

Book Reviews

Works intended for notice in this column should be sent direct to the Book-Review Editor (R. O. Gould, Department of Chemistry, University of Edinburgh, West Mains Road, Edinburgh EH9 3JJ, Scotland). As far as practicable books will be reviewed in a country different from that of publication.

Acta Cryst. (1990). A46, 424

Symmetry in molecules and crystals. By M. C. F. LADD. Pp. 274. John Wiley and Sons, Chichester, England and New York, 1989. Price (paper) £32.50. ISBN 0853122555.

This book is intended as a text book to introduce the ideas of crystal and molecular symmetry to students working towards higher degrees. The main parts of the book cover point groups and space groups in a way that should be readily accessible to the novice. Ideas unfamiliar to the intended reader are introduced slowly and with copious examples. For instance, the author has chosen to discuss a few space groups in considerable detail, but each of these is carefully chosen to introduce some new concept. The emphasis is on the visualisation of the symmetry; the mathematics is kept simple though there is a series of very short Appendices on vector methods and rotation matrices *etc.*

The author introduces the subject with a detailed discussion of the morphological symmetry of crystals which may be helpful for a mineralogist but is less likely to impress a solid-state physicist or a chemist. This approach essentially restricts the discussion to crystallographic point groups though the author does point out in passing that rotation axes other than 1, 2, 3, 4 and 6 are possible in other contexts. The book ends with a brief account of X-ray diffraction, just enough to derive the systematic absences and show their uses in space-group determination, and a brief account of group theory with application to quantum chemistry. It is surprising that no reference is made to vibration spectroscopy. Problems are provided at the end of each chapter and each problem comes with a worked out solution, an aid that will be welcomed by those who are serious about developing their understanding of the subject.

Extensive use is made of stereo diagrams but no viewer is supplied with the book. An Appendix gives the names

of suppliers, a description of how to construct your own stereoscope and a four-line description of how to achieve stereopsis. Few readers who are not already equipped to view stereo diagrams are likely to make the necessary effort; this is unfortunate as these are just the readers to whom the book is directed. The reviewer found the separation of the pairs a little too large for comfortable viewing with the unaided eye.

There are a number of typographical errors, some of which could be particularly confusing to the unwary reader. In Eq. 2.10 '=' has been substituted for '+' with unfortunate results; in the rather complex Table 3.8 the heading 'orthorhombic' has slipped leaving the orthorhombic point groups listed under monoclinic and most of the trigonal point groups listed under orthorhombic. On p. 131 $d^*(hkl)$ is given as $d(hkl)$, a particularly confusing error at a point where the relation between the two is being explained. With so many diagrams, many of them stereodiagrams, it is not surprising that some are less than satisfactory. The perspective of the cube in Fig. 1.10 has been delightfully Escherised but more serious damage has been done to Fig. 5.19 which is so badly misdrawn as to be useless. Something strange has also happened to the symbol for the 6_1 axis in Table 5.8. In spite of these, and many less serious slips, the book is one that any instructor could recommend to a student interested in learning about crystal symmetry. However, because its approach is crystallographic, the book will be less useful to students who are primarily interested in molecular symmetry.

I. DAVID BROWN

*Institute for Materials Research
McMaster University
Hamilton
ON L8S 4M1
Canada*