

Book Reviews

Progress in Inorganic Chemistry, Volume 47. Edited by Kenneth D. Karlin (Johns Hopkins University). Wiley and Sons: New York, 1998. v + 978 pp. \$145.00. ISBN 0-471-16357-0.

Volume 47 of *Progress in Inorganic Chemistry* continues the tradition of thorough, authoritative reviews on important current topics of inorganic chemistry. Its eight chapters deal with a diversity of topics. Terminal Chelate Complexes of the Transition Metals (Parkin) covers the recent literature on the group 16 (6A) ligands including oxygen. The emphasis is on recent literature and on Se and Te. Coordination Chemistry of Azacryptands (Nelson, McKee, and Morgan) covers ligands where the majority of potential donor atoms are nitrogens. It begins with synthesis and then discusses the properties of complexes in ascending order of complexity of the structure. Polyoxometallate Complexes in Organic Oxidation Chemistry (Neuman) is an interesting analysis of the recent literature with a particular view toward catalytic properties. Metal Phosphonate Chemistry (Clearfield) beautifully reviews the subject from a materials science point of view. The emphasis is on the layered structures based on Zr and V, but the compounds of the other transition metals are covered as well. Oxidation of Hydrazine in Aqueous Systems (Stanbury) covers the recent work in this area with a focus on the mechanistic roles of transition metal ions. Metal Ion Reconstituted Hybrid Hemoglobins (Venkatesh, Rifkind, and Manoharan) is a thorough review of the subject, particularly as the work bears on cooperativity. Three-Coordinate Complexes of "Hard" Ligands: Advances in Synthesis, Structure, and Reactivity covers complexes with negative ligands with an emphasis on the literature since 1977. Complexes of d^{10} ions are not dealt with. Metal-Carbohydrate Complexes in Solution (Verchère, Chapelle, Xin, and Crans) deals with recent work on the solution structure of these complexes.

This book is an essential component to any research library.

Edwin H. Abbott, *Montana State University*

JA9856295

10.1021/ja9856295

Ullman's Encyclopedia of Industrial Chemistry, 5th Completely Revised Edition. Edited by Barbara Elvers, Stephen Hawkins, and William Russey. VCH: New York, 1995. \$14100 (36 volume set). ISBN 3-527-20126-2.

The Ullmann encyclopedia has been greatly revised and expanded from previous editions. The latest version, the 5th edition initially published in 1985, is written in English, a departure from the traditional German. The format has been adjusted to segregate industrial chemistry fundamentals from topical coverage, and the size has been greatly expanded from the 1972 edition 25 volume count to the current 36 volumes. The editors have made the commitment to revise between three and 4 volumes per year, thus ensuring that the content remains relatively current. The coverage is similar to that of the *Kirk-Othmer Encyclopedia of Chemical Technology*. The contributors are primarily European with a limited number of contributors from Asia and the U.S. A strong industrial influence is maintained through the selection of contributors with broad industrial experience. The sections are well written and distilled down to contain only necessary information. Extensive reference lists are provided at the end of each section. Most of the sections can be easily understood by engineers and scientists who are not experts in the topic being reviewed. It provides an excellent resource for practicing industrial engineers and academic researchers.

The encyclopedia is a massive collection of information of interest to practicing chemical engineers and chemists. It is divided into two main areas, including a set of eight volumes covering various aspects of industrial chemistry fundamentals such as analytical methods, process control engineering, chemical engineering fundamentals, unit operations, reactor fundamentals and engineering, and environmental protection and safety.

The section on reaction engineering contains an excellent overview of both reaction fundamentals and reactor design. The fundamental section covers most of the important kinetic models used for homog-

enous and heterogenous catalysis. Extensive reference lists are provided which will lead the reader to more detailed discussions. The section on commercial reactor design provides one of the most detailed sets of figures of a commercial reactor available in the literature. The reactor description is provided along with a list of typical industrial applications.

The analytical methods section covers analytical procedures commonly used in research and process engineering activities. Methods are detailed in a clear manner which allows the nonanalytical chemist to clearly understand the potential areas of application.

The chemical engineering fundamentals, unit operations, and process control sections provide information typically found in chemical engineering textbooks. The emphasis is on the application of technology with a limited discussion of transport phenomena. The numerical methods section is well written and includes a discussion of available computer programs which can be used to solve typical chemical engineering problems.

The explosive growth in safety and environmental regulations has significantly impacted the responsibilities of the practicing engineer and scientist. The environmental and safety section spans two volumes and thoroughly addresses the major topics in the area. An extensive discussion of toxicology issues is presented including a detailed description of standard toxicological assessment protocols such as the Ames test. Industrial responsibilities are reviewed in light of the current regulatory environment throughout the two volumes. The environmental discussion is broken down by media, with separate sections on soil, water, and air. Analytical methods for determining contaminant levels are briefly discussed as are methods for cleanup and purification of contaminated media.

In addition to this treatment of fundamentals, a 28 volume set containing alphabetized overview discussions on a host of topics is included. The topics cover very diverse areas of chemical technology. A brief sample of the major topics covered includes oil refining, paper processing, textiles, flavors and fragrances, plastics, gas (synthetic) production, enzymes, detergents, chlorine, ceramics, coal, drugs, and dyes.

As the list indicates, this topical section contains both global information as well as specific details on compounds of industrial significance. As an example, the oil refining section provides a detailed description of refining unit operations. One shortfall of several of the "mature" technology sections is the lack of coverage of new technologies. Despite the level of maturity of these areas, new technologies are continually being introduced which produce significant cost reductions. These new technologies should be addressed.

In one of the more detailed efforts, the plastics section provides an exhaustive coverage of the topic ranging from basic materials science to process considerations. Additives are discussed in detail as well as a fairly detailed summary of processing and reaction fundamentals. A section on the latest advances in plastic recycling is also included.

Emerging and novel technologies are addressed globally in sections such as the biotechnology, microelectronics, and pharmacology sections with more detailed information provided in specific related sections such as the section on enzymes, semiconductors, and drugs.

Sections on specific products, chlorine, oxygen, hydrogen, etc., include detailed information on manufacturing costs, market and end use issues, along with detailed descriptions of industrial processes currently used in chemical production.

In summary, the encyclopedia is an excellent addition to a technical library. Its broad coverage provides the reader with an excellent source of up-to-date industrial chemistry information, and the reference citations provide an avenue to more detailed information.

R. Bruce Eldridge, *University of Texas at Austin*

JA9856203

10.1021/ja9856203