

BOOK REVIEW

Book Review: Mineralogy of Uranium and Thorium. (2016) By Robert J. Lauf. Schiffer Publishing. ISBN 9780764351136, 352 pages. \$59.99.

Mineralogy of Uranium and Thorium draws the reader in with its visual appeal and unique content. The book not only provides a comprehensive overview of the mineralogy and crystallography of uranium- and thorium-bearing minerals, but also describes the geologic context of radioactive mineral deposits. *Mineralogy of Uranium and Thorium*. It includes hundreds of pictures of radioactive minerals and illustrations of crystal structures and forms.

The introduction includes safety information, a summary of economic reserves, and a brief survey of characterization techniques for radioactive minerals including several examples of the use of instant photographic film for autoradiography. The book is divided into three sections: categorization and genesis of radioactive mineral deposits, the geographic distribution of ore deposits, and systematic mineralogy.

The ore deposits section provides a brief overview of the geochemistry of uranium and thorium, before describing 13 genetic types of uranium and thorium ores. These descriptions are brief but compact and include subcategories for many of the ore deposit classes.

Mineralogy of Uranium and Thorium dedicates an entire section to descriptions of economically or historically significant uranium and thorium deposits. This section is organized geographically with deposits summarized and described for each relevant country. For each country, the author provides a map showing the locations of significant deposits, a table summarizing the type, status, and size of each deposit, and a table listing the radioactive minerals first described in that country and the date of each discovery. Most of the summaries also include photographs of mineral and ore specimens from that specific country. The geologic focus of this section provides important context for the mineral classification sections.

The largest section of the book is a systematic description of uranium- and thorium-bearing minerals and their crystal structures. The first chapter describes primary uranium and thorium oxides and silicates, and is followed by chapters on secondary minerals, other uranium- and thorium-bearing minerals, and minerals that contain uranium and thorium as impurities. The chapter on secondary minerals is the longest and covers oxides, hydroxides, carbonates, sulfates, silicates, selenites, tellurites,

arsenites, molybdates, tungstates, niobates, titanates, phosphates, arsenates, and vanadates.

Each mineral description summarizes the physical properties of the mineral and noteworthy collecting localities and deposits. Images abound in this section, with multiple pictures of some mineral species. The author cites references to mineral structures and genesis within the text and includes a full bibliography at the end of the book. Two appendices list all the minerals in the book and compile obsolete and varietal mineral names and synonyms.

Most descriptions of the primary and secondary minerals also include detailed crystallographic structure diagrams and descriptions of crystal symmetry and unit-cell parameters. Those who purchase the book can download structural files for all the minerals shown in the book and can view and manipulate them in 3D using the provided CrystalViewer software for free. This is a unique and valuable addition to the systematic mineralogy section of the book.

Mineralogy of Uranium and Thorium expands upon the author's previous work on the subject, a 144-page paperback entitled *Introduction to Radioactive Minerals*. Although the books have a similar chapter structure, the 352-page *Mineralogy of Uranium and Thorium* includes crystal structure diagrams and the 3D crystal visualization software. *Mineralogy of Uranium and Thorium* also contains maps and details of specific mining localities not covered in the older book.

Mineralogy of Uranium and Thorium is accessible and engaging for experts, students, and collectors alike. Those in the mining industry or interested in ore deposits will appreciate the geologic and economic context provided in the initial chapters. Crystallographers will appreciate the numerous structural diagrams and the 3D visualization software. Collectors who enjoy viewing and identifying minerals will approve of the photography. This book would be a useful reference for uranium and thorium geochronology laboratories. It could be used as a supplement to an ore deposits or genetic mineralogy course or in a project assignment for an Earth materials or mineralogy course. *Mineralogy of Uranium and Thorium* is a worthy read even if one does not have a specific research interest in radioactive minerals.

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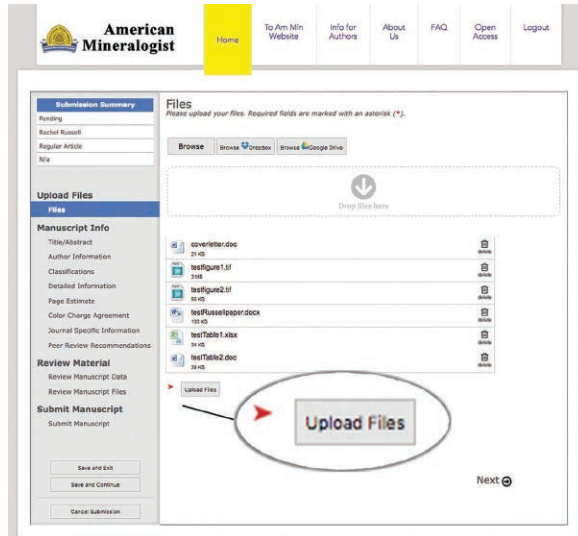
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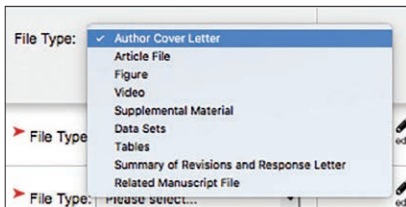
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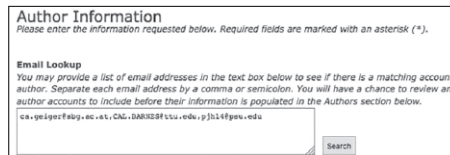
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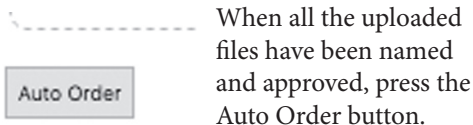
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