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BOOK REVIEW

ELECTRON MICROPROBE ANALYSIS AND SCANNING ELECTRON MICROSCOPY IN GEOLOGY (2nd ed.) by S.J.B. Reed, Cambridge University Press, August 2005. 206 pages, $70.00

In this book, the author aims to describe electron microprobe analysis (EMPA) and scanning electron microscopy (SEM) from a geologic standpoint, a goal that he clearly states on the first page. The author adequately meets this goal throughout the book. He initially provides discussion of how EMPA and SEM can be used to answer specific geologic questions and later gives examples, illustrations, and images of geologic data acquired using these techniques. The material is not necessarily presented in a "how-to" manner of conducting EMPA and SEM analyses, instead the author provides background material that needs to be considered when setting up for such analyses.

The book consists mostly of individual chapters designed to explain the principles, instrumentation, and techniques of EMPA and SEM. The book is well illustrated and offers several color plates to demonstrate recent advances in EMPA and SEM image processing and data acquisition. The final chapter of the book is especially helpful in explaining geologic sample preparation techniques and methods, a topic not readily found elsewhere. There is also a very valuable appendix section, which provides energy dispersive (ED) X-ray spectra of various mineral species. This is a well-compiled resource and a unique approach to the subject that would be useful for beginners who are acquiring and interpreting their first ED spectra on unknown minerals. Many references are given throughout the book, particularly for further discussion of topics not covered in detail in this text. There is also a complete reference list and a thorough index at the back of the book.

This book would be helpful for those new to the field of EMPA and SEM, who are not yet well-versed on the fundamentals and techniques of these procedures. The book does not include an abundance of technical and mathematical detail, so it is easier to read than most texts on the subject, which is a benefit to geologists looking to conduct such analyses. The book is written at an introductory level, so it would be a useful reference for students who are about to use electron microprobes and scanning electron microscopes.

Overall this is a valuable introductory book to have in any electron microprobe or scanning electron microscope laboratory that conducts analyses on geologic materials. It covers all the basic aspects of EMPA and SEM and how to troubleshoot some typical problems encountered in analyzing geologic materials using these methods. However, at times the book is too general in its scope and would benefit from additional detail, both in text and in figures, to help explain certain complex principles. This is particularly the case in chapters 2 (*Electron-specimen interactions*), 5 (*X-ray spectrometers*), 7 [*X-ray analysis (1)*], and 8 [*X-ray analysis (2)*]. The book aims to limit the amount of technical detail given, but in an attempt to provide easily accessible information, the author inhibits the reader's understanding of some complicated topics by cramming too much information into a single sentence or by too succinctly stating such information (again in chapters 2, 5, 7, and 8). When mathematical equations are given and referred to, it would be advantageous to the reader if the author provided effective examples to work through. Also, at times I found the book to be written in an overly complex manner, making it difficult to read in some sections. Sentences lacking punctuation (there is general lack of commas throughout the text) also made it difficult to read at times. Even so, the book is well organized and is written at an appropriate level for its intended audience.

As a geologist and geochemist who has worked in an EMPA and SEM research laboratory for three years, I would buy this book because unlike other texts on the subject matter, it discusses EMPA and SEM in somewhat basic terms, specifically from a geologic viewpoint, and without unnecessary mathematical detail or attention to advanced information not necessarily needed to carry out successful EMP and SEM analyses.

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