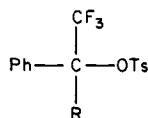


Table II. Bond Angles in 1-Phenyl-2,2,2-trifluoroethyl Tosylates



compd	R	PhCOTs	PhCCF <sub>3</sub>	PhCR	CF <sub>3</sub> CR	CF <sub>3</sub> COTs	RCOTs
1e	CH <sub>3</sub>	110	110	114	109	100	113
1a	CF <sub>3</sub>	115	109	115	107	102	108
1d	CN	114	111	112	107	102	110

Ground-state strain is a possible contributor to the reactivity of the highly substituted substrates **1**, and indeed X-ray crystal structure analyses<sup>8</sup> of **1a**, **1d**, and **1e** reveal each to be distorted from the tetrahedral, as illustrated by the bond angles at the central carbon (Table II). The differences between the largest and smallest angles range from 12° to 14° for the different substrates, comparable to those in tri-*tert*-butylcarbinyl *p*-nitrobenzoate,<sup>9</sup> a compound for which ground-state strain is generally accepted as a major contributor to the observed reactivity. As **1a**, **1d** and **1e** are all distorted there is no sure basis to ascribe the anomalously high reactivity of **1a** and **1d** relative to **1f** to ground-state strain, particularly as the quantitative relationship between geometries and energetics is not known. Bond lengths C-OTs for **1a**, **1d**, and **1e** are 1.436, 1.432, and 1.457 Å, respectively, while relative reactivities in TFA at 25 °C are 1.0, 50, and 2.6 × 10<sup>7</sup>, respectively. The significantly greater reactivity

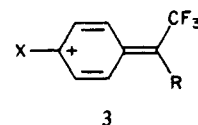
(8) We thank Dr. J. F. Sawyer for these determinations, details of which will be reported elsewhere.

(9) Cheng, P.-T.; Nyburg, S. C.; Thankachan, C.; Tidwell, T. T. *Angew. Chem., Int. Ed. Engl.* **1977**, *16*, 654-655.

(10) Jones, P. G.; Kirby, A. J. *J. Chem. Soc., Chem. Commun.* **1979**, 288-289.

and bond length of **1e** are consistent with a proposed<sup>10</sup> correlation between these properties.

A plausible explanation consistent with all the results is that the transition states for reaction of **1a-c** and **1f** all resemble **3** with



the charge delocalized onto the aryl ring. Consequently the difference in the effect of R (H or CF<sub>3</sub>) is small. The fact that ρ<sup>+</sup> values when R = H<sup>1a</sup> and CF<sub>3</sub> are similar supports this interpretation. When R = CH<sub>3</sub> or when the CF<sub>3</sub> group is not present there is less electron demand and a lower effect of X.

**Acknowledgment.** Financial support by the Natural Sciences and Engineering Research Council of Canada is gratefully acknowledged.

**Registry No.** **1a**, 86669-60-5; **1b**, 86688-54-2; **1c**, 86669-61-6; **1d**, 86669-62-7; **1e**, 73572-26-6; **1f**, 13652-13-6.

## Book Reviews\*

**Topics in Current Chemistry. Volumes 98 and 101. Host Guest Complex Chemistry I and II.** Edited by F. Vögtle. Springer-Verlag, Berlin, Heidelberg, and New York. Volume 98: 1981. 197 pp. \$35.00. Volume 101: 1982. 203 pp. \$37.50.

These two volumes consist of reviews covering fundamental aspects and applications of complexes formed between cavity-containing ligands, hosts, and small neutral molecules or ions, guests. Volume 98 contains four chapters, focusing on the structure, complexation properties, and analytical applications of a wide variety of host compounds. The first chapter of Volume 98, Crown-Type Compounds—An Introductory Overview (E. Weber and F. Vögtle), provides a short survey of the field. The main topics covered include classification and nomenclature of macrocyclic and acyclic ligands, general complexation properties of crown-type compounds, and effects of complexation on the chemical properties of the guest particles. The relationship between the structure and complexation properties of crown-type hosts is treated in detail in the section titled Concept, Structure, and Binding in Complexation (D. Cram and K. Trueblood). This chapter is not a general survey but deals primarily with work from the authors' laboratory, with emphasis on macrocycles containing rigid structural units, the spherands, and hemispherands. The use of molecular models and X-ray structural analysis in the design of host molecules, structural changes accompanying host complexation, and correlation of the structure with free energy of complexation are the main topics in this section. The third chapter, Complexation of Uncharged Molecules and Anions by Crown-type Host Molecules (F. Vögtle, H. Sieger, and S. W. Möller), surveys in detail the work done on inclusion complexes of small molecules with coronand, cryptand, and catapinand type ligands. Complexes of acyclic neutral ligand hosts with small guest molecules are also treated. Minor topics include complexes with hosts containing lipophilic cavities, complexes with anions as guests, and multicomponent complexes. Volume 98 con-

cludes with a short chapter titled Analytical Applications of Crown Compounds and Cryptands (E. Blasius and K.-P. Janzen). This chapter focuses primarily on the applications of monomeric and polymeric cyclic polyethers in chemical separation. Extraction and chromatographic methods are the primary subject areas. Brief accounts are given of the uses of cyclic polyethers in photometric and electrochemical determination methods.

