Book Reviews

Works intended for notice in this column should be sent direct to the Book-Review Editor (J. H. Robertson, School of Chemistry, University of Leeds, Leeds LS2 9JT, England). As far as practicable books will be reviewed in a country different from that of publication.

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Kristallgeometrie: Packungen und Symmetrie in Stereodarstellungen. By G. HARSCH & R. SCHMIDT. Pp. 120, 52 stereodiagrams. Frankfurt am Main: Verlag Moritz Diesterweg, 1982. Price DM 38.00.

This unusual book provides a compact and convenient (pocket-sized) set of very well chosen illustrations, with a brief but informative text. It is intended to accompany the study of fuller textbooks, but is in itself adequate for rapid reference or revision.

The diagrams, which occupy alternate pages, are in two colours, for stereoscopic viewing using the red and green filters provided. They are of admirable clarity and quality, combining the skills of the two authors as graphic artist and as lecturer. They are in many ways a useful substitute for three-dimensional models.

The text pages give, in brief and concentrated form, a clear explanation of the geometrical and structural aspects of the accompanying drawing.

The book is in two parts. The first covers all the standard structural types, and includes close-packing, cubic and hexagonal AX and AX_2 lattices, perovskite, spinel, and several simple molecular structures; a total of 25 diagrams.

The second part illustrates the elements of molecular and space-group symmetry, alone and in combination. Bravais lattices are shown, and space-group diagrams (with the symbols explained and the symmetry elements and the site point groups clearly indicated) for five of the crystal systems, excluding monoclinic and triclinic.

Though it is clear and thorough, it must be observed that this is accurately called a 'work-book'. The text is concise but somewhat condensed, and most students will require to work through the more complex examples very carefully, with help from a tutor or from a fuller text at times.

With that reservation, the book can be recommended as an addition to the range of teaching materials available for teaching basic crystal chemistry, and will be particularly useful when self-directing study is emphasized. Its translation from German to English would greatly widen its usefulness.

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Инструментальные методы рентгеноструктурного анализа. Л. А. Асланов. **(Instrumental methods of X-ray analysis.** By L. A. ASLANOV). Pp. 288. University of Moscow Press, 1983. Price 1r 20k.

There are, at present, a great number of textbooks on the market devoted to X-ray crystallography, but very few on the techniques that are in common use today. Professor Aslanov has gone a long way towards correcting the imbalance. This is certainly a book both for students and for research workers. It is divided into three main sections: production of X-rays, photographic techniques and diffractometry.

In the first section, many details are given about X-ray tubes, collimators, focusing *etc.*, the kind of information that, as I well know, can be difficult to find in the literature, especially in a single account. It is refreshing also to see that the book is reasonably up-to-date since it discusses the production of X-rays by synchrotron sources (though only Soviet machines are described here). Furthermore, considerable discussion is provided on detectors, including solid-state and television detectors.

The section on photographic methods describes the usual Laue, Weissenberg, precession methods, and so on. But here again more detail is given than one usually finds in books. It is useful, too, to see a discussion on microdensitometry, a much neglected subject.

In the final section a very full explanation, complete with mathematical formulation, is given about all types of diffractometer geometries. This will perhaps be the most useful section of all to the working crystallographer, as this information is very difficult to get hold of elsewhere.

This book makes a valuable contribution to the literature, although, since it is in Russian, it can only have a limited international appeal. It would be a pity if it were not translated into English. There are 176 diagrams, all of them clearly and simply drawn, and the book is generally well written.

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Einfuehrung in die Kristallographie. By W. KLEBER. 15th ed. Foreword and edited by H.-J. BAUTSCH, J. BOHM & I. KLEBER. 384 pp., 370 Figs., 40 Tables, 2 Appendices. Berlin: VEB Verlag Technik, 1983. Price DM 29.

The 'Kleber' is still one of the classic and very useful textbooks on introductory crystallography. After going through many editions within a period of almost 30 years, this latest (15th) edition has been thoroughly revised again, up-dated, and supplemented with recent literature references (up to 1981). An English translation of the 10th edition of 'Kleber', by W. A. and M. A. Wooster, in 1971, has been reviewed in *Acta Cryst.* (1972). A**28**, 221. Since that time some major changes have been made, especially in the chapters on crystal chemistry and crystal physics. Various old terms like *UP*- and *M*-resonance structures

have been replaced by a more conventional description of the covalent bond and of hybrid orbitals. There is also a modern and better organized presentation of the main structure types, including the silicates, especially chain silicates (but the formulae for anthophyllite and actinolite, on p. 154, are incomplete). One slight criticism here is that most of the old structure drawings are still used. These are quite heterogeneous and, in some cases, not informative: *e.g.* NiAs, scheelite or CdI_2 with S being assigned as the anion instead of I. Also, a somewhat more comprehensive treatment of polymorphism, compiling the various examples which are scattered throughout the text, might have been desirable.

