simple procedures to a hexagonal unit cell with a volume approximating 9000 Å^3 (ettringite) demonstrates its great usefulness.

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[1] This assumption does not necessarily preclude the substitution of H_3O^+ (or H_2O) for a cation, such as K^+. Under such circumstances, this oxygen, together with its associated protons, would be additive to those of the symmetrical sites of the 'oxygen lattice'.

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BOOK REVIEWS

WYCKOFF (R. W. G.) *Crystal Structures*. Vol. 2. 2nd edn, New York, London, Sydney (Interscience Publishers), 1964. viii+588 pp. illus. Price: 180*s*.

This volume of 'Crystal Structures' covers inorganic substances of the types R_nX_m (other than RX and RX_2), $R(MX_2)_n$ and $R_n(MX_3)_p$, but unlike the first edition it postpones $R_n(MX_4)_p$ to Vol. 3. The text has been largely rewritten and brought up to date, with references up to late 1962, and with increased bibliographic coverage (by about 15 %) for the years up to 1955 that were covered by the first edition. The amount of material presented has thus been increased by about 80%, but as a result of the change of format from the loose-leaf style the shelf space required has been reduced by 25 % without any loss of detail or clarity.

The first edition was very troublesome to consult because the text, figures, and tables were in separate sections, the summary tables for

each section were split up among the various supplements, and there was no index to the volume. All these difficulties have now been eliminated, and access to the information is very straightforward. Although there is no index of mineral names (such as was provided collectively for vols. 1–3 of the first edition) these names are included with chemical names in the name index, and constitute about 5 % of the entries.

The text is in the same style, and the figures (projections and shaded packing drawings) are of the same high quality as in the first edition. The information given for each structure includes space-group, cell dimensions, atomic positions, and important interatomic distances (bonded and non-bonded), and inter-bond angles where appropriate. The nature of the structure and co-ordination is described qualitatively and although no quantitative indications of accuracy are included there are critical, and sometimes sceptical, comments. A particularly useful feature is the strong emphasis on the inter-relationships of structures, both in the comments and in the way that structural considerations are sometimes allowed to override the strictly chemical classification of the chapters. This sometimes leads to unexpected positions in the book for some materials—for example, Fe_3O_4 does not appear in the section on R_3X_4 but is left for the section of Vol. 3 that treats the spinels. Similarly, where it is convenient, the R, M, and X symbols of the chapter headings are allowed to include groups and radicals like CN, CO, UO_2, &c. However, provided that one uses the general index rather than the sectional indices no difficulty of reference arises.

Of faults there are few. One might have preferred to see the international space-group symbols given primacy, rather than in brackets after the Schoenflies symbols. The most serious is that the references to the literature are indexed solely through the chemical formulae, so that in cases of polymorphism one cannot find which references relate to which structure. The extreme example is $CaCO_3$, with three structures and thirty-two references, but there are quite a number of others. The index is generally satisfactory, though it is surprising that one cannot find Fe_3O_4 under iron, ferrous, or ferric but only under magnetite. The only errors noticed are the substitution of bixbyite for La_2O_3 at the bottom of p. 5, and the fact that the formulae on the cover and the title page do not tally with those of the chapter headings.

It will be an essential book for anyone concerned with crystal structures, whether they possess the first edition or not.

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