The topics covered in Volume 101 cover a broad range of subjects in the field of host-guest chemistry. The first article, Structural Chemistry of Natural and Synthetic Ionophores and Their Complexes with Cations (R. Hilgenfeld and W. Saenger), is a selective review of the crystal structures of a wide variety of ionophores and their metal ion complexes. Included in the review are the naturally occurring peptide and polyether antibiotics, synthetic macrocyclic and macrobicyclic ligands, and the open-chain polyethers or podands. Comparisons between the ligand conformation(s) in the free and complexed form in the solid state are made, and, whenever possible, solution and solid-state structural data are compared. Comprehensive compilations of published crystal structures are included for each type of ionophore.

A second chapter on ionophores, Dynamic Aspects of Ionophore Mediated Membrane Transport (G. Painter and B. Pressman), deals primarily with membrane transport processes of naturally occurring polyether carboxylic acid ionophores. The conformational dynamics of selected ionophores in bulk solvents of varying polarity are related to the conformational dynamics of these ionophores during the cation transport process and the effects of specific ionophore-membrane interactions are discussed. A short treatment of the biological properties of ionophores, with emphasis on cardiovascular effects and monovalent cation transport across red blood cell membranes, concludes this chapter. The third section of this volume is Bioorganic Modelling—Stereoselective Reactions with Chiral Neutral Ligand Complexes as Model Systems for Enzyme Catalysis (R. Kellogg). This chapter reviews the application of macrocyclic compounds as model systems for certain enzymatic processes. The

\* Unsigned book reviews are by the Book Review Editor.

main topics discussed include design of stereoselective crown ethers, macrocycles with protease or hydrogenase activity, and other macrocycles with the potential to model various types of catalytic processes. The final chapter, Phase-Transfer Catalyzed Reactions (F. Montanari, D. Landini, and F. Rolla), is a detailed treatment of phase-transfer catalysis (PTC). The major topics covered are general principles and mechanism of PTC, PTC catalysts, incorporation of phase-transfer catalysts into polymeric matrices, and applications of PTC. While much of the discussion relies on examples of PTC employing quaternary ammonium or phosphonium salts, applications of monomeric and polymeric macrocyclic and pseudomacrocyclic compounds as phase-transfer catalysts are well described.

These two volumes provide up-to-date reviews of both general and highly specialized aspects of the reactions between cavity containing host molecules and small charged or neutral guest ions or molecules. The extensive literature bibliographies at the end of each chapter provide a convenient entry point into the literature.

Richard W. Taylor, *University of Oklahoma*

**Progress in Theoretical Organic Chemistry. Volume 3. Molecular Structure and Conformation. Recent Advances.** Edited by I. G. Csizmadia. Elsevier Scientific Publishing Co., Amsterdam and New York. 1982. 344 pp. Dfl 220; U.S. \$102.50.

This volume contains additional advances made in theoretical organic chemistry since the first symposium held in Teneriff in 1975. The topics covered are structural consequences of hyperconjugation, conformational preferences in methyl derivatives, nonclassical polyhedral organic molecules and ions, correlation energy in molecular structure, analytical equations for conformational energy surfaces, and quantum chemical studies on the mechanism of enzyme reactions.

O. Eisenstein, *The University of Michigan*

**Predicting the Properties of Mixtures: Mixture Rules in Science and Engineering.** By L. E. Nielsen (Monsanto Company). Marcel Dekker, Inc., New York, N.Y. 1978. vii + 96 pp. \$12.50.

Nielsen's brief book gives a concise and straightforward method of treating the properties of two-component mixtures. Three particularly powerful mixing rules are given that are generally useful for the three classes of mixtures: one-phase miscible mixtures; two-phase systems with one continuous phase and one dispersed phase; two-phase systems with two continuous phases. The small number of empirical parameters in these rules makes them especially useful in data reduction or in predicting the physical properties of mixtures from a small amount of experimental data.

In addition to giving many practical examples in the application of the three rules to polymer systems, Nielsen shows how many other empirical mixture rules are special forms of these three rules.

This book should be of considerable interest to chemists and engineers interested in formulating polymer systems that meet certain mechanical, electrical, and other physical specifications.

John W. Larson, *Marshall University*

**Heparin (and Related Polysaccharides).** By Wayne D. Comper (Monash University). Gordon and Breach Science Publishers, Inc., New York, N.Y. 1981. xiii + 266 pp. \$55.95.

This seventh volume in the Polymer Monograph series offers a radical departure from the previous six by dealing with a naturally occurring polysaccharide of essentially biological and biomedical interest rather than a synthetic polymer.

The principal chapters follow a brief introduction and are devoted to monosaccharide composition, monosaccharide sequence, secondary and higher order structures, ionic interactions, the distribution of heparin in vivo, and extracellular interactions. Each contains extensive references to the primary literature through 1979. Thus, this book is particularly appropriate to the needs of an individual who requires a thorough background in the chemistry and biology of heparin formation, structure, and activity.

