

BOOK REVIEW

HANDBOOK OF MINERALOGY, VOLUME 2: SILICA, SILICATES. By J. W. Anthony, R. A. Bideaux, K. W. Bladh, and M. C. Nichols. Mineral Data Publishing, Tucson, Arizona, 1995. xiv + 904 pages in two parts. \$135.00.

Into the breach between Fleischer and Mandarino's *Glossary of Mineral Species* and Klein and Hurlbut's *Manual of Mineralogy* comes the *Handbook of Mineralogy*, an encyclopedic catalog of virtually all minerals recognized by the International Mineralogical Association (IMA). This work in progress will eventually comprise five volumes that treat the major mineral groups as classified by Dana. The first volume in the series reviews the elements, sulfides, and sulfosalts. The second volume covers 904 silica and silicate species from abswurbachite to zussmanite in a handsomely produced two-part set.

At the risk of violating some readers' sense of taxonomical purity, the *Handbook* orders the minerals within each volume alphabetically, with one page devoted to the vital characteristics of each species. For each mineral the following information is provided: crystal data (crystal system, forms, and habits); physical properties (cleavage, hardness, and density); optical properties (color, streak, and refractive indices); cell data (space group, lattice parameters, and Z); X-ray powder pattern (d values and relative intensities for the seven strongest peaks); chemistry (compositional analyses for up to four samples); polymorphism and series (chemical and structural relatives); mineral group; occurrence (typical petrologic growth environments); association (other minerals that share spatial and genetic relationships); distribution; origin of mineral name; type material and museum source; and references (up to eight, but usually four or five, citations from the literature).

Including all this information on a single page obviously requires serious triage; the authors describe it as a "seemingly callous winnowing of sacred classical descriptive matter." There are no photographs or line drawings, and descriptions of geologic occurrences are notably brief.

The question is whether this volume fulfills its goal as a compendium of the "data crucial to the identification of all species" so that the reader may distinguish a given mineral from all others. To this end the volume achieves a qualified success. The alphabetical ordering scheme certainly speeds the location of a known mineral. But without an index or cross-referencing system, the user must have a clear idea of the mineralogical possibilities to make the best use of this guide. This problem may be partially solved through the use of SEARCH, a mineral datafile for IBM compatible computers that is free from Mineral Data Publishing with the purchase of this volume. But SEARCH indexes only by mineral name or composition, and the need for

an accessory computer program pilfers the *Handbook* of the convenience that is supposed to be its forte.

The true beauty of this volume lies in its comprehensive attitude. A trip to Klein and Hurlbut's *Manual of Mineralogy* may provide you with the salient features of epidote, but what if your research unearths dmisteinbergite, plumbotsumite, or, for a mineral that's truly out of this world, tranquillityite? Though the odds of encountering a given arcane mineral may be low, the chances that a petrologist will run into some esoteric species are wonderfully high. This volume presents the logical first recourse for geologists who require an efficient information source for both common and obscure minerals. Of special importance in this regard is the reference section, which includes those articles (with full titles) from which the *Handbook* tabulated its data. Additional crystal structure reports also are cited.

The *Handbook* follows IMA nomenclature, and, for those unfortunate enough to study amphiboles, helpful classification tables are included in Figures 1–3. Even in the absence of natural complexity, however, IMA rules can be a little quirky. The student interested in chrysotile will find nothing between the entries for chrysocolla and clinochlore; he or she will have better luck with clino-, ortho-, or parachrysotile. For those without mineralogical sophistication, a mineral group directory like that found in the JCPDS *Search Manual* would have been extremely handy. Moreover, though this volume purports to cover silica and silicates, neither moganite nor keatite is listed here because both of these silica polymorphs have successfully eluded IMA recognition.

Some small changes might have improved the reference section. Because the *Handbook* draws heavily from reliable warhorses, the citations often include old works, especially Dana (1892), and other mineral compendia, such as the various editions of Deer, Howie, and Zussman. Such sources are of limited use to the reader, and they serve to exclude modern studies in mineral physics. Further, crystallographic and chemical data in the *Handbook* are referenced according to locality but not to authorship. Lastly, the monotonous typesetting of the reference section screams for creative formatting to allow for quick scanning.

The high price of this volume will assuredly stop most researchers from purchasing the *Handbook* to grace their personal book collections. On the other hand, the benefits of this *Handbook* certainly should place it in the library of every geology department. The authors deserve congratulations for this epic effort.

PETER J. HEANEY
Princeton University