

factors, and where the low-order reflections make a relatively large contribution towards the least-squares matrix elements, this could be because the data set was limited or because an inappropriate weighting scheme was employed. The effect should be decreased if an extinction parameter is refined as this can also soak up errors for low-order reflections.

Refinements were carried out for five structures, with models where a N atom was given occupation factors 0.86, 1.0 and 1.14. 0.86 corresponds to replacing N by C, and 1.14 to replacing N by O. The occupation factor for a C

atom was adjusted so that the total scattering power of the molecule was constant. The effect was observed for all the structures although in some cases only for limited data sets (Table 1). The effect increases as $(\sin \theta / \lambda)_{\max}$ decreases.

References

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International Union of Crystallography

Acta Cryst. (1984). A40, 309

Union Office Computer

With the help of a generous donation from the Japanese crystallographic community, a minicomputer with 384K bytes of memory and 15M bytes of hard disc storage (with magnetic cartridge tape back-up) has been installed in the Union office at Chester. Six VDU terminals and two printers, together with the software supplied, allow timely accounting for all the Union's financial transactions. A

balance sheet and accounts, comparable to those published in the annual Executive Committee reports [*cf. Acta Cryst.* (1984). A40, 68–85], can now be produced at short notice. In addition, the progress of all papers throughout the journal production process will be monitored, duplications identified, status reports listed and subject index, chemical name index, author index and formula indexes maintained. Production of the next cumulative index will save approximately the total cost of the microcomputer.

An engraved wall plaque commemorating the Japanese gift has been placed in the Chester office.

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.

Acta Cryst. (1984). A40, 309–310

Points, lines and walls in liquid crystals, magnetic systems and various ordered media. By M. KLÉMAN. Pp. 322. Chichester–New York–Brisbane–Toronto–Singapore: John Wiley & Sons, 1983. £29.95.

The technical importance of liquid crystals has challenged many papers, especially in the theoretical interpretation of their outstanding properties which are essentially determined by defects. Approximately 30 years ago a similar development took place in the theory of plastic deformation of metals. It could be shown then that edge and screw dislocations as defined by the direction of a line and their Burgers vector, given by the well known Burgers circuit, suffice to explain the dynamic behaviour of crystals during plastic deformation. Since structural details of the kernel of dislocation lines were irrelevant, the extension of this theory to materials other than metals was very simple. Now, a more generalized treatment of similar defects is offered in Kléman's book, which explains the topology of defects in media which are in general characterized by a tensor field, e.g. a director field in the case of first-order tensors.

The author starts by showing many pictures of defects predominantly taken with the optical microscope using crossed nicols. It is regrettable that no direct correlation between these pictures and the defects described in the text

book is given; this could have been done at least in some cases. Then a classification of defects is given, beginning with the symmetry of nematic, smectic and cholesteric phases. The formal topological description of most of the defects is explained in terms of the so called 'Volterra process', which is a valuable means whereby an adequate description of many types of dislocation, disclination *etc.* is possible. In the following chapters a systematic review of the most important defects in liquid crystals is given. Obviously these defects also play an important role in the magnetic properties of crystals where spin orientation and spin density are the relevant factors describing their properties (e.g. Bloch walls, Néel walls, helimagnets *etc.*). In the last chapter Kléman gives a review of a generalized group-theoretical classification of topologically stable defects. This method yields a unique treatment of singularities including lines and walls, which are partially described in a more or less artificial manner by the Volterra process. Obviously a better understanding of the relevant basic mathematics is necessary in this part of the book. The treatment of the dynamics of liquid crystals, which is an important field of present and future development in this field lies beyond the scope of this textbook.

Apparently the author has endeavoured to keep the mathematical background necessary for full understanding of a complicated subject as low as possible. Consequently, advanced students as well as scientists may use it as a good