Beginning research students working on related topics may find this book particularly helpful.

William T. Winter, *Polytechnic Institute of New York*

**Correlation Analysis of Organic Reactivity.** By John Shorter (University of Huff, England). John Wiley and Sons, New York, N.Y. xii + 235 pp. \$41.95.

This little book consists of seven chapters plus an appendix and an index. As the title implies, its thrust is directed toward the state of the art of the empirical correlation of reactivity with structure in organic reactions. Discussion begins with so-called linear free energy relationships and progresses to contemporary concepts of multiple regression (i.e., use of multiple parametric equations). Chapters one and seven deal with the necessary statistical considerations for multiple regression, whereas

the substance of the text centers on substrate reactivity (Chapters 3 and 4), medium effects (Chapter 5), and reagent analysis (Chapter 6).

Discussion features the substrate reactivity equations of Hammett, Yukawa and Tsuno, and Swain and Lupton, as well as the work of Taft. Medium effect considerations are mainly given to the equations of Hughes and Ingold, Kirkwood, and Grunwald and Winstein, as well as Koppel and Palm. Reagent analysis centers on the Brønsted relationship with subsidiary consideration given to Swain and Scott, and Edwards, as well as hard and soft acid and base theory. The more recent work of C. D. Ritchie and Jencks is also discussed. Mention is given to new ideas in all chapters and particular attention is paid to references.

Along with the very good referencing, a large number of footnotes are found involving expanded explanations of the text. The author is well written in the area, having one previous book and chapters in two other works to his credit. The reader should be grounded in the thermodynamics and kinetics of organic reactions in order to handle the short but well-versed introductions given.

Finally, the book makes no attempts to be comprehensive but chooses those relationships which appear to the author to have the most promise of success in correlating reactivity. This book should appeal most to kineticists in the area because of its many references and attention to those equations which give the best correlation in given instances.

Robert W. Huffman, *Northern Arizona University*

**Advances in Organometallic Chemistry. Volume 20.** Edited by F. G. A. Stone (University of Bristol) and Robert West (University of Wisconsin). Academic Press Inc., New York. 1982. IX + 369 pp. \$56.00.

Volume 20 continues the spirit and style of the earlier volumes in this series. The organization of the book and the quality of the reviewers are uniformly high. The authors have not tried to bury the readers with all the information in it, but have selected what seemed most interesting and important to them, and have provided a generous amount of leading references. The titles and the authors of the six chapters comprising the volume are as follows: (1) Transition metal formyl complexes (J. A. Gladysz); (2) The organic chemistry of gold (G. K. Anderson); (3) Arsonium ylides (Y. Z. Huang and Y. C. Shen); (4) The methylene bridge (W. A. Hermann); (5) Nucleophilic displacement at silicon: Recent developments and mechanistic implications (R. J. P. Corriu and C. Guerin); (6) The biological methylation of metals and metalloids (J. S. Thayer and F. E. Brinckman). The complete coverage of preparation, characterization, reactivity, and chemical reactions of the titled metal complex compounds are the main characteristic features of Chapters 1-4. The largest part of the book (93 pp) is the chapter on the methylene bridge. Chapter 5 deals with controlling factors of the stereochemistry and rationalization of the stereochemistry by Frontier-Orbital approximation for the nucleophilic displacement at silicon. The last chapter, entitled biological methylation of metal and metalloids, is devoted to chemical rate studies of methylcobalamin, other aqueous trans-methylations, and the mechanisms of trans-methylations. In addition, most of the chapters end with a useful conclusion section.

The book is well produced and the illustrations are of high quality. In all, researchers and chemists interested in organometallic chemistry will find much of concern to them in it.

Hanafi H. Zoorob, *El-Mansoura University, Egypt*

**Quantum Theory of Chemical Reactions. Volume II. Solvent Effects, Reaction Mechanisms, Photochemical Processes.** Edited by R. Daudel, A. Pullman, L. Salem, and A. Veillard. D. Reidel, Boston. 1980. vii + 325 pp. \$41.50.

This is the second of a three-volume series that composes a collection of essays on the applications of quantum theory to important chemical problems. The diversity of approaches is impressive. The methodologies range from the experimental (e.g., Perchard's chapter on inert matrices) to the largely qualitative (e.g., Berke and Hoffmann's chapter on 1,2 shifts in organometallics) to the highly mathematical (e.g., Tapia's chapter on medium effects). The book jacket suggests that this and the accompanying two volumes "can be used as supplementary reading from the first-year undergraduate course upwards". While the reviewer feels this is unlikely for the vast majority of American readers, from introductory students all the way through faculty members, the editors are inherently right—this set of books offers insights into molecular phenomena of interest that may be understood and employed at all levels of education and awareness.

Joel F. Liebman, *University of Maryland Baltimore County*

**CRC Handbook of Chromatography. Carbohydrates. Volume 1.** Edited by Shirley C. Churms (University of Cape Town). CRC Press, Inc., Boca Rouge, Florida. 1982. x + 272 pp. \$54.00.

