

## Notes and News

*Acta Cryst.* (1979). A35, 701

### Request for Donations of Publications and Geological Specimens

On 18 March 1978 a fire destroyed a large part of the University of Lisbon, namely the building where the Faculty of Science and the Natural History Museum were located. The Mineralogical and Geological Museums were almost completely destroyed, together with all records and specimens, as was the Library belonging to the Geological Society of

Portugal, entrusted to the Department, and all its books, maps, etc. were lost in the fire.

Under these circumstances, teaching and research activities are almost impossible, and the Department is making an appeal for international assistance, requesting donations of books, magazines and geological specimens (including minerals, rocks and fossils).

Offers of assistance should be sent to Professor C. A. de Matos Alves, Head of the Department of Mineralogy and Geology, Faculty of Science, University of Lisbon, Lisbon, Portugal.

## 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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**Molecular vibrations in crystals.** By J. C. DECIUS and R. M. HEXTER. Pp. xii + 391. Maidenhead, England: McGraw-Hill, 1977. Price, US \$29.50, £15.60.

Group theoretical methods, applied to the vibrational analysis of isolated molecules, culminated in the FG matrix formalism and are well known to every chemist interested in infrared or Raman spectroscopy.

The present book extends these methods to the more complex situation in which the molecules, neutral or ionized, are embodied in a crystal without loss of individuality. This leads to the use of internal coordinates as dynamic variables. In this approach the force constants matrix **F** has a clear physical significance. The difficulty is transferred to the calculation of the **G** matrix, both matrices being necessary in order to write down the equations of motion with the aid of these coordinates.

To develop this programme, the authors explain in detail the fundamental notions of space group and wave vector group and how to construct translationally adapted internal coordinates. The reader is progressively accustomed to the various difficulties by working out simple examples; linear crystals, linear polymers, tridimensional mono- or diatomic crystals, including calculation of phonon dispersion curves. Infrared and Raman selection rules for one or two phonon processes and analysis of Van Hove's critical points are carefully studied.

An important part of the book is devoted to the calculation of the splitting into multiplets of the molecular vibrational levels by two methods: (a) the FG matrices (on the basis of 'normal molecular coordinates'); (b) the vibrational exciton. Intermolecular force models currently used, dipole-dipole or atom-atom interactions, are compared. An interesting discussion concerns the effect of the crystallite shape on the multiplet splitting resulting from long range forces, and the effect of these forces on the splitting of LO and TO modes is carefully discussed. The last chapter

deals with the problems of impurities, of isotopic substitutions in crystals and of molecules in rare gas matrices.

Finally, numerous clear tables complement this book: characters, selection rules, correlation tables, list of the 230 space groups, and tabulation of all distinct sites in every space group. This well documented book is thus very useful to the research worker in solid-state vibrational spectroscopy.

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**Direct methods in crystallography.** Edited by H. A. HAUPTMAN. Pp. 301. Obtainable from Polycrystal Book Service, PO Box 11567, Pittsburgh, Pennsylvania 15238, USA. 1978. Price \$13.50.

This book contains the proceedings of the Symposium on Direct Methods in Crystallography held in Buffalo in early August 1976. The reviewer received his copy in mid-January 1979. Such a phase shift places him in a delicate situation. Should he necessarily assert that all is best in the best of all possible worlds and so be agreeable to the editor?

About 95% of the material presented here has already been published elsewhere, in many articles in *Acta Crystallographica*, in a book and in lecture notes on schools and meetings held in York (1974), Prague (1975), Erice (1978) and Twente (1978). The idea of capturing within the covers of a single volume the essential contributions of the participants, as stated in the preface, is indeed a very good one but the final product, hampered by such a delay, can today only interest a minority of specialists or historians. Direct