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Inorganic crystal structures. By B. G. HYDE and STEN ANDERSON. Pp. xviii + 430. Chichester, New York: John Wiley, 1989. Price £41.55.

The main purpose of the authors of this book is to demonstrate the sphere-packing approach to a wide variety of structures. They are successful in this and provide a very attractively illustrated mine of information as well. They do not claim to be exhaustive, but can justifiably claim that "it is sufficiently comprehensive that the reader will be able to acquire the ability to deal with many more structures in a similar way."

After a brief introduction on packing, chapter 2 describes structures that are based on cubic closest packing and conveniently viewed along a fourfold axis of the c.c.p. array. They describe some 20 structure types in this way, including anatase, perovskite and spinel as well as some more unusual ones such as UCl_5 and a range of bronzes. Chapter 3 deals similarly with structures based on h.c.p. arrays viewed along the $\bar{6}$-axis, and relates NiAs and wurtzite to rutile, olivine and many other structures including such molecular ones as BCl_3 and UCl_6.

Chapters 4 and 5 deal with structures related to h.c.p. arrays viewed along [100] and [110] respectively, showing, among many more complex examples, the relationship of rutile to corundum and hollandite. Chapter 6 returns to c.c.p. structures, viewed along [110], from $CdCl_2$ to various twinned structures, and chapter 7 concludes this section with examples of mixed (h + c) stacking.

In chapters 8 and 9, structures based on primitive cubic and hexagonal arrays respectively are considered, with particular emphasis on structures related to the fluorite and AlB_2 types.

Chapter 10 deals with stereochemically significant lone-pair electrons, using the authors' extension of the Gillespie–Nyholm approach, in which lone pairs on cations are taken as the steric equivalent of O^{2-} or F^- ions. Then, instead of considering the cation to be at the centre of a distorted polyhedron, it is itself considered to be distorted from the centre of an essentially regular coordination polyhedron.

A variety of topological transformations are introduced in chapter 11, *e.g.* the derivation of the bisdisphenoid from octahedra and tetrahedra, use of which is made in chapter 13, dealing with the relatively few structure types related to body-centred cubic packing. In between, in chapter 12, some noncommensurate phases are described. The book concludes with chapters dealing with alloys and silicates.

Of course it is possible to find some omissions: I was suprised that calcite gets the briefest of mentions (and that relating it to perovskite, not to an h.c.p. array), while aragonite does not appear at all. Also, hydrates are not included. Given the size of the book, it is remarkable how many substances are covered, and how many ways of viewing the same structure are described: rutile is illustrated at least 13 times in five chapters. This book can be warmly recommended to all interested in solid state chemistry both as a clear introduction to the subject and as a likely source of a new view of an old friend.

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