

Zerovalent Compounds of Metals: by L. Malatesta and S. Cenini, Academic Press, New York/San Francisco/London, 1974, v + 241 pages, \$19.75.

This book's coverage is more limited than its title might suggest. Metal carbonyls, as such, and complexes containing only unsaturated hydrocarbons have been excluded, leaving complexes of tertiary phosphines and related ligands as the primary center of attention.

The book is divided into two distinct parts. Part 1, entitled, "The stabilization of low oxidation states of transition metals", is concerned with the nature of metal-ligand bonding in low oxidation state complexes. The authors discuss the controversy concerning the π -acceptor character of ligands in terms of the data available from a variety of studies (spectroscopic, theoretical, kinetic and thermodynamic) and show that few unambiguous conclusions can be drawn. Nevertheless, they have performed a positive service in organizing and presenting this data.

Part 2, "Complexes with trivalent P, As, and Sb derivatives", surveys the chemistry of such compounds. A total of 130 pages is devoted to nickel, palladium, and platinum, with tables summarizing known ML_n , ML_2 (alkene), and ML_2 (alkyne) complexes and their methods of synthesis. The reactions of ML_2Z ($Z = L$, acetylene, dioxygen, etc.) species also receive extensive discussion. On the other hand, complexes of other transition metals with Group V ligands are covered in 10 pages. Furthermore, a nine-page section on isocyanide complexes is included, seemingly as an afterthought.

The authors have provided much useful information, but access to their efforts is not easy. There is no author index and both the table of contents and the subject index are brief. Literature coverage is to the end of 1972, which necessarily means that some sections are already severely dated. The availability of this book should benefit those interested in the chemistry of phosphine complexes of the nickel triad metals. Unfortunately, it does not effectively fill a more general need.

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Advances in Inorganic Chemistry and Radiochemistry, Vol. 17, edited by H.J. Emeléus and A.G. Sharpe, Academic Press, New York/San Francisco/London, 1975, vii + 402 pages, \$ 35.00, £ 16.80.

The newest volume of this series contains seven reviews on inorganic topics. None of these reviews is devoted wholly to any area of organometallic chemistry, but some do cover aspects of metal-carbon bonded compounds.

"Inorganic Compounds Containing the Trifluoroacetate Group", by C.D. Garner and B. Hughes, deals with both main group and transition metal compounds. Trifluoroacetates merit being singled out this way in view of their exceptional reactivity, compared to other metal carboxylates. A few organometallic

compounds are discussed. Mercury(II), thallium(III) and lead(IV) trifluoroacetates receive special attention in view of their applications in synthesis.

The second chapter on "Homopolyatomic Cations of the Elements", by R.J. Gillespie (whose research has contributed so significantly to the development of this area) and J. Passmore will be fascinating reading, irrespective of the reader's area of specialization. It provides fine support to those who maintain that interesting and original research in main group inorganic chemistry is still possible.

The review on "Use of Radio-Frequency Plasma in Chemical Synthesis" by S.M.L. Hamblyn and B.G. Reuben which follows is interesting, but as the authors point out, the economics of such plasma applications still are unfavorable, and any real understanding of chemical processes in plasmas still is lacking.

F.H. Jardin's chapter on "Copper(I) Complexes" is mostly inorganic but also covers briefly copper(I) alkyls and aryls, their complexes and their reactions. There are, however, excellent reviews elsewhere which are devoted exclusively to the organometallic aspects of copper chemistry, so the main value of the present review lies in its inorganic content.

"Complexes of Open-Chain Tetradentate Ligands Containing Heavy Donor Atoms" by C.A. McAuliffe is a review so narrow in scope that it will have very limited appeal to the general reader. For the purpose of this review "heavy" is a relative term, since the "heavy atoms" covered include sulfur and phosphorus.

U. Mayer and V. Gutmann discuss "The Functional Approach to Ionization Phenomena in Solutions". In this chapter the authors outline their "electron pair donor/electron pair acceptor approach" to solute-solvent interactions, a functional approach which, it is claimed, "provides a qualitative interpretation of all ionization phenomena".

The final chapter, the longest one, by A.H. Norbury, is devoted to the "Coordination Chemistry of the Cyanate, Thiocyanate and Selenocyanate Ions". It appears to be an exhaustive treatment of the complexes of these ions whose chemistry is livened up by the fact that they are ambident ligands which can bond either via the nitrogen or the chalcogen atom. Structural aspects are stressed.

A subject index and tables of contents of the previous volumes of this series are provided.

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Advances in Catalysis, Vol. 24, edited by D.D. Eley, H. Pines, and P.B. Weisz, Academic Press, New York/San Francisco/London, 1975, xvi + 427 pages, \$38.50, £18.50.

This latest volume in the *Advances in Catalysis* series, in keeping with an editorial preface about catalysis and relevance, includes chapters on "The Economics of Catalytic Processes" (J. Dewing and D.S. Davies) and "Catalysis for Motor Vehicle Emissions" (J. Wei) (the former is very worthwhile reading