## Laboratory Note

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### A simple method for testing X-ray beam uniformity

A pinhole in a thin piece of lead mounted on a goniometer head can be used to check the uniformity of the X-ray beam on a full-circle diffractometer. Beam uniformity must be carefully checked if a monochromator is being used.

X-ray beam uniformity is sometimes measured with a pinhole probe mounted on a stage with graduated orthogonal $x$, $y$ motions. We find the following much simpler device entirely satisfactory. It consists of a lead disk about 10 mm in diameter and 0.5 mm thick pierced by a sharp needle to form a hole 0.1 mm or less in diameter. The disk is mounted on a goniometer head and oriented perpendicular to the X-ray beam. The pinhole is then centered in the $\chi$ circle using the goniometer head adjustments. Beam intensity is measured with the detector at $2\theta = 0$, the beam stop removed and the X-ray beam attenuated.

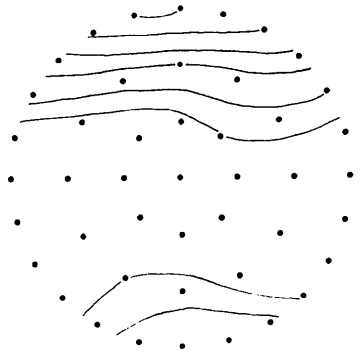

Fig. 1. The dots mark positions at which the intensity of the X-ray beam is measured when the offset and $\chi$ settings described in the text are used. The contours mark intensity changes of 5%, the center region is within 5% of the maximum intensity. The beam area surveyed is 0.6 mm in diameter, the monochromator is pyrolytic graphite and the X-ray source is a standard-focus Mo tube opperated at 50 kV, 10 mA. The X-ray beam is attenuated approximately 50 times by a 0.006 inch (152·4 $\mu$m) thick leaf from a thickness gauge. *CAUTION*: If the pin hole is removed, much greater attenuation is required.

The position of the pinhole in the beam is varied by translating it horizontally using the goniometer head $x$ motion and rotating the $\chi$ circle by suitable increments. We find the following settings satisfactory: 0.1 mm offset, $\Delta\chi = 45°$; 0.2 mm offset, $\Delta\chi = 30°$; 0.3 mm offset, $\Delta\chi = 15°$. Intensities are conveniently plotted on polar coordinate paper. Fig. 1 shows contours obtained in this way for an X-ray beam with good horizontal uniformity but further adjustment needed to correct vertical variation.

The advantage of this method is the simplicity of the device required.

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## Crystallographers

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*This section is intended to be a series of short paragraphs dealing with the activities of crystallographers, such as their changes of position, promotions, assumption of significant new duties, honours, etc. Items for inclusion, subject to the approval of the Editorial Board, should be sent to the Executive Secretary of the International Union of Crystallography (J. N. King, International Union of Crystallography, 5 Abbey Square, Chester CH1 2 HU, England).*

Professor **J. D. Dunitz,** Professor of Chemical Crystallography at the ETH-Zentrum, Zürich, has been elected a foreign member of the Royal Netherlands Academy of Sciences.

Dr **David Harker,** Research Scientist Emeritus at the Medical Foundation of Buffalo, received the 1980 Fankuchen Award in X-ray Crystallography and delivered his Award Lecture entitled 'My Life with Symmetry' at the Alabama ACA Meeting on 18 March.

Professor **G. Kostorz** has been appointed a professor of physics with special interest in the physics of metals at the Eidgenössische Technische Hochschule, Zürich. Professor Kostorz is a Co-editor of the *Journal of Applied Crystallography* and his new address is given on the inside front cover of this issue of the journal.

Professor **S. Ramaseshan,** formerly Head of the Materials Science Division of the National Aeronautical Laboratory in Bangalore, India, has been appointed Joint Director of the Indian Institute of Science, also in Bangalore.

Professor **Y. Takéuchi** succeeded Professor **S. Hosoya** as the President of the Crystallographic Society of Japan for the period April 1980–March 1981. The thirtieth anniversary of the foundation of the Society will be celebrated at the Society's next annual meeting, to be held at the University of Tokyo later in 1980.

Professor **Harold W. Wyckoff**, of the Department of Molecular Biophysics and Biochemistry, Yale University, has succeeded Dr **Jenny P. Glusker** as President of the American Crystallographic Association for 1980. Dr Quintin C. Johnson, of the Chemistry and Materials Science Department, Lawrence Livermore Laboratory, Livermore, California, has been elected Vice-President for 1980 and will become President in 1981. Dr **K. Ann Kerr,** of the Department of Chemistry and Physics, University of Calgary, continues as Secretary, and Dr **Robert A. Sparks,** of the Syntex Corporation, Cupertino, California, has been elected Treasurer.

