

program. A very complete, two-volume, \approx 500-page manual and 40-page "quick guide" are provided. The system also includes more than 400 screens of online help for novices and 80 screens of more compressed information for experts. Sample document, molecule, and image files are provided along with an easy to follow and well-designed "tutorial" which takes about an hour to complete and covers constructing molecules, sketches, and documents and combining molecules into sketches and inserting images into documents. Installation can be accomplished easily

and almost automatically by following instructions on a setup menu.

In combination with an Apple Laserwriter, ChemText provides an attractive method to prepare "presentation" quality documents containing structures and equations on an IBM PC. It is an excellent scientific word processor but does lack some of the features found in dedicated general purpose word processors.

Barry Snider, Brandeis University

Book Reviews*

High-Performance Liquid Chromatography. Advances and Perspectives. Volume 4. Edited by C. Horvath (Yale University). Academic Press: New York. 1986. xi + 321 pp. \$70.00. ISBN 0-12-312204-X

This volume is the fourth in a series of books that deal exclusively with HPLC. The editor's goal is to provide up-to-date accounts of new developments in various areas of HPLC. To this end he has been very successful in enticing well-known chromatographers to write authoritative reviews on topics ranging from instrumentation to applications. As with the previous 3 volumes, the quality of the 4 chapters in this book is outstanding.

The first contribution, by Potter and Lewis, deals with reversed-phase chromatography of proteins. It follows a similar chapter that was presented in Volume 3 but stresses high-resolution aspects of biopolymer analysis. The chapter is short and does not dwell on theory. Instead it summarizes operational variables that have to be dealt with when large molecules are involved. Chapter 2 deals with one of the most important critical areas in HPLC, the development and characterization of various packing materials. Floyd and Hartwick introduce the concept of selectivity at a fundamental level and then present a concise description of the various types of interaction that can be exploited to optimize a separation. Mechanistic studies are presented along with applications. Chapter 3 deals with electrochemical detectors in HPLC. In his 103-page contribution, Shoup starts out with electrochemical principles and follows up with the most detailed and thorough coverage of design principles and operating characteristics for electrochemical detection that is available to date. Some 300 references are listed. The chapter by Snyder et al. also deals with the separation of large separation processes and discusses in great detail mechanisms that can be exploited in terms of adjustment of stationary-phase and mobile-phase parameters. This chapter contains a significant amount of theory. An attempt is made to summarize the topics as they are discussed. Special emphasis is placed on optimization and a large number of applications is presented. A comparison of RP, IEC, and SEC is shown in the appendix. This is a particularly informative method to highlight the differences between these techniques in physical terms.

There is very little that can be criticized in this book. It is timely and can be highly recommended. It is particularly important for scientists that deal with biomolecules.

Wolfgang Bertsch, *The University of Alabama*

Surface and Interfacial Aspects of Biomedical Polymers. Volume I. Chemistry and Physics. Edited by Joseph D. Andrade (University of Utah). Elsevier Science Publishers: New York and London. 1985. \$69.50. XVI + 470 pp. ISBN 0-306-41741-3

This is an excellent text covering many aspects of surface and interfacial characterization of polymers, specifically those associated with biomedical applications. In fact, this title is somewhat restrictive in that anyone who is interested in the surface chemistry and physics of polymers, be they biomedically related or not, will find this text extremely useful. The text is intended as an introductory text for advanced undergraduates and graduate students as well as a reference text for those who wish to practice in the area. It is somewhat ambitious with respect to use as an advanced undergraduate text. However, the way it is laid out and the material presented will make it very useful for graduate courses. The text is a series of 13 chapters written by various authors. The chapters cover a large number of subjects concerning the characterization and measurement of polymer surface characteristics. Despite the fact that it is claimed to concern biomedical polymers, there is no discussion of biomedical applications whatsoever. The text is extremely

well laid out; despite the fact that there are multiple authors, there is a high degree of continuity through the text. Eight of the chapters are authored or co-authored by Dr. Andrade. Additionally, he has obviously taken considerable care in organizing the text such that even those chapters not co-authored by him are of similar uniform format and possess approximately the same degree of theory and applied information. Each of the chapters contains both introductory material and experimental description as well as key results found in the area. There is also a considerable amount of basic data.

