

Laboratory Note

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A technique for controlling preferred orientation in powder diffraction samples*

The technique for forming spherical agglomerates from solids suspended in a liquid (Sirianni, Capes & Puddington, 1969) can be used on a laboratory scale with normal laboratory apparatus to eliminate, in the cases we tested, preferred orientation in X-ray powder diffraction samples. Smith & Barrett (1979) in a recent review have described the problem of obtaining a randomly oriented sample as 'probably the most difficult problem in sample preparation' and summarized methods for obtaining such samples. Apparently, liquid-phase agglomeration has not been used for this purpose. In this process (see e.g. references in Capes, McIlhinney & Sirianni, 1977), finely divided solids in liquid suspension can be agglomerated and separated from the suspending liquid by the addition of a small amount of a second liquid which preferentially wets the solid and is immiscible with the first liquid. With a certain amount of bridging liquid and suitable agitation (as in a laboratory sample shaker or high-speed domestic blender) the solids are separated as highly spherical bodies of controllable size. This process has become known as 'spherical agglomeration'. With water as the suspending fluid and varsol as the binding liquid (any hydrocarbon immiscible with water would be suitable), we have tested this technique on platy materials (graphite, talc and palygorskite) and fibrous brucite $[\text{Mg}(\text{OH})_2]$ from the Jeffery Mine, Quebec. Spheres ranging from 50 μm to 1 mm in diameter were produced. The size of the plates or fibres was reduced by grinding to considerably below that of the spheres desired. Transmission photographs of stationary specimens (either one large sphere or a few small spheres on a fibre mount) showed random orientation. As this technique uses ordinary laboratory apparatus and small amounts of material it should be of use to overcome problems of preferred orientation in powder specimens. For some materials the grinding required could result in line broadening which

might be a limiting factor in some applications.

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References

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- Sirianni, A. F., Capes, C. E. & Puddington, I. E. (1969). *Can. J. Chem. Eng.* **47**, 166-170.
- Smith, D. K. & Barrett, C. S. (1979). *Adv. X-ray Anal.* **22**, 1-12.

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, 5 Abbey Square, Chester CH1 2 HU, England).

Professor **J. M. Cowley**, Department of Physics, Arizona State University, USA, and Professor **M. M. Woolfson**, Department of Physics, University of York, England, have resigned as Co-editors of *Acta Crystallographica*. They have been succeeded by Professor **R. Collela**, Physics Department, Purdue University, USA, and Dr **B. T. M. Willis**, Materials Physics Division, AERE Harwell, England. Dr **S. Jagner**, Department of Inorganic Chemistry, Chalmers University of Technology and University of Göteborg, Sweden, has also been appointed a Co-editor, whilst Dr **M. Hospital**, Laboratoire de Cristallographie et de Physique Cristalline du CNRS, Talence, France, was appointed a Co-editor earlier this year.

A special model-making unit, employing handicapped people, is to be set up in the Department of Chemistry of the University of Edinburgh. The unit will be known as the Beavers Miniature Model Unit in Honour of Dr **Arnold Beavers**, who was Reader in the Department until his retirement two years ago.

Professor **E. C. Frank**, Henry Overton Wills Emeritus Professor, H. H. Wills Physics Laboratory, Bristol, England, has been elected a foreign associate of the USA National Academy of Engineering.

Dr **O. Kennard**, University Chemical Laboratory, Cambridge University, England, has received the 1979 Chemical Society Award in Structural Chemistry for her work with particular reference to biologically important molecules.

Dr **R. A. Laudise**, Director of the Physical and Inorganic Chemistry Research Laboratory, Bell Telephone Laboratories, Murray Hill, New Jersey, has been elected a member of the USA National Academy of Engineering.

Professor **J. V. Smith**, Department of Geophysical Sciences, University of Chicago, USA, has been awarded the 1980 Murchison Medal of the Geological Society of London in recognition of his distinguished contribution to crystallography, mineralogy and petrology.

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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Advances in X-ray analysis, Vol. 22. Edited by **G. J. McCarthy**, **C. S. Barrett**, **D. E. Leyden**, **J. B. Newkirk** and **C. O. Ruud**. Pp. xvii + 492. Plenum Press, 1979. Price, US \$ 42.50.

The articles in this volume, which is the proceedings of the 1978 Denver Conference, have been collected into seven sections: special techniques in powder diffraction; evaluation of XRD patterns; applications of XRD; instrumentation and laser sources; mathematical data analysis for XRF; XRF applications; XRF innovations.

In the first part of the book the authors consider problems in the analysis of materials by means of certain diffraction techniques, such as high- and low-temperature analysis, minimization of errors due to preferred orientation, and characterization of thin films, which allow the study of materials in the special conditions of employment.

In the second section, the principles of quantitative evaluation of the results of X-

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