## International Union of Crystallography

*J. Appl. Cryst* (1980), **13**, 199–200

### Commission on Crystallographic Apparatus
### IUCr X-ray Attenuation Project

At the International Union of Crystallography Congress which was held in Warsaw in 1978, the Commission on Crystallographic Apparatus decided that there was a need to evaluate the techniques for the measurement of X-ray attenuation coefficients. A committee was set up to organize the project, and planning for the project is now well advanced.

It is the aim of the organizing committee to encourage the participation in the project of laboratories using a diverse range of techniques of measurement. For example, sources of incident X-ray beams which are to be used range from synchro-

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tron radiation sources to radio-isotope sources. A diverse range of detection systems are also to be used.

All laboratories participating in the project will receive standard specimens from the project organizers and will be required to answer detailed questions about their equipment, techniques of measurement and their analysis of the experimental results. The first specimen will be silicon. Later specimen sets will include germanium, magnesium and pyrolytic graphite.

Any laboratory interested in participating in the project should contact: Dr D. C. Creagh, Chairman, IUCr X-ray Attenuation Project, Physics Department, Royal Military College, Duntroon, ACT 2600, Australia.

*J. Appl. Cryst.* (1980). **13**, 200

## Change of publisher of Structure Reports, Molecular Structures and Dimensions and other publications

As from 1 January 1980, D. Reidel Publishing Company, PO Box 17, 3300 AA Dordrecht, The Netherlands, has taken over the publication and sales of all the publications of the International Union of Crystallography previously handled by Bohn, Scheltema and Holkema. These publications include *Structure Reports, Molecular Structures and Dimensions, Symmetry Aspects of M. C. Escher's Periodic Drawings, Fifty Years of X-ray Diffraction, Early Papers on Diffraction of X-rays by Crystals,* and miscellaneous other publications of the Union such as the bibliographies and the *Index of Crystallographic Supplies*. Orders for all these publications may be placed direct with the publishers or with Polycrystal Book Service, PO Box 11567, Pittsburgh, PA 15238, USA or with any bookseller.

# 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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**Очерки о свойствах кристаллов.** М. П. Шаскольская **(Essays on properties of crystals.** By *M. P. Shaskolskaya*). Pp. 189, Figs 114. Moscow: Nauka, 1979. Price Rb 0.30.

Although this book is a logical continuation of the volume *Crystals* by the same author, it may however be treated and read quite independently. It is addressed to a wide circle of readers interested in science and technology.

In a simple and interesting way the *Essays* present the connections between symmetry and physical properties of crystals, describe their applications in science and technology and show new possibilities for obtaining attractive materials.

The first ten chapters deal with crystal structure and symmetry. The next two parts give interesting examples of how crystallographic knowledge can be used to answer some practical questions in computer electronics or to solve such problems as those connected with defence against hailstorms or with retention of the tetragonal phase in tin materials.

The next chapter starts with an explanation of the Curie law governing the symmetry of the physical properties of crystals and is followed by a description of the preparation and application of single crystals such as those of Seignete salt, quartz and barium titanate. Examples of piezoelectric ceramics are also dealt with here.

The following three chapters give a description of optical properties of crystals, mainly of the elecro-optical effect and its technological applications such as the investigation of strains in materials and transparent-model studies of metal constructions.

The last part is devoted to the defects observed in real crystal structures: surface and interface defects, dislocations and point defects. It shows the various applications, mainly in electronics, that the new crystalline materials have. It is also shown that the knowledge of structure allows the design of new materials with desired properties and may give rise to the development of new technologies.

The historical approach to the subject permits the reader to follow the development of ideas and applications and to realise the contributions some individual scientists have made to this progress.

The author shows herself as a master of simple and yet attractive presentation of the problems of crystal physics and their contributions to technical progress.

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## Book Received

*The following book has been received by the Editor. Brief and generally uncritical notices are given of works of marginal crystallographic interest; occasionally a book of fundamental interest is included under this heading because of difficulty in finding a suitable reviewer without great delay.*

**Solar cells. Their science, technology, applications and economics.** Editors: *T. Coutts, L. L. L. Kazmerski* and *S. Wagner*. A new international journal, published quarterly from November 1979. Lausanne: Elsevier Sequoia. Price (Vol. 1, four issues) Swiss F 160.00, approx. US $ 97.00.