An introductory chapter thoroughly reviews the purposes of the text. One particularly useful section of this chapter contains lists of key textbooks and monographs in the area, recent symposia proceedings that are related, a list of important serials and publications, and finally societies and professional organizations of interest. This is a rather useful set of information for those people who are just beginning to become familiar with this field. While these listings may make the book dated rather rapidly, their inclusion illustrates that the authors truly wish to introduce the reader to all aspects of the field. The first several chapters of the book are devoted to polymer surfaces and their dynamics as an introduction. The next chapters are concerned with the nature of polymers and their given surface properties. Model polymers for probing surface characteristics are presented with considerable technical detail. Polymer layers and multilayers as model surfaces are described. The book then contains a series of chapters concerning instrumental analyses of surfaces including discussion of surface infrared spectroscopy, contact angle and interfacial energetics, interface acid base charge transfer properties, surface Raman spectroscopy, and interfacial electrochemistry of biomedical surfaces. Finally, several chapters are included to present related topics such as a discussion of the surfaces of graph and block copolymers and also interfacial tension and amorphous polymer-water interfaces.

Thus the textbook presents a remarkably complete description of polymeric surfaces, the methods used for probing them, and key results in many areas that are directly relatable to or important for biomedical applications of polymers. In summary, this textbook is an extremely complete, well-written, and thorough discussion of the subject. It should be on the shelves belonging to anyone interested in biomaterials and biomedical polymer surface properties and, in fact, is of considerable utility to those people who are interested in any surface characteristic of polymers.

Kenneth J. Himmelstein, *Allergan, Irvine, California*

Spectroscopy of Molecular Excitons. By V. L. Broude and E. I. Rashba (Academy of Sciences of the USSR, Moscow, USSR) and E. F. Sheka (Academy of Sciences of the USSR, Chernogolovka, USSR). Springer-Verlag: New York, Heidelberg, Berlin, Tokyo. 1985. ix + 271 pp. \$48.00. ISBN 0-387-12409-8

This book is an important bridge between molecular spectroscopy and solid-state physics. Its appearance will, hopefully, draw attention to a hitherto little appreciated classical endeavor of molecular crystals spectroscopy.

Molecular excitons may or may not play an important role in the newly discovered high-temperature superconductors. They also may or may not play an important role in the nervous system. They certainly do play an important role in organic conductors, in the characterization of polymers, and in the primary process of photosynthesis. The discovery of molecular excitons, as well as their basic characterization, comes from work on molecular crystals, mainly from spectroscopic work.

Based on an earlier Russian version, this book is a beautiful exposition of more than two decades of work based, to an important extent, in the Soviet Union and in which the three authors played a major role. It is a very welcome addition to the international literature. In contrast to

*Unsigned book reviews are by the Book Review Editor.

some other Soviet publications, this book does give full credit to work done in the West. It gives a very complete report of the progress in the field of molecular excitons and it manages to do so in its 271 small pages.

The material presented is authoritative, up to date (to its time of publication), scholarly, and meticulous in its scientific judgement. The reader can trust every statement. Experiment and theory are combined in a beautiful balance reminiscent of Herzberg's classical spectroscopy texts.

The text starts with the experimental background (classifications of molecular crystals spectra) and then delves into the theory of perfect, doped, and mixed crystals. However, the theoretical formalism is always presented in conjunction with concrete experimental examples (Herzberg's classical balance). The obvious sequence is to start with perfect crystals, then go to lightly doped ones, and finally go to heavily doped (mixed) crystals. However, the authors emphasized throughout the book how the study of both lightly and heavily doped crystals has been instrumental to the understanding of perfect crystals. It is this methodology of positive feedback and iterative logical procedure that has been so fruitful in this field and could probably be adapted productively in related fields. Thus, following this emphasis on mixed and doped crystals there are chapters on band-to-band spectra of perfect crystals and on vibronic spectra of perfect and imperfect molecular crystals. Because of their optical transparency and wealth of vibrational structure, molecular crystals served as a par-excellence testing ground for modern notions of band theory, group theory, and percolation theory (and after the book's publication, also fractal concepts). At least one of the authors (Rashba) applied these insights to other classes of crystals (e.g., semiconductors).

