McCarthy (G. J.), Editor. *Scientific Basis for Nuclear Waste Management: Volume 1.* New York and London (Plenum Press), 1979. xviii + 563 pp., 175 figs. Price $49·50.

As part of its 1978 Annual Meeting in Boston, Massachusetts, the Materials Research Society held a symposium entitled 'Science Underlying Radioactive Waste Management'. This proved such a success that a similar symposium was included in the 1979 Annual Meeting and now looks like becoming an annual event. This weighty volume contains 72 of the 79 papers presented at the 1978 meeting, and is designated volume 1 in anticipation of annual publication of the symposium proceedings.

Geology and geologically orientated materials science have been a major component of radioactive waste management research since the early days when it was considered that near surface or very deep burial was the safest and most convenient method for disposal of the various wastes involved. As reflects the emphasis of the times, the majority of papers in this volume concern disposal of the so-called 'high-level' wastes, that is those produced as spent power reactor fuel elements, or reprocessed from them. These wastes present a unique disposal problem, since apart from their biotoxicity and radioactivity they also emit heat for many hundreds of years after their production. The general concept for their disposal is by deep burial in a mined facility in granite, salt, or clay.

The scope of the papers is essentially limited to materials chemistry, geochemistry, and mineralogy, and apart from the keynote address very few of the papers deal with broad disposal concepts. Over half of the papers are concerned with either fabrication or properties of various solid waste forms (glass, ceramic, metal matrix, and also cements for intermediate level wastes). Unfortunately A. E. Ringwood's presentation on immobilization in SYNROC, a novel proposal at the time, does not appear in this volume. A further three papers discuss the corrosion properties of various canister materials which may be used to contain the solid waste form.

Mineralogists will undoubtedly find many of these earlier papers fascinating, as the incorporation of radionuclides in aluminosilicates and titanates presents special problems and to many will be a novel and unfamilar field. The bulk of the waste form papers deal with glasses; their manufacture, radiation stability, and leaching and dissolution behaviour in natural groundwaters. Several of these papers examine natural, geologically occurring, glasses.

The remainder of the book examines the effects (thermal and radiation) of the wastes on the host rock and the geochemical interactions of radionuclides leached from the solid form with the surrounding rock envelope. The two rock types emphasized are evaporites and crystalline igneous materials. It is this section of the volume which will be of considerable interest to the environmental geochemist. Many of the papers deal with experimental studies of sorption processes in rock/groundwater systems during migration and the modelling techniques used to perform dose and safety assessments. Additionally several papers examine direct injection into the ground of various waste types as either liquids or cement slurries.

Whilst the book is already quite thick (and well produced from camera-ready copy) it is perhaps a pity that no space was allotted for discussion of papers, as this often sheds most light on the atmosphere of current opinion at such a meeting. Whilst the aspects considered are somewhat limited, combined with a little background reading this volume should give a newcomer to this rapidly expanding and crucial field of geochemical research a reasonably up-to-date overview of the problems of nuclear waste disposal. As a regular publication perhaps the nearest equivalents in style are the Lunar Science Conference proceedings.

N. A. CHAPMAN

Pies (W.) and Weiss (A.). *Crystal Structure Data of Inorganic Compounds. Part c. Key Elements: N, P, As, Sb, Bi, C. c2: Key Elements P, As, Sb, Bi (Substance Numbers c1134–c3338).* (Landolt-Börnstein: Numerical Data and Functional Relationships in Science and Technology, New Series. *Group III: Crystal and Solid State Physics. Vol. 7*). Springer-Verlag. Berlin, Heidelberg, and New York, 1979. xxvii + 452 pp., 14 figs. Price DM 550 ($302.50).

Following publication in 1978 of the tables of structural data for nitrogen compounds (*Mineral. Mag.* **43,** 563) this volume, the latest in the series (*Mineral. Mag.* **43,** 187) continues the data for this group of elements by providing full structural data on all inorganic compounds containing the key elements P, As, Sb, Bi. The compounds thereby covered include the phsophates and arsenates, compounds rich in mineral counterparts. However, prior to the production of an alphabetical index to the series reference must be made through a precise knowledge of a mineral's chemical formulation. Even then not all minerals are included, presumably due either to the lack of a known synthetic equivalent or to the lack of suitable structural data. Again the work, although very expensive, can be recommended to crystal structural laboratories.

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