

**Fourier Transform Spectrometry.** By Sumner P. Davis (University of California, Berkeley), Mark C. Adams (ITT Industries Aerospace/Communications, Fort Wayne, Indiana), and James W. Brault (Formerly of National Solar Observatory, Kitt Peak, Arizona). Academic Press: San Diego. 2001. xiv + 262 pp. \$79.95. ISBN 0-12-042510-6.

This is an interesting book written by a group of physicists who provide solid background on the “nuts and bolts” of Fourier transform spectrometry from the perspective of a group of scientists who are primarily concerned with astronomical observations. Interwoven with discussions of the relevant facts is a very conversational discussion not only of the principles of the theory and the practice of the art, but also memoir-like digressions that enhance the work. From the reviewer’s standpoint, it is probably worthwhile to mention what the book is not. It is not the more general treatise on Fourier transform spectrometry that its title might evoke. Although a good deal of the theory presented does offer a broader view of more than just optical spectroscopy, this volume will probably be of relatively little interest to analytical chemists using Fourier transform infrared spectroscopy or to the large community composed of NMR spectrometrists. It would be even less likely to intrigue the much smaller group concerned with Fourier transform mass spectrometry. In short, this is a solid, albeit specialized, contribution.

By its very nature, this text covers literature ranging from the experiments of Michelson in the 1880s through 1950 (which the authors term “prehistory”) through the development phase of the 1950s to 1970 to the so-called modern era, which extends to the year 2000. These authors do not have a superficial interest in their subject. As they note, “...the book grew out of an extended (now more than 25-year) discussion about precision spectrometry and the limitations of performance as dictated by the laws of physics.” As a consequence of this approach, the book is a review and an introduction to some of the fundamentals of Fourier transform spectrometry that contains in-depth discussions of some of the more arcane details that would only be of interest to the aficionados. It has numerous worthwhile discussions ranging from fundamental theorems to noise and line-fitting, all explicated in an engagingly clear manner. Thus, the book is not a current-awareness treatise so much as a window into the past. Within that context, it is a worthwhile contribution not only to students of science, but to the history of science as well. I recommend it to those with or without a preexisting interest in the topic.

Charles Wilkins, *University of Arkansas*

JA0153060

10.1021/ja0153060

**Chiral Intermediates.** Edited by Cynthia A. Challener (Freelance Writer). Ashgate Publishing Limited: Aldershot, England and Burlington, Vermont. 2001. xxiv + 804 pp. \$295.00. ISBN: 0-566-08412-0.

This reference book provides a comprehensive listing of and specific information about over 4700 chiral chemicals. In four chapters, Part I covers the fundamentals of chirality, some of the key issues that drive the chiral market, sources of chiral compounds, and methods for obtaining chiral compounds. The second part lists available chiral intermediates. Each listing entry is made up of the structure itself, its record number, main record name, CAS registry number, Merck index number, and EINECS number, as well as its molecular formula, physical properties, synonyms, and major manufacturers and suppliers. Part III contains indexes of CAS Registry numbers, EINECS numbers, and names and synonyms, and Part IV provides a directory of manufacturers and suppliers.

JA015385F

10.1021/ja015385f

**Handbook of Raman Spectroscopy: From the Research Laboratory to the Process Line.** Edited by Ian R. Lewis (Kaiser Optical Systems) and Howell G. M. Edwards (University of Bradford). Dekker: New York, Basel. 2001. xiv + 1054 pp. \$225. ISBN 0-8247-0557-2.

In *The Handbook of Raman Spectroscopy*, the editors provide a good overview of modern Raman spectroscopic techniques and recent applications. It includes a number of informative illustrations and representative Raman spectra. The breadth of information covered in this handbook, from instrumentation specifics to data analysis and varied applications, is very useful. Topics include basic theory of Raman scattering, evolution of Raman instrumentation, Raman microscopy and Raman imaging, in vivo Raman spectroscopy, use of chemometrics in processing Raman data, and teaching Raman spectroscopy in undergraduate laboratories.