There is amazingly little overlap between this book and the monumental work of Pope and Swenberg (*Electronic Processes in Organic Crystals*). The latter emphasizes the electrical properties of organic solids, an area obviously not covered by the present book. Together, these two books give a complete representation of the electronic properties of simple molecular solids, both optical and electrical (excluding, of course, the developments of the last 4-5 years).

Finally, this book is also a very appropriate memorial to the numerous, important, and elegant scientific contributions of V. L. Braude, whose untimely death did not allow him to see the finished product.

Raouf Kopelman, University of Michigan

Low Temperature Oxidation, the Role of Vitreous Oxides. By Francis P. Fehlner (Corning Glass Works). John Wiley & Sons: New York. 1986. xxiv + 237 pp. \$49.95. ISBN 0471-87448-5

This book is a comprehensive review of the theories and experimental data on processes related to low-temperature oxidation of metals. The materials presented should make the book a very useful source of reference for research workers and practicing scientists. All relevant aspects related to oxide formation are dealt with. After the Introduction, the book starts with a chapter on the kinetics of oxide growth (Chapter 2). A more fundamental description of vitreous oxide structure (Chapter 3) and charge transport processes (Chapter 4) then follow. These are then followed by chapters on the various stages of oxidation: chemisorption of oxygen and formation of oxide islands (Chapter 5), formation of oxide films (Chapter 7), and growth of three-dimensional oxide (Chapter 8). The last chapter (Chapter 9) is devoted to one specific example, the formation of silicon oxide, which is the most important vitreous oxide to date. The nature and the role of the metal-oxide and oxide-gas interface is separately treated in Chapter 6.

Various factors important in each stage of oxide formation are covered, from the roles of impurities and of water, to the analytical description of the growth and ion transport processes, to the experimental observations. Furthermore, each aspect is covered comprehensively. However, because the author tried to cover so much detail, there are times that the reader may feel that he is reading a collection of brief abstracts of a list of papers on a subject. The lack of an adequate critical evaluation of literature information at times may make the book less valuable for beginners to this field, especially graduate students. The fact that the author really did not define vitreous oxide until the third chapter also makes it less likely that the book can be used as a textbook. These shortcomings are minor, and they should not reduce the real value of this book to the research workers in this field.

Harold H. Kung, Northwestern University

Thermophiles: General, Molecular, and Applied Microbiology. Edited by Thomas D. Brock (Department of Bacteriology, University of Wisconsin, Madison). John Wiley and Sons: New York. 1986. xii + 316 pp. \$47.50. ISBN 0-471-82001-6

Thermophiles are organisms that live at high temperatures. Thermophilic bacteria have been found in all types of geothermal habitats such as boiling springs of neutral pH, sulfur-rich acidic springs, and deep-sea vents. At present there is considerable interest in industrial uses of thermophiles. Their enzymes catalyze biochemical reactions at temperatures that are higher than those of conventional organisms and are

more stable at conventional operating temperatures. This book describes all known thermophilic bacteria and should be of interest to microbiologists, biotechnologists, and biochemists. Topics covered are the following: methods of isolation and study of thermophiles, diversity, physiology and growth, membranes and lipids, and genetics. Also included are four chapters on industrial applications. These are as follows: uses of thermostable enzymes, production of fuels and chemicals, waste treatment systems, and microbial mining. References and an index are included.

