
Publications

Book reviews

The Biochemistry of Plants—A Comprehensive Treatise, Vol. 4, Lipids: Structure and Function, edited by P.K. Stumpf (Academic Press, 111 Fifth Ave., New York, NY, 1980, 691 pp., \$65).

This treatise consists of eight volumes: The Plant Cell; Metabolism and Respiration; Carbohydrates: Structure and Function; Lipids: Structure and Function; Amino Acids and Derivatives; Proteins and Nucleic Acids; Secondary Plant Products; and Photosynthesis. Volume 4 contains 19 chapters covering a wide variety of topics. Harwood leads with a general chapter on structure, distribution and analysis of plant acyl lipids. This overview is quite constructive since authors of other chapters frequently either fail to place their topics in a suitable perspective or cover only a narrow aspect of a broad topic. Sentences such as, "By virtue of its quarternary nitrogen, it carries no net charge and will, therefore, associate to form tightly packed membrane molecules provided that its fatty acid constituents allow" (p. 13) and the frequent misspelling of Hilditch (Hildritch) are annoying, but not serious, distractions.

Phospholipid biosynthesis (Mudd) is pure enzymology with just the barest mention of distribution turnover, or factors effecting composition. Phospholipid-exchange systems (Mazliak and Kader) helps to place some of the sub-cellular compartments in perspective. Membrane lipids: structural function (Raison) delves into the usual physical chemistry of transitions. Certain plants classified as chilling-sensitive, chilling-tolerant, or cold-hardened provide interesting opportunities to attempt to relate membrane alterations to physiological properties. Harwood's chapter on sulfolipids focuses almost entirely on diacylsulfoquinovslyglycerol and this lipid's possible role in photosynthesis. Galactolipid (Douce and Joyard), as the major (80%) polar lipid of the chloroplast, would also seem to have a relatively unique function.

Fatty acids are treated in three widely separated (1, 7 and 19) chapters. Stumpf essentially limits coverage to palmitic, stearic, oleic, linoleic and α -linolenic acids. Mangold and Spener cover cyclic fatty acids, cyclopropanoid, cyclopropenoid, and cyclopentenyl. All of the other strange and fascinating fatty acids found in plants are essentially ignored except in Harwood's introductory chapter. This even extends to *trans*-3-hexadecenoic acid. Cutin, suberin, and waxes are covered in the longest and one of the most comprehensive chapters, which includes almost 100 references to the author's (Kollattakudy) pioneering research. Triglycerides are covered well by Gurr. Galliard has reviewed hydrolytic enzymes and α , β , and ω oxidation. According to Galliard and Chan, the lipoxxygenases seem to be related to tissue wounds. Spurgeon and Porter refer in passing to the existence of 400 carotenoids of known structure but wisely limit coverage to relatively few, relatively simple, compounds.

Goodwin uses an introductory table of 16 sterol nuclei and 20 side-chain structures to attempt to simplify the discussion of sterol biosynthesis. The scurrying back and forth, needed to follow the conversion of Δ^7 -avenasterol (6-C) to poriferasterol (4-E), rapidly becomes tiresome. Although quite a bit is known about the biosynthesis of sterol derivatives (Mudd) such as esters, glycoside and acylated steryl glycoside, relatively little is known regarding the physiological role of these lipids.

This reader was somewhat at a loss to account for the presence of the other four chapters in this volume on lipids. The extension of the isoprene pathway into the terpenoids (Loomis and Croteau) could easily have given rise to an additional volume. Coverage of higher analogs of acetoacetate (polyketides) giving rise to phenols, flavones, anthraquinones and mycotoxins such as patulin (Packter) seems to duplicate some material more appropriately included in the volume on secondary plant products. Extensive coverage of net carbohydrate synthesis via the glyoxylate cycle utilizing the acetate derived from catabolism of fatty acids (Beevers) also seems out of place. Last, but not the least confusing, is the inclusion of ethylene formation from methionine (Yang and Adams).

This is an excellent collection of very high quality review chapters largely related to plant lipids. All chapters are very well done by knowledgeable experts. Any unhappy comments are related in part to an attempt to view the book in terms of the title which includes the description "A Comprehensive Treatise" and in part to the extensive coverage of nonlipid topics. In this age of the "information explosion," a true comprehensive treatise on any such broad topic as plant biochemistry may be an unattainable goal by virtue of publishing costs. When a book of this quality comes along it would seem desirable to accept it for what it contains and not quibble. This volume is recommended to lipid biochemists at the graduate or professional level.

Applied Headspace Gas Chromatography, edited by B. Kolb (Heyden and Sons, Inc., 247 S. 41st St., Philadelphia, PA 19104, 1980, 185 pp., \$29).

