Book reviews

Developments in Food Proteins—5, edited by B.J.F. Hudson (Elsevier Science Publishing Co. Inc., 52 Vanderbilt Ave., New York, NY 10017, 1987, 341 pp., $86.50).

This book is the fifth volume in a series on developments in food proteins by the same editor. The first volume was published in 1982. The editor has rather successfully covered a wide spectrum of protein resources in each volume by dealing with topics not previously covered in earlier volumes and by expanding to areas of increasing importance to food scientists and technologists.

This hardback volume contains seven chapters written by 12 authors. In general, the book is well-illustrated and indexed. The first chapter discusses both conventional uses of peanuts and new uses of peanut protein ingredients such as defatted flours as extenders and/or replacers of existing foods. Chapter Two deals with factors affecting the use of cottonseed as a source of food proteins, including various methods of gossypol removal and/or inactivation as well the comparison of various protein ingredients produced by different methods. Chapter Three summarizes the current status on structural, physical and functional characteristics of the major 7S and 11S seed storage globulins, including comprehensive amino acid sequences for a wide range of species such as soybean, pea and peanut and possible use of these proteins as functional ingredients in food products.

Intermolecular forces involved in the mechanisms of interactions between chymosin and various forms of casein micelles are the topic of discussion in Chapter Four in an attempt to improve the understanding of protein-protein interactions in food systems. Effects of electrostatic repulsion, ionic bonding and steric and hydration repulsion on enzymatic and acidic coagulation of casein micelles are discussed. Chapter Five discusses mechanisms associated with various important functional characteristics of muscle proteins such as water binding, solubility, swelling, surface activity, adhesion and gelation, with particular reference to myofibrillar proteins, myosin and actin.

Chapter Six discusses improvements of foaming/gelling properties of proteins by understanding the mechanisms by which proteins perform these functions. Included are the effects of various intrinsic and extrinsic factors as well as chemical and enzymatic modification of protein structure, manipulation of processing conditions, use of additives and finally the use of novel combination of oppositely charged proteins to accomplish the desired objectives. Chapter Seven discusses the needs for standardized functionality test methods for proteins, and identifies the desired attributes of test procedures. Factors affecting measurement and prediction of functional properties are reviewed for several important properties such as foaming, gelation, emulsification, hydration and solubility.

Each chapter has a summary and a list of references that provide ready access to the proper information source. This book should be a useful resource for food scientists and technologists interested in protein technology and applications in foods and related topics. This includes the readers of *JAOCS*, particularly those handling oilseeds and oilseed products.

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Chromatographic Chiral Separations, Chromatographic Science Series, Vol. 40, edited by Morris Zief and Laura J. Crane (Marcel Dekker Inc., 270 Madison Ave., New York, NY 10016, 1988, 410 pp., $199.50).

This book is a relatively detailed exposition of virtually all aspects of the chromatographic separation of stereoisomers. Each of the 14 chapters has been written by authors with extensive hands-on experience in their topic. Hence, each of the various techniques is presented in an authoritative and positive manner.

In addition to a brief historical introduction, the book contains one chapter devoted to indirect separation of enantiomers (as diastereomers), the remaining chapters focusing principally upon the chiral stationary phases and chiral mobile phases that are either of widespread utility or of intrinsic interest. These include specifically "imprinted" polymers, Pirkle-type phases, cellulose-derived phases, protein phases, chiral polyacrylamide and polymethacrylate phases, cyclodextrin phases, ligand exchange systems and chiral ion-pairing systems. Preparative enantiomer separations, the influence of mobile phase composition, and a review of separations of biologically active molecules on commercial chiral phases round out the book.

Because this book is complete and relatively current (some 1986 references are cited), it is not only an excellent primer for those wishing to learn about the field of chiral chromatographic separations, but also is a good reference text due to numerous tables, examples and figures.

As stereochemistry pervades almost all areas of chemistry and biochemistry, this book should find wide readership in the chemical and pharmacological communities.

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The Alveograph Handbook, by Hamed Faridi, Vladimir Rasper and B. Launay (American Association of Cereal Chemists, 3340 Pilot Knob Rd., St. Paul, MN 55121, 1987, 56 pp., $48 US, $52.80 elsewhere).

The Alveograph Handbook is more than the standard set-up, maintenance and normal procedures manual, which might be expected from the title. The book is in 8.5 by 11-inch format with handbook-type chapters on basic instrument design, standard procedures, calibration and maintenance, and troubleshooting.

In addition, this publication provides chapters on theoretical aspects of the parameters measured

by the instrument, an extensive discussion of interpretation of the alveogram, some interesting modifications of standard procedures (some for both nonflour and nonfood applications), and an introduction to factors that may influence Alveograms of flour doughs.

A chapter on theoretical aspects of alveography describes dough deformation during testing on this instrument and provides a brief introduction to basic rheology terms and concepts. Much of the chapter is devoted to theoretical discussion, complete with complex mathematics, of the biaxial expansion mode, which is the basis for fundamental rheological calculations related to the alveograph. Several graphs are used to picture the results of the mathematical treatments; these certainly are useful for readers who may be many years removed from their mathematical training.

Chapters on interpretation of alveograms and modifications to standard procedures, when combined with theoretical considerations, make it clear that the alveograph is most useful for empirical determinations within a given setting. It seems clear that working with the alveograph as a measure of fundamental rheology is likely to be frustrating at best. However, it may be useful in a number of settings as an empirical method developed for specific applications.

This volume is a complete operating handbook as well as a comprehensive review of alveograph literature. It certainly has a place in the library of persons interested in commercially available rheology testing equipment.

