

Book Reviews *

Experimental Methods in Polymer Science. Modern Methods in Polymer Research and Technology. By Toyochi Tanaka (Massachusetts Institute of Technology). Academic Press: New York. 2000. xii + 604 pp. \$95.00. ISBN 0-12-683265-X.

This volume is a continuation in the series on polymers, interfaces, and biomaterials. While the title of the book may be somewhat ambiguous, the main focus is on physical techniques for the elucidation of polymer structure and morphology in both solution and the solid state. This is a timely book in many respects: the field of polymer science is expanding rapidly at the moment due to the continuing interest in and development of nanoscale science, and polymeric materials are expected to play a crucial role in this arena. A complete understanding of the structure and physical properties of these materials is essential. The multidisciplinary aspects of modern polymer science also create a significant demand for books such as this that describe the principles of the respective method as well as detailed procedures for those experiments.

The book is divided into six chapters: (1) Light Scattering; (2) Neutron Scattering; (3) Fluorescence Spectroscopy; (4) NMR Spectroscopy in Polymer Science; (5) Mechanical Spectroscopy of Polymers; and (6) Polymer Hydrogel Phase Transitions. In selecting chapters for a book such as this, it is inevitable that certain areas are neglected, such as thermal analysis, X-ray scattering, etc., especially when a chapter on polymer hydrogel phase transitions is included. While this is an interesting chapter, it seems out of place, considering the subject matter of the other chapters. Given this minor weakness, the book is well written and concise in its coverage of the general areas. The voluminous chapter on NMR spectroscopy, over 200 pages, is particularly broad in its scope and would be of interest to researchers at various levels. Two particularly pleasing aspects of the work are the comprehensive reference list associated with each chapter and the presence of references from recent years, i.e., 1998 and 1999. The devotion of a considerable section of each chapter to the description of actual experiments and the applications of these various techniques is also an extremely useful approach and successfully demonstrates the advantages and disadvantages of each physical technique.

This book is highly recommended as a reading and advanced teaching tool to a wide range of researchers in the general field of polymer science. It is particularly well suited to the nonexperts in these various fields and serves as a practical guide to the area of polymer characterization.

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Chromatography of Polymers. Hyphenated and Multidimensional Techniques. Edited by Theodore Provder (Olmsted Falls, OH). American Chemical Society: Washington, DC (Distributed by Oxford University Press: New York). 1999. xii + 346 pp. \$120.00. ISBN 0-8412-3661-5.

This book covers hyphenated and multidimensional chromatographic techniques for analyzing complex polymers. Its 21 chapters are organized into three different sections: Detection and Data Analysis, Field Flow Fractionation and Coupled Liquid Chromatography Methods, and Polymer Applications. The first two sections of the book focus primarily on the various new developments and improvements in these techniques, such as multiple detector SEC and combined GPC and MALDI TOF mass spectroscopy, while the third section centers on the applications of these techniques to a diverse group of interesting polymeric materials, e.g., metallocene-catalyzed polyolefins and PPG-glucan. The references do not extend beyond 1998.

JA004739K

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Affinity Chromatography: Methods and Protocols. Methods in Molecular Biology. Volume 147. Edited by Pascal Bailon, George K. Ehrlich, Wen-Jian Fung, and Wolfgang Berthold (Hoffmann-La Roche Inc.). Humana Press: Totowa, NJ. 2000. x + 230 pp. \$79.50. ISBN 0-89603-694-4.

This book is a useful guide for new and experienced practitioners in the field of affinity chromatography. Each of its 19 chapters focuses on a specific technique and begins with an introduction describing its basic principles. A Materials and Methods section follows, providing step-by-step instructions on how to conduct a successful experiment using that technique. All chapters end with a troubleshooting Notes section that suggests alternative procedures and offers solutions to common problems.

JA004744O

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Reagent Chemicals. Ninth Edition. American Chemical Society Specifications. Oxford University Press: New York. 2000. xii + 752 pp. \$165.00. ISBN 0-8412-3671-2

This edition, like the editions preceding it, publishes the specifications used in analytical testing as determined by the American Chemical Society Committee on Analytical Reagents. The ninth volume does, however, introduce some changes and additions. New analytical techniques, such as mass, infrared, and plasma spectrometry as well as ion and thin-layer chromatography, are covered. New reagents appropriate for ultratrace analysis are specified, and "clean room" analytical practices are described. One important change in this volume is the addition of a section on the criteria for standard-grade reference materials in which the specifications of over 400 standards are given.

JA004741B

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Modeling NMR Chemical Shifts: Gaining Insights into Structure and Environment. Edited by Julio C. Facelli (University of Utah) and Angel C. de Dios (Georgetown University). American Chemical Society: Washington, D.C. (Distributed by Oxford University Press). 1999. x + 374 pp. \$130.00. ISBN 0-8412-3622-4

This book was developed from the proceedings of the Second International Symposium on NMR Chemical Shifts held in August 1998. The first four chapters review state-of-the-art research in calculations of NMR chemical shielding and its application to polymers, biomolecules, and catalysis. The remaining 19 chapters describe topical research in the field at the time of the symposium and cover such subjects as calculating chemical shifts in biological systems, understanding ^1H chemical shifts, elucidating the role of local geometry in defining NMR chemical shifts, and modeling chemical shifts in inorganic compounds.

JA004748T

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Metal Ions in Biological Systems. Volume 37. Manganese and Its Role in Biological Processes. Edited by Astrid Sigel and Helmut Sigel (University of Basel). Dekker: New York. 2000. xlvii + 762 pp. \$250.00. ISBN 0-8247-0288-3

In 20 chapters, this book investigates the important role that manganese plays in living organisms. Some of the more general topics discussed are the availability of manganese to organisms, how it is absorbed and transported in microorganisms, what enzymes and proteins contain manganese, and what its role is in health and disease. On a more specific note, the use of manganese to define the role of other divalent metal ions in ribosomes and proteins is discussed; the part manganese plays in concanavalin A, other lectins, and various enzymes is explored; and the use of model compounds to understand the nature of manganese redox enzymes is examined. The book concludes with a discussion of the role of tyrosyl radical–manganese complex in photosynthetic water oxidation.

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