

Book review

Electron Deficient Compounds; by K. Wade, Nelson and Sons, London, 1971, 203 pages. £3.95 (boards), £1.95 (paper).

In the teaching of elementary inorganic chemistry, bonds are often classified into well-differentiated types, such as ionic, covalent, metallic and electron deficient. Such classification may be useful in accommodating a wide variety of molecular structure, but it often means that students, who go on to look at the subject in more detail are slow to realise that these types represent extremes between which there is continuous gradation. In his contribution to the Nelson series, *Studies in Modern Chemistry*, Dr. Wade has set electron deficient bonding in a wide context. It is seen not as anomalous and cut off from the rest of chemistry, but as a part of the whole and, in certain situations, entirely appropriate.

Inevitably, much of the book is devoted to the chemistry of boron hydrides and carboranes and there are excellent and authoritative accounts of the structures and reactions of these compounds. These will be useful to advanced undergraduates and to research workers wishing to become familiar with this particular area of chemistry. The accounts, though not comprehensive, show the most important features clearly, so that there is no danger that the wood is lost in the trees. For organometallic chemists, there is a good summary of structural features of the hydrides, alkyls and aryls of the electro-positive elements (particularly aluminium) and a brief account of their reactions. One whole chapter, devoted to the structure and bonding of diborane, illustrates how, for the more advanced student, material usually found in a variety of courses may be drawn together. Evidence from infrared, ^1H and ^{11}B nuclear magnetic resonance spectroscopy and from X-ray and electron diffraction is set side by side in such a way as to show both the strengths and limitations of each physical technique. The various bonding descriptions of diborane are then compared. The place of electron deficient compounds in chemistry as a whole, described by numerous asides throughout the book, is emphasised in a final chapter, which has sections on carbonium ions, metal clusters, π -complexes and electron-rich species (such as XeF_2). All these topics are dealt with more fully in other publications, but it is important that they have been brought together here.

Each chapter concludes with an up-to-date list of references, many of them to key reviews, and a set of problems and questions. This is a stimulating textbook and a valuable source of information about an interesting and important group of compounds.

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