

ATR by Mirabella thoroughly points out all the nuances and pitfalls of this powerful sampling technique. The diffuse reflectance chapter by Blitz is the best presentation I have seen contrasting the way the technique is traditionally performed in the near-IR and visible regions (using an integrating sphere) with the much different accessories generally used on commercial Fourier transform infrared (FT-IR) instruments. The chapter by McClelland, Bajic, Jones, and Seaverson introduces PAS, including how it can be applied in conjunction with step-scanning FT-IR spectrometers to obtain uniform depth-profiling information at all wavelengths. The IR microspectroscopy chapter by Katon describes the historical evolution of IR microscopes and emphasizes the importance of good sample preparation. Sommer's chapter on Raman microspectroscopy provides a brief review of the Raman effect and addresses experimental considerations and capabilities of this technique. Emission spectroscopy is described in a chapter by Zhang, Franke, and Niemczyk. The final chapter on fiber optics in molecular spectroscopy is nicely developed by Brown.

The practical utility of the book is enhanced, in part, due to the fact that several of the authors have industrial experience and/or have worked closely with industry during their careers. In each case, the authors are experts in their areas and have provided an excellent overview along with information that is practically useful to those not as familiar with the technology. There are some errors and oversimplifications, and occasionally nomenclature changes from one chapter to another. For example, IRS is an abbreviation for infrared spectroscopy in Chapter 3, while it refers to internal reflectance spectroscopy in Chapter 4. Overall, the book is excellent. I have no hesitation in recommending it to research associates or analytical chemists with a need or interest in learning more about any of these applications of molecular spectroscopy.

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Food Lipids: Chemistry, Nutrition and Biotechnology (Food Science and Technology Series/88). Edited by Casimir C. Akoh (University of Georgia) and David B. Min (University of Ohio). Marcel Dekker: New York and Basel. 1998. xi + 816 pp. \$225.00. ISBN 0-8247-9985-2.

This valuable resource provides a state of the art overview of the field of Food Lipids from the point of view of their Chemistry and Analysis and their Biotechnology, together with their role in Nutrition and in certain disease states, particularly Cardiovascular disease. The volume is organized into 28 chapters, written by individuals, or groups of individuals who are nationally and internationally recognized experts in their particular fields. Consequently the book represents an authoritative and up-to-date treatment of many topics of current importance in the field of Food Lipids, and provides a comprehensive reference resource for workers in a number of related areas. These include human and animal nutrition, lipid biochemistry and metabolism, food processing and storage, lipid analysis, dietary lipids and cardiovascular disease and obesity, antioxidants and agricultural applications including genetic engineering of crops producing vegetable oils.

Part I comprises seven chapters dealing with the Chemistry and Properties of lipids. It includes a very useful introductory chapter on the Nomenclature and Classification of lipids that includes review of the IUPAC nomenclature for fatty acids, and an overview of the conversion of essential fatty acids to the metabolically important prostaglandins and leukotrienes. The clarity and high quality of the figures and diagrams in this chapter set the high standard for the remainder of the book, although, somewhat disappointingly for a text of this quality, no use is made of color. Other chapters in this section deal with the Chemistry and Function of Phospholipids, Lipid-based Emulsions, Chemistry of Waxes and Sterols, Lipid Extraction and Analysis including Trans Fatty Acids and the Chemistry of Frying fats.

Part II deals with Industrial Extraction and Processing of Food Lipids

and includes chapters on Recovery, Refining, Converting and Stabilizing Edible Fats and Oils, the Crystallization and Polymorphism of Fats, and the Chemical Interesterification of Food Lipids particularly as applied to the physical properties of edible fats such as margarines and the production of fat substitutes such as Olestra.

Part III covers what has always been a major problem for the food industry, the oxidation of lipid components in foods and edible oils, with the accompanying implications for food storage, quality, and safety. This section includes chapters on Lipid Oxidation of Edible Oils, Fatty-acid Oxidation in Plant Tissues, Methods of Measuring Oxidative Lipid Oxidation, and Antioxidant Mechanisms and a chapter on Lipid Oxidation of Muscle Foods in which it is noted that lipid oxidation is one of the major causes of quality deterioration in frozen meats. This also describes examples where oxidation leads to enhancement of product quality, for example, in the production of fresh fish aromas. This phenomenon is also known to consumers of fine wines.

Part IV deals more specifically with some of the Nutritional Aspects of Lipids, and comprises seven chapters on a diverse range of topics including both synthetic and natural Antioxidants, and an authoritative overview of the role of Fats and Oils in human Health, that includes discussion of the now largely discounted role of trans fatty acids in CHD, and relationships between dietary lipids and cancer. This section also includes a very well referenced and topical chapter on the Omega Fatty Acids, including mechanisms of biosynthesis and desaturation, the role in membranes and cell physiology, and dietary sources and possible nutritional importance of the numerous PUFA's. Additional chapters cover the topics of Dietary Fats, Eicosanoids, and the Immune System, Dietary Fats and Coronary Heart Disease, and Dietary Fats and Obesity. The final chapter in this section, Lipid-Based Fat Substitutes, presents an extensive and timely description of what is arguably the most significant nutritional substitute since the introduction of artificial sweeteners. This chapter includes sections on the classification of fat replacers, and descriptions of the different types of lipid based fat substitutes, including those such as the sucrose polyesters (Olestra), that are already on the market, and others that are currently under review by the FDA. The chapter concludes with sections on side effects and safety, and FDA regulatory updates, that will be of considerable interest to clinicians, nutritionists, dietitians and others.

The final section, Part V, contains six chapters devoted to the Biotechnology and Biochemistry of Food Lipids. It includes an overview chapter, Lipid Biotechnology and additional chapters on Microbial Lipases, Enzymatic Interesterification, Structured Lipids, Biosynthesis of Fatty Acids and Storage lipids in Oil-Bearing Seed and Fruit tissues and a final Chapter on Genetic Engineering of Crops that Produce Vegetable Oils.

As a minor fault, the main index for the book is not particularly comprehensive, or complete. For example, a search for the term "atherosclerosis" yields only a single reference (p 452), and completely misses the 30-page chapter entitled Dietary Fats and Coronary Heart Disease. Similarly, the term "prostaglandins" is referenced only once (p 704), despite a detailed review of the topic (pp 9–12 in chapter 1) and again in chapter 19, Dietary Fat, Eicosanoids and the Immune System. In compensation, however, the references for the individual chapters are comprehensive and up-to-date, and provide a valuable resource for further readings on specific topics.

In summary, this is an important and timely volume that will be of interest to a broad spectrum of readers. It amply fulfills its stated objectives of providing a textbook of food lipids, although probably more suited to graduate than undergraduate instruction. In addition it will provide a valuable reference text for researchers and practitioners in a variety of fields, encompassing the food industry, agriculture and biomedical disciplines, including particularly those with nutritional and biochemical interests.

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