M. C. W. Smith, Ann Arbor, Michigan

Atmospheric Chemistry and Physics of Air Pollution. By J. H. Seinfeld. John Wiley & Sons: New York. 1986. xxiii + 738 pp. \$59.95. ISBN 0471-82857-2

Some subjects are thought to be fundamentally complex by most people. All subjects can be made complex with a bit of effort. This air pollution text by John Seinfeld is a Mathematical engineer's approach to a topic of importance to most city dwellers, all environmentalists, and not a few chief executives and departments of state. The level at which most people interact with air pollution is the following:

What is it?
Is it above the government standard?
Is it worse inside or outside my home?

The level at which most experts can answer these questions is often qualitative and at best factor-of-two-ish. Furthermore, the answers often depend more on the inadequacies of analytical equipment than on the fundamental science of the problem.

It is widely known that coal-burning electricity-generating plants produce pollutants including sulfur dioxide and particles in an amount depending on the quality of both fuel and abatement installed. These plants are required to meet a federal standard for the ground-level impact of their pollutant plume. It is not well-known that the most mathematically sophisticated models are scarcely better than guesswork when given the best available starting conditions at predicting where, when, and how large that impact will be.

As a reference book, *Atmospheric Chemistry and Physics of Air Pollution* is in a handy location on my bookshelf. I use it frequently. If I were to try to use it as a text book, all but my most mathematically gifted students would be lost, and even they might have trouble seeing the smog through the individual particles.

Donald H. Stedman, University of Denver

Developments in Ionic Polymers. Volume 2. Edited by Alan D. Wilson and Howard J. Prosser (Laboratory of the Government Chemist, London). Elsevier Applied Science Publishers: New York. 1986. XII + 356 pp. \$79.25. ISBN 0-85334-419-1

This book, the second one in the developments series of ionic polymers, is intended with Volume 1 to update and complete the earlier work of L. Holliday on Ionic Polymers (Applied Science Publishers, 1975).

The first volume of this series covered the following seven topics: Ionic Polymers, History Definition and Classification; Oxide glasses as Ionic Polymers; The structure and properties of Ionomers; Conformational effects of ion-pair clustering in Ionomers: a theoretical analysis; Polyelectrolyte cements; Ionic Polysaccharides; and Polyelectrolyte interactions leading to phase demixing.

In this second volume, ten specialists have authored or coauthored the book and the material is divided into eight chapters.

The first chapter, by R. A. M. Thomson, covers the "preparation of Ionic Polymers" (76 pages, 324 references). It gives a comprehensive review of the preparative methods for ionic polymers, i.e., the anionics and the cationics, but only a brief discussion of the ampholytics. Its discussion is limited to organic polymers displaying little, if any, cross-linking. Chapter 2 is entitled "Smectic clays as ionic macromolecules", by G. Lagaly (63 pages, 133 references). After a description of the mineral clay structure and of the intracrystalline reactivity, the author discusses the interaction of clay with polymers. Chapter 3, by M. Pineri, is devoted to the "structure and physical properties of some carboxylated elastomers" (21 pages, 33 references). Chapter 4, by T. Tsutsui, is on "ionene polymers: preparation, properties and applications" (27 pages, 99 references). Although quiet extensive, the references here are at least 3 years old. Chapter 5, by E. Tsuchida and K. Abe, is on the "Polyelectrolyte complexes" (76 pages, 206 references). Chapter 6, by P. J. Brookman and J. W. Nicholson, is on the "Ionic Polymer membranes" (36 pages, 86 references). It is one of the application chapters found in this book. Chapter 7, by F. A. Hutchinson, is on the "Application of ionic polymers in Medicine" (26 pages, 142 references). The remark made about Chapter 4 applies here also. Chapter 8, by F. Beck, is on the "Electrical and Chemical aspects of electrodeposition of paint" (21 pages, 34 references).

The first five chapters review a particular aspect of the field, giving good general overview and in certain cases suggestions of further work. The last three chapters, or application chapters, are certainly welcome

and should allow workers in the polymer field to get an insight into these more specific and specialized fields.

Pierre F. Bataille, *Ecole Polytechnique de Montréal*

Kinetics of Nonhomogeneous Processes. Edited by Gordon R. Freeman (University of Alberta). John Wiley and Sons: New York. 1987. xvi + 873 pp. \$99.95 ISBN 0471-81324-9

Although this volume is indicated to be "A practical introduction for chemists, biologists, physicists and material scientists," many of the sections are quite mathematical in content and give rigorous treatments of specialized topics. The book is divided into 15 sections, the last of which is an appendix.

