
Publications

Book reviews

A Theoretical Approach to the Preselection of Carcinogens and Chemical Carcinogenesis, by Veljko Veljkoovic (Gordon and Breach Science Publishers, One Park Ave., New York, NY 10016, 1981, 114 pp., \$36.50).

This book was compiled to analyze the problem of chemical carcinogenesis from the standpoint of physical principles directly influencing intermolecular processes and therefore living systems. The relevance of this book is emphasized by the fact that approximately 80-90% of the cases of cancer in humans are associated with environmental factors. The 114 pages within this text are divided into nine major chapters. Each chapter is well written and easily understandable by individuals not specifically educated in this area. Numerous tables and figures are included to aid in the readers' appreciation of the concepts discussed. The first two chapters discuss the electron-ion interaction potential of organic molecules and their carcinogenic properties. It was suggested that compounds whose potential lies in the area between 3.30 and 3.80 eV have a greater probability of being carcinogenic than compounds whose physical parameters are outside this range. The next two chapters deal with the carcinogenicity and role of the average quasi-valence number (AQVN) in biological systems. After considering numerous compounds, the author found the largest number of chemical carcinogens had AQVN areas between 2.40 and 3.10.

Using the above physical criterion the author suggests that many compounds can be rapidly evaluated for their potential carcinogenicity without undertaking lengthy and costly evaluation procedures. Absorption peak also was reviewed as an additional characteristic of carcinogenic compounds in Chapter 5. Most were found to have a peak in the area between 210 and 260 NM. Of interest and of considerable alarm are the vast number of normal physiologically active compounds having the above characteristics. After a discussion of these characteristics it was logical to have Chapters 6 and 7 review the antitumor activity of various compounds in regard to their physical properties. The use of information in these chapters may be of practical benefit in the initial selection of drugs with desired biological effects.

Chapter 8 is devoted to correlating the AQVN of selected compounds and their biological activity. Compounds such as vitamins, hormones and other biological compounds were considered and found to have activities that correlate with their AQVN. This observation suggests that AQVN analysis may have wide implications as an initial screen for many potential and useful drugs.

Chapter 9 is a general review of the contents of this book. This book would be of value as a reference text for many libraries. Furthermore, anyone interested in chemical interactions will find this book interesting and helpful.

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Liquid Chromatography in Clinical Analysis, edited by P.M. Kabra and L.J. Marton (Humana Press, Inc., Clifton, NJ, 1981, 466 pp., \$56).

This volume is divided into three parts: an introduction to the technique, equipment and columns; therapeutic drug monitoring and toxicology; and endogenous human biochemicals. The therapeutic monitoring section follows through the sequence of "anti" drugs, anticonvulsants, antiarrhythmics, antibiotics, antidepressants and antineoplastics to hypnotics and sedatives and toxicology screening. Endogenous biochemicals covered include catecholamines, steroids, proteins, bilirubin and conjugates, porphyrins, organic acids, nucleosides and polyamines. The editors appear as authors or coauthors on six of 19 chapters. When the authors of the chapter on steroids seem to suggest on financial and cost containment grounds that HPLC has little to offer the clinical laboratory, the editors have inserted something of a "disclaimer."

Coverage differs from that usually encountered in a book where the title suggests emphasis on analytical methodology. There is usually also rather extensive coverage of why the analytes are to be measured in specific biological fluids or tissues. The chapter on catecholamines by Kissinger et al. is particularly to be recommended in this regard. Gehrke and Kuo have done outstanding work on the HPLC of nucleosides and modified nucleosides and established a predominant position in this area of HPLC analysis. Analysis of the latter compounds has assumed importance as being of potential interest in cancer.

It is perhaps characteristic of the rapid pace of this field that the reported procedures are completely out of date. Gehrke and Kuo describe separations based on 2.4 meters of first generation columns. In work presented elsewhere (i.e., FASEB, 1981, Freiburg, 1981) by this group this same analysis has been modified and greatly extended to include over 40 compounds using 25 or 50 centimeters of second generation columns.

This is an excellent, well organized comprehensive book. Texts on clinical analyses usually have topics such as sterols, steroids, bile acids, fat soluble vitamins and/or related materials of interest of oil chemists. In the present volume this is limited to a chapter on sterols. Considering the editors' "disclaimer" of this chapter it would seem necessary to refrain from a positive recommendation to oil chemists.