Details on gas, liquid, and solid analysis, as well as applications in gemology, environmental science, archaeology, and forensics are provided. Of particular value are specifics on industrial applications and Raman systems used in processing. Examples include pharmaceutical applications, semiconductors, biomedical studies, organic fibers and films, catalysts, distillation control, and manufacturing process monitoring.

The editors’ intent was to provide a resource to the chemical community that answered the questions: “Can Raman spectroscopy be of use?” and “What type of instrumentation will obtain the most useful data?” I believe their stated objectives have been met. They sought to provide case studies and useful guidelines to new users as well as information to Raman spectroscopists seeking to expand their applications, and this has been accomplished. The references cited are relevant and timely. *The Handbook of Raman Spectroscopy* will serve as a

valuable tool to Raman spectroscopists, other chemists and engineers, and students.

This handbook is useful as a complementary text to the recent publication *Handbook of Fourier Transform Raman and Infra-red Spectra of Polymers*, by A. H. Kuptsov and G. N. Zhizhin, which contains a large collection of Raman spectra of industrially important polymers. It shares common themes with other books, including *Modern Techniques in Raman Spectroscopy*, edited by J. J. Laserna; *Analytical Applications of Raman Spectroscopy*, edited by M. J. Pelletier; and *Raman Spectroscopy for Chemical Analysis*, by R. L. McCreery.

Ronda L. Grosse, Ph.D., Dow Corning Corporation

JA015342Z

10.1021/ja015342z

**Progress in Inorganic Chemistry. Volume 50.** Edited by Kenneth D. Karlin (Johns Hopkins University). Wiley: New York. 2001. viii + 632 pp. \$150.00. ISBN 0-471-43510-4.

The reviews in *Progress in Inorganic Chemistry* are consistently useful: over 35% of the articles published in the last 10 years have already been cited over 50 times. The series has now become an essential complement to research in the area.

This volume surpasses even the usual high standard, the range of topics being particularly broad. One article, by Lagow and Chang on calcium phosphate bioceramics as bone replacements, is illustrated by graphic color photographs that look as if their more natural home would be a book on surgery. Since the original work in this area is largely described in patents, this review is by far the most accessible source on the topic for the academic reader. In the materials area, there is also a review on large-pore zeolites by Balkus. Here again, much of the original work is described in patents, making this review particularly welcome. Metal sulfide and oxide analogues of fullerene-like nested spheres and nanotubes are described by Tenne in the next chapter, with some discussion of the applications of MoS<sub>2</sub> to lubrication.

In the bioinorganic area, Chaudhuri and Wieghardt discuss complexes of phenoxyl radicals and give special attention to the recent finding that such ligands occur in enzymes, such as galactose oxidase, where Cu(II) is the metal involved.

Michel, Hoffman, Baum, and Barrett discuss porphyrazines, which are analogues of porphyrins with N instead of CH at the bridging (meso) positions. I was surprised to find how many unusual structures had been made with a wide variety of appended substituents, notably ones capable of binding metal ions.

With Fisher's review of gas-phase coordination chemistry, we encounter a rarely treated topic, yet one that has direct relevance to the role of solvent. The main mass spectroscopic techniques used are discussed, together with the main trends found in the reaction of metal ions with simple organic molecules in the gas phase.

Moving to a more organic perspective, Gilbertson describes the emerging area of combinatorial approaches to catalyst discovery, with emphasis on synthetic applications. Finally, an article by Rovis and Evans covers a wide variety of asymmetric organic reactions with copper complexes as catalysts. A variety

of reactions are seen, including cyclopropanation of alkenes and imines and C–H insertion, where carbene precursors, such as diazo compounds, are the reagents. Oxidations include the Kharasch–Sosnovsky reaction, the allylic acyloxylation of alkenes. Lewis acid-catalyzed reactions such as the hetero-Diels–Alder reaction are also discussed.

In summary, this is a volume that interested readers across the whole spectrum of inorganic chemistry will not want to miss.

Robert H Crabtree, Yale University

JA015350F

10.1021/ja015350f

**Carotenoid-Derived Aroma Compounds.** Edited by Peter Winterhalter (Technischen Universität Braunschweig) and Russell L. Rouseff (University of Florida). American Chemical Society: Washington, DC (distributed by Oxford University Press). 2002. xii + 323 pp. \$140.00. ISBN 0-8412-3729-8.

