

BOOK REVIEWS

Organometallic Compounds of The Group IV Elements. Vol. I. The Bond to Carbon; edited by Alan G. MacDiarmid, Decker, New York, 1968. Part 1, xvi + 603 pages, \$36.50. Part 2, xiii + 263 pages \$22.

Volume I of this most welcome series is in two parts. Part 1, has chapters by E. A. V. Ebsworth on "Physical Bases of the Chemistry of the Group IV Elements", and by C. Eaborn and R. W. Bott on "The Synthesis and Reactions of the Silicon-Carbon Bonds".

The chapters in Part 2, are by F. Glockling and K. A. Hooton on "Synthesis and Properties of the Germanium-Carbon Bond"; by J. G. A. Luitjen and G. J. M. van der Kerk on "Synthesis and Properties of the Tin-Carbon Bond"; and by L. C. Willemsens and G. J. M. van der Kerk on "Synthesis and Properties of the Lead-Carbon Bond".

One hears much to-day of the growth of organometallic chemistry in expressions such as: "extraordinary development", "phenomenal growth", "dramatic breakthrough", etc. Perhaps insufficient attention or acclaim is given to editors and authors of books, reviews and chapters. When these writings are done on a level of high quality, they can be profound sources of stimulation to contributions by laboratory workers.

Whatever be the propelling motives, chemists are grateful for the significant help provided. The plan of Dr. MacDiarmid underlying this series is excellent, and the authors are to be congratulated for their outstanding contributions. The coverage is timely, scholarly and filled with splendid research suggestions growing out of discussions of various aspects of the material presented. Here and there the style is stimulating and provocative but not pungent or acrid. For example, in a consideration of electronegativities we find the following: "As far as the elements of Group IV are concerned, all the scales agree in making carbon the most electronegative of the elements of the group, but this is as far as agreement goes... Thus the current argument about the relative electronegativities of the elements of the group seems a little sterile; it is better to study correlations between properties than to try to establish the orders of relatively nebulous parameters as electronegativity. We need much more information about the distribution of electrons in bonds, about the mechanisms of reactions, and about the relationships between measured properties like reaction enthalpies and spectroscopic parameters before such discussion is likely to become constructive".

The object of this series is "to present to the senior student and to the research investigator a summary of the organometallic chemistry of the group IV elements... Comparable data for the different group IV elements, where known, will be conveniently presented so that the reader may... make correlations, comparisons, extrapolations, or interpolations from one element to another. Each volume will be devoted to a discussion of the Group IV element-X bond where X is a specific element or group of elements (In volume I the element is carbon). The element or group of elements which X represents will be different for each volume. Within each volume

there will be a chapter devoted to each of the following topics : the Si-X, the Ge-X, the Sn-X, and the Pb-X bond. Each chapter will discuss (a) processes by which the given bond is synthesized, (b) processes by which the given bond is cleaved, and (c) some of the more important physical and spectroscopic properties which are related directly or indirectly to the presence of the given bond in a molecule".

It might be mentioned that the chapter on the Si-C bond (including the relevant parts of the indexes) is a total of about 490 pages, which may set a record of sorts for the length of a chapter. Incidentally, the classic by Eaborn on "Organosilicon Compounds", published in 1960, had 530 pages. Only small sections of that book have been used after little or no modification for the present chapter by Eaborn and Bott which is restricted to the Si-C bond.

If the succeeding volumes of this series maintain the same high standard of excellence, then we have here, something more than a splendid "reference for libraries". There is unfortunately a somewhat common lament and discordant note, the price is inordinately high.

Henry Gilman

J. Organometal. Chem., 17 (1969) 358-359

Chemistry and Technology of Silicones; by W. Noll, Academic Press, New York, 1968. xiv + 702 pages, \$32.50.

This volume is a translation of the second edition of "Chemie und Technologie der Silicone" (Verlag Chemie, 1968). It represents, in the words of the preface to the first German edition, an attempt "to describe concisely and yet thoroughly the entire field of silicone chemistry, from the monomers to the polymers, from the methods of their synthesis to their chemical and physical properties and the technology of their use and application". The translation is of high quality, and the text is easy to read.

The first 385 pages of the book present a clear, concise general survey of organosilicon chemistry, with little specific reference to silicones, and could be read with much profit by newcomers to the field wishing to form an overall picture of reactions of organosilicon compounds. There are some minor inaccuracies (*e.g.* cleavages of aryl-silicon bonds by aluminium halides to give arylaluminium compounds are described, apparently in ignorance of a 1963 study indicating that such reactions do not occur under the conditions concerned), and the brief considerations of reaction mechanisms are in rather naive terms, but these defects are unimportant.

The great value of the book lies in description of the methods of making useful silicone polymers and in the accounts of the practical applications of these polymers in industry. Inevitably there is some generalization about behaviour of "silicones" without specification of the particular formulations on which the experimental information was obtained, but attention is drawn to this fairly frequently in the text. It is very much to be hoped that this full and authoritative account will not be read only by specialists, for it could be of great stimulus to a wide range of scientists in industry by revealing to them the potential applications of silicones in their own fields of technology.

C. Eaborn

J. Organometal. Chem., 17 (1969) 359