This volume is the first of a series of handbooks dealing with single classes of compounds, which will replace the "Handbook of Chromatography" first published in two volumes in 1972. This practical handbook draws from the literature a wide variety of procedures which use many experimental techniques for the separation and detection of carbohydrates and their derivatives. The classes of compounds include reducing sugars and their volatile derivatives suitable for gas chromatography, partially methylated sugars encountered in linkage analysis studies on carbohydrate polymers, oligosaccharides, glycopeptides and glycoproteins, glycolipids, and polysaccharides. The techniques summarized are gas chromatography, various types of liquid chromatography including HPLC, partition chromatography on ion-exchange resins, ion-exchange chromatography, and gel permeation chromatography, paper chromatography and thin layer chromatography. Further sections discuss affinity chromatography and paper electrophoresis. For each technique and class of compound, separation conditions are specified and relative mobilities are presented in tabular form. Destructive and non-destructive detection techniques for gas chromatography and the various types of liquid chromatography are summarized, and there is an extensive list of spray reagents for the detection of compounds on paper chromatograms and thin-layer plates. Later sections in the book give methods for the isolation and purification of different types of carbohydrates from plant material and clinical samples, procedures for the depolymerization of polysaccharides and their permethylated derivatives, and experimental details for the preparation of derivatives for analysis. The handbook concludes with a useful list of products and sources of chromatographic materials.

This volume, which provides a wealth of information with extensive literature citations, will be invaluable for those engaged in compositional analysis and in the structural elucidation of carbohydrate-containing macromolecules. It is unfortunate for those interested in glycoconjugates that separations of aminodeoxysugars and their derivatives are rather sketchily covered. However, the areas discussed are of a sufficiently specialized nature that the omission of the general organic separation procedures mainly used by synthetic carbohydrate chemists is quite justified. The volume deals almost exclusively with analytical aspects of separation techniques, and it is a pity that little attention is given to preparative separations, since problems of scale-up are often far from trivial. Within these limitations, the editor and her associates are to be congratulated on bringing together much information so that the volume will be the first place of reference for specialist and novice alike. The already well-thumbed copy of the handbook in the reviewer's laboratory shows that it gives ready access to much practical information.

Gerald O. Aspinall, *York University*

#### Volumes of Proceedings

**Metabolic Effects of Utilizable Dietary Carbohydrates.** Edited by Sheldon Reiser. Marcel Dekker, Inc., New York. 1982. ix + 360 pp. \$49.50.

Proceedings of an ACS symposium held in New York in 1981; reproduced from typescript; indexed.

**Raman Spectroscopy: Linear and Nonlinear.** Edited by J. Lascombe and P. V. Huang. John Wiley and Sons, Inc., New York. 1982. xxxi + 834 pp. \$64.95.

Proceedings of the Eighth International Congress held in Bordeaux in 1982; reproduced from a remarkable miscellany of typescripts, including some composed of fuzzy dots; not provided with a subject index.

**Electrochemistry in Industry: New Directions.** Edited by Uziel Landau, Ernest Yeager, and Diane Kortan. Plenum Press, New York and London. 1982. vii + 388 pp. \$49.50.

Proceeding of an international symposium held at Case Western Reserve University in 1980; reproduced from flamboyantly individual typescripts; indexed.

**New Vistas in Glycolipid Research. Volume 152. Advances in Experimental Medicine and Biology.** Edited by Akira Makita, Shizuo Handa, Tamotsu Taketomi, and Yoshitaka Nagai. Plenum Press, New York and London. 1982. vii + 490 pp. \$62.50.

Proceedings of the Biwako Symposium on Glycolipids, held in Japan in 1981; reproduced from uniform typescript; indexed.

**Reaction Injection Molding and Fast Polymerization Reactions. Volume 18. Polymer Science and Technology.** Edited by Jiri E. Kresta. Plenum Press, New York and London. 1982. vi + 302 pp. \$42.50.

Proceedings of an international symposium held in Atlanta in 1981; reproduced from uniform typescripts; indexed.

**Nutrition Policy Implementation: Issues and Experience.** Edited by Nevin S. Scrimshaw and Mitchel B. Wallerstein. Plenum Press, New

York and London. 1982. vi + 558 pp. \$65.00.

Proceedings of a conference held by the MIT International Nutrition Planning Program and sponsored by the United Nations University, Tokyo, at a mysteriously concealed date. Set in type and indexed.

**Progress in Research and Clinical Application of Corticosteroids.** Edited by H. J. Lee and T. J. Fitzgerald. Heyden and Son, Ltd., London. 1982. x + 302 pp. \$52.95.

Proceedings of the Sixth Annual Clinical Symposium, held in 1981; reproduced from typescript; indexed.

**Developments in Atomic Plasma Spectrochemical Analysis.** Edited by Ramon M. Barnes. Heyden and Sons, Ltd., London. 1981. xvii + 751 pp. \$21.95.

Proceedings of a conference held in Puerto Rico in 1980; reproduced from typescript; indexed.

**Management and Conservation of Resources.** By The Institution of Chemical Engineers. Pergamon Press, Oxford and New York. 1982. ca. 200 pp. \$45.00.

