gerschenson, D. F. Haggerty, Jr., W. Desmond, and J. F. Mead; Uptake and Retention of Fatty Acids by Tissue Culture Cells, Robert P. Geyer; Fatty Acid-induced Steatosis in Monolayer Cell Cultures, M. S. Moskowitz; Regulation of Cell Lipid Metabolism and Accumulation. V. Quantitative and Structural Aspects of Triglyceride Accumulation Caused by Lipogenic Substances, C. G. Mackenzie, J. B. Mackenzie, and O. K. Reiss; Cellular Lipid Nutrition and Lipid Transport, J. M. Bailey; Transport of Plasma Lipoproteins and Ultrastructure of Human Arterial Intimacytes in Culture, A. L. Robertson, Jr.; and Cholesterol Metabolism in Tissue Culture Cells, G. H. Rothblat, R. Hartzell, Jr., H. Mialhe, and D. Kritevsky.

Lipid classes studied for the most part were fatty acids, triglycerides, and sterols with less attention to phospholipids and other complex lipids. Lipoproteins and other proteins were also involved in the studies. The phenomenon of development of lipid-rich particles in tissue culture cells, alternatively known as lipofuscinosis or steatosis appears to be brought into sharp focus by a number of these papers. This in itself represents a valuable contribution.

Techniques used in the studies, in addition to tissue culture and nutrition, included a variety of biochemical, radioisotopic, histochemical, and electron microscopic procedures.

A wide range of metabolic phenomena comes under consideration in the papers and discussions from nutrition, to accumulation of lipid in cells versus uptake and adsorption of lipid on cell surfaces, to essential fatty acids, to chole-

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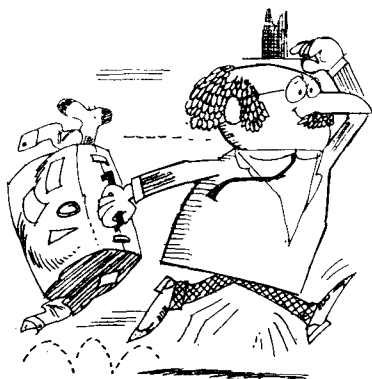


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Meetings

AOCS National Meetings

1968—Washington, D. C., Washington Hilton Hotel, March 31–April 4 (Joint Meeting with AACC); New York, Statler Hilton Hotel, Oct. 20–23.

1969—San Francisco, San Francisco Hilton, April 20–24. Minneapolis, Leamington Hotel, Oct. 5–8.

AOCS Section Meetings

Northeast Section—April 23, Military Park Hotel, Newark, N.J.

North Central Section—May 15th, Spinning Wheel, Hinsdale, Ill.

Southwest Section—May 15, 1968, Michael's Los Feliz, Los Angeles, Calif.

Northern California Section—May 3, 1968, Engineers Club, San Francisco, Calif.

Other Organizations

* May 12–17, 1968—ASTM Conference on Mass Spectrometry (Sponsored by Technical Committee E-14), Hilton Hotel, Pittsburgh, Pa.

May 13–17, 1968—Seventh National Meeting of the Society for Applied Spectroscopy, Sheraton-Chicago Hotel, Chicago.

May 19–24, 1968—28th Annual Meeting, Institute for Food Technologists, Philadelphia, Civic Center, Philadelphia, Pa.

* May 20–24, 1968—Inter-American Conference on Materials Technology (Sponsored by ASTM and other Societies), Southwest Research Institute, San Antonio, Texas.

June 10–14, 1968—Conference on Lipid Metabolism, Kimball Union Academy, Meriden, N. H.

June 11–12, 1968—Food Science Symposium, Cornell University, New York State Experimental Station, Geneva, N. Y.

June 16–20, 1968—The 72nd Annual Conference of the Association of Food and Drug Officials of the United States (AFDOUS) Hartford Hilton Hotel, Hartford, Conn.

June 25–28, 1968—Gas Chromatography and Its Exploitation, 7th International Symposium, Falkoner Centret, Copenhagen, Denmark.

Aug. 19–21, 1968—The 48th Annual Convention of the American Soybean Convention, Roosevelt Hotel, New Orleans.

Sept. 9–11, 1968—Third International Symposium on Drugs Affecting Lipid Metabolism, Milan, Italy.

* Sept. 12, 1968—Symposium on the Synthesis and Uses of Labelled Lipids and Sterols, Milan, Italy.

Sept. 8–12, 1968—The 12th International Conference on the Biochemistry of Lipids, University of Loughborough, England.

Sept. 12–13—Society of Cosmetic Chemists, Seminar, Sheraton Hotel, Boston, Mass.

Sept. 16–21, 1968—IXth Congress of International Society for Fat Research (ISF), Rotterdam, Netherlands.

Oct. 14–17, 1968—82nd Annual Meeting of the Association of Analytical Chemists, Marriott Motor Hotel, Twin Bridges, Washington, D. C.

* Additions to previous calendar

terol metabolism, to regulation of lipid metabolism, to transport of lipid across cellular plasma membranes.

The book is highly recommended for all workers studying the metabolism of lipids in biological systems. It appears that tissue culture now affords another available approach to many metabolic problems using a simplified biological system that still retains cellular organization.

The book is printed on a good quality paper with a very readable size print and is bound in paperback. It has a subject index, 245 bibliographic references, numerous well made figures and tables throughout, and is well edited.

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DICTIONARY OF ORGANIC COMPOUNDS, 3rd Supplement, edited by R. Stevens (Oxford University Press, New York, 279 p, 1967, \$28).

The third annual supplement is published to keep the fourth edition of the five-volume Dictionary of Organic Compounds up to date and make the properties of new compounds readily available to users of this set. Like previous supplements, it not only contains new material obtained from papers published during 1966, but also revises existing entries in the main work. According to the authors, the current edition of the Dictionary will be kept up to date by publishing four supplements, one each year followed by a fifth supplement which will be a cumulative edition containing both new material collected that year as well as all the material in the previous four supplements. Thus, purchasers of this reference work could keep their sets current by buying a volume each year; or they may wait several years and purchase the cumulative edition.

The Dictionary contains a large amount of information and should be extremely useful to chemists seeking this kind of data. The compounds described in this supplement, as in the other volumes, are arranged in alphabetical order and thus it serves as its own index. The principal entries are cross-referenced, full structural formulas and physical properties are given, useful derivatives are described and literature references are cited.

While the information on organic compounds is not so complete as in some other reference works, it contains enough information to satisfy the needs of many investigators. More information can be obtained easily by consulting the references given.

This set probably will not be purchased by individual chemists since the cost is considerable (\$280 for the five-volume set including the first supplement and approximately \$28 for each additional supplement) but would be a worthwhile addition to the library of research organizations concerned with organic or biological research.

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"Developmental Psychobiology" Journal Launched

Interscience Publishers, a division of John Wiley & Sons, Inc., announces an entirely new journal dealing with the area of animal and human development, where physiological or genetic variables are related to behavior.

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