Zeolite Molecular Sieves. By *A. Dyer*. Wiley, Chichester 1988. xi, 149 pp., bound, £ 25.70.—ISBN 0-471-91981-0

Crystalline microporous solids replete with cavities and channels of molecular dimension (3 to 10 Å diameter) are all the rage these days. Not only are they important, as they have been for several decades past, as adsorbents, ion-exchangers and catalysts, they are also promising materials for applications such as second harmonic generation (in laser technology), as the basis of novel microdevices for electro- and photo-catalysis, and potentially as novel membranes in a range of new laboratory-scale and commercially viable fuel cells.

Good books on the fundamentals of zeolite structure and properties exist already, the ones by *Breck* (Wiley, 1974) and *Barrer* (Academic, 1978) and Special Publication No. 23 "The Properties and Applications of Zeolites" (edited by *R. P. Townsend*, the Chemical Society, London, 1980) as well as ACS Symposium Series 218 on "Intrazeolite Chemistry" (Ed. *G. D. Stucky* and *F. G. S. Dwyer*), being particularly noteworthy. There is also a relatively large collection of admirable review articles devoted to various aspects of the science and technology of zeolites which have appeared in the last five years.

This book adds very little to the information already collated in the open literature. It consists of ten brief chapters, the contents of which provide hardly any new items of information and precious few chemical or other surprises. For that reason alone it cannot be recommended as a favored introductory text, which is what it purports to be. In parts the text reads like advertisers copy. Thus, on p. 84, we are told in arid terms that horticultural applications (of clinoptilolite and mordenite) generally use 5 to 10% incorporation of the zeolite into growing media. "The value of this has been shown in the production of tomatoes, bell peppers, house plants and strawberries", and that "obviously ion exchange has a role in these phenomena".

There are a number of misprints. On p. 81 there is talk of "large part mordenite" (not large port) and Figure 80 is labelled 'Tonic' rather than 'Ionic' radius.

More serious, however, is the improper use of figures and micrographs published elsewhere. Figures 42 and 43, for example, appeared in ACS Symposium Series 218 (p. 183, (1983)) and the Springer Series in Surface Science 5 (p. 124, 1986). Had the senior author of these original publications been consulted, and his permission to re-publish sought (a common courtesy), this text would not, as now, be in breach of copyright law.

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Problem-Solving with Microbeam Analysis. By *K. Kiss*. Elsevier, Amsterdam 1988. 410 pp., hard cover, Dfl 245.00.—ISBN 0-444-98949-8

Microbeam techniques have matured into appropriate methods for the characterization of materials on the micron- and even submicron scale. During the last two decades, instruments such as the electron microprobe and the scanning electron microscope went on the production line and are now in third generation development. Other instruments, e.g. the electron- and ion probes have been constructed and have become commercially available, and, although numerous further instruments have been designed and significant applications have been announced, their ultimate breakthrough has not yet been achieved.

On the other hand, the characterization of microstructures is of high-ranking value in quality assurance and materials research. More and more applications become known, and more commercially available instruments become useful in the guidance of research, especially in high-tech industries. Obviously, each one of these techniques has special capabilities, but none of them are suited to uniquely cope with all the complex problems. Besides, instrument prices in the range of 100 000 to 600 000 US $, and operation costs are very high.

Each technique has its own specific literature, but apart from reviews and proceedings, there exists as yet no survey on the various techniques and their respective fields of application. This book fills this gap and will help engineers, analysts and scientists facing various microanalytical problems to work with those techniques or to select the above mentioned expensive intruments.

Part 1 deals with optical and electron microscopy, X-ray and electron spectroscopy, with ion beam methods as well as Raman and laser techniques. One chapter summarizes those methods especially used for the control of microelectronic devices, another is devoted to the combination of complementary techniques and the last chapter is involved with the strategy of selecting the most suitable technique for solving the problem.

Part 2 includes a great variety of case histories and selected applications of the various techniques. Two entire chapters are devoted to synthetic polymers and microelectronics, a third to miscellaneous problems in metallurgy and corrosion as well as glasses and ceramics, catalysts, fibers, food products, cosmetics and the environment. The numerous examples of failure analysis and trouble shooting reflect the author's wide experience. The book concludes with a bibliography of 829 references, a glossary of acronyms and a subject index with about 1200 keywords.

The advantages and limitations of the individual techniques are evaluated adequately and critically and listed concisely. It is intentional that the finer details of the various methods have been omitted or abridged. However, this reviewer would have wished for some more fundamental information on particular techniques: (i) Optical microscopy is insufficiently described. The principle is mentioned, and some variants such as phase or interference contrast microscopy are discussed briefly, but knowledge of the fundamental figures of merit like spatial resolution, magnification and depth of field are assumed. (ii) X-ray spectroscopy is, in general, based on the Moseley law, and focusing spectrometers fulfill the Rowland condition: no mention is made of either of these two rules. On the other hand, an entire page (p. 54) is spent on artifact peaks called escape-peaks, although the formula $E = E_c - 1.74$ keV would have been self explanatory. (iii) The chapter describing electron spectroscopy in only eleven pages is meagre throughout and in this case a comparison of advantages and limitations is missing. (iv)