Proceedings of a symposium "which had to be cancelled", organized by the Institution of Chemical Engineers, emphasizing production and conservation of energy.

**Current Topics in Mass Spectrometry and Chemical Kinetics.** Edited by J. H. Beynon and M. L. McGlashan. Heyden and Son, Ltd., London. 1982. xii + 153 pp. \$52.95.

Proceedings of a symposium held at University College, London, in 1981 to honor Professor Allan Maccoll.

**Advances in Thin Layer Chromatography: Clinical and Environmental Applications.** Edited by Joseph C. Touchstone. John Wiley and Sons, Inc., New York. 1982. xv + 521 pp. \$55.00.

Proceedings of a symposium held in Philadelphia in December, 1980; reproduced from uniform typescript; indexed.

**Soft Ionization Biological Mass Spectrometry.** Edited by H. R. Morris. Heyden and Son, Ltd., London. 1981. xii + 156 pp. \$42.95.

Proceedings of a symposium sponsored by the Royal Society of Chemistry in 1980; reproduced from variegated typescripts; indexed.

**Chaos and Order in Nature.** Edited by H. Haken. Springer-Verlag, Berlin, Heidelberg, and New York. 1981. viii + 275 pp. DM 60. \$26.00.

The proceedings of the International Symposium on Synergetics held in Bavaria in 1981, as produced by a richly varied collection of typewriters. Not indexed.

**Coca and Cocaine (A Special Issue of the Journal of Ethnopharmacology).** Edited by L. Rivier. Elsevier Sequoia S.A., Lausanne. 1981. 223 pp. \$60.00.

Contains papers based on a symposium on Erythroxylo-n-New Historical and Scientific Aspects, held in Ecuador in 1979. Typeset and indexed.

**Advances in Organometallic and Inorganic Polymer Science.** Edited by Charles E. Carraher, Jr., John E. Sheals, and Charles U. Pittman, Jr. Marcell Dekker, Inc., New York. 1982. xii + 449 pp. \$67.50.

Papers reprinted from the *Journal of Macromolecular Science Chemistry*, Vol. A16, No. 1. Indexed.

**Recent Advances in the Quantum Theory of Polymers. Lecture Notes in Physics. No. 113.** Edited by J.-M. André, J.-L. Brédas, J. Delhalle, J. Ladik, G. Leroy, and C. Moser. Springer-Verlag, Berlin, Heidelberg, and New York. 1980. v + 306 pp. \$22.00.

The proceedings of a symposium held in Namur in 1979, containing all the lectures in uniform typescript. Not indexed.

**Management of Industrial Wastewater in Developing Nations.** Edited by D. Stuckey and A. Hamza. Pergamon Press, Oxford and New York. 1982. x + 500 pp. \$70.00.

The proceedings of an international symposium held in Alexandria, Egypt, in 1981, containing 41 of the 64 papers, reproduced from typescripts. The concern is with control of industrial pollution, particularly by methods appropriate to countries with developing technologies. Indexed.

**Understanding Process Integration.** By The Institution of Chemical Engineers. Pergamon Press, Oxford and New York. 1982. 185 pp. \$32.00.

Proceedings of a symposium held at an unspecified place and time, concerned with industrial chemical processes and their analysis. Reproduced from typescript and not indexed.

**Origin and Chemistry of Petroleum.** Edited by Gordon Atkinson and Jerry J. Zuckerman. Pergamon Press, New York and Oxford. 1981. ix + 116 pp. \$30.00.

The proceedings of the Third Annual Karcher Symposium, held in Oklahoma in 1979, reproduced from typescripts. Indexed.

**Faraday Symposia of the Chemical Society. No. 15. Chromatography: Equilibria and Kinetics.** Edited by D. A. Young. The Faraday Division, The Royal Society of Chemistry, London. 1980. 192 pp. \$60.00.

The proceedings of a symposium held at the University of Sussex in 1980, containing the papers and the ensuing discussions. Typeset, but not indexed.

**Microcalorimetry of Macromolecules.** Edited by B. Sedláček, C. G. Overberger, and H. F. Mark. John Wiley & Sons, New York. 1981. v + 112 pp. \$12.00.

The proceedings of the 20th Prague IUPAC Symposium, held in 1979. Typeset but not indexed. Part of the annual subscription to the *Journal of Polymer Science*.

**Advanced Topics on Radiosensitizers of Hypoxic Cells.** Edited by A. Breccia, C. Rimondi, and G. E. Adams. NATO Advanced Study Institute Series, Plenum Press, New York and London. 1982. xiii + 284 pp. \$39.50.

Contains the lectures and "workshops" given at a NATO Advanced Study Institute held in Italy in 1980, devoted to nitroimidazoles. Indexed.

**Polymeric Separation Media. Polymer Science and Technology. Volume 16.** Edited by Anthony R. Cooper. Plenum Press, New York and London. 1982. ix + 276 pp. \$39.50.

Contains manuscripts collected from a symposium held in Las Vegas in 1980, reproduced from typescripts. A few are only abstracts. Token index.

