Laboratory Notes

J. Appl. Cryst. (1974). **7**, 406

A simple structure-building technique

A number of commercially available structure building kits are marketed (Walton, 1969) and many crystallographers construct their working models from miscellaneous pieces of wire and plastic. A simple structure-building technique is described that is inexpensive, easy to construct and use, and produces an attractive end product.

Small button magnets* are used to fix stainless steel welding rod ($\frac{1}{16}''$ diameter) perpendicular to a mild-steel base plate ($18\times18\times\frac{1}{16}''$). The wires are glued (Araldite) to the magnets so that the wire protrudes into the slot in the base. This enables the wires to be accurately located on the base. The other end of the wire is pointed and a short length of electrical plastic sleeving (4×1 mm bore) pushed on. The sleeve can be pushed up and down the wire to fix the coordinate perpendicular to the plane of the base and a predrilled polystyrene sphere† slid on. In use a suitable grid drawn on a sheet of paper is placed on the baseboard and held in position by the magnets placed to locate the atoms. The base should be painted to avoid corrosion and if the polystyrene balls are painted (Walton, 1969) an attractive and easily constructed model results. A schematic drawing of the method is shown in Fig. 1.

* Alnico button magnets (types 5757 and 5756) from Jessop-Saville Ltd., Brightside Lane, P.O. Box 94, Sheffield S9 2SS, England.

† 'Elford' polystyrene spheres (various sizes) from Philip Harris Ltd., Ludgate Hill, Birmingham, B3 1DJ, England.

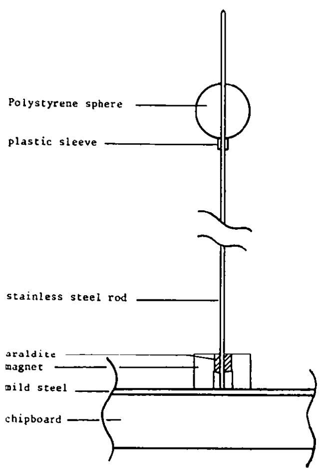

Fig. 1. A schematic drawing of the technique.

M. WEBSTER

Department of Chemistry
The University
Southampton SO9 5NH
England

(*Received* 5 *January* 1974; *accepted* 8 *January* 1974)

Reference

WALTON, A. (1969). *Progress in Stereochemistry*, edited by B. J. AYLETT and M. M. HARRIS, Vol. 4, p. 335. London: Butterworth.

J. Appl. Cryst. (1974). **7**, 406

X-ray polarization with a pyrolytic graphite crystal

Many experiments which could with advantage be carried out with polarized X-rays are precluded or made excessively tedious by lack of a source of sufficient intensity. New measurements on pyrolytic graphite have indicated that use of crystals of this material may, for certain wavelengths, provide a suitable source.

For Cu $K\alpha$ radiation, the 0006 of pyrolytic graphite diffracts at $2\theta=86{\cdot}87°$. As measured with a graphite crystal on a diffracted-beam monochromator [see Fig. 2(*b*) of Mathieson (1968)] using X-rays polarized by a similar crystal, the uncorrected ratio of the π to σ components is of the order of $<0{\cdot}007$. Correcting for the small π component in the incident beam gives $p_\pi/p_\sigma<0{\cdot}005$. The theoretical value for p_π/p_σ is 0·003 ($\equiv\cos^2 2\theta$).

An estimate of the effective intensity of polarized X-rays to be expected with a pyrolytic graphite crystal in any given experimental set-up is obviously difficult to derive. However where such a crystal has been used in a particular set-up as a monochromator for 0002 and Cu $K\alpha$ radiation, a guide can be offered. The ratio of the peak intensities 0006/0002 for the specimen studied (UCAR, grade ZYA, nominal 'mosaic' spread $0{\cdot}4\pm0{\cdot}1°$), as measured on the diffracted-beam device in the 'parallel' position [*i.e.* with $\varphi_\cup=180°$ in Fig. 2(*b*) of Mathieson (1968)] with polarized X-rays, is of the order of 0·16. For an unpolarized source, the overall effectiveness would be half this value. Combining this crystal with a high-power rotating-anode X-ray generator would provide an intensity of polarized X-rays suitable for many experiments.

It may be noted that, for Cr $K\alpha$ radiation, reflexion from the 0004 of pyrolytic graphite will yield efficient polarization of radiation of that wavelength. The π/σ components ratio (theoretical = 0·005) would not be as advantageous as for the Cu $K\alpha$ case but the reflexion efficiency would be higher.

L. D. CALVERT*
R. C. G. KILLEAN†
A. McL. MATHIESON

Division of Chemical Physics
CSIRO
P.O. Box 160
Clayton
Victoria
Australia 3168

(*Received* 18 *February* 1974; *accepted* 12 *March* 1974)

Reference

MATHIESON, A. McL. (1968). *Rev. Sci. Instrum.* **39**, 1834–1837.

* On leave from Division of Chemistry, National Research Council of Canada, Ottawa, Canada KIA OR9.

† On leave as SRC Senior Visiting Fellow from School of Physical Sciences, University of St. Andrews, North Haugh, St. Andrews, Fife KY16 9SS, Scotland.

Crystallographers

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, 13 White Friars, Chester CH1 1NZ, England).

Professor **J. D. Dunitz**, Professor of Chemical Crystallography at the Swiss Federal Institute of Technology in Zurich, was recently elected a Fellow of the Royal Society.

Professor **A. Guinier** of the University of Paris received the 1974 Fankuchen Award of the American Crystallographic Association for his wide-ranging contributions to teaching and research in X-ray crystallography. He delivered the Fankuchen Memorial Lecture at the Spring meeting of the A.C.A. at Berkeley.