tions to the field of crystal growth, through technical achievements, publications and presentations, and their impact on science and technology in crystal growth worldwide. Those selected need not be citizens of the United States. Nominations, together with concise supporting documentation, should be forwarded by 1 November 1977 to Dr E. A. Giess, AACG Awards Committee, IBM, T. J. Watson Research Center, Yorktown Heights, NY 10598, USA.

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.

Mössbauer effect methodology. Vol. 10. Edited by I. J. GRUVERMAN and C. W. SEIDEL. Pp. ix+354. New York: Plenum, 1976. Price US$39.00.

The Mössbauer effect has become established as a useful tool for probing the solid state. This book, a collection of papers presented at a meeting held annually to discuss applications of the technique, shows that it is especially valuable when more conventional methods of study are difficult to apply. It contains papers in two main areas: catalysis and biological molecules. The change in chemical state of a surface Mössbauer atom (^{57}Fe, ^{119}Sn or ^{99}Ru) and sometimes in particle size can be monitored during a catalytic reaction, and this may have commercial use. In iron proteins the ligand-field levels of the iron atoms may be deduced from measurements of electric quadrupole and magnetic hyperfine interactions of ^{57}Fe and can give structural information. In both of these applications a small proportion of the Mössbauer isotopes can be detected and measured in the presence of a larger number of non-resonant atoms. The remaining papers give a good impression of current varied activity in physics and chemistry research in which Mössbauer spectroscopy is being used.

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Méthodes physiques d'étude des minéraux et des matériaux solides. By J.-P. EBERHART. Pp. xiii+507, Figs. 200, Tables 44. Paris: Doin, 1976. Price 580 FF.

Crystallographers tend to be very compartmentalized individuals. X-ray specialists are ignorant of electron diffraction, while electron microscopists know little about X-rays. It is therefore a pleasure to find a book about all the principal analytical methods based on the interaction of X-ray beams, electron beams and to a lesser extent neutron beams, with crystalline solids.

The first part (100 pp.) deals theoretically with the different radiations and with the nature of their interaction with atoms. The reviewer was surprised at the choice of some of the symbols used (*e.g.* f instead of ϱ for electron density, $\bar{q}$ instead of P for Patterson density and R instead of s for the reciprocal-lattice vector). The author was evidently faced with the difficulty that different conventions are used in X-ray, electron and neutron diffraction. In a second edition a glossary of symbols would be very useful.

Part two (50 pp.) deals with the production and measurement of radiation. The various counter methods of X-ray detection are described in more detail than is found in most textbooks and the reader is better able to compare the merits of the different detectors.

Part three (210 pp.) covers analytical applications of diffraction. In the chapters on X-ray diffraction the Laue, oscillation, Weissenberg and powder methods are discussed in detail. The section on powder diffraction is particularly extensive and treats identification and quantitative analysis of mixtures, lattice-parameter determination, grain-size measurement and preferred orientation. Single-crystal methods discussed include crystal orientation with Laue photographs, lattice-parameter and space-group determination and there is an introduction to structure determination. There is some confusion in the definition of the structure factor. On p. 241 $F(hkl)$ includes the polarization factor but on the next page $F(hkl)$ the coefficient in the Fourier series for electron density is defined as $F_m(hkl)/\sqrt{LP}$ where $F_m(hkl)$ is called the measured structure factor.

Electron diffraction and microscopy are treated together since a knowledge of scattering theory is essential for the interpretation of electron micrographs of crystals. High-resolution electron microscopy is full of pitfalls for the inexperienced who may describe as structural features what in fact are principally diffraction effects. Micrography of defects in crystals and low-energy electron diffraction (LEED) are also discussed.

The last part (100 pp.) treats spectroscopic methods of analysis. These are X-ray fluorescence, electron probe microanalysis, scanning electron microscopy, photoelectron spectroscopy (ESCA), Auger electron spectroscopy and secondary ion emission spectroscopy.

As far as the reviewer – an X-ray crystallographer – can judge, the specialist will learn little new about his own field although the theory is always explained clearly and rigorously and there is a wealth of technical hints. Eberhart's purpose appears to be to explain the different methods to specialists in other fields and in this he has succeeded admirably. At the end of each chapter is a book list; there is also a bibliography of original work (up to 1974). The clarity is enhanced by the excellent two-colour diagrams which are probably responsible for the very high price. English-speaking readers with school-standard French will find the linguistic effort well worth while.

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X-ray diffraction topography. By B. K. TANNER. Pp. xiv+174, Figs. 80, Tables 6. Oxford: Pergamon Press, 1976. Price $12.50, £6.25.

The book *X-ray diffraction topography* is written, as the author himself says, as an elementary treatment of X-ray topography comprehensible to the non-specialist.