

NEW BOOKS

edited by F. W. Quackenbush

MANUEL D'ANALYSE DES CORPS GRAS (Textbook of Analysis of Fats), by J. P. Wolff (Azoulay, Paris, 524 p.)

For those with knowledge of the French language, this book covers the field of the analysis of fats very adequately. The material is up-to-date and the reference material covers a broad field.

The introductory section covers basic nomenclatures and definitions, including degrees of precision and replicability.

Section 1 deals with general comments on the application of physicochemical methods. This includes various spectrophotometric, chromatographic and potentiometric methods. The discussions are quite basic and well written.

Section 2 describes general methods of analyses. As might be expected, the methods detailed do not always follow AOCS procedures, but also include AFNOR, UICPA, DGF and other sources. Where methods are the same, reference at the end of each chapter indicates the exact source. Frequently, several methods are given, and where possible, comparisons between methods are detailed. Methodology is quite complete and thus contributes to making this book very useful as reference material.

Section 3 details particulars of individual fats and their by-products. This includes analysis and comments on control procedures for the individual material. The material is mainly listed according to origin, and covers the subject well.

Reference sources are both European and American, and thus the contents are broad. The book is well written, and should serve as an excellent reference manual.

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AIR POLLUTION, VOL. 2, Second Edition, A. C. Stern, Editor (Academic Press Inc., New York, 684 p., 1968, \$32.50)

This is a text which uses a multiple-author approach to present the latest methods on air pollution analysis, monitoring and surveying. It is an improved and much expanded version of the material presented in the first edition. Sections covering air sampling, odor measurement, meteorological measurements, source testing, source monitoring and air pollution surveys have been updated. New material details the available analytical techniques for chemical analysis of specific gases and aerosols. Special attention has also been given to the methods of characterizing particulate pollutants and monitoring airborne radioactivity.

This book is recommended to persons concerned with air pollution problems. It represents a valuable handbook for chemists and engineers. It is a good reference source which will be used by people in the many related fields concerned with air pollution problems.

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ANALYSIS AND CHARACTERIZATION OF OILS, FATS AND FAT PRODUCTS, Vol. 2, H. A. Boekenooen, Editor (Interscience Publishers, John Wiley, New York, 1968, 681 p., \$26.50)

The purpose of this book is described by the editor as presenting more detailed knowledge of methods for the analysis of fats. To achieve this, the book is devoted to a series of chapters consisting of comprehensive reviews of subject matter areas. The areas covered are as follows:

Mass Spectrometry in Fat Analysis, E. Stenhagen, presents a detailed review of the recent (to 1965) application of mass spectrometry to the analysis of the

structure of most of the classes of lipids. Several interesting examples of structural analysis of triglycerides and other high molecular weight materials are discussed.

Measurement of Oil Color, M. Naudet and E. Sambue. The currently employed methods of oil color determination are reviewed from the point of view of theoretical aspects, accuracy and reproducibility. The methods compared are visual-iodine, FAC, APHA, Livibond and Gardner scales; and photometric methods.

Paper and Thin Layer Chromatography in Fat Chemistry, P. Vogel and T. Wieske, 368 references. A review of the separation of most of the lipid classes as well as antioxidants, vitamins A and D and dyestuffs using both thin-layer and paper chromatography is presented. Many illustrations of the separations discussed are given. In most cases enough detail is given so that the separation can be repeated thus saving time in referring to the original literature.

Analysis of Glycerides and Composition of Natural Oils and Fats, G. Jurriens. This chapter contains a wealth of experimental details, thereby allowing one to determine the structure of a fat from the methods outlined. After a short discussion of various separation methods, detailed experimental methods are given for the following: determination of S and U moieties by both ozonolysis and oxidation; their separation by both TLC and GLC; techniques for determination of glycerides after separation by TLC. Finally, an example of the application of enzymatic hydrolysis techniques is discussed.

The Determination of the Position of Double Bonds in Fatty Acids, P. G. Begemann. The commonly employed procedures for double bond position determination (KMnO₄, ozone, and osmium followed by scission with periodate) are discussed. Detailed experimental procedures are given for the application of both the osmium tetroxide and ozonolysis method to the determination of bond position.

A chapter is devoted to the determination of vitamins E, D and carotenoids in fats, G. Brubacher; the assay methods for these vitamins are presented.

The largest section of the book, 291 p., is devoted to the chemistry and analysis of olive oil (J. G. Tores). This chapter on olive oil probably represents one of the most complete reviews, of its type currently available. After a discussion of olive oil chemistry, assays and procedures for the determination of chemical components and characteristics, adulterants and quality are given in detail.

The chapters are well written and well documented. In cases mentioned, the chapters can serve as a laboratory manual for the determinations outlined. The book is written in the same style as Volume 1. However, the latest reference to be found in the book was to the year 1965 indicating a large time lag between writing and publication (1968). This has in many cases reduced the value of several of the chapters. Portions of this book would certainly be valuable to most lipid chemists. However, in view of its price it is recommended for reference library collections where it is readily accessible rather than for personal library shelves.