**Free-Electron Generators of Coherent Radiation. Physics of Quantum Electronics. Volumes 8 and 9.** Edited by Stephen F. Jacobs, Gerald T. Moore, Herschel S. Pilloff, Murray Sargent III, Marlan O. Scully, and Richard Spitzer. Addison-Wesley Publishing Company, Reading, Massachusetts, and London. 1982. 1068 pp. \$30.50 (Volume 8); \$29.50 (Volume 9).

Contains the texts of the lectures given at a "workshop" on free-electron laser devices held in Idaho in 1981, reproduced from typescripts. Indexed.

**Coordination Chemistry. No. 21.** Edited by J. P. Laurent. Pergamon Press, New York and London. 1981. x + 190. \$50.00.

Contains the plenary and section lectures given at the 21st International Conferences, held in Toulouse in 1980, reproduced from all sorts of typescripts. Indexed.

**Chemical Engineering Education.** The Institution of Chemical Engineers, Pergamon Press, Oxford and New York. 1982. 212 pp. \$32.00.

Proceedings of an international symposium held in London in 1981, containing a variety of short papers, reproduced from typescripts of impressive, if not esthetic, variety, from the British Isles and Europe. Not indexed.

**The Jubilee Chemical Engineering Symposium.** The Institution of Chemical Engineers, Pergamon Press, Oxford and New York. 1982. \$90.00.

Contains many of the papers presented at a Jubilee Symposium of the Institution of Chemical Engineers, held at Imperial College in 1982. An impressive variety of type-faces is exhibited, but an index to them or to the subject matters is not to be found.

**The Rare Earths in Modern Science and Technology. Volume 3.** Edited by Gregory J. McCarthy, Herbert B. Silber, and James J. Rhyne. Plenum Press, New York and London. 1982. xxiii + 588 pp. \$59.50.

Proceedings of a conference held at the University of Missouri in 1981, containing 120 contributions, reproduced from the authors' very varied typescripts. Indexed.

**Steric Effects in Biomolecules.** Edited by G. Náray-Szabo. Elsevier Scientific Publishing Company, Amsterdam and New York. 1982. xvi + 420 pp. \$107.00/Dfl. 230.00.

Proceedings of an international symposium held in Hungary in 1981, containing the papers reproduced from the authors' typescripts, plus a list of poster titles. Indexed.

**Anthracycline Antibiotics.** Edited by Hassan S. El Khadem. Academic Press, New York. 1982. xii + 285 pp. \$25.00.

Contains ten of the major papers presented at a symposium held in New York in 1981, with emphasis on cancer chemotherapy, reproduced from the authors' typescripts. Indexed.

**Applied Headspace Gas Chromatography.** Edited by B. Kolb. Heyden, London, Philadelphia, and Rheine, FRG. 1980. x + 185 pp. \$29.50.

Combined proceedings of a symposium held in Beaconsfield, England, and a colloquium held in Überlingen, FRG, in 1978, reproduced from the authors' typescripts. Indexed.

**Interfacial Synthesis. Volume III. Recent Advances.** Edited by Charles E. Carraher, Jr., and Jack Preston. Marcel Dekker Press, Inc., New York. 1982. xii + 391 pp. \$65.00.

The content originally appeared in the *Journal of Macromolecular Science—Chemistry*. Vol. A15, No. 5.

**Commodity and Engineering Plastics.** Edited by Norbert Platzer. John Wiley & Sons, New York. 1982. xvi + 239 pp. \$28.00.

The proceedings of a symposium held at the 181st National Meeting of the American Chemical Society held in Atlanta in 1981, published as part of the subscription to the *Journal of Applied Polymer Science*.

**Structure and Mobility in Molecular and Atomic Glasses. Annals of the New York Academy of Sciences. Vol. 371.** Edited by James M. O'Reilly and Martin Goldstein. New York. 1981. xii + 345 pp. \$74.00.

Contains papers from a conference held by the NY Academy of Sciences in 1980. Some are full length, and some are abstracts of poster sessions. Typeset, but not indexed.

**Surface Contamination: Genesis, Detection and Control. Volumes 1 and 2.** Edited by K. L. Mittal. Plenum Press, New York and London. 1979. xvi + 1056 pp. \$35.00 per volume.

The proceedings of a symposium held in Washington in 1978, reproduced from typescript. Index in each volume.

**Cellular and Subcellular Localization in Plant Metabolism.** Edited by Leroy L. Creasy and Gexa Hrazdina. Plenum Press, New York and London. 1982. ix + 277 pp. \$37.50.

Papers presented at a symposium held by the Photochemical Society of North America in Ithaca New York in 1981, reproduced from typescript. Indexed.

**Flavonoids and Bioflavonoids. 1981.** Edited by L. Farkas, M. Gabor, F. Kallay, and H. Wagner. Elsevier Scientific Publishing Company, Amsterdam, Oxford, and New York. 1982. xix + 534 pp. \$104.75; Dfl. 225.00.

The proceedings of an international symposium held in Munich in 1981 reproduced from the authors' highly varied typescripts. Keyword index.

