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Book review

Rings, Clusters and Polymers of the Main Group Elements; edited by A.H. Cowley (University of Texas at Austin), ACS Symposium Series 232, American Chemical Society 1983, x + 182 pp. $ 32.95. ISBN 0-8412-0801-8.

This book comprises ten lectures given at a symposium in September 1982 in memory of Professor Ralph Rudolph. The contributors, from both America and Europe, are distinguished workers in the field of main group rings and clusters, and the book gives a series of concise and readable summaries both for those wishing to keep abreast of recent work and those beginning research. In most cases there are extensive references to the original literature. Inevitably for a book produced from a symposium, connections between chapters are tenuous. Nevertheless the various stages in the development of new areas of cluster chemistry are well illustrated.

Boron hydride clusters have been known for a long time and the principles governing their structures are well established. Current interest centres on development of systematic high yield syntheses (described here by S.G. Shore). However, for metalloboranes, described by N.N. Greenwood, the current emphasis is on new structure types: working out well-controlled syntheses is a task for the future. The chapter by J. Riess on the coordination and related chemistry of polycyclic tetraphosphorus compounds shows the rapid development of the subject and the chapter by H.A. Allcock outlines the advantages and potentialities of phosphazene polymers as carrier molecules for bioactive or catalytically active groups. A much shorter chapter by R.H. Neilson et al. describes the use of organometallic Si—N—P reagents in the synthesis of phosphorus—nitrogen polymers. Another by T. Chivers et al. is on cyclophosphathiazenes. Anionic clusters are discussed by H.G. Von Schnering and by J.D. Corbett et al. in chapters which illuminate the as yet little studied intermetallic compounds of the Main Group elements. The structures of clusters of both main group and transition elements have led to imaginative generalisations about electron counting and about molecular orbitals: this is an area where Professor Rudolph himself contributed. It is fitting, therefore, that the two remaining chapters are on theoretical aspects, one by A.H. Cowley et al. on hapticity of carbocyclic ligands and the other by H. Bock on unstable intermediates formed in pyrolyses.

This is a stimulating book, which draws together material scattered in the inorganic literature and gives interesting insight into largely unexplored relationships between isolated molecules and extended structures.

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