Book Reviews

Works intended for notice in this column should be sent direct to the Book-Review Editor (R. F. Bryan, Department of Chemistry, University of Virginia, McCormick Road, Charlottesville, Virginia 22901, USA). As far as practicable, books will be reviewed in a country different from that of publication.

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Elements of inorganic structural chemistry. Selected efforts to predict structural features, 2nd English ed. By ERWIN PARTHÉ. Pp. xii + 169 (computer program disk included). Geneva: K. Sutter Parthe, 1996. Price US $60. ISBN 2-9504924-2-8.

This book starts with the sentence 'Definition: Two structures are called configurationally isotopic if they have the same space group, the same number of atoms in the unit cell on the same Wyckoff sites with the same or similar positional coordinates (x,y,z) and the same or similar values of the unit cell axial ratios (c/a, a/b, b/c) and cell angles (α, β, γ)'. The sentence gives a good indication of what the reader can expect, a book rich in definitions, in which a familiarity with *International Tables for Crystallography* (1992, Vol. A) is assumed, despite a disclaimer to the contrary in the preface. The subtitle 'Selected efforts to predict structural features' better describes the book's contents, which strongly reflect the author's lifelong interest in the classification and prediction of tetrahedral structures, *i.e.* structures in which at least some of the atoms are tetrahedrally coordinated. This is a category which, by the author's own admission, contains only $\sim 20\%$ of known inorganic compounds. Those for whom the term 'inorganic chemistry' means 'transition metal complexes' will find little of interest here as compounds with organic components are explicitly excluded from consideration.

Developed from notes to accompany a course given by the author, the book shows how electron counting rules can be used to predict the likely tetrahedral structure of a wide range of compounds. Given the difficulty of remembering the 32 specially defined variables that appear in these rules, a glossary would have been more helpful than the index that gives only the page number on which each term is defined. Fortunately for a user who might be confused by the complexity of the rules, they are all coded into the DOS program *VEC* that comes with the book. *VEC* is easy to install and use and, when given a chemical formula, it applies the rules and presents the user with a possible structural diagram. The disk also contains a database of the nearly 400 structures described in the book. A rotatable picture of each structure would have been helpful, but the addition of graphics would probably have rendered the database much less portable.

The first two chapters contain mostly definitions and Chapters 3–9 show how the electron counting rules can be used to predict the structures of a range of different substances such as elements, normal valence compounds, compounds with adamantane structures and compounds containing tetrahedral anions. The text of the book, which is published privately, has some weaknesses. Germanic constructions, persistent spelling mistakes (*e.g.* 'differenciate') and some inexplicably large spaces between words in mid-sentence tend to interrupt the flow. However, the meaning is clear and the language easy to understand. There are excellent figures that make it easier to visualize the many structures that are described and their numbering makes them easy to find when they are referred to in other parts of the book. A number of exercises, with solutions, are provided for students. Experienced crystallographers will appreciate the appendix of unit-cell transformations, but its inclusion is surprising and may reflect the author's frustration in dealing with the large number of different space-group settings found in the literature.

While the crystal chemist will find much of interest in the book, not least the definitions of different systems of systematic labelling (*e.g.* Pearson codes, Ramsden notation), the neophyte will find the book heavy going. As the opening quotation indicates, a considerable background knowledge of crystal chemistry and of crystallography is assumed. The text would undoubtedly be a helpful supplement to a postgraduate course of the kind given by the author, but this is not a book that a novice could use without direction.

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Designing the molecular world: chemistry at the frontier. Edited by PHILIP BALL. Pp. vii + 376. Princeton, NJ: Princeton University Press, 1994. Price $16.95 (paperback). ISBN 0-691-02900-8.

Philip Ball has written an excellent summary of the state of the art of structural chemistry for the nonspecialist. He covers a broad range of topics, including basic principles of X-ray crystallography, NMR spectroscopy and kinetics, and describes advances in chemistry, biochemistry and materials sciences. He writes knowledgeably and, for the most part, accurately about all these topics in a way that should be comprehensible to all. His writing is lucid and entertaining, and the book is amply and excellently illustrated. Most chemists, physicists and biochemists could benefit from reading it; although there may be little in the book of which they are not already aware, this balanced overview of the many facets of structural chemistry illuminates links and patterns of interaction that give the reader a valuable, popular, integrated summary.

Besides reviewing all the currently fashionable topics, such as quasicrystals, fullerenes, molecular sieves, supramolecular assemblies and self assembly, self replication, chaos, fractals, the origin of life and global warming, Ball offers speculations on future applications and developments. His comments on the reconciliation of science and spirituality with respect to