

For anything more elaborate, I knew that I would have had to perform a literature search from Goldschmidt's 1964 volume onward. Such a search is now unnecessary, because of the availability of this excellent treatise.

The all-encompassing coverage of this text is furthered by the professional range (industry to academe; materials science, crystallography, and engineering) and geographic range (USA to Germany) of the four authors.

Coverage includes the fundamental principles of the techniques involved, the instrumentation used, as well as a wide variety of practical applications of high temperature diffraction, with many clear drawings and photographs. A wide range of relevant topics is covered, such as the use of high intensity sources permitting, for example, improved time resolution; various position sensitive detectors including linear and area ones; in situ process analysis and other examples of applications.

This volume is suitable as an advanced level textbook or as a reference book and can be highly recommended.

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CONCISE ENCYCLOPEDIA OF MATERIALS CHARACTERIZATION, edited by R. W. Cahn and E. Lifshin. Pergamon Press, New York, 1993, 641 pages, price \$300.

Pergamon Press published the eight volumes of the Encyclopedia of Materials Science and Engineering in 1986. Supplementary volumes followed in 1988 and 1990. This well-known and highly respected reference work covers some 7700 pages. To make this material more easily accessible to workers in restricted fields, a series of concise encyclopedia has been extracted from the larger resource. Some articles have been revised and some new ones have been added.

It is not really possible to review in detail an encyclopedia containing 116 articles by different authors. To give you an idea of the range of topics covered, here is an alphabetical listing by title of a few articles from the beginning, middle, and end, with author, number of pages, and number of references in parentheses.

- Acoustic Emission (C. A. Tatro, 3, 15).
- Acoustic Microscopy (R. Gilmore, 5, 11).
- Adhesives: Tests for Mechanical Properties (W. J. Renton, 5, 9).
- Anodization Spectroscopy (M. G. Blamire, 2, 4).
- Art Forgeries: Scientific Detection (S. J. Fleming, 6, 27).
- Microstructural Evolution: Computer Simulation (D. J. Srolvitz, 10, 20).
- Microtextural Analysis (R. W. Cahn, 3, 13).
- Mössbauer Spectroscopy (U. Gonser and F. Aubertin, 8, 27).
- Neutron Radiography (D. A. Garrett, 2, 3).
- Nuclear Magnetic Resonance Spectroscopy (E. A. Williams and P. E. Donahue, 4, 7).
- X-Ray Diffraction, Time Resolved (M. Sutton, 3, 11).
- X-Ray Fluorescence Spectrometry (E. P. Bertin, 7, 5).

- X-Ray Microanalysis, Quantitative (J. C. Russ, 3, 5).
- X-Ray Powder Diffraction (W. Parrish, 7, 12).

There is clearly a wide range of useful articles, covering old as well as recently developed techniques, written by experts. An outline of both theory and practice is given to the extent permitted by the space, with many high quality drawings and clearly reproduced photographs.

In sum, an excellent resource both for scientists, engineers, and technicians working in materials characterization as well as for others who might have need of such information.

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ELECTROCHROMISM: FUNDAMENTALS AND APPLICATIONS, by P. M. S. Monk, R. J. Mortimer, and D. R. Rosseinsky. VCH Publishers, Weinheim, FRG, 1995, xxiii + 216 pages, price \$98 hardcover. ISBN 3-527-29063-X

This book is short but comprehensive. The inorganic electrochromic materials described are mostly oxides, anhydrous and hydrous. Oxides covered include those of W, Mo, V, In, Co, Ni, Fe, Mn, Nb, Ir, Pd, Rh, Ru, Nb, and various mixtures. Other inorganic materials described include metal phthalocyanines and cyano complexes. Organic electrochromic systems discussed include those based on bipyridilium, polyaniline, polypyrrole, polythiophene, carbazoles, and quinones.

This book rather exhaustingly describes known electrochromic materials. In addition, it nicely describes the mechanism of electrochromism and the various potential device applications for electrochromic materials. One important application is for displays, especially large area displays. So far electrochromic devices have not competed well with other display devices, such as liquid crystal displays. There are, however, other potential applications for electrochromic materials, such as windows with controlled transmittance or mirrors with controlled reflectivity.

This book is recommended for anyone considering research in the area of electrochromic materials or electrochromic devices. The book is well-organized and well-written but the near total lack of color photographs is very disappointing. One is left with the feeling that perhaps photochromic devices in their present state of development are not very impressive to the eye.

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