

Gmelin Handbook of Inorganic Chemistry. 8th edit. *Ge. Organogermanium Compounds. Part 1*. Springer-Verlag, Berlin, etc. 1988, xv + 232 pages. DM 1053, ISBN 3-540-93568-1.

This is the first volume in a Gmelin series on organogermanium compounds, i.e. compounds containing at least one Ge–C bond. The series is being coordinated by Professor J. Satgé, which should ensure its quality, and the excellent choice of the author for this opening volume is Professor F. Glockling, who has himself contributed extensively to the development of organogermanium chemistry.

Although tetraethylgermane was first described by Winkler, as long ago as 1887, the year after he discovered germanium, the subsequent development of organogermanium chemistry was very slow. Much less research has been carried out on organogermanium compounds than on related derivatives of silicon and tin, no doubt because of the relatively high cost of germanium and the absence of any direct industrial application of organogermanium species. However, according to the Preface of this volume, about 1500 publications on organogermanium chemistry had appeared up to 1983, and the pace has undoubtedly increased since then. Much of the work in the period 1945 to about 1970 followed the pattern of that defined by the very much more extensive investigations of organosilicon compounds, and to some extent was disappointing in the sense that few substantial differences between organogermanium and organosilicon chemistry were revealed. In more recent years, however, such differences have emerged and the subject has become more lively and challenging.

The volume mainly deals with mononuclear organogermanium compounds of the types GeR_4 and GeMe_3R , where R is an alkyl, cycloalkyl, substituted alkyl (e.g. CF_3 , CH_2Ph , $\text{CH}_2\text{CO}_2\text{Me}$), alkenyl, alkynyl, aryl, or heterocyclic group. (There is also, however, a valuable 20 page list of textbooks monographs and reviews dealing exclusively or partly with organogermanium chemistry.) The accounts are clearly, concisely, and authoritatively written, and it is very easy to find from them the information one seeks. Literature coverage is complete up to the end of 1985. There are the usual empirical formula and ligand formula indexes.

This is an excellent start to the new series, which promises to be an important addition to the literature of organometallic chemistry.

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Purification of Laboratory Chemicals; by D.D. Perrin and W.L.F. Armarego. 3rd edition. Pergamon, Oxford etc., 1988, xii + 391 pages. Hardcover: £40.00; \$75.00. Softcover: £20.00; \$37.50 ISBN 0-08-034715-0 (Hardcover); 0-08-034714-2 (Flexi-cover).

It is eight years since the second edition of this much used reference work appeared, and this updated edition is timely. All five chapters included in earlier editions have been expanded, and a new one (14 pages long), on purification of biochemicals and related products, has been added.

Chapter 1, on common physical techniques used in purification, has been lengthened by inclusion of recent developments by recognition of the increasing use

of some old techniques, such as Schlenk-type manipulation. Chapter 2, on chemical methods used in purification, has likewise been slightly enlarged to take account of advances. The heart of the book remains, of course, Chapters 3 and 4, in which individual organic and inorganic (including a few organometallic) substances, respectively, are dealt with in alphabetical order; there are ca. 4000 entries in Chapter 3, and ca. 750 in Chapter 4. Some small changes have been made to Chapter 5, which deals with general methods for the purification of classes of organic compounds. Not surprisingly, there is an increased emphasis on safety aspects.

The authors perform a valuable service to the chemical community in producing this guide. It is understandable that they cannot be up to date with every entry, but I was a little surprised to find that they seem not to have drawn on the systematic studies on solvent drying methods carried out by Burfield and his co-workers in recent years. Thus the comparison of various drying agents for amines by Burfield, Smithers, and Tan (*J. Org. Chem.*, 46 (1981) 629), is not mentioned under pyridine or triethylamine, and type 3A is not included in the list given in the book of currently available molecular sieves, even though it has been shown (in bead not powder form) to be much better for methanol than the 4A sieve stated in the book to be suitable for this solvent, and (as powder not beads) to be "the dessicant *par excellence* for ethanol" (D.R. Burfield and R.H. Smithers, *J. Org. Chem.*, 48 (1983) 2420). Type 3A is also better than 4A for acetonitrile (D.R. Burfield, *J. Org. Chem.*, 49 (1984) 3854.)

There is probably no need to recommend this new edition, since the many chemists who have used the second edition will rightly insist on having it available. The price of the soft-cover version makes it realistic to have copies at hand in individual laboratories to supplement the hard-cover copies in the libraries.

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