**Methods in Protein Sequence Analysis.** Edited by Marshall Elzinga. Humana Press Inc., Clifton, New Jersey. 1982. xxv + 589 pp. \$64.50.

The proceedings of the IVth International Conference, held in Brookhaven in 1981, containing full papers, as well as "Communications", which were presented in poster sessions, all reproduced from the authors' typescripts. Indexed.

**Percolation Processes. Theory and Applications.** Edited by A. E. Rodrigues and D. Tondeur. NATO Advanced Study Institute, Sijthoff & Noordhoff, The Netherlands and Rockville, Maryland. 1981. viii + 588 pp.

Contains the 13 lectures given at a NATO Advanced Study Summer School held in Portugal in 1978, reproduced from the authors' typescripts, and not indexed.

**Advances in Steroid Analysis.** Edited by S. Görög. Elsevier Scientific Publishing Company, Amsterdam and New York. 1982. 464 pp. \$104.75; Dfl. 225.00.

Proceedings of a symposium held in Hungary in 1981, containing 69 papers reproduced from typescript. Indexed.

**Atomic and Nuclear Methods in Fossil Energy Research.** Edited by Royston H. Filby. Plenum Press, New York and London. 1982. xii + 506 pp. \$59.50.

Proceedings of a conference held in Mayaguez in 1980, containing papers reproduced from the authors' typescripts. Indexed.

**Adsorption at the Gas-Solid and Liquid-Solid Interface.** Edited by J. Rouquerol and K. S. W. Sing. Elsevier Scientific Publishing Company, Amsterdam and New York. 1982. xii + 512 pp. \$102.50; Dfl. 220.00.

Proceedings of an international symposium held in Aix-en-Provence in 1981. The papers, reproduced from typescripts, are in French or English. Author index only.

**Modern Chlor-Alkali Technology.** Edited by M. O. Coulter. Ellis Horwood Publishers, Chichester. 1980. 289 pp. \$89.95.

Proceedings of a symposium held at an undisclosed place and date.

sponsored by the Society of Chemical Industry, containing 23 review chapters. Not indexed.

**The Assessment of Major Hazards.** The Institution of Chemical Engineers, Pergamon Press, Oxford and New York. 1982. ii + 427 pp. \$60.00.

The proceedings of the "EFCE Event No. 272", organized by the Institution of Chemical Engineers, held in April 1982, dealing with explosives, fires, toxic hazards, earthquakes, etc., in chemical plants. Not indexed.

**A Century of Chemical Engineering.** Edited by William C. Furter. Plenum Publishing, New York and London. 1982. viii + 463 pp. \$49.50.

Papers from an ACS Symposium held in Las Vegas in 1980. Brief index.

**Bulletin de la Société Chimique Beograd. Volume 47.** Documenta Chemica Yugoslavica. 1982. 194 pp.

Proceedings of the Second Yugoslav Symposium on Chemistry and Technology of Fibers and Textiles, in abstract form, in English and Russian.

**The Chemical Regulation of Biological Mechanisms.** Edited by A. M. Creighton and S. Turner. The Royal Society of Chemistry, London. 1981. x + 319 pp. £15.00.

The proceedings of the 1st Medicinal Chemistry Symposium organized by the Royal Society of Chemistry and the Society of Chemical Industry, held in 1981, consisting of review papers reproduced from typescript. Not indexed.

**Electron Distributions and the Chemical Bond. ACS Symposium.** Edited by P. Coppens and M. B. Hall. Plenum Press, New York. 1982. ix + 479 pp. \$55.00.

The volume represents the proceedings of a symposium held at the Spring 1981 ACS Meeting in Atlanta. It brings together Theoretical Considerations, Extended Solids, Molecular Solids, and Electrostatic Properties, and is a blend of review papers and recent research results.

**Quantum Theory of Chemical Reactions. Volume I. Collision Theory, Reaction Paths, Static Indices.** Edited by R. Daudel, A. Pullman, L. Salem, and A. Veillard. D. Reidel Publishers. Dordrecht, Holland. 1980. vii + 248 pp. Dfl 65; U.S. \$34.20.

This volume represents the proceedings of an international seminar held in Paris in 1979, which covered topics from dynamic study of small particles, mechanisms of reactions, aromaticity rules, to the examination of large molecules of biological interest.

#### Books in the ACS Symposium Series

(All published by the American Chemical Society, Washington, D.C.)

**Insect Pheromone Technology: Chemistry and Applications.** Edited by Barbara A. Leonhardt and Morton Beroza. 1982. 260 pp. \$35.95 (\$43.95 export).

This 14-chapter volume explores recent findings of foremost authorities in alternative pesticide research; discussions include advances in isolation, identification, synthesis, and application of pheromones.

**Catalytic Activation of Carbon Monoxide.** Edited by Peter C. Ford. 1981. 358 pp. \$36.50.

This volume's 21 chapters focus on the design of efficient catalysts for processes such as conversions to liquid fuels via the Fischer-Tropsch reaction and hydrogen production via the shift reduction, as well as the chemistry of the fundamental reactions involved.

