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Optical determination of rock-forming minerals (*W. E. Tröger*). **Part 1: Determinative tables** (English edition of the 4th German edition). By *H. U. Bambauer, F. Taborzky* and *H. D. Trochim*. Pp. 188. Stuttgart: E. Schweizerbart'sche Verlagsbuchhandlung, 1979. Price DM 48.00.

Following the arrangement of Tröger, and using Strunz's mineral names and structural formulae, this is undoubtedly one of the most comprehensive set of tables for the optical determination of rock-forming minerals. The tables are clearly and logically presented and the determinative diagrams are cross-referenced by each mineral having its own number. The section on monograms contains all the standard charts, but, in the interests of completeness, could well have included the one for Tobi's method of determining the optic axial angle, 2*V* or 2*E*. This book is likely to remain the standard work for many years to come.

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Current topics in materials science. Vol. 1. Edited by *E. Kaldis*. Pp. xi + 761. Amsterdam: North Holland 1978. Price, US $ 115.50, Dfl. 260.00.

This book is a timely collection of topics having relevance to current materials work. It is said to be the first of a planned series concerned with advanced materials technology. The approach employed in this volume is of particular value to individuals conducting materials development work since the background needed for many of the more important current materials problems is generally not covered within the training provided under a single academic discipline. This text primarily consists of topical reviews digested from the technical literature combined with experiences of the respective authors. Fundamental aspects of crystal growth mechanisms are treated in the first three chapters with particular emphasis on materials having importance to advanced electronic device technologies. An entire chapter is devoted to whisker growth processes which have not only intrinsic scientific interest but also considerable technological importance relative to electronic device reliability. The following two chapters are devoted to important special crystal film growth techniques used in the fabrication of high-frequency electronic devices. These treatments include theoretical modelling of the wide variety of atomic mechanisms taking place at silicon crystal surfaces. In addition, experimental details are discussed in sufficient detail to give a feeling for the operation of such fabrication techniques as chemical vapour deposition systems. The growth mechanism and important properties of other crystals such as $LiNbO_3$ are discussed in other chapters. Finally, one chapter discusses a few aspects of metal–hydrogen alloys. While this chapter concentrates on the Nb–H system for modelling hydrogen–lattice interactions, it includes many interesting details concerning mechanisms appropriate to storage alloy hydrides which have vast importance for potential renewable energy systems. The absorbed hydrogen atoms are pictured as residing in interstitial sites with associated large lattice expansion effects which induce observed phase transformations.

This volume is highly recommended for materials scientists and engineers whose work involves them in appropriate aspects of advanced materials technology. It should be of considerable value to individuals involved in either fundamental materials research or device fabrication technologies.

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Diffraction and imaging techniques in material science. Revised second edition. Edited by *S. Amelinckx, R. Gevers* and *J. Van Landuyt*. Pp. xvii + 847. Amsterdam: North-Holland, 1978. Price $109.75, Dfl. 225.00.

The review of the first edition by M. Prutton [*Acta Cryst.* (1972), A**28**, 223–224] gave the book very high marks. The single volume contained the proceedings of a 1969 NATO summer school whose goal was to teach at an advanced level recent developments in the field. Continuing demand for copies after the first edition was exhausted has led to this second revised edition, providing ample support of the reviewers' opinions. This two-volume second edition under a slightly different title (the initial word 'modern' has now been dropped) is of a quality no less than that of the first. In many instances detail in the electron micrographs has been improved. Plaudits to the publishers who did not try to rest on their laurels. By contrast, many of the errors that inevitably slip past authors, editors and proof readers have reappeared in the revised edition. While most of the errors that have caught my eye are not likely to mislead the reader, the missing exponent 2 in equation 57 of Gevers' paper (page 28) could cause trouble. An *errata* sheet is clearly indicated.

Not only have the authors updated and expanded their original contributions to varying degree in the texts (15% increase) and especially in the bibliographies (42% increase) but three additional articles have been added while the three-article set on the scanning electron microscope (Booker) has been omitted. In the preface to the second edition the editors provide no explanation or reason for this last change.

The additions clearly enhance the value of the new edition because the articles added are significant parts of the field. The most important is a masterful presentation on the weak-beam method (Cockayne). The paper on direct structure imaging (van Dyck) may present many readers with problems since it does not use the terminology and mathematical forms developed in the introductory chapters on electron diffraction. It also provides insufficient introduction to the crystallographic concepts required to follow the explanation of the examples used in the experimental section. However, the addition of the computer program in the appendix will be appreciated by many a student in the field. Advanced workers may appreciate the essentially theoretical presentation of the study of substitutional order–disorder by diffraction (de Ridder).

The absence of the SEM contributions (Booker) is difficult to understand and represents a genuine loss. In particular, the absence of the discussion on electron channelling effects introduces a major gap in the otherwise excellent coverage of all pertinent electron diffraction pheno-