Free Radicals in Biology V, edited by W.A. Pryor (Academic Press, 111 Fifth Ave., New York, NY, 1982, 283 pp., \$48).

With the discovery of the presence of selenium in glutathione peroxidase, it might almost be said that lipid peroxidation became respectable in the eyes of the biochemical community. The field could be studied in terms of enzymatically generated free radicals and enzymatic systems for removal of free radicals. Lipid peroxidation and antioxidants were from this viewpoint minor side issues related to a little leakage from the enzymatic systems. Respectability in turn has led to remarkable progress. This is particularly evident in the discussion of white cells and infection (Boehner, Boxer and Ingraham) and peroxidative reactions in red cell biology (Chiu, Lubin and Shobet). As so frequently seems to be the case, various parts of the problem are isolated in relatively obscure genetic lesions. On the other hand, the assertion that pharmacological doses of vitamin E enhance the rate of phagocytosis may lead to new fads. Flohe brings glutathione peroxidase into focus but has relatively little to say about the non-selenium containing glutathione peroxidase, glutathione S-transferase. Many of the previous questions regarding the relative action and importance of catalase and glutathione peroxidase disappeared with the appearance of data on subcellular localization. A number of new questions arise, however, in terms of cyclooxygenase and lipoxygenase products such as PGG₂, 12-HPETE and 15-HPETE.

The plant lipoxygenases are treated separately by Vliegenhart and Veldink. Prostaglandin endoperoxides were reviewed by Porter in Vol. 4 of this series. Mason considers the free-radical intermediates in the metabolism of toxic chemicals in considerable detail. This chapter goes far beyond the old standbys such as carbon tetrachloride and trichresylphosphate. In the section on polynuclear aromatic hydrocarbons, one notes with interest the statement that "Molecular orbital calculations support either diolepoxides or cation free radicals as the ultimate carcinogens..." Other chapters include the free-radical theory of aging by Harman; superoxide radical and hydrogen peroxide in mitochondria by Forman and Boveris; and the role of iron in

enzymatic lipid peroxidation by Aust and Svingen. Aust and Svingen thoroughly criticize all previous suggestions regarding the initiating species in lipid peroxidation but in turn make a rather vague case for the perferryl ion. The following quote (p. 13) may be viewed in several lights. "Unfortunately, proposals for perferryl ion-promotion of initiation have often had to rely on corroborative negative data indicating that other intermediates, such as HO[•], H₂O₂, superoxide alone, or iron alone cannot promote or do not participate the promotion of initiation of lipid peroxidation. Thus it often appears that the proposal for perferryl ion promoted initiation of lipid peroxidation is used as a stop-gap measure filling a void in our knowledge. However, the evidence the perferryl ion promotes initiation of lipid peroxidation is perhaps permissible since to date the perferryl ion has not been isolated and circumstantial evidence is all that is available." With five volumes completed and more in process most everyone will eventually have a chance to express their "non-referred" views and many strange ideas will appear in print. Harman's views on aging are somewhat controversial. Under certain circumstances in certain species, certain antioxidants increase average lifespan but not total lifespan. The initial observations were made more than 10 years ago and subsequent experimentation has not been particularly encouraging.

This is a valuable series to the lipid chemist and biochemist. As noted above there has been an increasing tendency to focus on the strictly enzymatic aspects and some chapters hardly mention lipids. On the other hand this particular volume seems to be one of the high points of the series to date. Not only this volume but the whole series is recommended for all fat and oil chemists and biochemists.

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New publications

Soyfoods Industry Directory & Databook 1982, by William Shurtleff and Akiko Aoyagi, The Soyfoods Center, PO Box 234, Lafayette, CA 94549, 51 pp., \$75 first copy, \$50 each additional copy.

Proceedings of the 11th Scandinavian Symposium on Lipids (held June 1981 in Bergen, Norway), edited by Reinhard Marcuse, Scandinavian Forum for Lipid Research and Technology, c/o Box 5401, S-402, 29 Göteborg, Sweden, 1982, 246 pp., paperback, 115 Swedish krona (\$19 in

US currency) plus postage. Includes papers on biochemistry, physicochemistry, food chemistry, synthesis and technical chemistry, and analytical chemistry.

