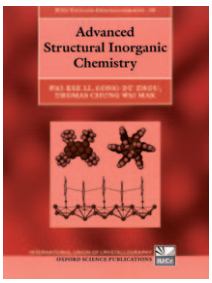
Advanced Structural Inorganic Chemistry



By *Wai-Kee Li*, *Gong-Du Zhou* and *Thomas C. W. Mak*. Oxford University Press, Oxford 2008. 688 pp., hardcover € 52.99.—ISBN 978-0-19921-695-6

The tenth book from the successful series *IUCr Texts on Crystallography* has been published. It is a revised version of a book published in 2001 by Beijing University Press. The book consists of a thoroughly edited and expanded compilation of lecture notes the authors use for their courses at the universities of Hong Kong and Beijing. The book is virtually free of errors, well-edited, and supplied with a good keyword index.

The title of the book reminds the reader of the textbooks *Structural Inorganic Chemistry* by Wells and *Advanced Inorganic Chemistry* by Cotton and Wilkinson. The outline of *Advanced Structural Inorganic Chemistry*, however, is entirely different. The book is subdivided into three parts. The first two parts deal with theory, whilst in the third part the structural chemistry of selected elements is described. The book has been written for students looking for an easy-to-read introduction to bonding and structure of chemical compounds.

Part I (Fundamentals of Bonding Theory) starts with an introduction to quantum theory usually found in physical chemistry textbooks followed by a description of the electronic structure of atoms. The covalent bonding in molecules is described using molecular orbital theory followed by a short chapter about chemical (mainly ionic) bonding in condensed phases. Part I finishes with a short introduction to computational chemistry.

The second part (Symmetry in Chemistry) starts with an introduction into symmetry and elements of group theory, including symmetry elements, point groups, character tables, and term symbols. After the chapters on applications of group theory (MO theory, construction of hybrid orbitals, and vibrational spectroscopy) and bonding in coordination compounds (crystal and ligand field theory, spectra of metal complexes), material one would expect in a IUCR textbook is covered. On 100 pages symmetry in crystals and common inorganic crystal structures (structures of metals and ionic solids) is described.

Part three starts with the chemistry of the main-group elements with each of the groups 1, 2, and 13–18 treated in a separate chapter. After the chapters on structural chemistry of rare-earth elements, metal–metal bonds, and transition-metal clusters, the book closes with an overview of supramolecular chemistry.

In part III, the authors have also selected recent results from the original literature on inorganic molecular and coordination chemistry they consider important. Solid state chemistry is given little consideration in this section. For students, part III provides an interesting insight into recent developments in molecular inorganic chemistry. For advanced readers, this part is entertaining and inspiring reading.

The theoretical basics from part I and II are not interlinked with the structural chemistry of the elements in part III and it is left for the reader to work out which section of part I and II is relevant for rationalizing the structural chemistry described in part III.

The book may be a useful text for students knowing the subject already and needing an all-in-one text for exam preparation. For students new to inorganic chemistry, the excellent bibliography at the end of each chapter provides suggestions for further reading that are necessary for a deep understanding of the subject.

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