

Department of Energy under contract No. W-31-109-ENG-38.

MICHAEL T. SHORT  
WILLIAM J. EISLER JR

*Division of Biological and Medical Research*  
*Argonne National Laboratory*  
*Argonne*  
*IL 60439*  
*USA*

FRED J. STEVENS

*Diagnostics Division*  
*Abbott Laboratories*  
*North Chicago*  
*IL 60064*  
*USA*

(Received 22 November 1982;  
accepted 1 February 1983)

*J. Appl. Cryst.* (1983), **16**, 360

### A simple method to cut a single crystal in any desired direction

A simple and efficient method to cut a single crystal of any shape along any desired crystallographic direction with a disk diamond saw without angular adjustments has been developed and used in this laboratory. The crystal plane is aligned in a (horizontal) single-crystal diffractometer by means of the multiple diffraction technique, with error much less than  $0.01^\circ$ . The detector arm is then rotated to coincide with the normal to the plane, *i.e.* the bisector of the incident and diffracted beams, while the crystal is kept fixed by locking the  $\omega$  axis. The detector is then replaced by a V-shaped steel piece (Fig. 1) machined to fit exactly in the detector arm. A steel cylinder whose geometrical axis intercepts the diffractometer axis slides on the V groove. A flat sample holder that belongs to the saw is screwed at the extreme of

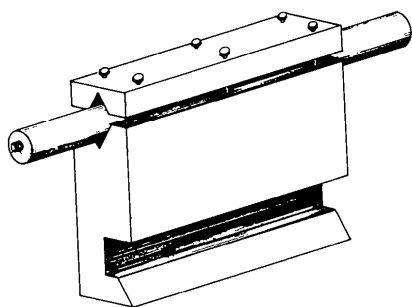


Fig. 1. V-shaped steel piece and cylinder.

the bar (Fig. 2) at the same threaded hole used to secure it to the saw. The bar is carefully advanced until the flat surface of the sample holder touches the crystal which is then glued to it by means of a few drops of a 'super bonder' glue. After one minute the crystal can be loosened from the goniometer head and the cylinder carefully pushed back, lifted and put with the sample holder facing upwards. A ring-shaped mould put on top of it, surrounding the crystal, is then filled with wax or epoxy resin that provides a strong enough grip to support the cutting pressure (Fig. 3). The crystal holder is screwed back in the saw, with the crystal ready to be cut in the prescribed direction and to produce slices of the desired thickness.

The basic idea of the method is to align the crystal accurately and to transfer it to the saw without the goniometer head whose grip would not stand the cutting pressure of the saw.

As in this method of alignment the crystal can be rotated through  $360^\circ$  around the normal to the reflecting plane and independently around the  $\omega$  axis, it is easy to align it to be cut along any prescribed non-crystallographic direction.

The method has been used to cut Ge crystals along the (301) plane and rutile ( $\text{TiO}_2$ ) along (201). In both cases the deviation of the final surface with respect to the crystalline plane was about  $0.2^\circ$ , which is enough for most crystallographic purposes. The major part of this error is most probably due to lack of precision of the rotating diamond saw disk (wobbling, parallelism and so on).

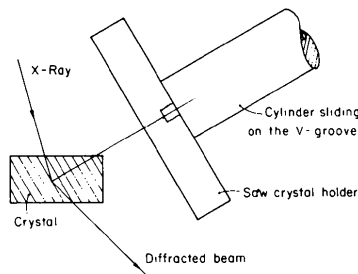


Fig. 2. Geometry of the method.

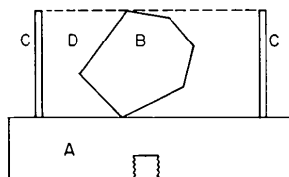


Fig. 3. Crystal in the sample holder ready to be cut. A Sample holder, B crystal, C annular mould, D wax.

Professor M. Hart (1982) has kindly reminded us of the method due to W. Bond (1961). This method is capable, according to the author, of providing finished surfaces with a misorientation of about  $2^\circ$ , orienting them with a diffractometer and grinding the crystal which is attached to a specially designed gadget, provided the initial error of the cut is within  $5^\circ$  of the desired direction. Bond's method could then very well complement the new method described here when a highly accurate cut is needed. Alternatively, a precision wobbling-free disk saw might be able to attain precision similar to that in Bond's method. Finishing of the surface is then achieved by the usual methods.

CICERO CAMPOS  
LISANDRO P. CARDOSO  
S. CATICHA-ELLIS

*Crystallographic Laboratory*  
*Instituto de Fisica*  
*UNICAMP*  
*Caixa Postal 6165*  
*13.100 Campinas*  
*São Paulo*  
*Brasil*

(Received 9 November 1982;  
accepted 4 February 1983)

### References

- Bond, W. L. (1961). *J. Sci. Instrum.* **38**, 63.  
Hart, M. (1982). Private communication.

### Crystallographers

*J. Appl. Cryst.* (1983), **16**, 360–361

*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 2HU, England).*

**Stephen Arnold Bryant** died on St Stephen's Day, 26 December 1982, at the age of 75. He was the Technical Editor of the publications of the International Union of Crystallography from 15 November 1962 to 31 December 1975, and was the first (for a considerable period the only) full-time employee of the Union. Between its foundation in 1948 and 1962 the technical editing had been done by university workers in an honorary capacity, but with the increasing volume of publication it proved impossible to find further willing workhorses, and the Union lost one of its hidden subsidies. It gained in professionalism.