This volume is the proceedings of a symposium held at Beaconsfield, England, and an international colloquium at Uberlinger, West Germany, sponsored by Perkin-Elmer. The 21 papers are stated to have been selected to represent coverage of the most typical headspace applications. The initial chapter by the editor, however, tends toward the theoretical aspects of the technique. Several of the applications are of direct interest to the lipid chemist, including aroma compounds in dairy products and volatile hydrocarbons in breath as indicators of peroxidative degradation of lipids. Other topics of peripheral interest involve sol-

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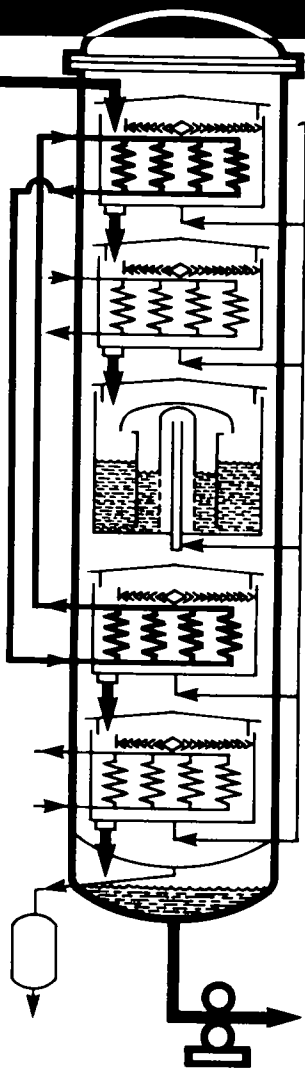
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vents and monomers in packaging materials. Possibly of less interest are chapters on brewing, spices, medical microbiology, forensic science and industrial hygiene. Frequent reference is found to the Models F40-45 series of Automatic Headspace Analyzers manufactured by Perkin-Elmer.

Headspace analysis is a convenient approach to complex samples containing volatile constituents. The flavor and fragrance profile applications are relatively obvious. Ethane and pentane evolution as an indication of in vivo lipid peroxidation or vitamin E status represent a somewhat more esoteric application. In general, the text is clear and the figures are of reasonable quality. Many of the papers were translated from German and awkward phrases and constructions abound. "According to Heimschler (1) formaldehyde attacks strongly the respiratory organs on proteins" appears on p. 24 and "Due to its high electron affinity the two vicinal diketones, diacetyl, as well as 2,3-pentanedione, can be determined under these conditions with high sensitivity in an ECD of this type" on p. 76. Headspace gas chromatography is an important, relatively new aspect of analytical chemistry. While this book is perhaps not vital to the individual lipid chemist, it does constitute a reasonable reference book.

Maintaining and Trouble-Shooting HPLC Systems—A User's Guide, edited by D.J. Runser (John Wiley and Sons, Inc., New York, NY, 1981, 163 pp., \$27.50).

This book seems to be based on the authors belief that the old chestnut "If all else fails, read the directions," describes the normal behavior of the typical instrument user. Unfortunately, he may be correct. The author does not cover theory, instrumentation, practice or application, only trouble-shooting and maintenance. Coverage is rather shallow and much of the equipment illustrated is, at best, obsolescent. Detectors are limited to refractive index and UV-visible. The section on column regeneration should tactfully be ignored if modern, second generation 5μ packings are used. Considering, however, the cost of modern equipment and the astounding cost of service calls, if you or any of your staff ever glance idly through this volume for five minutes, the cost of the book will probably be recovered many times over. Buy several and firmly attach a copy to every HPLC in use.

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New publications

Advances in Chromatography, edited by J. Calvin Giddings, Eli Grushka, Jack Cazes and Phyllis R. Brown, Marcel Dekker Inc., 270 Madison Ave., New York, NY 10016, 1981, 312 pp., \$39.75.

Chemical Abstracts Service, 2540 Olentangy River Rd., PO Box 3012, Columbus, OH 43210, in conjunction with BioSciences Information Service (BIOSIS), has announced plans to produce jointly a series of publications under the general title BIOSIS/CAS Selects, published biweekly, which will bring together abstracts and summaries of current reports from both the biological and chemical literatures on specific research topics.

Protein Functionality in Foods, by John Cherry, American Chemical Society/Symposium Series, 1155 16th St. NW, Washington, DC 20036, 332 pp., \$36.75. Contains 14 papers from a symposium held during the ACS meeting in Houston, March 24-28, 1980.

Two 1980 symposia proceedings, **Test Protocols for the Environmental Fate and Movement of Chemicals**, \$30, and **Optimizing Chemical Laboratory Performance through the Application of Quality Assurance Principles**, \$28, are now available from the Association of Official Analytical Chemists, 1111 N. 19th St., Suite 210, Arlington, VA 22209.

Nutrition and Environmental Health: The Influence of Nutritional Status on Pollutant Toxicity and Carcinogenicity, Vol. II: Minerals and Macronutrients, by Edward J. Calabrese, John Wiley and Sons, 1981, 402 pp., \$45.

Chemical Engineering and the Environment, edited by A.S. Teja, John Wiley and Sons, 1981, 100 pp., \$27.95.

Cancer Causing Chemicals by N. Irving Sax, Van Nostrand Reinhold, 135 W. 50th St., New York, NY 10020, 1981, 480 pp., \$39.95.

Handbook of International Food Regulatory Toxicology, Vol. 2: Profiles, by Gaston Vettorazzi, SP Medical and Scientific Books, 175-20 Wexford Terrace, Jamaica, NY 11432, 1981, 198 pp., \$30. Presents findings of world's major health organizations on the toxicological effects of food-coloring substances.

Chemical Technicians' Ready Reference Handbook, second edition, edited by Gershon J. Shugar, Ronald A. Shugar, Lawrence Bauman and Rose Shugar Bauman, McGraw-Hill Book Co., 1221 Avenue of the Americas, New York, NY 10020, 1981, 867 pp., \$39.50.

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