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Animal Fat: Resources, Properties, Refining, Application (Proceedings of the Lipidforum Symposium at Oslo, Norway, October 1986), edited by Reinhard Marcuse (The Scandinavian Forum for Lipid Research and Technology, c/o SIK, Box 5401, S-402 29 Göteborg, Sweden, 1987, 214 pp., SEK 260, US $40).

This relatively comprehensive book is divided into 26 chapters containing contributions to a Lipidforum symposium held in Oslo, Norway, during October 1986. The organizers did an excellent job of bringing together practical information pertaining to animal fats, including marine oils, that extends beyond what the title implies.

From a conceptual standpoint, the presenters are very consistent in providing an objective approach to their specific subjects. This is most evident in the five presentations devoted to nutrition. As an example, the chapter on Nutritional Aspects of Animal Oils and Fats identifies health-related concerns connected with eating animal fats and recognizes current thinking on how to reduce the risk of contracting diet-related cardiovascular disease (CVD). This is done without forsaking the notion that animal fats represent a viable alternative to more expensive vegetable fats for underdeveloped countries where "energy-dense animal fat having a high degree of oxidative stability can make an important positive contribution to the diet. At the same time, it can provide a high proportion of essential fatty acids and fat-soluble vitamins."

Consistent with this practical approach is considerable data related to chemical and physical properties of animal fats. One chapter in particular makes good use of graphics to explain the polymorphism of triglycerides in general, and tallow and lard in particular.

The four chapters related to processing are straightforward and, in some cases, general enough to be appreciated by those who may have a need to know but are not skilled in the art. One unexpected but informative chapter deals with the separation of fats and oils in industrial waste water.

Because of the significance of the Scandinavian fishing industry, it is not surprising that the book contains eight chapters that address marine oils. Again, the authors provide useful information pertaining to why fish oils are attractive nutritionally, their chemical and physical properties, and their potential for use in margarines, shortenings and fatty derivatives. One interesting chapter addresses how a fish itself utilizes fat.

The book does lack information pertaining to dairy fats. As indicated in the preface, the symposium purposely omitted dairy fats because it had been the subject of a previous Lipidforum.

Overall, the book contains enough useful information to warrant recommending it not only to students connected with the study of fats and oils, but also to those needing to achieve a better understanding of fundamentals related to the fats and oils industry.

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Food Analysis: Theory and Practice, by Y. Pomeranz and C. Meloan, (Van Nostrand Reinhold Co., 115 Fifth Ave., New York, NY 10003, 1987, 797 pp., $41.95).

This is one of the most used of food analysis books for courses in food analysis at the advanced undergraduate and even graduate level. I have used the first edition in my own course and am now using the second edition. It is useful as a text and continues to be a good reference for students carrying out research that may require instrumentation use.

The book contains a general section, followed by another covering methods and instrumentation. Virtually every instrumental and analytical method is covered here. The last section of the book is devoted to applications and chemical composition. Topics covered are the determination of moisture, ash and minerals, carbohydrates, lipids, nitrogeneous compounds and objective sensory evaluation of foods.

This edition is essentially a rewrite, since there have been so many changes in analytical aspects of food chemistry. Obviously, no one book can treat all of the areas of instrumental analysis in the depth of a specialized monograph. However, this book discusses the principles and practice of each technique in sufficient detail for students and researchers to make intelligent decisions concerning the

type of analysis they might need to carry out on a particular sample. The book abounds with illustrations detailing both instrument and method operation as well as the results obtained.

If I could buy only one book dealing with the analytical chemistry of foods, this would be it. This book will be useful to anyone dealing with analytical methodology, regardless of area of specialization. It should not be suggested that it is only for student use.

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New books

Olive Oil in Antiquity: Israel and Neighbouring Countries from Neolith to Early Arab Period, edited by M. Heltzer and D. Eitam, Proceedings of the 1987 Conference at the University of Haifa, sponsored by the Culture & Art Division of the Ministry of Education & Culture, Shemen Industries Ltd., Miloumor-Milouot Ltd. and the Research Fund of Israel Edible Oil Industry. For information on obtaining copies of the 244-page book, contact David Eitam, Shemen Industries Ltd., 2 Tovim St., PO Box 136, Haifa 31000, Israel.

Managing Safety in the Chemical Laboratory, by James P. Dux and Robert F. Stalzer, Van Nostrand Reinhold Co., 115 Fifth Ave., New York, NY 10003, 1988, 154 pp., $28.95.

The following books are available from Alan R. Liss Inc., 41 E. 11th St., New York, NY 10003:

Nutrition and Immunology, edited by Ranjit K. Chandra, 1988, 352 pp., $96.

Supercritical Fluid Extraction and Chromatography: Techniques and Applications, edited by Bonnie A. Charpentier and Michael R. Sevenants, American Chemical Society, 1155 16th St. NW, Washington, DC 20036, 1988, 262 pp., $59 US and Canada, $71.95 elsewhere.

CRC Handbook of Sugar Separations in Foods by HPLC, by Philip E. Shaw, CRC Press Inc., 2000 Corporate Blvd. NW, Boca Raton, FL 33431, 1988, 224 pp., $97.50 US, $115 elsewhere.

Handbook of Reliability Engineering and Management, edited by W. Grant Ireson and Clyde F. Coombs Jr., McGraw-Hill Book Co., 11 W. 19th St., New York, NY 10011, 1988, 656 pp., $59.50.

Macromolecular Sequencing and Synthesis: Selected Methods and Applications, by David H. Schlesinger, 1988, 282 pp., $69.50.