

alkyne cyclooligomerization, alkyne carbonylation, reactions in homogeneous aqueous systems, cyclic hydrocarbons from diazoalkanes, and propene conversion to acrolein and acrylonitrile). The sections on heterogenization and immobilization of homogeneous catalysts, including biphasic approaches, are noteworthy as excellent and up-to-date reviews. The Epilogue (25 pages) is one of the best summaries this author has seen on future trends and pioneering areas in homogeneous catalysis, and borrows from the conclusions and outlook summaries of other chapters.

Most chapter sections are really excellent reviews, and many include discussion of recent developments and future prospects. Some chapters are terse to the point that other literature sources are more useful, especially for students. Each section has more of an industrial or academic perspective, and most sections have extensive and thorough patent and literature references. Occasional English typos were noted in some sections but do not detract from the excellence of the volumes.

As the Foreword notes, homogeneous catalysis is a "significantly still growing and industrially vital domain of catalysis", so this two-volume set will be indispensable to industrial chemists, organic chemists with interests in the production of commodity and fine chemicals by organotransition metal-mediated homogeneous catalysis, and of course organometallic chemists for whom homogeneous catalysis has represented one of the most important and significant applications. The price will put it out of the reach of advanced students in courses on homogeneous catalysis (for which less comprehensive but more readable texts exist), but the books will be indispensable to faculty teaching these courses. The stress on the applied aspects is very useful for those academic researchers who wish to learn more about industrial approaches, perspectives, and research opportunities outside of what can be gleaned from the patent literature, and this constitutes perhaps the greatest contribution of this two-volume set.

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Progress in Inorganic Chemistry. Volume 46. Edited by Kenneth Karlin (Johns Hopkins University). Wiley: New York. 1997. v + 488 pp. \$125.00. ISBN 0-471-17992-2.

This volume of the long-running series contains four articles that should find interest among a broad range of chemists.

The first paper, Anion Binding and Recognition by Inorganic Based Receptors by Beer and Smith, deals with the issue of molecular recognition and should find the widest audience. Starting with a brief introduction to anionic recognition in biological and organic systems, the authors provide a thorough survey of inorganic hosts including neutral metal-containing Lewis acids and a variety of charged metal ion-containing complexes of macrocycles, calixarenes, and smaller ligand systems. Distinction is made between hosts that bind through orbital overlap interactions and those that bind primarily through electrostatic interactions. The 86-page paper is nicely illustrated and contains 262 references through 1996. There is a balanced presentation of the authors' own work and that of others.

The second, and briefest (44 pp), paper, Copper(I), Lithium, and Magnesium Thiolate Complexes: An Overview with Due Mention of

Selenolate and Telluroolate Analogues and Related Silver(I) and Gold(I) Species by Janssen, Grove, and van Koten, deals with the syntheses and structures of the title compounds. The first part of the article covers copper(I) thiolates while the second part presents lithium and magnesium thiolates. An extensive list of reported thiolates of Cu(I), Ag(I), and Au(I) is provided; however, only the structures of the copper compounds are discussed. This presentation is thorough and well-illustrated and comprises both monomeric and polynuclear complexes, including mixed-metal species. The list of structurally characterized Li and Mg compounds includes a few Se and Te analogues; however, once again only the thiolate structures are discussed. The paper is extensively referenced with 165 listings through 1996. One wonders whether the actual coverage justifies the rather long and cumbersome title.

The third paper, The Role of the Pyrazolate Ligand in Building Polynuclear Transition Metal Systems by La Monica and Ardizzoia, focuses on systems which have potential catalytic activity; however, the general theme of making extended frameworks of metal ions bridged by small ligands is of interest in a number of applications. Following an introduction to the pyrazolate ligand and its coordination modes, the authors survey the various types of complexes starting with homoleptic copper, silver, and gold pyrazolates which tend to have polymeric structures. Complexes containing a dimetal pyrazolate-bridged core and other ligands are organized by metal triad. Separate sections deal with "heterobridged" complexes in which the metal centers are linked by pyrazolate and non-pyrazolate bridges, complexes containing monodentate pyrazolates and dinucleating functionalized pyrazolates, and the catalytic activity of the bridged complexes. The authors have standardized the molecular graphics which facilitates viewing and interpreting the crystal structures. The discussion, with 217 references through 1997, integrates synthetic methods, spectral characterization, structures, and some reaction chemistry.

The final and longest (190 pp) article, Recent Trends in Metal Alkoxide Chemistry by Mehrotra and Singh, occupies half of this volume. A brief but useful historical introduction is followed by six main sections on synthetic procedures, properties and structures, compounds derived from unusual alcohols, oxoalkoxides, alkoxides as synthons for organometallic derivatives, and alkoxides as precursors to ceramic materials. The authors' stated goal is to offer an account of the field since 1985. The coverage is comprehensive with 590 references through 1996, though a few recently reviewed areas such as oxovanadium and -molybdenum alkoxide clusters are omitted. This paper will likely be the standard review for much of this chemistry for years to come.

A minor criticism is that in the large tables of crystal data provided, certain space group symbols are consistently misprinted, such as " $P2_{1/n}$ " instead of " $P2_1/n$." Also, the large number of crystal structure diagrams reproduced directly from the original literature vary widely in quality. Rather than a reflection on the authors, this serves as a testament to the lack of a consistent standard in the graphical presentation of X-ray structural results. Overall, this volume is an interesting and useful addition to the series.

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