Section 1. Introduction by Gordon R. Freeman. The concepts pertaining to the kinetics of structured or nonhomogeneous systems are discussed.

Section 2. Ionization and Charge Separation in Irradiated Materials by Gordon R. Freeman. A quantitative treatment of electron behavior in irradiated gases, liquids, and solids is presented.

Section 3. Radiation Track Structure Theory by Herwig G. Paretzke. This section discusses interactions of photons, neutrons, electrons and heavy charged particles to form track structures in various materials.

Section 4. Track Reactions of Radiation Chemistry by John L. Magee and Alope Chatterjee. Since radiation chemistry must be considered in terms of track reactions, the sequence of nonhomogeneous processes that form intermediates and eventually final products are considered.

Section 5. Single Pair Diffusion Model of Radiolysis of Hydrocarbon Liquids by Andries Hummel. A mathematical development with examples of diffusion of ion pairs in liquids.

Section 6. Stochastic Model of Charge. Scavenging in Liquids under Irradiation by Electrons or Photons by Gordon R. Freeman. A treatment of the eventual fates of ions produced by radiation of various materials.

Section 7. Models of Cellular Radiation Action, by Albrecht M. Kellerer. A largely statistical treatment of the effects of radiation doses on living tissues.

Section 8. Mechanisms and Kinetics of Radiation Effects in Metals and Alloys by Louis K. Mansur. A discussion with equations and graphics of the effects of radiation on crystal structure.

Section 9. Stochastic Theory of Electron-Hole Transport and Recombination in Amorphous Materials by Jaan Noolandi. A mathematical and graphical treatment of the movement of electron-hole pairs.

Section 10. Charge Transport in Monolayer Organizes by Dietmar Möbius. A discussion of electron transfers across monolayer and multilayer organizes.

Section 11. Stochastic and Diffusion Models of Reactions in Micelles and Vesicles by Masanori Tachiya. A largely mathematical treatment of the migration of soluble materials between micelles in the aqueous phase.

Section 12. Polymerization and Aggregation during Gelation by Mohamed Daoud. A general and mathematical treatment from a physicist's viewpoint of the gelation process for polymers.

Section 13. Dynamics of Entangled Polymer Melts by William W. Merrill and Matthew Tirrell. A mathematical and pictorial presentation of the dynamics of molecular entanglement in polymer melts.

Section 14. Chemical Waves by Kenneth Showalter. A generalized treatment with specific chemical examples of repetitive or autocatalytic chemical reactions that result in chemical pulses, e.g., the iodate-arsenite reaction.

Jay E. Taylor, *Kent State University*

Alkaloids: Chemical and Biological Perspectives. Volume 5. Edited by S. William Pelletier (Institute for Natural Products Research and the Department of Chemistry, University of Georgia). John Wiley & Sons: New York. 1987. xiii + 714 pp. \$125.00. ISBN 0-471-85372-0

As with previous volumes, this work presents concise reviews of selected alkaloid topics. This volume is comprised of thorough investigations of five alkaloid families that have been the focus of chemical and biochemical research of recent years.

Chapter 1 addresses the chemistry and biochemistry of the indolizidine alkaloids. Great attention is given to polyhydroxy members of this family. The discussions on structure-activity relationships and glycosidase inhibition should be of particular interest to the reader. Chapter 2 reviews the structures and the syntheses of the phenanthroindolizidine alkaloids. The numerous approaches utilized to construct the phenanthroindolizidine skeleton are detailed. The aporphinoid alkaloids are the subject of Chapter 3. The introductory narration nicely places these alkaloids in relationship to other species of the Annonaceae plant family (over 2000 species). Chapter 4 encompasses the chemistry and pharmacology of the thalictroid alkaloids. The use of these alkaloids, via their presence in natural extracts, is also presented and lends to the reader an intriguing and colorful insight into the long history of these compounds. The final chapter (5) surveys the chemistry of the cephalotaxine alka-

loids. Emphasis is given to compounds such as harringtonine and homoharringtonine which have been shown to display antileukemic activity. This reviewer found the discussion pertaining to biomimetic approaches to the synthesis of cephalotaxine to be quite brief, but nonetheless interesting.

