

Pd or Cu; $n = 3$, $M = \text{Cr, Co or Fe}$) and $[\text{Cr}_2(\text{O}_2\text{CMe})_4(\text{OH}_2)_2]$, sulfur-nitrogen compounds ($[\text{S}_3\text{N}_2\text{Cl}]\text{Cl}$ and $\text{PhN}=\text{S}=\text{O}$), metal-induced and metal-catalyzed organic synthesis, active metals (including Mg, Pd, Fe, Ni and Co), and solid state preparations (e.g. TiO , ZnCr_2O_4 , $[\text{Mo}_6\text{Cl}_8]\text{Cl}_4$, FeI_2 , Ga_2S_3 and KAg_4I_5). The concluding four chapters (in a total of 28 pages) deal with the principles of work under inert gases, solvent recycling, analytical methods and the economics of synthetic procedures.

It must be noted, at this point, that this is not a good book for undergraduates. Although the authors are to be congratulated for their concern with safety, and many of the practical procedures are very clearly described, they have included many poor pedagogical examples. It is unforgivable to describe aluminium(III) bromide as AlBr_3 , molybdenum(V) chloride as MoCl_5 , and hexaaquanickel(II) chloride as $\text{NiCl}_2(\text{H}_2\text{O})_6$! There is no mention of the metal-metal bonding in $[\text{Cr}_2(\text{O}_2\text{CMe})_4(\text{OH}_2)_2]$ (surely the only reason for including it?), and the reported characterization data are sparse and inconsistent (^1H NMR and MS data are only rarely cited). In a number of cases, preparations which are already extremely well described in *Inorganic Syntheses* are reproduced here in briefer (and less helpful) forms. The selection of examples is obscure (do undergraduates really need to prepare organozirconium compounds?) and the order of presentation of some of the material is ludicrous. For a teaching book, there is little logic to be found in the selection and grouping of material (just what principles are being demonstrated?).

In summary, despite being cheap, good value for money, and well produced, the book gives the overall impression of being a random collection of syntheses from a series of laboratory courses. Although it may well make a useful laboratory manual for the University of Jena, its appeal to other German universities must be very limited, and to American and English universities it has nothing to offer at all. We regret that we cannot recommend this volume to either libraries or teaching laboratories, and this is indeed a matter of regret. A book of this nature (particularly with the great emphasis placed upon safety) is needed, but this is not the book. On a scale of one to ten, this is Elsa Lanchester not Bo Derek.

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Houben-Weyl Methoden der Organischen Chemie, Organo- π -metall-Verbindungen als Hilfsmittel in der Organischen Chemie, 4th edition, Volume E18, parts 1 and 2; edited by J. Falbe, Georg Thieme Verlag, 1986, xxvii + 1428 pages, DM 1580, subscription price DM 1422.

The Houben-Weyl Series has as its purpose to detail the chemistry (synthesis and reactions) of various classes of compounds. It complements the Gmelin inorganic and Beilstein organic series, which are more concerned with comprehensive lists of compounds and their properties. This present volume deals with π -complexes of metals with particular reference to their uses in synthetic organic chemistry.

The first section begins with a systematic account of the preparation of π -bonded

organometallic complexes, organised with respect to the number of carbon atoms which are associated with the metal. The stoichiometric reactions of such complexes are next considered with particular reference to substitution, addition and ligand replacement. A recurrent theme of this section is the difference in reactivity between the free and bound ligands. Under the heading of reactions catalysed by π -complexes there are excellent accounts of hydrogenation including enantioselective reactions, the Fischer-Tropsch Synthesis and a range of hydrometallations and dimetallations.

Section two of this volume continues the discussion of catalytic reactions with critical accounts of hydroboration, carbometallation and a range of other additions to carbon-carbon multiple bonds. Oxidation, reductive substitution, isomerisations and rearrangements and alkene and alkyne metathesis are also considered in detail.

The organisation of this volume is a tribute to Dr. Jurgen Falbe and his collaborators. The contents tables are very detailed, obviating the need for a subject index. There is a complete author index as well as a useful index of compounds. The book is well illustrated, with many valuable tables, increasing its accessibility to the user who does not read German well. It is, however, surely an appropriate time to consider producing these volumes in English. Both Gmelin and Beilstein are now published in English and at least 450 pages of this current volume (by Professor P. Pauson) must originally have been written in English. There is an excellent bibliography of review articles and monographs for each section, running well into 1985. A glance through the first four pages or so of these revealed six published in German, five in Russian with subsequent English translation and one hundred and nine in English. Many useful references, again running into 1985, are also given in each section.

Like the other volumes in this series this work is attractively presented and meticulously accurate. The price of the series is now so high as to deter all but the most affluent libraries from purchasing it, but this volume should be accessible and will be invaluable to any organic or organometallic chemist.

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Metal Clusters; edited by Martin Moskovits, Wiley-Interscience, New York and Toronto, 1986, ix + 313 pages, £47.95, ISBN 0-471-89388-9.

Cluster science has made considerable progress over the past decade, as the editor of this interesting book, Martin Moskovits, and many of his chapter authors remind us. The subject has attracted the attention of chemists and physicists, experimentalists and theoreticians, synthetic chemists and spectroscopists, rather aptly providing the focal point around which scientists from a wide range of disciplines nucleate. We are now beginning to understand how to make and examine molecular clusters and to unravel the intricacies of their structures, to appreciate their relevance to what happens at surfaces, and to get some feeling for the subtle differences between naked metal clusters containing but a few atoms, studied in