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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Coherent inelastic neutron scattering in lattice dynamics. By B. DORNER. Pp. viii + 96. Berlin, Heidelberg, New York: Springer, 1982. Price DM 44.00, US $20.80

Bruno Dorner has spent the last decade as helper and collaborator to numberless experimenters wishing to measure phonon dispersion curves by neutron coherent inelastic scattering. This book condenses the wisdom learnt from these experiments with excellent detailed chapters on the analysis of phonon dispersion curves through lattice dynamics, the calculation of phonon intensities, and the analysis of phonon linewidths. The work is presented as a sandwich, with experiment and theory intermingled, each illustrated by sample experiments taken from the work of the author and his collaborators. One must say what the book does not attempt to be. The introduction is very brief and the reader must look elsewhere to find out what a phonon is, or how you go about measuring a phonon dispersion curve. I was disappointed that the chapter on triple-axis spectrometer techniques, which the author is so well qualified to write, consists of only 8 pages in which to cover history, monochromator performance, higher-order contamination, resolution, focusing and horizontal and vertical curved focusing monochromators. Never mind, the real meat of the book comes next with a masterly account of the measurement of phonon intensities in complicated structures. This represents a really welcome addition to the literature. For a native German Dorner's English is faultless, his Germanic origin only showing in his precise logical style. Within its self-imposed limitations this is an excellent book. I hope one day Dorner will give us a complete account of the history, development and use of this most successful field in solid-state physics.

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Neutron cross sections, Vol. 1. By S. F. MUGHABGHAB, M. DIVADEENAM and N. W. HOLDEN. Pp. x + 850 approx. New York: Academic Press, 1981. Price US $58.00.

The famous *Barn Book Resonance Parameters* report BNL-325 has now been re-issued in a fourth edition in a standard book format, published in two volumes covering atomic numbers $Z = 1$ to 60 and $Z = 61$ to 100. This definitive set of data for nuclear and reactor physicists describes in a parameterized form the many sharp peaks or resonances in the neutron cross sections. The method of parameterization derived from the Breit–Wigner theory of neutron resonances is clearly described in the initial chapters. The resonance parameters given here can then be used by computer codes to recalculate the neutron cross section or any derived function of it. The book also contains definitive values for the thermal cross sections which are also of great interest to condensed-matter scientists. The book is clearly a product of the latest technology with all the hundreds of tables faultlessly presented as only computers can. The second volume contains an innovation in a table of strong resonances from all the elements ordered in energy. This will clearly be of great importance to the new field of resonance radiography by helping scientists to identify unknown isotopes in their samples.

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Neutron scattering. (Vol. 15 of **Treatise on Materials Science and Technology**). Edited by G. KOSTORZ. Pp. xxv + 523. New York: Academic Press, 1979. Price US $66.50.

Neutron scattering has plenty of disadvantages as a technique in materials science. It is expensive, restricted to a few centres at reactor and accelerator institutes, and, for most users, somewhat bound in red tape. Experiments can rarely be done at the whim of the experimenter but only after lengthy form filling, deliberations of committees and negotiations of scheduling times. Why then is there in the words of the foreword 'current mounting excitement about neutron scattering studies' in materials science? This book explains why. It is the sheer breadth of the neutron techniques and frequently the uniqueness and directness of neutron results which make them worth all the trouble. I can never forget my own past, when after spending years measuring exchange interactions in a particular salt by spin resonance, I was able to get a much better result in weeks on a neutron spectrometer. It is the neutron's ability to penetrate centimetre-sized samples that has given neutron scattering a special place in applied materials science. Now neutron scattering, especially neutron small-angle scattering, is