Overall, this volume offers the reader a clear summary of recent advances made in each of these alkaloid families. The lists of references are quite extensive and the material is presented in a logical manner. In conclusion this book should be of value to those interested in alkaloid chemistry.

Scott L. Dax, *University of Wisconsin—Madison*

Asymmetric Synthesis: Construction of Chiral Molecules Using Amino Acids. By Gary Coppola and Herbert F. Schuster (Sandoz Research Institute). John Wiley & Sons: New York. 1987. xiii + 393 pp. \$55.00. ISBN 0-471-82874-2

In recent years, a large body of information on the elaboration of readily available chiral natural materials (the "chiral pool") into synthetically useful intermediates has emerged. This monograph collates the use of α -amino acids in asymmetric synthesis with particular emphasis on chemical transformations that are of general interest to organic chemists, especially as applied to the synthesis of pharmaceutical agents, agrochemicals, and natural products. Two types of asymmetric synthesis are explored: those in which the chiral center of the amino acid is incorporated directly in the target molecule and those in which the amino acid is used as an external source of chirality to impose asymmetry on chemical transformations. The information in this book covers the literature up to December, 1985, with several addenda extending this coverage to those papers appearing subsequent to the preparation of the original manuscript and prior to publication.

The text is divided into an introduction and nine chapters addressing various amino acids or families of amino acids (Alanine, The Phenylalanine Family, Valine, The Leucine Family, Hydroxy Amino Acids, Sulfur-Containing Amino Acids, Difunctional Amino Acids, The Proline Family, and Tryptophan). The chemical transformations involving the various amino acids are clearly presented through numerous schemes that are supported by accompanying text. While most of the discussion is aimed at the means by which new, synthetically useful chiral species may be realized from amino acids, some examples of the exploitation of amino acids in total syntheses are also depicted.

This text provides a useful and concise compilation of the developments in the use of α -amino acids as sources of chirality in asymmetric synthesis (up to the end of 1985). It should prove to be a useful reference book for practicing organic chemists facing the need for the preparation of natural and unnatural asymmetric materials. Clearly, the biggest benefit of this text is that it assembles widely scattered literature on this increasingly important member of the "chiral pool" into a single convenient source. Its utility in this regard is amplified by the clear pictorial style that has been adopted, facilitating the rapid retrieval of information. This book is recommended for all libraries at institutions engaged in chemical research and the desks of serious practitioners in the field of organic synthesis.

Glenn J. McGarvey, *University of Virginia*

α -Aminoacid-*N*-Carboxy-Anhydrides and Related Heterocycles. By Hans Rytger Kricheldorf (Institut für Technische und Makromolekulare Chemie, Universität Hamburg). Springer-Verlag: New York, Heidelberg and Berlin. 1986. 213 pp. \$88.00. ISBN 0-387-17072-3

In the 80 years since Herman Leuchs first reported the synthesis and polymerization of an α -aminoacid-*N*-carboxyanhydride (NCA), the use of synthetic polypeptides as protein models has yielded a wealth of information pertaining to biological systems. The utility of NCA polymerization for preparing amino acid polymers and copolymers, as well as the advent of newer, more powerful analytical methods (high-field NMR for example) to study them, has stimulated a renewed interest in these materials. This monograph critically reviews the literature pertaining to the synthesis and polymerization of amino acid NCA's.

The book is divided into three major sections. 1. Synthesis and Characterization of NCA's; 2. Oligomerization and Polymerization of NCA's: Chemical Aspects; and 3. Polymerization of NCA's: Physical Aspects.

