Powder data

The powder data were obtained by a diffractometer (Toshiba ADG-301) using Cu $K\alpha_1$ radiation ($\lambda = 1{\cdot}54051$) filtered by Ni where Si powder was used as an internal standard. Intensities represent relative peak height.

Crystal physics

The crystals are uniaxially negative. The refractive index along **c** is $1{\cdot}79 \pm 0{\cdot}03$ and the birefringence is 0·010, for a W lamp. The melting point estimated by DTA is 1668 ± 5 K. Piezoelectricity was observed along **c** at room temperature. Moh's hardness is about 6·5.

Comparison with other results

Preliminary experiments on $BaZnSiO_4$ crystals showed that the crystal structure was essentially identical with that of $BaZnGeO_4$. The superstructure reflections of $BaZnSiO_4$ are weaker than those of $BaZnGeO_4$.

The author wishes to thank Professor H. Komatsu for comments on optical measurements. Support by the Grant-In-Aids from the Ministry of Education of Japan is acknowledged.

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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).

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Professor **A. V. Crewe**, of the Departments of Physics and Biophysics and the Enrico Fermi Institute of the University of Chicago, USA, has been awarded the Duddell Medal and Prize of the UK Institute of Physics for his development of an ultra high resolution scanning transmission electron microscope.

Professor **K. H. Jack**, of the Crystallography Laboratory, University of Newcastle upon Tyne, has been elected a Fellow of the Royal Society.

Professor **G. A. Jeffrey**, of the Department of Crystallography of the University of Pittsburgh, has been awarded the 1980 Claude S. Hudson Award of the American Chemical Society for his contributions to the chemical profession with special reference to carbohydrate chemistry. The Award will be made at the San Francisco ACS Meeting on 27 August 1980. The award address will be entitled 'Crystallography, Quantum Mechanics and Carbohydrates'.

Professor **D. Turnbull** of Harvard University has been awarded the 1979 *Acta Metallurgica* Gold Medal. His research interests include nucleation and growth in crystals, diffusion in solids and liquids, solid state reactions and the nature of the glassy state.

Dr **B. G. Williams**, formerly at the University of Dar es Salaam, Tanzania, has been awarded a Royal Society senior research fellowship at the Department of Physical Chemistry at the University of Cambridge.

Notes and News

Announcements and other items of crystallographic interest will be published under this heading at the discretion of the Editorial Board. The notes (in duplicate) 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).

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CHESS. Cornell high energy synchrotron source

Proposals are now being accepted for experiments to be carried out at CHESS, the new high energy synchrotron radiation facility at Cornell University, Ithaca, New York. Presently, three beam lines are fully operational and supply radiation for four experimental stations. These stations have available intense polarized radiation at energies in the hard X-ray range (a few keV and above). The characteristic energy of the radiation will be in a range up to 35 keV. Proposals exploiting this unique feature of the facility will receive preference. CHESS will provide the capability to facilitate studies in EXAFS, X-ray topography, small-angle scattering, Compton scattering, deep-level spectroscopy, and X-ray crystallography, but proposals need not be limited to these areas.

Proposals should be submitted by 31 August 1980. Beam time will be allocated according to the recommendation of a proposal review panel and the expected schedule of operation of the CESR storage ring.

Proposals should be sent to Proposals Secretary, CHESS, Clark Hall, Cornell University, Ithaca, New York 14853, USA.

Details on current instrumentation and available facilities can be obtained from B. W. Batterman, Director, or N. W. Ashcroft, Associate Director. Telephone: (607) 256-5161.

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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Fundamentals of crystal growth

1. By *F. Rosenberger*. Pp. x + 530. Berlin: Springer, 1979. Price DM 79, US $ 39.50, *ca* £ 18.

Rather more than £1000 million are spent annually growing 5000 tonnes of crystals for solid-state devices which seem always to need bigger, cleaner, more perfect and cheaper crystals of an ever increasing range of materials. These demands can only be met by people who understand the processes occurring in their apparatus. However, the necessary

theory uses concepts from many disciplines and there has long been a need for a book setting out the basic science. This book is the first volume of a trilogy aimed to meet this need. The subjects treated are correctly indicated by the subtitle *Macroscopic Equilibrium and Transport Concepts*.

Five main chapters (in total about 200 000 words with 271 figures and many useful tables) deal with the relevant aspects of thermodynamics, phase relations and the transport of heat and mass. Each topic is introduced simply, the relevant parameters are then discussed and the general relations established. Since the general relations are usually too complex for most purposes, the approximations needed to make usable solutions possible are then discussed in detail. For the expert this examination is invaluable because the ranges over which the approximations are acceptable are often much smaller than is commonly believed.

Professor Rosenberger is a skilled author and he has taken great trouble to ensure that even with detailed arguments the reader is never bored. His enthusiasm for his subject is catching, particularly when presenting arguments based on thermodynamics, which occupy more than half the book. Because the subject is interdisciplinary, the treatments given expect only minor previous knowledge: a passing acquaintance with differential calculus is needed, but any undergraduate in a physical science should have little difficulty in following the arguments or solving the problems given (with answers) at the ends of the chapters. Thus the book can safely be recommended to anyone interested in the subject.

Any book can be criticized. The purists will complain that this one does not give credit to all the authors who have contributed to the arguments. However, in a text book it seems sensible to concentrate on references which give complete derivations and relevant data and to rely on these secondary sources to give credit to those who deserve it. Possibly a more relevant criticism is that the treatment of hydrodynamics is not complete. In part this is not the author's fault. The Navier–Stokes equations even with the Boussinesq approximation are not very tractable. An excellent account is given of linear stability theory in unstirred liquids but the treatment of the important systems with disc-like stirrers stops at the infinite disc in a semi-infinite liquid. Treatments of finite-depth liquids (even with rotation) are available and a warning should have been given that with finite discs not all the liquid is stirred. However, this may well not be fair criticism, since a semi-empirical analysis would fit better in the third volume which we are told deals with the theory of real systems.

Judged by the first volume, the set of three should be a standard work for many years to come.

J. C. BRICE

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Crystal growth bibliography. Solid state physics literature guides, Vol 10. Compiled by *A. M. Keesee, T. F. Connolly* and *G. C. Battle* Jr. Pp. viii + 430 (Vol. 10*A*), pp. iv + 568 (Vol. 10*B*). New York: Plenum Press, 1979. Price US $ 95.00

This bibliography belongs to the *Solid State Physics Literature Guides* series and includes about 5000 references on the crystal growth of inorganic materials. The references are concerned with experimental, theoretical and review papers as well as technological reports and books published from 1972 to 1977. The bibliography is divided into two volumes, one of which contains all of the bibliographic citations and the other presents permuted title and author indices.

As far as the crystal growth of inorganic materials is concerned, this bibliography is covenient to search for a paper from its author(s) and from the subject which appears in the title of the paper, especially the name of the material or its chemical composition and the method or mechanism of crystal growth. However, it is a little incovenient to find some desired papers in the categories Czochralski, epitaxy, film, flux, melt, silicon, solution, theory and transport, because so many papers are listed according to the alphabetical order of representation of the title and there is no similarity among neighboring papers. I would say, if these parts were classified into much finer items, it would become more convenient to use this bibliography. Due to a trick of computer permutation, we find some curious classifications such as II, *X*, substrate, temperature and so on.

It is a matter for regret from the view point of crystal growth that there are no papers about crystal growth published in mineralogical, geological and meteorological journals. For example, the nucleation and growth of water vapor or the formation of clouds and snow are very interesting and are also important subjects in science and even in technology. Minerals can also teach us many mechanisms and histories of crystal growth.

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