An ACS meeting in San Francisco in March 2000 is the source of the 21 chapters in this volume. The contributions are organized into five topical categories: Analysis, Biogenesis and Biotechnology, Thermal Generation, Occurrence, and Occurrence in Grapes and Wine. Author and subject indexes are provided.

JA025203X

10.1021/ja025203x

**The Chemistry of Organic Silicon Compounds. Volume 3.** Edited by Zvi Rappoport (The Hebrew University, Jerusalem) and Yitzhak Apeloig (Israel Institute of Technology, Haifa). J. Wiley & Sons: New York. 2001. xviii + 1153 pp. \$445.00. ISBN 0-471-62384-9.

The 18 chapters in this latest addition to the series, *The Chemistry of Functional Groups*, continue the long-standing tradition of excellence associated with the series. Written by an international array of authors, the chapters include both theoretical and experimental aspects of the title subject. References are generally current through mid- to late-2000. Author and subject indexes are provided, as are the tables of contents of the preceding two volumes, the more recent of which appeared in 1998.

JA025204P

10.1021/ja025204p

**Polymer Nanocomposites: Synthesis, Characterization, and Modeling.** Edited by Ramanan Krishnamoorti (University of Houston) and Richard A. Vaia (Air Force Research Laboratory). American Chemical Society: Washington, DC (distributed by Oxford University Press). 2002. x + 246 pp. \$120.00. ISBN 0-8412-3768-9.

The 16 chapters of this volume result from presentations made at the March 2000 meeting of the ACS in San Francisco. The

symposium from which the contributions in this volume are derived focused on synthesis, characterization, and modeling of polymer nanocomposites. Topics include "Surface-Initiated Anionic Polymerization: Tethered Polymer Brushes on Silicate Flat Surfaces", "Studies of Organically Modified Clays by Scattering Techniques", and "Molecular Simulations of Ultra-Confining Polymers: Polystyrene Intercalated in Layered-Silicates". Author and subject indexes are provided.

JA025208U

10.1021/ja025208u

**Polymer Colloids: Science and Technology of Latex Systems.** Edited by Eric S. Daniels, E. David Sudol, and Mohamed S. El-Aasser (Lehigh University). American Chemical Society: Washington, DC (distributed by Oxford University Press). 2002. xii + 419 pp. \$165.00. ISBN 0-8412-3759-X.

The 25 contributions in this volume are derived from the Polymer Colloids Symposium held in June 2000 in honor of J. W. Vanderhoff. The majority of the chapters are oriented toward industrial interests and include discussions of the synthesis of various types of latexes, including homopolymers, copolymers, and natural polymers, and the processes associated with their production. Author and subject indexes are provided.

JA0252025

10.1021/ja0252025

**Anticancer Agents: Frontiers in Cancer Chemotherapy.** Edited by Iwao Ojima (State University of New York at Stony Brook), Gregory D. Vite (Bristol-Myers Squibb Pharmaceutical Research Institute), and Karl-Heinz Altmann (Novartis Pharmaceuticals). American Chemical Society: Washington, DC (distributed by Oxford University Press). 2001. xii + 364 pp. \$140.00. ISBN 0-8412-3745-X.

This volume in the ACS Symposium Series is based on presentations made at the March 2000 ACS meeting in San Francisco. It is composed of 19 chapters, some of which are contributions from laboratories that were not represented at the symposium. Topics include taxane-based substances, inhibitors of farnesyltransferase, and carbohydrate-based tumor antigens. Author and subject indexes are provided.

JA025209M

10.1021/ja025209m

**Anisotropic Organic Materials: Approaches to Polar Order.** Edited by Rainer Glaser (University of Missouri-Columbia) and Piotr Kaszynski (Vanderbilt University). American Chemical Society: Washington, DC (distributed by Oxford University Press). xiii + 322 pp. \$135.00. ISBN 0-8412-3689-5.