**Modifications of Proteins: Food, Nutrition, and Pharmacological Aspects.** Edited by Robert E. Feeney and John R. Whitaker. 1982. 402 pp. \$54.95 (\$65.95 export).

This book draws attention to the interrelated research on chemical and enzymatic protein modification in the pharmacological, nutritional, and food sciences.

**Chemically Modified Surfaces in Catalysis and Electrocatalysis.** Edited by Joel S. Miller. 1982. 301 pp. \$36.95 (\$44.95 export).

Major emphasis is placed on surface modification for catalytic, electrocatalytic, and photoelectrochemical applications.

**Cyclopolymerization and Polymers with Chain-Ring Structures.** Edited by George B. Butler and Jiri E. Kresta. 1982. 454 pp. \$44.95 (\$53.95 export).

This 32-chapter volume includes recent studies on synthetic routes, mechanisms, and possible uses for cyclopolymers with chain-ring structure.

**Elastomers and Rubber Elasticity.** Edited by James E. Mark and Jørginder Lal. 1982. 576 pp. \$54.95 (\$65.95 export).

This 29-chapter book explores various aspects of newly synthesized elastomers—organophosphazenes, multiphase block copolymers, and polymers of controlled microstructure with the capacity for strain-induced crystallization.

**Graft Copolymerization of Lignocellulosic Fibers.** Edited by David N.-S. Hon. 1982. 381 pp. \$33.95 (\$40.95 export).

Reflecting current research on substitutes for expensive petrochemically derived synthetic polymers used in the oil and natural gas industries, this 21-chapter volume explores grafting reactions important to polymer, fiber, and wood product industries.

**NMR Spectroscopy: New Methods and Applications.** Edited by George C. Levy. 1982. 388 pp. \$49.95 (\$59.95 export).

This 17-chapter volume demonstrates the increased utility of NMR spectroscopy and the resultant advances in many fields.

**Soluble Silicates.** Edited by James S. Falcone, Jr. 1982. 364 pp. \$39.95 (\$47.95 export).

This 21-chapter volume outlines many aspects of silicate technology, demonstrating not only the acceptability of this significant commodity but also its promise for the future as a cost-effective inorganic material for the manufacture of synthetic silicates.

**Nutritional Bioavailability of Iron.** Edited by Constance Kies. 1982. 204 pp. \$29.95 (\$35.95 export).

This 12-chapter volume studies the amount of iron available in various foodstuffs along with changes in availability of iron due to food processing. In addition, the book explores the role of additives—such as ascorbic acid—and a number of other dietary variables which affect iron absorption.

**Ascorbic Acid: Chemistry, Metabolism, and Uses.** Edited by Paul A. Seib and Bert M. Tolbert. 1982. 604 pp. \$79.95 (\$95.95 export).

Exploring the chemistry, biochemistry, physiological roles, and kinetics of ascorbic acid, this 24-chapter volume summarizes current research on Vitamin C.

**Nutritional Bioavailability of Zinc.** Edited by George E. Inglett. 1983. 271 pp. \$35.95 (\$43.95 export).

Eighteen studies report on current perspectives and future directions for research on zinc in human nutrition.

**Chemical Reaction Engineering—Boston.** Edited by James Wei and Christos Georgakis. 1982. 614 pp. \$36.95 (\$44.95).

Forty-six papers are grouped into seven major areas: reactor modeling, reactor dynamics, kinetics, coal processes, multiphase reactors, physical processes, and mixing and polymerization.

**Coke Formation on Metal Surfaces.** Edited by Lyle F. Albright and R. T. K. Baker. 1982. 318 pp. \$38.95 (\$46.95 export).

This 15-chapter volume explores methods to combat coke formation on metal surfaces.

**Industrial Applications of Surface Analysis.** Edited by Lawrence A. Casper and Cedric J. Powell. 1982. 438 pp. \$46.95 (\$56.95 export).

Presenting an investigation in depth of surface analysis problems, applications, and techniques, this book also provides a wide range of specific examples of surface analysis.

**Colloids and Surfaces in Reprographic Technology.** Edited by Michael Hair and Melvin D. Croucher. 1982. 594 pp. \$58.95 (\$70.95 export).

This broad-based book studies the role that surface science plays in modern reprographic technologies. Twenty-eight chapters explore the following areas: photography, electrophotography, printing and novel imaging technologies, and ink-paper interactions and ink jet printing.

**Milton Harris: Chemist, Innovator, and Entrepreneur.** Edited by Miklos M. Breuer. 1982. 170 pp. \$18.95 (\$22.95 export).

Published from papers presented at the Milton Harris 75th Birthday Symposium held April 27–28, 1981 in Washington, DC, this *festschrift* recounts Milton Harris' many scientific contributions throughout his long, distinguished career.

**Biological Effects of Nonionizing Radiation.** Edited by Karl H. Illinger. 1981. 342 pp. \$28.50.

Contains 18 papers in the areas Molecular Dynamics in Aqueous Solution, Dielectric and Spectroscopic Properties of Membrane Systems, and of Nonequilibrium Systems, and Prototype Sensory Effects, based on a symposium held in Houston in March 1980.