

Book Review

GMELIN HANDBOOK OF INORGANIC CHEMISTRY, 8th Edition, New Supplement Series, Volume 51, BORON COMPOUNDS. Part 17, BORAZINE AND ITS DERIVATIVES, A. Meller, volume author, K. Niedenzu, volume editor, 1978, vi + 248 pages, DM 583, \$291.50. Volume 52, BORON COMPOUNDS. Part 18, BORON-HYDROGEN COMPOUNDS, Part 2, K. Beeker, T. Onak, W. Sawodny, S.G. Shore and M. Yamauchi, volume authors, K. Niedenzu, K.-C. Buschbeck, and P. Merlet, volume editors, 1978, vi + 238 pages, DM 591, \$325.10. Volume 53, BORON COMPOUNDS. Part 19, BORON-HALOGEN COMPOUNDS, Part 2, K. Beeker, M.K. Das, B.R. Gragg, H. Keller-Rudek, H. List and W. Sawodny, volume authors, K. Niedenzu, K.-C. Buschbeck, and P. Merlet, volume editors, 1978, x + 343 pages, DM 782, \$430.10. Gmelin Institut für Anorganische Chemie der Max-Planck-Gesellschaft zur Förderung der Wissenschaften and Springer-Verlag, Berlin/Heidelberg/New York.

The Gmelin Handbook boron series brings three new additions, all of which will be very useful not only to the boron specialist, but also, more generally, to inorganic and organometallic chemists.

Borazines had been discussed briefly and, unfortunately, incompletely, in Part 4 of this series. In view of the fact that borazine and its derivatives as a class occupy an important place both in inorganic as well as organic boron chemistry, complete coverage was desirable, and this has now been accomplished: Part 17 of the Gmelin boron series brings a volume devoted wholly to borazine compounds. It begins with a useful general discussion of the physical and spectroscopic properties of the borazines and of their technical applications. This is followed by listings of individual compounds, arranged according to substitution patterns of the $(BN)_3$ nucleus and molecular complexity. The usual thorough coverage brings all information from the literature of 1950-1976, with even some later material. The data given on the well-studied B-trichloroborazine are typical: preparation, including details of the procedure consid-

ered best by the author on the basis of personal experience; physical and thermochemical properties; structure; mass spectrum; spectroscopic properties (^{11}B , ^1H , ^{14}N NMR, ^{35}Cl NQR, vibrational); chemical reactivity.

The second boron hydride volume of the Gmelin boron series deals with BH_3 and some of its Lewis base adducts, B_2H_6 , B_2H_n^+ cations and anions, B_3H_8^- and adducts of B_3H_7 , B_4H_{10} and its derivatives and, finally, H_3BCO . These are the simplest and most basic species of boron hydride chemistry, and over the years they have been studied and restudied in great detail. Diborane itself, the simplest stable binary boron hydride, requires almost one-half of the book (112 pages) to cover the many studies - physical, spectroscopic, theoretical, thermochemical and chemical - which have been devoted to this important molecule in the 27 year period, 1950-1976. This chapter brings a superb review of all aspects of diborane. Molecular and ionic species containing three boron atoms, mainly adducts of B_3H_7 with Lewis bases and salts of the B_3H_8^- anion, have received increasing attention in recent years, and these compounds are discussed by Barton, Onak and Shore. Also covered are B_4H_{10} and its derivatives in a chapter by Onak, Shore and Yamauchi. The last short (9 pages) chapter deals with a single compound, the intriguing H_3BCO and the physical, spectroscopic and theoretical studies which have been devoted to it.

Part 19 of the Gmelin boron series, which is the second part of the boron-halogen compound coverage, deals principally with the four boron trihalides and some of their adducts with simple Lewis bases such as NH_3 , NMe_3 , PH_3 , and PMe_3 . Also included are halogenated polyboranes of type B_2X_4 , $(\text{BX})_n$, $(\text{B}_n\text{X}_n)^{2-}$ and B_2F_7^- and $\text{B}_3\text{F}_{10}^-$. Although the number of compounds actually involved is small, this volume is large (341 pages) because the boron trihalides are key chemicals, both for the inorganic and the organic chemist. Furthermore, boron trifluoride at least has attained industrial importance. As a result, the boron trihalides are well-studied molecules indeed, with a very well-developed chemistry. Thus, for instance, the preparation, physical and spectroscopic properties and the chemistry of boron trifluoride require 74 pages to detail; of boron trichloride, 60 pages.

These three volumes, with their complete, up-to-date (through 1976) literature coverage, contain chapters written in English as well as the more usual German. In any case, the usual English translations of the preface, the table of contents,

the chapter titles and the section headings will help those who need the sections of the books which are written in German.

Boron chemists will welcome these three new volumes of the Gmelin boron series. Further additions, the preface notes, are in preparation.

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