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Fifty Years of Electron Diffraction

Fifty Years of Electron Diffraction was published in 1981 by D. Reidel Publishing Company for the International Union of Crystallography and is edited by Peter Goodman, CSIRO, Melbourne, Australia. This important publication is the first of its kind to present the history and the current status report of this rapidly growing subject. It provides a

valuable reference source for students and researchers in the associated fields of crystallography, scattering physics, molecular structures in gases and the electron microscopy of solids. Part I gives a lively, newly researched account of the pioneer period, 1924–1928, when industrial research and early quantum mechanics produced the first definite evidence for electron diffraction. Part II completes the history with memoirs from 36 of the most distinguished scholars in the field. Part III is a text-level reference on six branches of the subject, ranging from scattering theory through to structure analysis. Liberally illustrated, the volume incorporates a comprehensive literature survey.

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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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Crystals: growth, properties and applications. Vol. 4. Edited by H. C. FREYHARDT. Pp. 219. Berlin, Heidelberg, New York: Springer Verlag, 1980. Price DM 98.00, US \$ approx 57.90.

This volume contains three independent review articles. Each article is well organized, thorough, clear, and, therefore, easy to read. Each includes much practical information about experimental methods and results, with ample discussion of underlying theory.

The first article is *High purity organic molecular crystals* by Norbert Karl. The article begins with a section on purification, which concentrates principally on zone refining, but also discusses sublimation, distillation, recrystallization, chromatography, chemical reaction, and synthesis. Next is a section which covers methods of growing single crystals, including Bridgman, sublimation, pulling, solution, and melt methods. The next section discusses characterization of the crystals, including analysis of their purity and structural perfection. Finally, two sections cover the preparation of oriented and polished specimens, and applications of the materials. This article has 100 pages and 315 references.

The second article is *Rare-earth germanates* by Ludmila N. Demianets, Anatoly N. Lobachev & Gennadi A. Emelchenko. The first section reviews the crystal structures of these materials. The second section discusses single-crystal growth; it concentrates mainly on hydrothermal methods, with a brief discussion of solution (flux) methods. The final section discusses characterization of the materials, principally by spectroscopic methods. This article has 44 pages and 102 references.

The third article is *Growth, properties, and applications of narrow gap semiconductors* by Horst Maier & Joachim Hesse. This article discusses $\text{Pb}_{1-x}\text{Sn}_x\text{Te}$, $\text{Pb}_{1-x}\text{Sn}_x\text{Se}$, and $\text{Hg}_{1-x}\text{Cd}_x\text{Te}$, and their applications as infrared detectors and laser diodes. First, the material requirements of these devices are discussed. Then a discussion of the phase diagrams of the three systems is given. Two following sections cover the growth of single crystals and epitaxial films. Melt, solution, vapor, Bridgman, zone melting, travelling solvent, solid-state recrystallization, and annealing methods are discussed. Liquid phase, vapor phase, molecular beam, and r.f. sputtering methods of epitaxial film growth are covered. The final section discusses infrared detector and laser diode device structures and technologies. This article has 75 pages and 249 references.

This book is highly recommended to anyone interested in the subjects covered. It will be found useful whether or not the reader has previous experience in these subjects.

M. D. LIND

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Structural phase transitions. I. Edited by K. A. MÜLLER and H. THOMAS. Pp. x + 190. Berlin: Springer Verlag, 1981. Price \$29.50, DM 50.00.

With the inevitable increase in the degree of specialization, one encounters the problem of either having single-author