

are scattered throughout the book, but are concentrated on the descriptive sections, and in particular include expansion of the chapter on synthetic gemstones to take into account new developments in this rapidly expanding field, and an interesting complete re-write of the chapter on the origin of diamond. The colour drawings of previous editions have been replaced by 12 sharp colour photographs of groupings of cut and uncut stones, in which the colour reproduction is, in general, good.

The ecological niche of this book lies nearer to Webster's treatise *Gems* than to the current popular illustrated accounts. In the preface the author and reviser indicate an aim at those engaged in the jewellery trade as well as at general readers. Approximately half the book is devoted to historical, technical and scientific introductions to the subject, including a little elementary crystallography, crystal structure and bonding, and a useful section devoted to data tables. The other half of the book is a descriptive account of a pretty comprehensive range of gem species.

Errors are not common, having been largely ironed out over the years. The reviewer doubts that the bonding in most gemstones is ionic (p. 30), a considerable degree of covalent character being required for the high hardness necessary for most gem uses. The table on p. 85 seems a little peculiar, being entitled 'Radiation ranges (in millimetres)' – the author uses Å units and the term 'wavelength' in the comparable table on the next page. In methylene iodide, iodine forms a true solution, not a colloidal suspension (p. 113). The name 'vorobyevite' is applied nowadays specifically to caesian beryl, whatever its colour (p. 303). Uvarovite is described (p. 338) as never having been found in pieces large enough for cutting. Relatively large (> 1 cm) uvarovite crystals have been known for some years from Outokumpu mine, in Finland,

and a few of these have been cut. The formulae on pp. 518–519 horrify an organic chemist! Confusion reigns between the monomers and their polymers. Vinyl acetate is  $\text{CH}_2\text{:CH.O.CO.CH}_3$ , hence polyvinyl acetate is  $[\text{.CH}_2\text{.CH(O.CO.CH}_3\text{).}]_n$ . Styrene (vinyl benzene) is  $\text{CH}_2\text{:CH.C}_6\text{H}_5$ , hence polystyrene is  $[\text{.CH}_2\text{.CH(C}_6\text{H}_5\text{).}]_n$ . Acetylene is  $\text{CH:CH}$ , and ethylene is  $\text{CH}_2\text{:CH}_2$ . Acrylic acid is  $\text{CH}_2\text{:CH.CO.OH}$ , methacrylic acid is  $\text{CH}_2\text{:C(CH}_3\text{).CO.OH}$ , methyl methacrylate (a liquid monomer) is  $\text{CH}_2\text{:C(CH}_3\text{).CO.OCH}_3$  and its glassy polymer is  $[\text{.CH}_2\text{.C(CH}_3\text{)(CO.OCH}_3\text{).}]_n$ .

The book seems a little expensive, but is a useful reference work, as well as a readable armchair account of the subject.

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## Books Received

*The following books have been received by the Editor. Brief and generally uncritical notices are given of works of marginal crystallographic interest; occasionally a book of fundamental interest is included under this heading because of difficulty in finding a suitable reviewer without great delay.*

**Sintering and related phenomena—Materials Science Research Series. Vol. 6.** Edited by G.C. KUCZYNSKI. Pp.xii+451, Figs. 172, Tables 18. New York Plenum Press, 1973. Price \$29.00.

Exploring experimental and theoretical approaches to sintering and related phenomena, the book focuses on recent

chemical and physical insights into this industrially important process. Of particular note is the chapter by A. J. Markworth and W. Oldfield discussing computer simulation in the study of pore behaviour in solids. Leading authorities in the field deal with: point defects and transport phenomena; grain growth and Ostwald ripening; application of models to actual compacts in sintering; application of sintering phenomena.

The book is the proceedings of the Third International Conference on Sintering and Related Phenomena, held at the University of Notre Dame, Indiana, June 5–7, 1972.

## Theory of metasomatic zoning.

By D.S. KORZHINSKII. Pp.162, Figs. 45. Oxford Univ. Press, 1970. Price £3.00.

The author derives systems of differential equations for infiltration and diffusion metasomatic zoning and uses them to study the main features of these processes. The signs that distinguish between infiltration and diffusion formations are examined. Various cases of infiltration and diffusion metasomatism are considered, and a theory of bimetasomatism is developed. The author discusses metasomatism without a temperature gradient and infiltration metasomatism with fall of temperature along the solution stream; particular attention is paid to a mathematical model for a stream with a wave of acid components. Computations are given for diffusion metasomatism to show that temperature gradients in zones of diffusion of material cannot be appreciable. The presentation of theoretical aspects is accompanied by reference to geological examples, and conclusions are drawn concerning the geological significance of the proposed theory.

This book was first published in Russian by Science Press, Moscow, in 1969.