

Book Review of Carboranes, 2nd ed.

Carboranes, 2nd ed. By Russell N. Grimes (University of Virginia). Academic Press (an imprint of Elsevier): Amsterdam. 2011. xviii + 1140 pp. \$245. ISBN 978-0-12-374170-7.

Carboranes are polyhedral boron–carbon clusters that are stabilized by electron-delocalized covalent bonding in the skeletal framework. In recent years, carborane chemistry has been experiencing a major surge of interest across a wide spectrum of technologies fueled by developing applications in such diverse areas as medicine, nanoscale engineering, catalysis, and metal recovery from radioactive waste. Consequently, this book on carborane chemistry is very welcome.

The scope of carborane chemistry has expanded considerably since the first edition was published in 1970; 17 chapters—totaling approximately 1100 pages in length as opposed to 272 in the original—are now required to provide a comprehensive account of modern carborane chemistry. Extensive tables, many of which are many pages long, of all known carboranes as well as complete lists of references to the literature are provided, with several chapters including more than 1000 references. A concise overview of the material in each chapter is provided at the beginning. These overviews give the reader a very useful summary of the extensive material covered.

The first chapter is a brief summary of carborane structure and bonding, followed by a short chapter on the general aspects of the synthesis and reactivity of carboranes. In the next eight chapters, the details of carborane chemistry are systematically presented in order of the size of the carborane cluster, starting with the relatively few four-atom clusters and ending with supraicosahedral carboranes containing up to 14 vertices. Very stable icosahedral structures dominate carborane chemistry and thus are the subject of three of these eight chapters. Chapter 12 is a discussion of carboranes having other main group atoms at one or more vertices of the carborane polyhedron. Similarly, Chapter 13 covers carboranes having transition metals and lanthanides at one or more vertices of the carborane polyhedron. Carborane polymers and dendrimers are discussed in Chapter 14, and the applications of carboranes in diverse areas, including catalysis and medicine, are described in the three remaining chapters.

This book is a valuable and comprehensive guide to carborane chemistry. I highly recommend it for any scientific library or laboratory involved in carborane chemistry.

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