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MEDIUM CHAIN TRIGLYCERIDES, John R. Senior, Editor (University of Pennsylvania Press, 300 p., 1968).

This useful book contains the transactions of a special symposium held at the University of Pennsylvania March 9 and 10, 1967. The papers are grouped under four head-

ings, as they were in the original symposium: Part I deals with the absorption and metabolism of long chain and medium chain triglycerides; Part II describes physical and clinical studies with medium chain triglycerides; Part III deals with clinical and experimental studies with medium chain triglycerides; and Part IV is concerned with medium chain triglycerides in infants and children.

The book bears witness to the present status of the saturated, randomized, medium-chain triglycerides, MCT (C 6-10 fatty acids), which Vigen K. Babayan first developed from coconut oil and other palm kernel oils about 15 years ago.

Part I emphasizes the differences in intestinal absorption of MCT and long chain triglycerides. A great deal of knowledge has accumulated since the observation 17 years ago that medium fatty acids are predominantly absorbed by the portal circulation whereas long chain acids are carried as triglycerides by the lymphatics. This part of the symposium included a discussion of the serum-lipid-depressing effect of MCT.

Parts II and III give physiological data which form the basis of the use of MCT in the treatment of such diseases in adults as malabsorption, intestinal resection, celiac disease, inflammatory bowel disease, pancreatic insufficiency, A-betalipoproteinemia and liver cirrhosis. Favorable results were reported by all examiners.

Part IV deals with the beneficial clinical effects of MCT in diseases of infants and children, especially cystic fibrosis. The more general discussion which follows suggests that further research should include studies of whether MCT has a nitrogen-sparing effect, whether it is of value in the treatment of obesity, what the mode of action is in reducing serum lipids, and what are the long term clinical effects of a diet in which MCT is virtually the only source of fat.

An appendix gives recipes for the inclusion of MCT in prepared foods which ought to be useful for clinicians and dietitians.

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GAS CHROMATOGRAPHY, by Orion Edwin Schupp III, Vol. 13, *Technique of Organic Chemistry*, edited by E. S. Perry and A. Weissberger (Interscience Publishers, New York, N. Y., 437 p., 1968).

This book is a comprehensive, basic manual on gas chromatography. There are seven chapters dealing with theoretical and practical aspects of the field and contained within a hard bound volume of excellent quality. The author includes a list of the symbols used in the text and shows rare good judgment in placing it immediately after the table of contents where it is much handier than being buried as an appendix.

There are many books on gas chromatography that purport to be basic reference texts on the subject. Few, if any, really make the grade in this regard. The theoretical considerations usually smother the beginner and the practical aspects amuse the "old-timer." Yet, Schupp has managed to effectively transverse both adeas and in so doing conveys the impression that he speaks from a wealth of personal experience. His theoretical discussions are distilled down to basic fundamentals and presented in a logical, coherent manner that should contribute to the edification of the beginner and delight the more experienced chromatographers. Perhaps he is sympathetic to his less mathematically inclined colleagues!

The third chapter deals with the operation and design of chromatography equipment with particular emphasis on performance. This section and the following chapter on columns will be particularly useful to chromatographers at all levels of experience. Both chapters are remarkably comprehensive considering the space limitations of the book.

The remaining three chapters deal with applications including special techniques and qualitative and quantitative analyses. The author has very carefully selected his material so as to provide the maximum coverage of a massive

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field. Perhaps in this area he will disappoint the more experienced chromatographers unless they happen to be faced with the necessity of entering an area with which they are unfamiliar. In such as case, Shupp has provided an excellent entré to the literature.

The discussion on liquid phases covered several of the proposed classification systems, but failed to include Rohrschneider's system for characterizing liquid phases. Such an omission is surprising in view of the freshness of much of the material in this book and more so in the face of the growing popularity of the Rohrschneider system that Walter Supina has so gallantly championed! A table of Rhorsechneider constants for popular liquid phases would lend added weight to an exceptionally useful text.

This text is highly recommended for gas chromatographers at all levels of experience and is particularly useful as an advanced text for students. It contains a wealth of useful reference material and should be a standard item in any GLC lab.

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HETERO-AROMATIC NITROGEN COMPOUNDS: PYRROLES AND PYRIDINES, by K. Schofield (Plenum Press, New York; Butterworths, London, p. viii + 434, 1967, \$24.00).

This book constitutes the first volume of a series in which the author aims to discuss and correlate the chemistry of the major mono- and bicyclic nitrogen hetero-aromatic systems by applying principles of physical organic chemistry.

The chemistry of pyrroles and pyridines is presented by first surveying the physical properties and then by correlating substitution reactions of the electrophilic, nucleophilic and radical types. The properties of functional groups attached to the pyrrole and pyridine nuclei are

summarized in special chapters. But syntheses of these systems are not included.