Detergent Analysis: A Handbook for Cost-Effective Quality Control, by B.M. Milwidsky and D.M. Gabriel, Halsted Press, John Wiley & Sons Inc., 605 Third Ave., New York, NY 10158, 1982, 291 pp., \$57.95.

Prostaglandins: Organ- and Tissue-Specific Actions, edited by Stan Greenberg, Philip J. Kadowitz and Thomas F. Burks (Modern Pharmacology-Toxicology Series, Vol. 21), Marcel Dekker Inc., 270 Madison Ave., New York, NY 10016, 1982, 454 pp., \$59.50.

Handbook of Chemical Property Estimation Methods: Environmental Behavior of Organic Compounds, edited by Warren J. Lyman, William F. Reehl, David H. Rosenblatt, McGraw-Hill, 1221 Avenue of the Americas, New York, NY 10020, 1982, 960 pp., \$42.50.

STP 764-Pesticide Tank Mix Applications: First Conference, edited by J.F. Wright, A.D. Lindsay and E. Sawyer, ASTM, 1916 Race St., Philadelphia, PA 19103, 1982, 99 pp., \$13.95 (20% discount for ASTM members). Publication based on the first ASTM symposium on Pesticide Tank Mix Applications held in October 1980 in Philadelphia.

Vegetable Oil Fuels, Proceedings of the International Conference on Plant and Vegetable Oils as Fuels held August 1982 in Fargo, ND, American Society of Agricultural Engineers, 2950 Niles Rd., St. Joseph, MI 49085, 1982, 400 pp., \$23.50, \$18.50 for ASAE members.

CHETAH (Chemical Thermodynamic Energy Hazard Evaluation), ASTM Data Series Publication DS 51, available in three packages, each \$295: Program and Data Bank punched in EBCDIC; Program and Data Bank EBCDIC for use in IBM 1130; Program and Data Bank punched in BCDIC. Designed to enable accurate estimation of the thermodynamic properties of a compound from its chemical structure. ASTM Sales Services Department, 1916 Race St., Philadelphia, PA 19103.

Proceedings of a Conference on Nonenzymatic Glycosylation and Browning Reactions: Their Relevance to Diabetes Mellitus, published in *Diabetes: A Journal of The American Diabetes Association*, Volume 31, Supplement 3, 1982, edited by Charles M. Peterson, American Diabetes Association, 2 Park Ave., New York, NY 10016, 82 pp., \$5.

These books are not available from AOCS. If you are interested in buying a publication listed, please write directly to the publisher, whose address is included.

Latest in *Lipids*

Scheduled for OCTOBER

Metabolism of Arachidonic Acid in Leukocytes: Isolation of a 5,15-Dihydroxy-Eicosatetraenoic Acid

Hydrolysis of Triglycerides in the Isolated Perfused Rat Lung
Cholesterol Metabolism in Human Monocyte-Derived Macrophages: Stimulation of Cholesteryl Ester Formation and Cholesterol Excretion by Serum Lipoproteins

Effect of Vitamin E on Pentane Exhaled by Rats Treated with Methyl Ethyl Ketone Peroxide

Immobilized Lipoygenase in Continuous Production of Fatty Acid Hydroperoxides

Differential Uptake of Cholesterol and Plant Sterols by Rat Erythrocytes in vitro

Autoxidation of Cholesterol Fatty Acid Esters in Solid State and Aqueous Dispersion

The Effect of Dihydroergotoxine on Lipid Peroxidation in vitro

The Effects of Phosphate on the Biosynthesis of Cholesterol in Rat Liver Homogenates

cis-5-Olefinic Unusual Fatty Acids in Seed Lipids of *Gymnospermae* and Their Distribution in Triacylglycerols

Inhibition of Lymphocyte Capping by Fatty Acids in Mouse and Man

Preferential Oxidation of Linolenic Acid Compared to Linoleic Acid in the Liver of Catfish (*Heteropneustes fossilis* and *Clarias batrachus*)

Effect of Chlorpromazine on Rat Arterial Lipid Synthesis, in vitro

A Study of the Plasma Lipoproteins and the Tissue Lipids of the Migrating Lamprey, *Mordacia mordax*

Communications

Synthesis of Diene Prostaglandins in Freshwater Fish

Fatty Acid Chain Length Combinations in Ascitic Fluid Triglycerides Containing Lymphatic Absorbed Medium-Chain Fatty Acids