This volume is based on a symposium held in New Orleans in 1999. Its 21 contributions are organized into five categories: "Characterization of Polar Materials", "Organic Thin Films",

"Molecular Materials and Crystals", "Liquid and Crystals", and "Liquid Crystals". Author and subject indexes are provided.

JA015394O

10.1021/ja015394o

**Trace Element Speciation: For Environment, Food and Health.** Edited by Les Ebdon, Les Pitts (University of Plymouth, U.K.), Rita Cornelis (University of Gent, Belgium), Helen Crews (Central Science Laboratory, Sand Hutton, York, U.K.), O. F. X. Donard (Université de Pau et des Pays de l'Adour, France), and Philippe Quevauviller (European Commission, Brussels, Belgium). Royal Society of Chemistry: Cambridge. 2001. xxviii + 391 pp. £69.50. ISBN 0-85404-459-0.

The 25 chapters that comprise this volume address a broad range of topics associated with speciation of trace elements and are grouped in five categories: "General Aspects", "Environment", "Food", "Health", and "Overview". The contents of the chapters are derived from a two-year project entitled "Speciation 21", which was designed to address issues associated with improving written standards and EC regulations for trace elements. There are a few references as recent as early 2000, and a subject index is provided.

JA025201C

10.1021/ja025201c

**Handbook of Near-Infrared Analysis, 2nd ed., Revised and Expanded. Practical Spectroscopy Series Volume 27.** Edited by D. A. Burns (NIR Resources) and E. W. Ciurczak (Purdue Pharma LP). Dekker: New York. 2001. xv + 814 pp. \$225.00. ISBN: 0-8247-0534-3.

Near-infrared (NIR) spectroscopy is used extensively in the analysis of agricultural and dairy products, polymers, textiles, pharmaceuticals, foods, and beverages. The Handbook of Near-Infrared Analysis is a reference for chemists and spectroscopists and consists of 29 contributions organized into sections on instrumentation and calibration, methods development, and applications of NIR spectroscopy. A survey of topics includes the theory of diffuse reflection in the NIR region; commercial NIR instrumentation; calibration of NIR instruments by chemometric methods, such as principal component and PLS regression; qualitative discriminant analysis; and NIR case studies of many actual products. This new edition also includes new chapters on the history of the method, FT-NIR; calibration transfer; biomedical applications; plastics; and detection of counterfeiting. The scope of the book is impressive, with many references to recent work published in the 1990s.

The book fulfills the authors' objectives as a reference handbook and is an important contribution to the chemical community. The chapters are written by experts in their fields, and the book begins with a solid review of the principles of near-IR spectrometry, including classical and quantum mechanics, anharmonicity, and combination and overtone bands. There is also excellent coverage of the theory of diffuse reflectance, including Schuster and Kubelka-Munk theories, anisotropic

scattering, and discontinuum theories of diffuse reflection. As such, the book is a valuable educational tool for advanced undergraduate and graduate students. The section on instrumentation provides a concise description of the current state-of-the-art and the manufacturers of different types of equipment, which aids practicing industrial spectroscopists. For example, in addition to the prevalent grating and filter instruments, acousto-optic tunable filters, near-IR emitting diodes, tunable lasers, Fourier and Hadamard transform devices are all at least mentioned. Dust-proofing, waterproofing, and vibration tolerance issues in instrumentation are also discussed. Methods for calibration and calibration transfer (inevitably an issue for practicing spectroscopists) are given in multiple chapters. The book devotes an entire chapter to special considerations in on-

line, in-line, and at-line analysis for process control, a traditional strength of near-IR spectrometry.

The weakest point of the book is the coverage of hyperspectral imaging, a new technique of rising importance in pharmaceutical and biomedical near-IR spectrometry. The cost of the book is also somewhat high for graduate students, but it is quite inexpensive when compared to an instrument. This volume should be on the bookshelves of those requiring either an introduction to or further helpful hints in this developing area of spectroscopic analysis. This is one reference that should be packaged with all near-infrared spectrometers that are sold.

**Robert A. Lodder**, *University of Kentucky*

JA015320C

10.1021/ja015320c