

Book reviews

Boranes and Metalloboranes: Structure, Bonding and Reactivity

C E Housecroft

158 pages. £29.95.

ISBN 0-7458-0459-4

It is the view of many inorganic chemists that boranes and metalloboranes constitute a narrow, specialized and somewhat obscure area which lies outside the mainstream of inorganic chemistry. However, the unique bonding properties of boron will always guarantee an extensive coverage in the standard general inorganic textbooks and current research in the area maintains a high profile in primary inorganic journals. Ever since they were first synthesized in the 1920s, the boranes (and their associated heteroboranes) have proved to be the toughest of challenges in all aspects, from the initial preparation, handling, and characterization to the overall description of their structure and bonding. Even now there are areas of controversy, and misconceptions and confusion abound. It is no surprise, then, that the subject is approached with some trepidation by teachers and students alike. It is with this in mind that this book, which is firmly targeted at an undergraduate audience, has been written.

The book is written in an easy-going, conversational style, uses plenty of illustrations and is ordered in a logical way. After an introductory first chapter (containing the obligatory highlighted Periodic Table, some definitions, and a brief explanation of nomenclature) the smallest borane, BH_3 , is introduced and its bonding, structure and reactivity are discussed in some detail. Various physical techniques and their application (and limitations) to boranes are then described. Next, boranes and borane anions of increasing size and complexity are shown and their structures discussed; this is followed by a chapter which similarly deals with metalloboranes. The ball-and-spoke diagrams used in these chapters (and throughout the book) do not make any allowance for bond overlap and I found them to be confusing on occasion, particularly for some of the larger and more complex molecules. The clear textual descriptions do, however, more than make up for this. Bonding in both the boranes and metalloboranes is then considered in various ways. Detailed molecular orbital descriptions of borane clusters of increasing complexity are given. Wade's rules are clearly outlined and, using worked examples, they are carefully applied to boranes and (together with the isolobal principle) to metalloboranes. The book concludes with a chapter outlining some aspects of reactivity. It is not exhaus-

tive, but acts rather as a taster: up-to-date references to more detailed reviews are given for those who want a more in-depth coverage.

Although I found the book to be well written and informative it does have a major weakness. Metalloboranes are, to all intents and purposes, a type of heteroborane. There are, of course, many other types of heteroboranes, but coverage has been restricted to metalloboranes alone. This somewhat artificial restriction has resulted in a book that covers only a part of what is already a specialized area. Admittedly the chemistry of heteroboranes, and carbaboranes in particular, is enormous but the book is only 158 pages long (including index and appendices) and there can be no justification for leaving them out on grounds of brevity. Consequently, many important features such as vertex-flipping and diamond-square-diamond rearrangements, which are more evident and more easily followed in heteroborane systems, are only mentioned in passing. More seriously perhaps, the large amounts of important chemistry more particular to the other heteroborane complexes are not covered at all. Inclusion of heteroboranes in a more general manner would provide a balanced coverage of the whole area. The book would then appeal to a much larger audience and tutors would be able to select those sections they perceive as relevant to their particular course. It must be said that boranes are usually fairly extensively covered in general inorganic textbooks. When this is considered alongside the book's price and the current state of funding to both students and educational institutions, it is difficult to envisage who might buy it other than those already involved in the very specific area at either teaching or research level.

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Progress in Clinical Biochemistry and Medicine Volume 10: Ruthenium and Other Non-Platinum Metal Complexes in Cancer Chemotherapy

E Baulieu *et al.* (eds)

Springer Verlag, Heidelberg 1989

226 pages. DM 138.

This volume consists of ten chapters presenting the plenary lectures of a symposium of the same title organized by the University of Trieste. The main emphasis is on the role of metal complexes in cancer chemotherapy, with some treatment of imaging and extensive discussion of the chemistry of the complexes