Section 1 reviews synthetic approaches to α -, β -, and ω -amino acid NCA's and their thio analogues. Also included are discussions of the IR and NMR spectroscopic characterization of NCA's and a number of useful tables listing a large number of known NCA's with compound data and references.

Section 2 reviews the reactions of NCA's with an emphasis on polymerization. Mechanistic aspects of NCA reactivity are given particular attention and the mechanisms associated with various initiating systems are examined in detail.

Section 3 covers the physical properties of the growing polymer chain with respect to their effect on the polymerization process. The emphasis is on the role of the solid-state secondary structure of polyaminoacids in the manifestation of "chain effects" in NCA polymerizations. The relative merits of several experimental methods are presented (X-ray diffraction, IR, CP/MAS NMR) and the measurement of molecular weight and its distribution are discussed in detail.

This monograph reflects Kricheldorf's own research interests by including the physical and mechanistic study of NCA polymerizations and does to a significant extent reflect his views of the various mechanisms involved. The specific nature of the subject matter precludes this as a general reference, but it is nonetheless quite comprehensive with respect to the synthetic and mechanistic discussions (775 total references!). Despite the thoroughness of the historical review, only a handful of references from the 1980's are cited. There is a short index, but the terms are somewhat general for quick reference and the majority of table entries are not included. We would also point out that copolymerization of amino acid NCA's is not discussed in any detail, probably in an effort to keep down the size of the manuscript. Overall, this book would be very useful to anyone involved with the synthesis and/or polymerization of amino acid NCA's. Especially helpful are the numerous practical tips and unpublished results from the laboratories of an author who benefits from almost 30 years experience in this area.

C. G. Overberger and Robert Bloodworth, *University of Michigan*

Organic-Chemical Drugs and Their Synonyms. Sixth Edition. Volumes I-III. By Martin Negwer. VCH Publishers: New York. 1987. 2470 pp (in 3 volumes). \$250.00. ISBN 0-89573-550-4

The previous edition of this work appeared in 1978, and in the ensuing years so much has happened that the number of drugs to be listed has increased nearly 50%. The compiler evidently has led a harried life trying to keep abreast of the tide, for the main work includes material only through 1982, and a hefty supplement carries the coverage to the end of 1985.

Two of the volumes consist of entries according to formula index; they include up to six per page, and include structural formula, names, and use. Volume III has an index according to structural classes or groups (e.g., amidines, pregnenes), a CAS Registry Number index, and a long index of synonyms. This work will probably see heavy reference use.

Organic Reaction Mechanisms 1985. Edited by A. C. Knipe and W. E. Watts. John Wiley & Sons: New York. 1987. ix + 621 pp. \$184.95. ISBN 0471-91127-5

The Editors carry bravely on, bringing with them a remarkably devoted crew of contributors (only one has been lost since the previous volume) who digest the mass of published literature, organize and compress it, and set it out for our use. In this volume, it is the literature dated December 1984 to November 1985 that is covered. As is customary, subjects that are reviewed in other works, (e.g., photochemical reactions, organometallic chemistry) are not duplicated. The content is easy to find because of the logical chapter divisions and the internal arrangement, but a good subject index ensures that the reader need not miss something just because it is in an unsuspected chapter. This work remains a valuable means of keeping abreast of the literature on mechanisms.

The Pesticide Manual. Eighth Edition. Edited by C. R. Worthing and S. B. Walker. The British Crop Protection Council. Distributed by Blackwell Scientific Publications: Palo Alto, CA. 1987. xix + 1081 pp. \$85.00. ISBN 0-94840401-9

In the nine years since the previous edition, new chemical agents have been introduced, and others have been withdrawn; this edition reflects these occurrences in its content. The entries occupy about 1-3 pages, as appropriate, and give nomenclature, properties, uses, toxicology, formulations, and analytical methods. Alphabetical order of common names is followed, but no less than 5 indexes are appended: Wiswesser Line-formula Notation; CA Registry Numbers; Molecular Formulae; Code Numbers; and Names (Chemical, trade mark, etc.). In addition, there are brief descriptions of the Wiswesser system and IUPAC nomenclature. The latter is abreast of recent developments, and the contents of the entries has been adjusted to reflect them. There is a separate list of superseded compounds.

