

Book reviews

Coordination Chemistry Reviews, Vol. 37; Ed. by C.D. Garner and K.R. Seddon, Elsevier Scientific Publishing Company, Amsterdam, 1981, 339 pages, Dfl. 223.00, approx. US\$89.20.

This is a companion volume (dedicated to J. Chatt) to that which formed Volume 35 of this series. The two together provide a survey of the coordination chemistry of the transition metals for 1979. The present volume deals with the following elements, and in brackets are shown the number of pages and references, respectively: Sc (6/30), Ti (24/159), Zr/Hf (17/105), V (13/56), Nb/Ta (11/53), Cr (21/118), Mo (32/226), W (7/67), Mn (22/289), Tc/Re (17/124), Ni (69/254), Zn/Cd (18/261), Hg (8/82). The authors are, for the most part, well-known (R.I. Crisp, R.C. Fay, C.D. Garner, M.N. Hughes, L.F. Larkworthy, F.E. Mabbs, D.A. Rice, K.R. Seddon and A.A.G. Tomlinson). As with the companion volume, organometallic chemistry is not specifically included, although compounds such as cyclopentadienylmetal alkoxides are described.

The combined work is obviously of considerable value to practitioners of transition metal chemistry and may be regarded as a successor to the Specialist Periodical Report on transition metals formerly published by the Royal Society of Chemistry. The typography is attractive and the venture is to be welcomed.

*School of Chemistry and Molecular Sciences,
University of Sussex,
Brighton BN1 9QJ (Great Britain)*

MICHAEL F. LAPPERT

Catalysis and Chemical Processes; ed. by R. Pearce and W.R. Patterson, Leonard Hill, London, 1981, xix + 348 pages, £25.

This is an interesting book to which eleven scientists contribute, only one of whom is an academic (J.M. Winterbottom, Chemical Engineering, Birmingham). The others are in industry, for the most part at I.C.I. (D.G. Bew, J.P. Candlin, C.R. Harrison, W.R. Patterson, R. Pearce, P.E. Starkey, D.J. Thompson, and M.V. Twigg), although there are also chapters by T. Edmonds (B.P.) and D.T. Thompson (Johnson Matthey).

The book is divided into three parts. The first (87 pages) is entitled "The Catalyst as Part of the Chemical Process" and deals with such topics as Catalysis (W.R. Patterson); "The Catalyst: Preparation, Properties, and Behaviour in Use" (M.V. Twigg); "Methods of Operating Catalytic Processes" (P.E. Starkey); "Economic Aspects of Catalytic Processes" (D.G. Bew). Part 2 (51 pages) deals with feed stocks for organic chemistry and comprises one chapter on "Oil-based Chemistry" (T. Edmonds) and the second on "Coal- and Natural Gas-Based Chemistry" (R. Pearce and M.V. Twigg). Part 3

(202 pages) is entitled "From Chemical Building Blocks to End Products" and comprises chapters on the following: "Managing Routes from Building Blocks to Final Products" (C.R. Harrison); "Carbon—Carbon Bond Formation. I: Carbonylation" (D.T. Thompson); "Carbon—Carbon Bond Formation. II: Oligomerisation, Isomerisation, Metathesis, and Hydrocyanation" (R. Pearce); "Carbon—Carbon Bond Formation. III: Polymerisation" (J.P. Candlin); "Selective Hydrocarbon Oxidation" (W.R. Patterson); "Catalytic Hydrogenation and Dehydrogenation" (J.M. Winterbottom); "Speciality Chemicals" (D.J. Thompson); and "Enzymic Catalysis" (D.J. Thompson).

