

Environmental Geochemistry

Treatise on Geochemistry, volume 9¹

Volumes of review articles tend to make a lot of promises, whether explicit or implied, e.g. comprehensive coverage of a subdiscipline, appropriate for everyone from advanced undergraduates to cutting-edge researchers. However, it is not always easy to deliver the goods. In practice, most of the time we end up with a hodgepodge of whatever the authors come up with by the submission deadline—if the editors are lucky, that is. This is not to say that such volumes are useless. On the contrary, they often include some very valuable chapters. But as a whole, they seldom deliver the sort of comprehensive coverage and accessibility for which one would hope.

Environmental Geochemistry, the ninth volume of the award-winning *Treatise on Geochemistry* series published by Elsevier, comes with the same set of promises. The website for the series (www.treatiseongeochemistry.com) claims that it “seeks to present a comprehensive, integrated summary of the present state of geochemistry,” and quotes reviews that tout it as “essential” for “undergraduates through professionals.” The difference between this volume and many others is that it delivers on those promises remarkably well. It really does consider the broad sweep of environmental geochemistry in a way that is useful to professionals and yet accessible to advanced undergraduates. The volume editor (Barbara Sherwood Lollar) and the series executive editors (H. D. Holland and K. K. Turekian) have accomplished an extraordinary feat that should be emulated by others putting together similar collections.

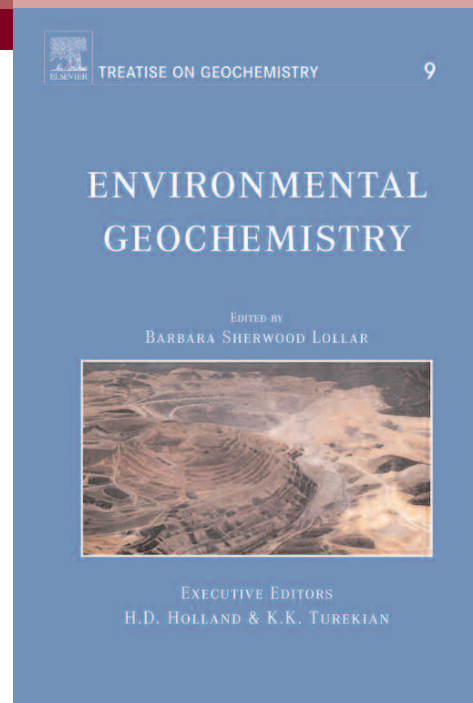
Here is how it seems to have been done. First, the editors clearly defined the scope of the volume within reasonable limits. Only local- and regional-scale processes were considered, since global-scale, atmospheric processes have been treated in other volumes of the series. Second, the editors developed a clear vision of how the topics to be considered should be organized. While some chapters deal with environmental problems where both natural and anthropogenic contaminant sources are important, others deal exclusively with anthropogenic sources. Beyond that, the editors did remarkably well at separating topics to be covered into convenient packages.

Some chapters (e.g. chapter 9.02, “Arsenic and Selenium,” and chapter 9.03, “Heavy Metals in the Environment”) are divided among elements that exhibit similar chemical behavior, while others (e.g. chapter 9.15, “The Geochemistry of Pesticides”) treat particular classes of contaminant compounds. Still others (e.g. chapter 9.09, “Salinization and Saline Environments,” and chapter 9.16, “The Groundwater Geochemistry of Waste Disposal Facilities”) address problems associated with particular types of natural and engineered environments.

This convenience in packaging would normally carry the price of considerable overlap among chapters, but once again the editors have done a remarkable job of avoiding this pitfall, as far as possible. For example, several of the chapters discuss sorption on mineral surfaces in the context of contaminant fate and transport, but only one (chapter 9.09, “Environmental Geochemistry of Radioactive Contamination”) goes into any depth, addressing the utility of surface complexation models for estimating how distribution coefficients will change under various geochemical conditions.

On the other hand, minimizing overlap would normally carry another price. That is, many scientists will not read every chapter in such a volume, so a lack of depth in any chapter might be detrimental. However, not only are the various chapters in the volume cross-referenced to one another, showing an exceptional degree of collaboration between editor and authors, but the volume has an index. In an age when any decent word processor can practically create an index on its own, there is no excuse for neglecting to include one. Unfortunately, too many collections of review articles fail in this respect, as well.

The authors of the chapters included in *Environmental Geochemistry* should also be commended for coming through with accessible, yet comprehensive and cutting-edge treatments of their topics. Reading through the volume, I was rewarded with many insights about where significant problems have yet to be solved and how my own, somewhat narrow, area of expertise might be brought to bear. At the same time, I never got the sense that the students in my undergraduate geochemistry class would have any trouble following most of the chapters, at least after the first half of my course. There is no larding with equations or abuse of overly technical language. Chapters in the volume could easily be used as supplemental reading for advanced undergraduate classes, and in fact, this semester I plan to have my students



read the chapter on radioactive contamination in preparation for a field trip to the Hanford Site.

My one problem with the entire *Treatise on Geochemistry* series is the price of the hard-bound editions (\$5450 for the ten-volume set.) This absurdly high price will certainly do nothing to appease those university librarians who have begun a movement to boycott high-priced Elsevier journals. Luckily, most of the volumes in the series are now available in paperback editions for \$89 each, which is much more reasonable.

Therefore, I highly recommend *Environmental Geochemistry* as a nearly ideal review volume for advanced undergraduates, graduate students, and professionals. However, obtaining a free copy by doing a short book review is even more highly recommended.

Barry Bickmore
Brigham Young University

¹ Barbara Sherwood Lollar, editor (2005) *Environmental Geochemistry, Treatise on Geochemistry 9*, Elsevier, ISBN 0-08-044643-4, US\$89; 8 0