Dr. Schofield has succeeded admirably in surveying and arranging the staggering amount of material. But a more judicious choice of literature data, presenting systematic and meaningful mechanistic studies, and inclusion of more equations, would have contributed to a better understanding and clarity of the discussions. Although the book was published in 1967, in the text the literature is only considered through 1964. Pertinent publications in 1965 are covered in appendices.

Many patent references are presented but without citation in Chemical Abstracts. Such omission is rather inconvenient to the reader.

Apart from these minor criticisms the wealth of information, which is presented in a well organized manner, makes this book highly attractive to research workers interested in the field.

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APPLIED SPECTROSCOPY REVIEWS, Vol. 1, edited by Edward G. Brame, Jr. (Marcel Dekker, Inc., New York, 455 p., 1968, \$14.50).

This book is a hardbound reprinting of the journal edition, Volume 1, issues 1 and 2, (1967-1968) and follows the same pagination. It contains, in addition, a complete author and subject index. Reviews contained in Volume 1 are:

Atomic Fluorescence Flame Spectrometry, J. D. Winefordner and J. M. Mansfield, Jr., p. 1-27.

Integrated Intensities of Absorption Bands in Infrared Spectroscopy, A. S. Wexler, p. 29-98.

Internal Reflection Spectroscopy, P. A. Wilks, Jr. and T. Hirschfeld, p. 99-130.

Methods and Applications in the Examination of Small Samples by High-Resolution NMR, R. E. Lundin, R. H. Elksen, R. A. Flath and R. Teranashi, p. 131-185.

Chemical Far Infrared Spectroscopy, J. W. Brasch, Y. Mikawa and R. J. Jakobsen, p. 187-235.

The Examination of Polymers by High-Resolution NMR, H. A. Willis and M. E. A. Cudby, p. 237-288.

Infrared Spectra of Adsorbed Molecules, M. R. Basila, p. 289-378.

Instrumentation, Spectral Characteristics and Applications of Soft X-Ray Spectroscopy, W. L. Baun, p. 379-432.

As can be seen, the reviews are on areas of spectroscopy which have not hitherto been covered in depth and, for this reason, are of value. In addition, they are authoritative, relatively complete and interesting. They are well worth having at hand.

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ORGANIC CHEMISTRY PROBLEMS by R. E. Busby and C. J. G. Shaw (Plenum Press, New York, xi + 300 p., 1967, \$5.95).

This book, although small in size (5 × 7½") is big in value to the student of organic chemistry or to the professional who wishes to sharpen up his deductive faculties.

The first half of the text, which comprises a collection of 307 typical problems involving the deduction of molecular structure from experimental data, is divided into two parts. Part I, intended for advanced undergraduates, contains 132 problems arranged in three sections covering aliphatic, aromatic, and combined aliphatic and aromatic chemistry. Part II, directed to graduate students, is devoted to 175 problems arranged in five sections covering aliphatic, alicyclic and aromatic chemistry; heterocyclic compounds; terpenes, steroids and carotenoids; carbohydrates and naturally occurring oxygen ring compounds; and alkaloids. In each part, 45 of the problems are taken from British academic examinations. Problems in each section of both parts of the book are arranged in order of increasing difficulty.

The second half of the text gives detailed answers to all problems, a feature that makes the book ideal for private study. A glossary and a detailed index complete the volume.

The authors note that problems were selected to meet the criteria (1) that the information provided in a problem should be as basic as possible; (2) that solution of some problems should be based on modern physical data; and (3) that all important areas of organic chemistry should be represented. Inspection of the book shows that the authors have indeed achieved their aim. The reviewer believes that many members of the American Oil Chemists' Society would find the book interesting and intellectually stimulating. It must be remembered, however, that this is not a book to be read, but rather one that requires the user to work.

Printing is clear and attractive, and binding appears adequate. A few errors are conveniently corrected under "Errata" and presented just before the first section of problems. At its modest price, the book is a bargain.

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DIETETIC FOODS, by A. E. Bender (Chemical Publishing, New York, 286 p., 1968, \$13.50).

This book is concise in arrangement and contents are easily identified by subtitles taken from the table of contents and printed in margins of text. The title is misleading because a survey covering dietary requirements, application of foods to disease, metabolic roles of nutrients and evaluation of nutritional methodology is included with the description of the preparation and use of dietetic foods. However, subject treatment is both technically correct and simple enough to be understood by those who have not studied science in detail but need a basic understanding of nutrition and dietary modification in general and food technology in detail. The chapters on enrichment of foods, protein-rich preparations and loss of nutrients are of particular interest and pertinent to current efforts to alleviate malnutrition. The handling of the difficult subject of protein evaluation is excellent as is the use of tables (54) to illustrate all topics presented. Illustrations of food processing, a glossary of medical terms and lists of British manufacturers of dietetic foods are included. References to "Recommended Dietary Allowances" are based on 1963 revision; therefore interpolation to 1968 allowances must be made by the reader. This book is recommended as a convenient source of topical information on dietetic foods with application to nutrition and diet therapy.

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