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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.

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Inorganic Reactions and Methods, Vol. 3. The Formation of Bonds to Halogens (Part I); 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

sizeable number of authors there is inevitably some unevenness in standard and treatment, but in general the accounts simply list reactions without any attempt to indicate their relative importance or their value in actual synthesis. Nevertheless for someone coming new to the chemistry of a particular element and wanting to set about making bonds between that element and a halogen the information presented would provide an introduction to the topic and a useful list of leading references.

Of the 710 pages in this book, 60 are taken up by an author index and no less than 194 by a very inefficiently presented formula index. I question whether either of these indices has more than minimal value, since the great majority of readers will be looking not for information on the work of particular authors or on a particular compound, but rather on general methods, and these they will find readily from the contents list. The 34 page subject index on the other hand is of value, because it enables the reader to look up the reactions of typical compounds, whereas the overall organization is based on types of products.

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Gmelin Handbook of Inorganic Chemistry, 8th Edition, Fe — Organoiron Compounds, Part A9: Ferrocene 9; Springer-Verlag, Berlin, 1989, xiv + 384 pages, DM1,742.00. ISBN 3-540-93590-8.

It is three years since Part A8 of this series of volumes, dealing with the chemistry of ferrocene and its derivatives, appeared. Part A7 (1980) initiated a detailed survey of the mononuclear disubstituted ferrocene derivatives $[\text{FeC}_{10}\text{H}_8\text{R}^1\text{R}^2]$, in which either (or both) R^1 and R^2 are organic functionalities containing oxygen, and described derivatives of alcohols and phenols (their esters, ethers, and ketones) and aldehydes. Part A8 continued this coverage with the ketone and carboxylic acid derivatives (including their salts, esters and acid chlorides), as well as heterocyclic derivatives with oxygen as the heteroatom. The current volume under review continues the coverage of mononuclear disubstituted ferrocene derivatives $[\text{FeC}_{10}\text{H}_8\text{R}^1\text{R}^2]$, in which either (or both) R^1 and R^2 are organic functionalities containing nitrogen, sulfur, selenium, boron or silicon.

Not surprisingly, the bulk of this volume is concerned with *N*-containing substituents, including 1,1'-, 1,2- and 1,3- substituted derivatives of amines (75 pages), amides (25 pages), isocyanate, $-\text{N}=\text{CR}'\text{R}''$ and $-\text{CR}=\text{NR}'$ derivatives (7 pages), cyanides (37 pages), functionalities containing *N-N* and *N=N* linkages (including hydrazines, hydrazides, hydrazones, semicarbazones, azo compounds and azides) (10 pages), nitro compounds and oxime derivatives (19 pages), and derivatives of *N*-heterocycles (29 pages).

The following section (74 pages) deals with sulfur-containing substituents, including mercaptans, sulfonium salts, thiocarbonic acids and esters, thiocyanates, sulfones, sulfonic acids, sulfinic acids, and derivatives of *S*-heterocycles. The volume continues with much smaller sections describing derivatives of selenium-containing substituents (5 pages), boron-containing substituents (16 pages), and a longer section on silyl substituents (50 pages). The final 43 pages of the book contain a detailed formula index of the compounds described within the volume.