

pentacarbonyl acetates) or routes to compounds with metals in unusual oxidation states (for example, $K_2[MnF_3(SO_4)]$). The final chapter on ligands and some main group compounds gives a general route to the *N*-(trimethylsilyl)alkanamines, important reagents for organoimido complexes and some representatives of the important class of functionalised tertiary aryl phosphines. In addition routes to a series of iodine and bromine polysulphur hexafluoroarsenate and antimonate(V) species are detailed and a clever high yield synthesis of BMe_3 completes the section. As with other volumes of *Inorganic Synthesis* each procedure or set of procedures is prefaced by a short informative introduction incorporating some key references to the topic.

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Advances in silicon chemistry. Vol. 1, G.L. Larson (Ed.), JAI Press, Greenwich (CT), 1991, xii + 387 pages, £54.00. ISBN 1-55938-176-0.

There has been a substantial number of monographs devoted to aspects of organosilicon chemistry in recent years but this one is of outstanding quality. It is the first in what is intended to be a continuing series on advances in silicon chemistry, and wisely the editor chose to focus it on aspects of the rapid development of organosilicon compounds in organic synthesis.

The first review (64 pages, 265 references), by G.A. Olah, G.K. Prakash and R. Krishnamurti deals with iodotrimethylsilane. It is a well-balanced account, dealing briefly with the preparation or *in situ* generation of the iodide and then outlining its synthetically useful reactions with various types of organic compounds. (I am puzzled, however, by the unusual chronology implied by the first two sentences on the preparation of the iodide, *viz*: "The first preparation of iodotrimethylsilane was reported by Voronkov and Khudobin in 1956 by the reaction of hexamethyldisiloxane with aluminium iodide. Pray et al. obtained iodotrimethylsilane in 1948 by the iodolysis of phenyltrimethylsilane.")

The second chapter, entitled 'The Chemistry of Cyanotrimethylsilane (123 pages, 727 references), by J.K. Rasmussen, S.M. Heilmann, and L.R. Krepki, is a model of its kind, and could hardly be bettered. A very good concise introduction (10 pages) on the preparation and properties of organocyanosilanes in general is followed by a well-organized account of reactions of Me_3SiCN with organic compounds.

The third chapter, on trialkylsilyl perfluoroalkanesulfonates (58 pages, 226 references), by G. Simchen, is in two parts, one dealing with their use as silylating agents and the other with their application as Lewis and catalysts in organic synthesis. Again the account is reasonably comprehensive and well-presented, but some of the print and formulae are so small that older readers will need their best spectacles!

The next chapter, on trimethylsilyldiazomethane (60 pages, 143 references), by R. Anderson and S.B. Anderson, is less comprehensive than the preceding ones, but presents a useful outline of the main applications of this very valuable

substitute for diazomethane. Three pages are devoted to its reactions with some transition metal complexes.

The final chapter (60 pages, 143 references), by J.Y. Corey, deals with dehydrogenative coupling reactions of hydrosilanes. It is concerned with reactions catalysed by transition metal complexes that result in replacement of H on silicon by other ligands, such as formation from R_3SiH of species of the types R_3SiX , where X is, for example, D, SiR_3 , $CH=CHR'$, OR' , SR' , NR_2' , or a transition metal also bearing other ligands. It is an effective account of a type of reaction that is likely to find increasing application in the next few years.

I could not read this book without feeling annoyed that I carried out almost all the early work on Me_3SiI (the preparation of which from phenyltrimethylsilane and iodine I improved by use of a little AlI_3 as catalyst) and Me_3SiCN (which I was the first to prepare) in 1948–1950 without realizing that they might undergo interesting reactions with organic compounds. (I found Me_3SiI particularly troublesome because it cleaved the ethereal solvents I was using!) If I had shown more foresight then the widespread application of organosilicon reagents might have come some 20 years earlier than it did!

This book will be much consulted, and should be available in every laboratory concerned with organic synthesis as well as in those engaged in organosilicon chemistry. It represents excellent value for money, and it is greatly to be hoped that the future volumes in the series will be of comparable quality.

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Heteroatom chemistry, E. Block (Ed.), VCH, Weinheim, 1990, xi + 376 pages. DM178.00. ISBN 0-89573-743-4.

This book contains the texts of 20 of the invited lectures given at the Second International Conference on Heteroatom Chemistry held in Albany, New York, in July 1989. The hetero-elements involved in these particular lectures are Cu, Ag, Hg, B, Si, Ge, Sn, Pb, As, Bi, O, S, and Se, with emphasis on sulfur.

I am doubtful that heteroatom chemistry is an appropriate subject for an international conference or for a book based upon such a conference, since the topic is so broad that it could cover all chemistry except that of hydrocarbons. There is no coherence between the various articles except for those on sulfur chemistry. The volume is dominated by Main Group elements, but there seems no reason in terms of the title why transition metals should not also have been included. (However, the stated scope of the journal entitled 'Heteroatom Chemistry' published by the same publishers is restricted to some Main Group elements, interpreted as including Cu, Ag, and Au.)

There is, of course, much material of interest in the book: how could there not be when the authors include, e.g., W. Ando, D.H.R. Barton, A.G. Brook, H.G. Kuivila, M.F. Lappert, and H. Sakurai? Because of this many organometallic chemists will find something of interest in it. I particularly enjoyed reading a clear and stimulating review of some theoretical aspects of organosilicon chemistry by Y. Apeloig. But most, if not all, of the new chemistry will in the meantime have been