The publishers make the following claim on the fly-leaf "The great value of this book is its broad approach to the subject of catalysis, and its treatment of the real problems and circumstances encountered in industrial processes." In the opinion of the reviewer this claim is generally valid, in that organometallic chemists, and in particular those in academic research, will find interesting new insights and discussions of themes which are not solely concerned with science. However, the editors are perhaps unfortunate in that two other monographs have recently appeared which deal with admittedly the more limited area of homogeneous catalysis and which although not particularly detailed appear to be more scholarly: "Homogeneous Catalysis", by G.W. Parshall, John Wiley & Sons and "Homogeneous Transition-metal Catalysis", by C. Masters, Chapman and Hall; and one other encyclopaedic text, also from industrial chemists, deals with the problem of CO-based chemistry at much greater depth (ed. J. Falbe, "New Syntheses with Carbon Monoxide", Springer-Verlag).

The book under review would have been significantly more useful if a rather larger number of references had been given. In that context, it is curious that a standard format has not been adopted; thus in some cases the year for the journal appears first, in others last. The quality of the material is also a little variable. For example, I find Chapter 1 unnecessarily elementary. There is a good deal of repetition, e.g., developments in the manufacture of acetic acid are discussed on pages 83 and 84 as well as on page 188, although the details are not identical.

A number of errors have been noted, which may be minor, as in some of the references, or are such that the reader might lose confidence in a particular author. For example, on page 75 hydroformylation is attributed to the rather strange triumvirate of "Union Carbide-Davey-John Matthey" (at any rate the first of these is correctly identified!). On the same page also, we find the statement "A further disadvantage of many homogeneous systems is that corrosive solvents are used to maintain the catalyst in solution." On this very page the processes mentioned prominently include the Monsanto acetic acid manufacture and the "Oxo" process. This is curious since the solvents in both these (as practised commercially) are the reactants and products.

There is much that is useful in this book, although its general level is rather that of *Chemical and Engineering News* or *Scientific American*, rather than say *J. Organometal. Chem.*, and I am pleased to have it on my shelves. In sum-

mary, then, I welcome a brave, but not completely successful, attempt to meet a formidable challenge.

*School of Chemistry and Molecular Sciences,
University of Sussex,
Brighton BN1 9QJ (Great Britain)*

MICHAEL F. LAPPERT

Advances in Organometallic Chemistry, Volume 19; edited by F.G.A. Stone and R. West, Academic Press, New York, 1981, ix + 318 pages, \$54.50

The latest in this well-known series contains the following contributions (the figures in brackets refer to the number of pages and references, respectively): Chemistry of Titanocene and Zirconocene, by G.P. Pez and J.N. Armor (44/145); Photochemistry of Organopolysilanes, by M. Ishikawa and M. Kumada (42/107); Alkali Metal—Transition Metal π -Complexes, by K. Jonas (23/62); Organic Compounds of Divalent Tin and Lead, by J.W. Connolly and C. Hoff (27/109); Novel Types of Metal—Metal Bonded Complexes Containing Allyl and Cyclopentadienyl Bridging Ligands, by H. Werner (25/52); Phase-Transfer Catalysis in Organometallic Chemistry, by H. Alper (26/78); Redistribution Reactions on Silicon Catalyzed by Transition Metal Complexes, by M.D. Curtis and P.S. Epstein (39/91); The Application of ^{13}C NMR Spectroscopy to Organo-Transition Metal Complexes, by P.W. Jolly and R. Mynott (45/95). This is followed by a short subject index (8 pages).

It will be noticed that in general these chapters are written by well-known authors. Indeed, in the case of chapters 2, 3, 5 and 6, to a large extent these are reviews of work carried out in the authors' laboratories. As for chapter 8, the examples which the authors choose to discuss in detail are selected from the compounds prepared at Mülheim by the Wilke group. Chapters 1 and 7 also contain significant contributions from their authors. The title of chapter 1 is somewhat misleading; the scope of this contribution is wider and deals with the chemistry of the metallocenes of Ti and Zr in oxidation states +2 and +3.

All of these reviews are very welcome and timely, and maintain the high standard set by preceding volumes in the series.

*School of Chemistry and Molecular Sciences,
University of Sussex,
Brighton BN1 9QJ (Great Britain)*

MICHAEL F. LAPPERT