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Book reviews

Stereochemistry of Organometallic and Inorganic Compounds, Volume 3: Chemical Bonds—Better Ways to Make Them and Break Them; edited by Ivan Bernal, Elsevier, Amsterdam, 1990, ix + 468 pages, Dfl. 300.00. ISBN 0-444-88082-8.

This volume is a collection of five rather disparate chapters, with the ostensible unifying theme of stereochemical efficiency. In the preface the editor apologises for the slightly tardy arrival of the volume, which was originally scheduled for 1988; this means that the references in most of the chapters run only to 1987, with a few from 1988.

The first section, from P. Braunstein and J. Rose, discusses heterometallic clusters in catalysis. It has frequently been observed that such systems display a synergistic effect, with the mixed cluster giving better results than related homometallic clusters. There are several extremely useful tables of data, and the problems of cluster integrity during catalysis are carefully addressed. In the second section, by Brent K. Blackburn, Stephen G. Davies and Mark Whittaker, conformational analysis of ligands bound to the chiral auxiliary $[(C_5H_5)Fe(CO)(PPh_3)]$ is described. This is a detailed and careful account, amply illustrated with clear diagrams, and is essential reading for anyone planning to make use of this reagent.

Steric and electronic effects on the photochemical reactions of metal–metal bonded carbonyls are reviewed by D.J. Stufkens. The primary photoprocesses are similar in homo- and heterobinuclear complexes, being dominated by metal–metal bond cleavage and CO loss. Domenico Osella and P.R. Raithby discuss stereochemical aspects of organometallic clusters from the point of view of the polyhedral skeletal electron pair theory. The account is almost exclusively of the preparation, structures and reactivity of alkyne-substituted clusters. The final chapter, by Yoshinori Yamamoto and Nobuki Sasaki details the stereochemistry of the Sakurai reaction, the allylation of a wide range of carbonyl compounds by allyltrimethylsilane in the presence of $TiCl_4$. Since the original discovery of the reaction, its scope has been extended to include a wider range of electrophiles. The stereochemical aspects are discussed in terms of simple diastereoselectivity and diastereofacial selectivity, and the regiochemistry of reactions with enones is also considered.

The volume has been produced from the authors' own camera ready manuscripts; these vary somewhat in aesthetic qualities, but all are clear and legible, with good quality diagrams. They are well referenced, and there is a good index for each chapter.

All the individual chapters in this volume are of good quality, and well worth reading. Their diverse character, however, makes it unlikely that individual readers will be specifically interested in more than one or two of them, which will probably restrict sales to library purchases.

In the USA and Canada the volume is available from Elsevier Science Publishing Co. Inc., P.O. Box 882, Madison Square Station, New York, NY 10159; in the rest

of the world from Elsevier Science Publishers BV, P.O. Box 211, 1000 AE Amsterdam, The Netherlands.

*School of Chemistry and Molecular Sciences
University of Sussex, Falmer, Brighton (UK)*

Penny A. Chaloner

Gmelin Handbook of Inorganic Chemistry, 8th Edition, Ge—Organogermanium Compounds, Part 3, Springer-Verlag, Berlin, 1990, xv + 518 pages, DM2266.00. ISBN 3-540-93595-9 and 0-387-93595-9.

This third instalment in the comprehensive survey of organogermanium compounds (written by F. Glockling with contributions from J. Satgé and U. Krüerke) mainly continues the coverage of compounds containing four organic groups attached to germanium through carbon. Thus the first 233 pages are concerned with compounds of the types $\text{GeR}_3\text{R}'$, $\text{GeR}_2\text{R}'_2$, $\text{GeR}_2\text{R}'\text{R}''$, and $\text{GeRR}'\text{R}''\text{R}'''$, where R is an alkyl or aryl group and R' etc. an alkyl, substituted alkyl, alkenyl, alkynyl, aryl or heterocyclic group. The next 115 pages deal with compounds in which the germanium is attached to four carbon atoms within a cyclic system (including spiro compounds). Subsequent, fairly brief, sections are concerned with carbon-centred radicals and radical ions derived from GeR_4 compounds, and with compounds containing low coordinate germanium centres, namely germenes, germanium-centred radicals $\text{GeR}_3\cdot$, germylenes GeR_2 and GeRR' , germanocenes, and certain ionic compounds (e.g. $\text{K}[\text{Ge}(\text{CF}_3)_3]$ and $[\text{Ge}(\text{C}_5\text{Me}_5)][\text{BF}_4]$). Almost all the information is presented, clearly and efficiently, in tables. There is the usual empirical formula index, which in this case extends to 130 pages, and from which it can be estimated that about 1650 species are covered in the volume. There is also a very useful ligand-formula index, which allows location of all the compounds containing a particular ligand. The literature has been searched completely up to the end of 1987, and there are some references up to mid-1989.

This is an outstanding volume even in the always excellent Gmelin series, and anyone active in the field of organogermanium chemistry who does not have it readily available will be at a considerable disadvantage.

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

Colin Eaborn

Inorganic Reactions and Methods, Vol. 3. The Formation of Bonds to Halogens (Part 1); edited by A.P. Hagen, VCH, New York, 1989, xxxii + 710 pages, £110.00, DM385. ISBN 0-89573-253-X.

It is stated rather ambitiously in this volume that the series of which it forms a part, initiated by the late Professor J.J. Zuckerman, "describes all of inorganic chemistry". The issue under review outlines the methods of forming bonds between halogens and the elements of Groups VIB (16), VB (15), and IVB (14). (The chapter on VIB elements is wrongly titled in the main text and contents list as dealing with bonds to Group VB elements.) Since the various sections are contributed by a