

summarized. However, I counted only 7 references to publications appearing in 1991 or later, 4 of those by Professor Nefedov and more up-to-date surveys of some of the topics covered are available.

The other chapters deal with: Acid-base behaviour in Macrocycles and other Concave Structures (U. Lüning); Photodimerization and Photopolymerization of Dimerization of diolefin crystals (M. Hasegawa); and ionic dissociation of Carbon-Carbon sigma Bonds in Hydrocarbons and the Formation of Authentic Hydrocarbon Salts (K. Okamoto, K. Takeuchi and T. Kitigawa). The last of these will be of indirect interest to some organometallic chemists in that some of it is concerned with carbonium stability. I was surprised to see how many salts in which both cation and anion are wholly hydrocarbon species, or hydrocarbons that readily undergo dissociation to such ion, are known.

The volumes in this series are well produced, and reasonably priced by today's standards.

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Applied homogeneous catalysis with organometallic compounds. Vols. 1 and 2. Edited by B. Cornils/W.A. Herrmann, VCH Weinheim, 1996, 1246 pages, DM 748.00, ISBN: 3-527-29286-1.

This two volume compendium seeks to provide a comprehensive handbook dealing with an important topic.

Volume 1 is entitled 'Applications' and that name really refers to 'applied homogeneous catalysis'. The use of the word 'applied' is intended to provide the flavour that the examples chosen are of industrial importance. Thus, successive chapters deal with: Carbon Monoxide and Synthesis Gas Chemistry (172pp) Hydrogenation (19pp) Reactions of Unsaturated Compounds (154pp) Oxidations (91pp) Reactions with Hydrogen Cyanide (Hydrocyanation) (22pp) Hydrosilylation and Related Reactions of Silicon Compounds (20pp) Reaction with Nitrogen Compounds: Hydroamination (14pp) Reactions of Hydrocarbons and Other Saturated Compounds (31pp) Asymmetric Syntheses (16pp)

Some of the above shorter sections are written by a single author or a collaborative pair. Thus H. Brunner deals with Hydrogenation; K. Huthmacher and S. Krill with Hydrocyanation; B. Marciniak with Hydrosilylation; R. Taube with Hydroamination; and R. Noyori and S. Hashiguchi with Asymmetric Syntheses. The other sections have a multiplicity of authors who are no less expert and come from both industrial and academic sectors.

There are 570 pages in Volume 1 and each chapter has an abundance of references.

Volume 2 is entitled 'Developments' with emphasis on recent progress in homogeneous catalysis. Successive chapters deal with:

Development of Methods (about 200 pp.)

Special Catalysts and Processes (about 230 pp.)

Special Products (about 170 pp.)

Finally there is a so-called epilogue in which the editors look forward to some future possible developments and requirements (25 pp.). There is a 47 page Index which covers both the Volumes.

The contributors to Volume 2 are equally distinguished as those in Volume 1 but are too numerous to be mentioned by name. However without exception they are among the most significant practitioners in this important area.

In conclusion these are immensely important books which fulfil a function which has hitherto lacked such powerful focus. They are strongly recommended.

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Advances in transition metal coordination chemistry. Vol. 1. Series Editor: Chi-Ming Che, Volume Co-Editor: Vivian W.W. Yam, Jai Press Inc., Hampton Hill, UK 1996, 293 pages, £69.50, ISBN: 1-55938-335-6.

This book is the first in a new series. The present volume deals with transition metal compounds having a metal-ligand multiple bond; each chapter focuses on an area of particular interest to the author. It is the Editors wish that in this as in some of the later volumes there should be a contribution from Chinese scientists.

For readers of this journal the most relevant chapter is the first, by A. Mayr and S. Ahn, which is concerned with the chemistry of carbyne-metal complexes and does so in 100 pages with 187 references taking the literature up to 1994. Some of the other chapters are equally up-to-date and in some cases even provide references to

the 1995 literature. The succeeding chapters are as follows:

“Formation of Metal-Ligand Multiple Bonds in Redox Reactions: The  $d^4-d^2$  Redox Couple in Tungsten- and Molybdenum-Chlorophosphine Complexes and Related Systems” James M. Mayer (48 pp; 98 refs).

