

Book Reviews

Pulp and Paper, Chemistry and Chemical Technology. Third Edition. Volume 3. Edited by J. P. Casey. John Wiley & Sons, Inc., New York. 1981. xxxii + 564 p. \$55.00.

This is the third volume of a four-volume set intended as a general reference to the pulp and paper industry. This latest edition of the series is completely revised. Unlike previous editions, multiple authors are employed. This improves the breadth of expertise, but detracts somewhat from the continuity present in previous editions. This volume deals with two main subjects: paper additives (267 pages) and paper properties (257 pages). Individual chapters are well referenced, with cited literature current to about 1980. While some knowledge in chemistry and engineering is assumed, the text is suitable for anyone with a general science background. It should be of particular value to those needing a ready reference on paper properties and testing.

The section on paper additives covers both wet and dry strength additives, natural and synthetic. Applications in both the paper machine wet end and size press are considered. Other major topics include dyeing, filling and loading, and surface sizing. The section on properties of paper has an organizational value of being written by one author. Relevant strength properties are reviewed, together with appropriate test methods. Of interest are discussions on interpretation of test data. Optical properties are covered, including brightness, color, and opacity. Some theory is reviewed. Rather brief coverage is given to chemical and electrical properties.

The book appears to be a worthwhile addition to the rather limited number of technical books on the pulp and paper industry. The series will likely become a standard reference set.

Earl W. Malcolm, *The Institute of Paper Chemistry*

¹³C NMR Data for Organometallic Compounds. By Brian E. Mann and Brian F. Taylor (University of Sheffield, UK). Academic Press, New York and London. 1981. viii + 326 pp. \$32.50.

The latest edition of the "Organometallic Chemistry" series of monographs is a timely compendium of useful data for this increasingly utilized and important technique for the characterization of main-group and transition-metal organometallic compounds. A concise (36 pages) introduction describes experimental techniques for compounds with quadrupolar nuclei, theoretical and empirical methods of chemical shift and spin-spin coupling calculation for diamagnetic complexes, relaxation mechanisms of particular importance in the study of organometallics, and applications of chemical shifts, ¹³C-X coupling constants, and relaxation times in structural determination and in the study of fluxional molecules; as the authors note, ¹³C NMR spectroscopy has made its greatest impact in organometallic chemistry in the latter area.

The bulk of the book is a tabulation of chemical shift and coupling constant data, with literature references through 1979, for compounds organized by ligand type. The ligands surveyed are: alkyl, vinyl, acetylenyl, aryl, carbene, carbyne, acyl, carbonyl, thiocarbonyl, olefin, acetylene, allyl, diene, cyclopentadienyl and dienyl, arenes, trienes, and cycloheptatrienyl. Within each ligand class the complexes are arranged by metal, and the particular carbon atom is italicized. A small table at the end lists shifts for paramagnetic complexes. Some typographical errors were noted but are unavoidable in a work of this magnitude.

This book is intended as a reference source for readers who are familiar with the techniques employed in routine ¹³C NMR spectroscopy of organic compounds. It is a valuable guide because accurate chemical shift prediction for these complexes is not as well developed as for organic compounds.

Louis Messerle, *University of Michigan*

Nucleic Acids and Proteins. Edited by Shen Zhao-Wen. Copublished by Van Nostrand Reinhold, New York, and Science Press of the People's Republic of China. 1980. XIV + 622 pp. \$42.00.

This book records the proceedings of a symposium on nucleic acids and proteins organized jointly by the Chinese Academy of Sciences of the People's Republic of China and the Max-Planck Gesellschaft of the Federal Republic of Germany and held in Shanghai in October of 1979. It consists of 90 communications, including ribosomes structure, insulin structure-function relationships, the mechanisms controlling protein-protein and protein-nucleic acid interactions, and the molecular bases of collagen diseases. Other topics include molecular mechanisms of virus maturation, the chemical synthesis of ribonuclease A, drug resistance conferred by plasmids, the cloning of bacteriophage DNA fragments, enkephalin involvement in acupuncture analgesia, the chemical synthesis of nucleic acids, proteins, and peptides, and many more. The papers on

chemical synthesis deal with various aspects of methodology. The variety of topics contained in this book represents a valuable reference in the field of biochemistry and molecular biology and it would benefit research in the field.