Modern NMR Techniques of Chemistry Research. By Andrew E. Derome (University of Oxford). Pergamon Press: Oxford and Elmsford,

NY. 1987. xvii + 280 pp. Paper: \$35.00. ISBN 0-08-032513-0. Hardbound: ISBN 0-08-032514-9

Most books on NMR spectroscopy are written either for the physical chemist, and abound with rigorous mathematical treatments, or for the organic chemist who is interested in interpreting spectra as simply as possible, usually empirically. Furthermore, books currently on the market are inclined to emphasize continuous-wave spectroscopy. The author's contention is that the advent of high magnetic-field instruments, involving pulse NMR and Fourier transform, in the 1980s is such an important development that an introductory treatment for general use by organic and inorganic chemists is now justified. He also believes that a substantial degree of understanding of the nature of pulse FT NMR can be gained with a quite limited amount of mathematics, provided that the subject is presented as much as possible in a physical-pictorial way. He emphasizes that such understanding increases the chemist's ability to design experiments and to interpret the results, and moreover, that it can contribute to the fun of research.

This book is written in an engaging, relaxed style, very appropriate for the intended audience, advanced students, beginning researchers, and older ones whose NMR education stopped with continuous-wave NMR. The balance between the pragmatic and the theoretical is nicely made. Practical details have their share of attention, and the author has tried to present the type of information that is rarely found in books, but is usually learned by word of mouth.

Four chapters deal with pulse FT NMR, including one with the title "Why bother with pulse NMR?" The nuclear Overhauser effect has a chapter. "Polarization Transfer and Spectrum Editing" is the next chapter, which is followed by one titled "Further Experimental Methods". Chapters on homonuclear and heteronuclear shift correlation and one on "Spin Echoes and J-Spectroscopy" complete the book. Short (25-35 citations) bibliographies accompany each chapter.

Books on Physics and Mathematics

A Topical Dictionary of Statistics. By Gary L. Tietjen. Chapman and Hall: New York. 1987. xii + 171 pp. \$22.50. ISBN 0-412-02101-4

This is not a dictionary in the conventional sense, but instead it is a collection of fifteen chapters, which deal in a discursive form with such topics as regression, epidemiology, multivariate analysis, reliability and survival analysis, etc. It is even indexed. The intended readership is broad, ranging from professional statisticians to journalists who need to interpret government or scientific reports.

A Handbook of Introductory Statistical Methods. By C. Philip Cox. John Wiley & Sons: New York. 1987. xxiv + 272 pp. \$34.95. ISBN 0-471-81971-9

This book is designed "to complement instruction in a first course for graduate students who intend to use statistical methods in their own research". It is pleasantly unpedantic in its presentation and takes little for granted—it even tells how to pronounce the Greek letters commonly used in statistical equations.

Engineering Optics. Second edition. By Keigo Iizuka. Springer-Verlag: Berlin and New York. 1986. xvi + 489 pp. \$37.50. ISBN 0-387-17131-2

This softbound volume follows the first edition by only one year, surely exceptional if not record-breaking! It has been revised in only small ways, however, in addition to appearing in a cheaper format. The content is a survey, but in some depth, and begins with a history of optics. Both the mathematics and the practice of optics are treated, including such subjects as holography, Fourier transform, and signal processing.

Radiant Properties of Materials: Tables of Radiant Values for Black Body and Real Materials. By Aleksander Sala. Elsevier Scientific Publishers: Amsterdam and New York. 1984. xvi + 479 pp. \$125.00. ISBN 0-444-99599-4

The first 50 pp of this book consist of text and equations to review briefly radiative properties of materials and definitions of terms and laws. This part serves as an introduction to the tables, which constitute the bulk of the book. A two-part table of 121 pp lists values for black-body radiation at different temperatures, and an even longer table deals with radiative properties of materials. This table is divided into three parts: metals and alloys; inorganic materials; and organic and biological materials. There is an index of materials.