New Books

L.A. Witting, Book Review Editor

Developments in Chromatography I, Edited by C.E.H. Knapman (Applied Science Publishers, Ltd., Ripple Road, Burking, 1G, OSA Essex, England, 1978, 245 p., $30).

Knapman, as editor of "Gas and Liquid Chromatography Abstracts," is well aware of the developing areas in chromatography. This book appears to be the first volume in a new review series on chromatography. It contains six separate chapters: The Characterization of Solute-Solvent Interactions in GLC, Vernon; Developments in Continuous Chromatographic Refining, Barker; Gas-Chromatographic Separation of Isomers, Sharples; Gas-Chromatography Detectors, Grant; Polymer Molecular Weight Distribution by Gel; Permeation Chromatography, Hatt; and Chromatography in Forensic Science, Smith.

The first chapter basically considers liquid phases in Kovats, Rohrschneider and McReynolds terms, and tends to be rather mathematically and thermodynamically oriented. Continuous refining is discussed primarily as a relatively large scale operation of interest to a chemical engineer rather than a bench chemist. Sharples considers the uses of liquid crystal phases, Bentonite type (organo-clays) columns, separation of optical isomers and gas solid separations. Graphitized carbon, for instance, has become widely used in this last area. Liquid crystal phases are advocated for analysis of polynuclear aromatic hydrocarbons. The chapter on detectors is particularly to be recommended. The second generation of electron capture detectors has arrived, and the Hall detector is commercially available. Nitrogen-phosphorus detectors and flame photometric detectors each have special advantages of which the analyst should be aware. While the mass spectrometer has become a popular GLC detector, this topic does not fit within the scope of this chapter. The final chapter gathers many conventional techniques together and illustrates their usefulness and application in the field of forensic science.

The relative broad spectrum of topics covered and relatively high price per page probably consigns this book to libraries rather than the laboratory bench. Approximately half the book, those chapters on phases, detectors and isomer separations, are of interest to oil chemists. This is an attractively produced, well printed volume with excellent illustrations.

LLOYD A. WITTING
Supelco Inc.
Bellefonte, PA 16823

Free Radicals in Biology, Vol. III, Edited by W.A. Pryor (Academic Press Inc., 111 Fifth Ave., New York, NY, 1977, 311 p, $35).

This is the most recent volume in a series that will apparently include at least two or three more volumes. Chapters include: "Applications of Radiation Chemistry to Biology," Benon, Bielski and Gebicki; "Free Radicals in Biology: The Pulse Radiolysis Approach," Adams and Wardman; "Chemical Mechanisms in Carbon Tetrachloride Toxicity," Recknagel, Glende and Hruszkewycz; "Lipofuscin: Fine-Structural and Biochemical Studies," Miquel, Bensch and Johnson; "Free Radicals in Enzyme-Substrate Reactions," Yamazaki; "The Pathological Effects of Light on the Skin," Epstein; and "The Involvement of Free Radicals in Chemical Carcinogenesis," Ts'O, Caspary and Lorentzen.

Pryor appears to have adopted an eclectic approch to volume content. One has the impression that chapters will eventually appear by anyone, whether chemist or biologist, working constructively and productively on any aspect of the field. Each individual volume appears to some limited extent to be a random product of manuscripts accumulated in house constituting enough pages for a book. The result is rather delightful and hopefully will find both the biologists and chemists broadening their outlooks. Volume I (1976) includes spin labeling, applications of electron spin resonance in biology, free-radicals in photosynthesis and an important chapter by Fridovich. Volume II (1976) is heavy on air pollution, smog, ozone, oxides of nitrogen and peroxyacyl nitrates, but also includes pyridinyl radicals, GSH-GSSG, singlet oxygen, and free radicals in proteins and nucleic acids. Volume IV is scheduled to include chapters by Tappel and McCay. This reviewer found the chapters in Vol. III on CC14 and chemical carcinogenesis particularly interesting. Recknagel points out how the hepatic catabolism of an exogenous material via a free-radical mechanism may injure or destroy the liver by overloading the protective systems. Reviews on chemical carcinogenesis are always enjoyable since this is an area where positive experiments with lipid antioxidants are particularly abundant and substantial. It might be argued that the chapter by Yamazaki logically belongs in the same volume with the chapter by McCay, but an editor obviously must live with logistical problems.

The general thrust of this series from the biological point of view can be briefly summarized. In adapting to life in an oxygen containing environment, organisms were forced to develop multiple lines of defense against unwanted free-radical initiated oxidations. Free-radicals arise from normal enzyme reactions, and they or their products are largely controlled by other enzyme systems, i.e., superoxide dismutase and glutathione peroxidase. The various chemically oriented chapters provide both a theoretical and practical approach to free-radical reactions in somewhat simpler, non-biological systems. An understanding of such chemical systems and the relevant applicable methodology is required for rapid progress in clarifying the biological systems. Of particular importance to the lipid chemist is free-radical leakage resulting in lipid peroxidation and generating a vitamin E requirement. This has been a controversial area for years but now appears to be subject to logical, if complicated, explanation. Lipid peroxidation has been suggested to play a role in carcinogenesis and the generalized phenomenon of aging. These processes are exacerbated by certain environmental factors but may conceivably be modified by antioxidants. This series can be heartily recommended to all lipid chemists interested in either biological systems or oxidative rancidy, both in terms of the explanation of past controversy and indications of future directions. Specific volumes, however, should be scanned to determine their relevance to the particular interests of the individual reader. Pryor is to be congratulated on the results thus far.

LLOYD A. WITTING
Supelco Inc.
Bellefonte, PA 16823