

and repetition of material has generally been avoided. Overall it should be most strongly recommended.

J. N. WALSH

Brown, M. E. *Introduction to Thermal Analysis: Techniques and Applications*. London and New York (Chapman and Hall), 1988. viii + 211 pp., 113 figs. Price £17.50.

Most mineralogists are familiar with differential thermal analysis and thermogravimetry, and possibly with differential scanning calorimetry and evolved gas analysis, but what about thermomagnetometry, emanation thermal analysis and thermosonometry? All is revealed in this fluently written book. Following a prominent definition of thermal analysis (the measurement of changes in physical properties of a substance as a function of temperature whilst the substance is subjected to a controlled temperature programme) and two introductory chapters, these techniques and many others are described systematically, starting with theory and principles, through relevant equipment, ending with well chosen examples of applications (a good number of these from the Earth Sciences). There are also chapters on the use of microcomputers in thermal analysis, derivation of reaction kinetics from thermal analysis data, and purity determinations of compounds from measurement of melting points, and guides are given to the literature of thermal analysis and to the main manufactures of thermal analysis equipment. Appendices list introductory experiments in thermal analysis and computer programs for data capture and processing.

This book is an excellent introduction to thermal analysis both at the undergraduate level and for established workers in other disciplines who might wish to apply these techniques in their research. It is also priced realistically!

D. J. MORGAN

Dyer, A. *An Introduction to Zeolite Molecular Sieves*. Chichester (John Wiley & Sons), 1988. xiii + 149 pp., 94 figs. Price £29.50.

This short but rather expensive book is intended as a general introduction to zeolite science and covers the geological occurrences of zeolites, structures of natural and synthetic forms, techniques used to characterize zeolite structures, their synthesis and stability, and the theoretical and practical background to the uses of zeolites as ion exchangers, catalysts, molecular sieves and

drying agents. It concludes with a short account of recent research into the synthesis of zeolite-like compounds containing Ga, Ge or P substituting for Si and Al in framework sites.

Although useful and readable summaries are given of zeolite structures, synthesis and uses, the overall value of the book is marred—most certainly for a mineralogist—by a superficial account of the genesis of natural zeolites (one section heading reads ‘hydrothermally treated’ for hydrothermally-formed zeolites) and a very poorly organized account of methods for zeolite structure identification. Under ‘X-ray methods’, X-ray diffraction gets a very brief treatment and the reader is left in doubt as to exactly *how* diffraction data are used to determine structures; in this section the statement is also made that X-ray fluorescence analysis is normally limited to atoms of atomic number greater than 20. Scanning and transmission electron microscopy are dealt with under ‘Other diffraction techniques’ and the section on nuclear magnetic resonance spectroscopy fails to explain satisfactorily the principles of this powerful technique for determining atom distributions within zeolite frameworks. Techniques are not, in fact, a strong point of this book: a separate chapter on the relative stabilities of zeolite structures to heat makes extensive use of differential thermal analysis and thermogravimetry but is illustrated by very poor-quality curves—for instance, the DTA curve in Fig. 82 is featureless and shows marked baseline drift, yet is cited as an example of quantification of a dehydroxylation process.

There is no doubt that parts of this book should have been subject to a more critical pre-publication review than has obviously been the case. Unfortunately, there is also little evidence of serious proof checking—the old favourite ‘minerologist’ and ‘phosphorous’ appear in Chapter 4, ‘data’ are often treated as singular, and the horizontal axis of Fig. 80 has ‘tonic’ for ionic radius. The idea for this book was a good one but the author has been badly served by his publishers.

D. J. MORGAN

Kalló, D. and Sherry, H. S. (editors). *Occurrence, Properties and Utilization of Natural Zeolites*. Budapest (Akadémiai Kiadó), 1988. xii + 857 pp., 256 figs. Price \$69.00.

Synthetic zeolites are used extensively by the petrochemical industry as catalyst and as molecular sieves to separate, on the basis of size and/or shape, components of liquid or gaseous mixtures. They are also now important constituents of