“Electronic Structure of Metal-Oxo Complexes” Vincent M. Miskowski, Harry B. Gray and Michael D. Hopkins (28 pp., 33 refs.).

“Excited-State Proton Transfer Reactions of Multiply-Bonded Ligands” Wentian Liu and H. Holden Thorp (22 pp., 64 refs.).

“Electrochemistry of High-Valent Oxo Complexes of Ruthenium, Osmium, and Rhenium” Chi-Ming Che and Vivian W.W. Yam (22 pp., 72 refs.).

“Conducting Metallic Complexes” Xiao-Zeng You and Yong Zhang (48 pp., 180 refs.).

There is a Subject Index (5 pages).

The book is clearly produced; the expertise of the authors is beyond question and the series is one to be welcomed.

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Perspectives on Bioinorganic Chemistry, R.W. Hay, J.R. Dilworth, and K.B. Nolan eds., Volume 3, ISBN 1-55938-642-8, pp. 304 + xi, JAI Press London, 1996, £69.50, US\$109.50.

The demands upon the chemist wishing to understand biological systems become greater every year. Reviews and review volumes become ever more necessary, and the editors of this series are to be congratulated on producing something both up-to-date enough and sufficiently different to warrant attention. It will probably represent the forefront of research for a relatively short time, but it will be useful as a summary of knowledge for considerably longer.

Chapter 1 by D.C. Weatherburn describes the structure and function of manganese-containing bio-molecules. Manganese is a rather unpopular element amongst inorganic chemists and yet it appears to be the essential metal in a large number of proteins and enzymes. Relatively few have been structurally characterised. This review summarises information on many of the manganese-containing systems, and includes more than one thousand literature references. Chapter 2, by Junhun Suh, is entitled “Repertoires of metal ions as Lewis acid catalysts in organic reactions”. This is a useful review that does not present any great detail on specific

metallo-enzymes, and contains material under some headings such as “Catalysis by binuclear metal ions” that are at first sight somewhat obscure. However, teachers should find this a valuable summary.

Chapter 4, by A. Messerschmidt, describes the copper enzyme ascorbate oxidase, and discusses its structure and function in considerable detail. The last two Chapters review rapidly developing and very important areas. T. Kiss and E. Farkas discuss the bioinorganic chemistry of aluminium, but very much from a classical point of view. For example, they present a lot of stability constant data and review briefly the effects of aluminium on metabolism, but they do not discuss detailed bioinorganic chemistry at the atomic level. Finally, A.R. Butler, F.W. Flitney, and P. Rhodes provide a brief review of nitric oxide in animal physiology. This is currently very useful, but is likely to date quite rapidly, so fast is this field expanding.

In summary, this is a useful book to dip into, and as a first resource in the areas it presents. It contains little organometallic chemistry, but should be available in libraries where many people will find it of value.

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The Molecular Chemistry of the Transition Elements, by F. Mathey and A. Sevin, ISBN 0-471-95687-2 (paperback), pp. 232 + x, John Wiley and Sons, Chichester, 1996, £18.99.

This book is intended as an introductory text in transition-metal organometallic chemistry. The students that the authors teach have a strong background in physics and mathematics and hence the approach differs from some others by its reliance on qualitative descriptions using frontier orbitals. As an introductory text, it is not intended to be comprehensive.

I compared this volume to two other popular texts, those by Elschenbroich and Salzer, and by Crabtree. Certainly the former is almost bereft of the theoretical discussions that occur throughout this book, but in contrast it contains much factual material on both transition and non-transition elements. The Crabtree book begins rather similarly, discussing types of ligand and then presents various classes of reaction. The current volume begins with a long discussion on ligands, orbitals and reaction types, and then presents what are termed the main functional groups in organometallic