

Book Reviews

Safety and Accident Prevention in Chemical Operations. Second Edition. Edited by Howard H. Fawcett and William S. Wood. John Wiley & Sons, Inc., New York. 1982. xiv + 910 pp. \$80.00.

The book is a collection of 37 chapters, each written by an expert in the respective field. The well-selected authors are practical men and women who work for the chemical industry or are active as consultants or academicians. An extremely wide range of safety-related information is presented. This includes the medical aspects of exposure to hazardous chemicals, the effects of government regulations, the role of insurance policies, and site selection. Other articles that are more of interest to the chemist are the disposal of hazardous wastes, the handling of flammable materials, the safety testing of materials, and the more traditional treatise of accident prevention in the laboratory and industrial plant. Additional chapters deal with the equipment and materials used in fire extinguishing. Fires, explosions, and other accidents are discussed and analyzed to add a realistic flavor.

As with any book of multiple authors, there is the danger of repetitive arguments; credit has to be given to the editors, who have kept this overlap to a minimum. The material is largely oriented toward the industrial chemist but is such an elaborate compilation of knowledge that many other disciplines can benefit. The book is a good source for ideas as well as an excellent supplier of information. A wealth of chemical and engineering data is presented in the form of tables. The articles are well illustrated with drawings and photographs, which include pictures of actual accidents. Each chapter concludes with a thorough list of references, often followed by a bibliography of suggested reading. Five appendices give additional data about carcinogens and list the names and addresses of numerous national organizations, labor unions, and federal agencies.

The book should be very useful to industrial chemists as well as those who intend to teach a course in industrial and laboratory safety.

Dietrich Schweiss, *Parke Davis & Co.*

Handbook of Applied Chemistry. Edited by Vollrath Hopp (Heochst AG) and Ingo Henning (Bayer AG). Hemisphere Publishing Corporation, New York. 1983. xi + 900 pp. \$42.50.

The subtitle of the book, "Facts for Engineers, Scientists, Technicians, and Technical Managers", describes well the audience that will find this handbook useful. The book is divided into four chapters as follows: (1) Fundamentals of general and inorganic chemistry; (2) Inorganic raw materials and large-scale products: Large-scale industrial processes; (3) Organic chemistry classification and nomenclature, and (4) Organic raw materials and large-scale products: Industrial processes. The aim of the book is to acquaint those engaged in the procurement of raw materials and sales and engineering with the chemistry and the safe handling and the applications of chemical intermediates. Earlier editions of this handbook had received wide demand by the chemical industry so that the present third edition has been published in English. The presentation of the material is in a simple and understandable form. Equations and illustrations are used widely and effectively. Chapters I and III cover the fundamentals of inorganic and organic chemistry. Chapters II and IV deal with industrial production processes, such as sulfur and the manufacture of sulfuric acid, inorganic pigments and fillers, synthetic fibers, etc. each chapter contains a set of simple self-evaluation questions. A good index is provided at the end of the handbook.

George A. Tsigdinos, *Michigan State University*

High-Performance Liquid Chromatography: Advances and Perspectives. Volume 3. Edited by Csaba Horvath (Yale University). Academic Press, New York. 1983. xiii + 230 pp. \$36.00.

This book is the third in an excellent series on aspects of modern liquid chromatography. There are four chapters, three of which deal with liquid chromatographic separations of nucleic acid fragments, proteins, and

peptides, predominantly by reversed-phase techniques. The fourth chapter is on mobile phase effects in liquid-solid chromatography. As with the other volumes, all chapters are written by recognized experts in the particular fields. The individual chapters are uniformly excellent, up to date, and written with a good blend of history, theory, and applications. With the heavy usage of liquid chromatography in bioanalysis and biomedical research, this book is particularly timely. It can be recommended without hesitation to those using (or contemplating using) liquid chromatography for these applications, or those using liquid-solid chromatography. Fundamental chromatographers will also want this book to keep the series intact. This series represents an excellent treatise on modern liquid chromatography, and Volume 4 is anxiously awaited.

John G. Dorsey, *University of Florida*

Molecular Quantum Mechanics. Second Edition. By P. W. Atkins. Oxford University Press, New York. 1983. \$45 cloth; \$27.95 paper. Solutions Manual \$14.95.

The second edition of "Molecular Quantum Mechanics" is much welcomed. Designed for undergraduate studies, the book is divided into Foundations 1 and 2, applications and advanced applications. Foundation 1 starts with the historical background, introduces the Schrödinger equation, and explains the translation, vibration, and rotation motions. Foundation 2 discusses the operators, the angular momentum, and the group theory and finishes with the techniques of approximation. The first set of applications is the one needed at the undergraduate level: atomic spectra, atomic structure, molecular structures, and molecular electronic transitions. In the more advanced application section, one can find the electric and magnetic properties of molecules.

As in the first edition, the book is successful in giving mathematical and qualitative explanations for the quantum-mechanical concepts. Numerous graphs and drawings illustrate in an efficient way the qualitative discussion. Many problems are found in the text. In a pedagogical approach, the solution starts with a description of the method to solve it before giving the detailed mathematical points. Some comments terminate each problem. This works very efficiently in the learning process. Additional problems are to be found at the end of each chapter. Clear detailed solutions are given in the solutions manual. It is clear that these two books will meet considerable success among students and professors.

O. Eisenstein, *The University of Michigan*

Chemical Ionization Mass Spectrometry. By Alex G. Harrison (University of Toronto). CRC Press, Inc., Boca Raton, FL. 1983. vi + 156 pp. \$56.00.

This is an excellent book on analytical applications of ion/molecule reactions, particularly for organic systems. It is a book which I can recommend strongly for analytical, organic, and physical chemists. It provides background on the fundamentals of gaseous ion chemistry necessary for understanding the formation of sample ions in chemical ionization mass spectrometry and the effects of changing reagent gases and experimental parameters on CI mass spectra. Thermochemistry and kinetics are clearly and coherently discussed and combined.

There is an extensive discussion of systematic studies of CI mass spectra of many classes of organic compounds. This discussion provides a good introduction to the use of CIMS for structure determination of organic compounds and also gives indications of areas where additional work in gaseous ion chemistry would be useful in interpreting CI mass spectra. The last chapter gives a brief indication of areas of current research in CIMS. The book will be valuable for those who are learning mass spectrometry, for those currently using CIMS as an analytical tool, and for those doing research in gaseous ion chemistry.

Burnaby Munson, *University of Delaware*