

and diffraction physics, as well as other branches of science.

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Defects in insulating crystals. Edited by V. M. TUCHKEVICH and K. K. SHVARTS. Pp. 774. Berlin, Heidelberg, New York: Springer-Verlag, 1981. Price DM 99.00, US \$39.60.

The ninth conference on *Defects in insulating crystals* held in Riga in 1981 was attended by 350 participants, including 200 from the USSR. There were over 200 communications presented as posters. The Abstracts of these papers were published in a separate volume (544 pages) but the list of the titles and addresses of the authors are presented in this volume as a supplement. At the conference 37 review reports were delivered and 34 of them are the content of this book. The amount of work done on defects in insulating crystals is vast and because of the lack of recent books on the subject this collection of review papers can be well appreciated.

A chapter is devoted to the theory and models of defects with special emphasis on the vibrational structure. Then there are reviews on excitons in different types of solids. Another chapter about radiation effects in insulating crystals discusses different aspects of primary and secondary effects. A number of papers are grouped under the title *Spectroscopy*. In fact, this covers different subjects, such as color center lasers, picosecond spectroscopy, impurity centers and even Raman scattering in amorphous PbTiO_3 . Finally, two papers are concerned with ionic mobility in alkali halides.

Professor C. Lushchik gave the summary talk in which he pointed out some subjects for future research in this field. Although this series of conferences originally concentrated on defects in alkali halides, the scope was gradually broadened to other insulating crystals. Also, the topic of research has shifted from the identification of defects to such subjects as relaxation processes, the creation mechanisms of defects, joint consideration of excitons and defects, and migration of hot defects. More and more interest is also seen in defects as probes for phonons in crystals. Although the reports can often be considered as rather short for the subjects treated they usually put the accent on the most recent developments and contain an extensive list of references.

In conclusion, it can be said that this book will be useful for all those doing research in the field of defects in ionic crystals.

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Computational crystallography. Edited by D. SAYRE. Pp. viii + 539. Oxford University Press, 1982. Price £25.00.

In a great many papers, numerous researchers (H. Hauptman, J. Karle, M. M. Woolfson, and others) provide a comprehensive review of the mathematical and physical background of the computing involved in the current techniques of diffraction-based molecular imaging.

The scientific treatise begins with the computing involved in measuring the diffraction pattern. It then deals with the phasing of the pattern by direct, Patterson, heavy-atom, and phase-refinement methods, and the use of computer graphics in the display and manipulation of molecular images, the structure refinement process and other computations important to crystallographers. At the end there is a short section on the principles of implementation.

This is an excellent book for crystallographers and physicists.

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Advances in X-ray analysis. Vol. 25. Proceedings of the 30th annual conference on the applications of X-ray analysis, Denver, Colorado, 3–7 August 1981. Edited by JOHN C. RUSS, CHARLES S. BARRETT, PAUL K. PREDICKI and DONALD E. LEYDEN. Pp. xviii + 398. New York: Plenum Press, 1982. Price US \$49.50. ISBN 0-306-41008-7.

This volume constitutes the proceedings of the 1981 Denver Conference and provides a broad perspective of X-ray spectrometric and X-ray diffraction techniques, giving a valuable overview of the present-day state of the art in X-ray applications. The chosen subject of the plenary lectures was *New techniques for the future of X-ray spectrometry*. The invited speakers, who are all pre-eminent pioneers in the development of particular techniques, focus on fluorescence techniques that are at the forefront of our understanding. These techniques, which approach a full elucidation of theory and active development of practical hardware, will most probably be in commercial use by the end of the decade.

In recent years a trend has developed for the conference to alternate emphasis annually between X-ray spectrometry and X-ray diffraction. This volume contains fifty-six papers of which thirty-three are devoted to topics in X-ray spectrometry while the remainder deal with X-ray diffraction.

The contents of the book are divided into seven headed sections. The first section is devoted to XRF detectors and XRF instrumentation and include, amongst others, two papers on the performance of solid-state room-temperature energy-dispersive X-ray detectors. The current progress with