The title of this book does not point out that it is intended primarily for use in earth sciences and also in material sciences. There is practically no coverage of the huge field of inorganic and organic chemical crystallography. The structure of the paraffins, anthracene and some polymers is discussed on two pages; proteins are not mentioned at all. Of course it is hardly possible to cover all topics of crystallography, crystal chemistry and crystal physics in only one book. This does not impair the value of this clearly written and well organized text.

Compared with the previous editions, there are now five main chapters instead of four, namely: 1. *Crystal symmetry and crystal morphology* (75 pp.), 2. *Crystal chemistry* (70 pp.), 3. *Physical-chemical crystallography* (55 pp.), 4. *Crystal physics* (86 pp.) and 5. *Structure analysis of crystals* (55 pp.). The popularity of 'Kleber' is demonstrated by its many editions; probably because it contains a rather comprehensive account of classical crystallography together with many practical applications. The excellent printing and the very reasonable price have to be mentioned in particular.

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Electron distributions and the chemical bond. Edited by P. COPPENS and M. B. HALL. Pp. ix+479. New York and London: Plenum, 1982. Price US $ 55.00.

This book represents the proceedings of a symposium held at the Spring 1981 American Chemical Society meeting in Atlanta. There are 21 contributions arranged in six sections covering: (1) Introduction, (2) Theoretical considerations, (3) Extended solids: theoretical and experimental results, (4) Molecular solids: theoretical results, (5) Molecular solids: experimental results, and (6) Electrostatic properties. The contributions form a coherent whole, and the editors and authors are to be congratulated on the result. Of particular value are the two lengthy contributions in §1 on charge density analysis: the theoretical approach by V. H. Smith and the experimental approach by P. Coppens. These provide the basic framework from which the later contributions are developed. §2 covers density functional theory, a quantum analysis of coherent diffraction, and relativistic effects. §§3, 4 and 5 cover a variety of theoretical and experimental charge density studies including covalently bonded semiconductors, metals, silicates, calcium beryllide, inorganic molecules, transition-metal complexes, metal–metal multiple bonds and organic molecules. §6 includes a discussion of the derivation of pseudomolecular electrostatic properties from crystal diffraction data, the use of constraints for electric field gradients at nuclear positions, the relevance of X-ray photoelectron spectroscopy, and the bearing of electron density analyses on general concepts in the electronic theory of organic chemistry. This book is complementary to *Electron density mapping in molecules and crystals*, edited by F. L. Hirshfeld, Weizmann Science Press of Israel (1977). Both should be on the shelves of crystallographic libraries.

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Studies in inorganic chemistry. Vol. 3. **Solid state chemistry 1982.** Proceedings of the Second European Conference, Veldhoven, The Netherlands, 7–9 June, 1982. Edited by R. METSELAAR, H. J. M. HEIJLIGERS and J. SCHOONMAN. Pp. 852. Amsterdam: Elsevier, 1983. Price US $202.00, Dfl 475.00.

What an unusual series is *Studies in Inorganic Chemistry*. The first two volumes are monographs; the third, a conference proceedings. Apparently the publishers have no clear plan for the development of this series, so potential subscribers had best examine each volume as it appears to see if it is worth the outrageous price.

Vol. 3 of the series is a collection of 11 invited lectures (179 pages) and 165 papers (669 pages) broken down into six subgroups: materials for energy conversion and storage (29 papers); defects, conduction, and diffusion (19 papers); solid-state reactions and synthesis (21 papers); spectroscopic studies (24 papers); magnetic interactions (16 papers); and crystal chemistry/structure (56 papers). In this collection of more-or-less classical solid-state chemistry I found many quite interesting articles.

As is to be expected in most proceedings, there is no consistent level of approach. The texts of the invited lectures vary from a one page abstract to a full 25 page article; coverage varies from general reviews to special topics. The papers average only 4 pages in length; they are, in many cases, merely extended abstracts with data. Browsers will enjoy them, but they should not serve as primary references. This raises the question of the value of such a work. To be of real scientific value each of these manuscripts will have to be published again in complete form. This collection merely serves as a snapshot of activity in a segment of the European solid-state community. Had it not been published, it would not have been missed.

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