Professor A. J. C. Wilson writes that Stephen Bryant brought to the Union great expertise in both crystallography

and editing. He graduated from Oxford in 1930 with first-class honours in chemistry and crystallography, having studied the latter under T. V. Barker. After obtaining also the degree of BSc by research he spent a few years in academic employment before moving to the Forest Products Research Laboratory at Princes Risborough. Ten years later he moved to Shell, and was successively research chemist, technical information officer in the London office, and finally senior technical editor at the Thornton Research Centre near Chester. After his appointment by the Union he set up a 'publication office' in one room of his house, from which the office of the Union has grown through three metamorphoses to its present size. He was a perfectionist in all matters concerned with printing, and it is almost entirely his doing that *Acta Crystallographica* maintained its outstanding quality in format during a period of great expansion in content. Always pleasant and friendly in personal relationships, he was not afraid to take on the Editor, or even the Executive Committee, if any changes that would result in a deterioration of quality of production were proposed on grounds of economy.

St John's Church, Chester, played a great part in Stephen Bryant's life. He was Secretary of the parish council from 1957 till his death, and latterly also Secretary of the Chester Team Parish Council. His funeral took place at the Church on 31 December 1982, and in spite of the wintry weather was well attended by his family, his friends, and Union representatives whose affection and respect he had earned in the course of his work.

Professor **Dan McLachlan Jr** died on 3 December 1982. Born in Arcola, Saskatchewan, Canada on 5 December 1905, he earned a PhD at Pennsylvania State College in 1936 in the laboratory of Wheeler P. Davey. Dr Jenny P. Glusker writes that he held positions at Corning Glass Works, the American Cyanamid Company, the University of Utah, Stanford Research Institute, the University of Denver and Ohio State University, where he was Emeritus Professor of Mineralogy at the time of his death. He was the ninth president of the American Crystallographic Association, a member of the US National Committee for Crystallography and a US delegate to many international meetings. His scientific studies included the interpretation of X-ray photographs, the rapid calculation and representation of electron density maps, the solution of the phase problem from the point of view of the Patterson function, the extension of the Donnay-Harker law and representation of the results of crystal structure

analyses. He authored two books on crystallography and one on humor and was working on *Crystallography in North America* (published in April 1983) at the time of his death. He will be greatly missed at ACA meetings.

The *Acta Metallurgica* Gold Medal for 1982 has been presented to Professor **Charles S. Barrett** of the University of Denver Research Institute.

Professor **Sivaramakrishna Chandrasekhar**, Professor and Head of the Liquid Crystal Laboratory, Raman Research Institute, Bangalore, India, has been elected a Fellow of the Royal Society of the United Kingdom.

Dr **Ludo K. Frevel**, Fellow by courtesy at Johns Hopkins University, has been designated as the first recipient of the J. D. Hanawalt Powder Diffraction Award.

Professor **B. Post**, Physics Department, Polytechnic Institute, New York, has received the Bertram E. Warren Award of the American Crystallographic Association.

Professor **John Monteath Robertson**, formerly Professor of Chemistry, University of Glasgow, has been awarded the 1983 Gregori Aminoff Gold Medal and Prize by the Royal Swedish Academy of Sciences for his pioneering contributions to the application of X-ray crystallography for the structure determinations of organic molecules and related development of methods. This is the 4th time that the Aminoff prize has been awarded, the first recipient being Professor **P. P. Ewald** in 1979, the second Sir **Charles Frank** in 1981, and the third Professor **Gunnar Hägg** in 1982.

Professor **C. A. Taylor**, Department of Physics, University College, Cardiff, has been awarded the Institute of Physics Bragg Medal and Prize for his many contributions to physics education.

## International Union of Crystallography

*J. Appl. Cryst.* (1983). **16**, 361

### Report of the Twelfth General Assembly and International Congress of Crystallography

The Report of the Twelfth General Assembly and International Congress of

Crystallography, held in Ottawa, 16 to 25 August 1981, has been published in the May 1983 issue of *Acta Crystallographica*, Section A, pages 425–480.

*J. Appl. Cryst.* (1983). **16**, 361

### Report of the Executive Committee for 1981

The report of the Executive Committee for 1981 has been published in the May 1983 issue of *Acta Crystallographica*, Section A, pages 481–499. It reports on the meetings and publications of the Union, the work of its Commissions, and the work of bodies not belonging to the Union on which the Union is represented.

## 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 LS9 9JT, England). As far as practicable books will be reviewed in a country different from that of publication.*

*J. Appl. Cryst.* (1983). **16**, 361–362

**Developments in crystalline polymers.** Vol. 1. Edited by **D. C. Bassett**. Pp. 279. London: Applied Science Publishers, 1982. Price £32.00.

This is an interesting and well-written collection of review papers on the subject of crystalline polymers. There are five chapters in this volume. They are written by active researchers who are responsible for the important recent developments in the understanding of crystalline polymers. The chapters are written with sufficient introductory material that the book is quite comprehensible to those who may not be involved in the same area of research as the authors.

The first contribution is by D. T. Grubb on *Electron microscopy of crystalline polymers*. As the title suggests, this chapter is concerned with electron microscopy and its wide range of applications in polymer science. Introductory sections describe the major problems encountered, the methods normally applied to deal with them, and the limitations imposed by radiation damage. Moving on to describe recent developments, some are due to new instruments, particularly the scanning transmission electron microscope (STEM), others to methods of improving contrast such as defocus phase contrast and improved staining and etching techniques. The controversy over the presence of ordered domains in amorphous polymers is then briefly commented on. As the author has indicated, polymers suffer by comparison with other materials in