



Book Review

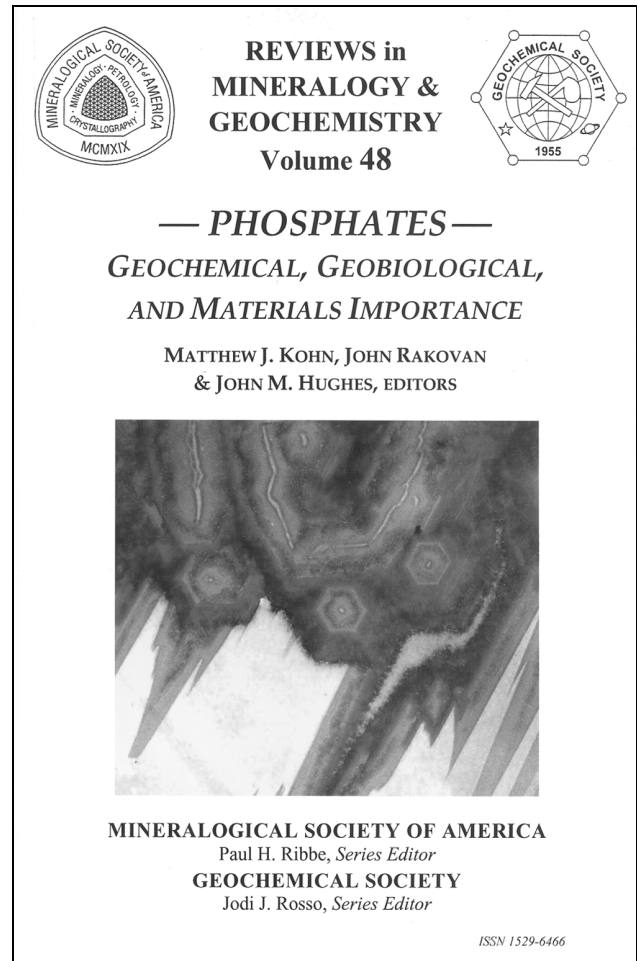
Phosphates: Geochemical, geobiological, and materials importance edited by M. J. Kohn, J. Rakovan, and J. M. Hughes. Mineralogical Society of America and Geochemical Society, Washington, D.C., USA, 2002, 742 p., \$40, (ISBN 0-939950-60-X).

When the editor contacted me about reviewing this book and gave me three weeks to complete it, I thought, “no problem.” With the hindsight of some 6 weeks behind me, the source of my delayed review was that, first, the book is long (742 p.), second, the broad-ranging and well-written chapters held my interest much more than I anticipated, and third, the old VWs that I drive kept breaking down.

The volume delivers on somewhat more than the title implies. Nineteen chapters compose it, with sections divided into mineralogy and geochemistry (composition, growth and surface properties, crystal chemistry, structure), geologic distribution (igneous, metamorphic, and sedimentary), geobiology (the global phosphorus cycle, the structure and trace element and isotope geochemistry of fossil teeth and bone), geo and thermochronology (U-Th-Pb, U-Th/He, and fission track dating and thermochronology), and materials applications (biomedical, nuclear waste, and luminescence) of phosphate minerals. The particular focus of many chapters is on the geologically relevant phosphate minerals apatite, monazite, and xenotime.

The editors clearly put a lot of effort into including the key authorities on each topic in this book. I can see this best with my own area of interest in biological apatites and isotope geochemistry. Mat Kohn led the editorial charge here, and the papers are very complete and well written. The same goes for the geo and thermochronology section: authors Harrison et al., Farley et al., and Gleadow et al. are the leaders in their respective fields, and their reviews are exhaustive yet very readable. It is harder for me to judge the mineralogy and geochemistry part of the book, but editors John Rakovan and John Hughes have long track records in this area, and the coverage here looks comprehensive. Certainly, the chapter by Huminicki and Hawthorne, “The crystal chemistry of phosphate minerals,” takes the prize for the most figures (67) of any chapter in the book.

This is a book for geochemistry students at any level on up to specialists with an interest in the fundamentals and many geologic applications of phosphate minerals. The utility of this book for these types of readers and for me will probably take several forms. First, I will definitely use several of the chapters as introductory review articles in upcoming graduate-level classes. The article on the trace elements



(Trueman and Tuross) and stable isotopes (Kohn and Cerling) in biological apatites are definitely the best reviews on these topics in print. Moreover, development and applications of the U-Th-Pb and U-Th/He systems for dating and thermochronology have really taken off in the last 5 to 8 years. The chapters by Harrison et al. and Farley et al. may be the first to comprehensively review these developing methods, and they should serve as excellent introductions for geologists and geology students.

In addition to these pedagogical uses, the volume is an excellent reference source. Within and outside my area of specialization, the chapters are laden with references, and I have compiled a long list of follow-up readings from them.

Lastly, I actually enjoyed a casual meander through many other chapters in the book. For example, I knew next to nothing about phosphates as nuclear waste forms. I found out

that this has a long history, and the article by R. Ewing did a nice job of bringing me up to speed quickly. I was also pretty clueless about the biomedical applications of apatites, and now I know why my probable hip replacement thirty years from now has a good chance of succeeding.

The carrot for this review was that I got a free copy of the book. This is good because, surely, I would have otherwise spent my hard-earned academician dollars (\$40 in fact) on a copy. The book is so comprehensive and relevant that I

suspect I have been remiss in not paying closer attention to other books in the series. If others are nearly as complete as this phosphates volume, I plan to go out and purchase some of them soon.

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