Mohamed E. Nasr, *Starks, C.P., Inc.*

Organic Chemistry: An Introduction. By Jack E. Fernandez (University of South Florida). Prentice-Hall, Inc., Englewood Cliffs, N.J. 1981. xxii + 538 pp. \$19.95.

This text is a modern, concise approach to organic chemistry. It is a valuable book for the nonchemistry majors. The students are taught to reason in chemical terms and to apply this reasoning to organic and biological situations. There are, however, some serious errors, such as the statement that coal is an impure form of graphite.

B. Nasser, *University of Michigan, Ann Arbor*

The Gifted and Non-Gifted. By Samuel Strauss. Saturn Press, Skokie, IL. 1981. 192 pp. \$6.95.

In a period in which academic science is faced with increasing shortages both of graduate students and of competent faculty, information on the original source of the nation's scientists—the young—may be useful. This volume, based on 30 years of work by the author, argues that increasing the crop of scientists by cultivating highly gifted children is not adequate, in that the population of gifted children and the population of future scientists do not overlap very well. The author suggests, on the basis of extensive field study, that a significant reason for this discrepancy is that above-average intelligence coupled with drive and perseverance are more important than genius and creativity for scientific success.

George D. J. Phillies, *The University of Michigan*

Topics in Inorganic and Organometallic Stereochemistry. Volume 12. Topics in Stereochemistry. Edited by Gregory Geoffroy (Pennsylvania State University). E. L. Eliel and N. L. Allinger, Series Editors. John Wiley and Sons, Inc., New York. 1981. x + 352 pp. \$60.00.

In a series that has been generally dominated by organic aspects of stereochemistry, this book is the first volume to be devoted entirely to inorganic and organometallic species. This is a desirable development for, as the editors point out, there is much to be gained if both organic and inorganic chemists become more aware of relationships that can exist between the two fields in the area of stereochemistry. Professor Geoffroy has collected six chapters that not only should stimulate the inorganic reader but also should interest those who consider themselves organic chemists.

The first chapter, Stereochemical Nomenclature and Notation in Inorganic Chemistry by T. E. Sloan, describes the current system employed by Chemical Abstracts with specific attention to the use of the Cahn-Ingold-Prelog notation for ligand indexing. T. C. Flood reviews the Stereochemistry of Reactions of Transition Metal-Carbon Sigma Bonds and emphasizes mechanistic considerations whenever possible. Catalytic or stoichiometric processes are discussed: oxidative addition/reductive elimination, insertion, electrophilic cleavage, addition, and transmetalation. B. Bosnich and M. D. Fryzuk discuss Asymmetric Synthesis Mediated by Transition Metal Complexes, a field hitherto noted by its lack of rationality and systematization. The main achievements are surveyed and an attempt is made to give a mechanistic basis for the reactions. A review of the structures of almost 200 Metal Nitrosyls by R. D. Feltham and J. H. Enemark is particularly timely for this important class of complexes. Many examples of complexes ranging from [MNO]⁴ to [MNO]¹⁰ are now well characterized structurally, and this chapter provides a data base for understanding the chemical and physical properties of nitrosyls. M. Gielen surveys the Stereochemistry of Germanium and Tin Compounds. Optical stability and substitution reactions of four-coordinate Ge and Sn compounds are discussed, and intramolecular rearrangements of trigonal-bipyramidal and *cis*-octahedral bis-(β -diketonato)metal complexes are analyzed graphically. In a final chapter on the Stereochemistry of Transition Metal Carbonyl Clusters, B. F. G. Johnson and R. E. Benfield provide a lucid summary of current views. The limited ability of the 18-Electron and Skeletal Electron Pair Theories to account for the bonding in polyhedral metal clusters leads to discussion of a more generally successful approach. A recent semi-quantitative rationalization of the polyhedra adopted by the ligand envelopes of the metal clusters is also described.

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