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Environmental and Low Temperature Geochemistry

By Peter Ryan



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Environmental and Low Temperature Geochemistry By Peter Ryan

Environmental and Low-Temperature Geochemistry presents conceptual and quantitative principles of geochemistry in order to foster understanding of natural processes at and near the earth's surface, as well as anthropogenic impacts on the natural environment. It provides the reader with the essentials of concentration, speciation and reactivity of elements in soils, waters, sediments and air, drawing attention to both thermodynamic and kinetic controls. Specific features include:

- An introductory chapter that reviews basic chemical principles applied to environmental and low-temperature geochemistry
- Explanation and analysis of the importance of minerals in the environment
- Principles of aqueous geochemistry
- Organic compounds in the environment
- The role of microbes in processes such as biomineralization, elemental speciation and reduction-oxidation reactions
- Thorough coverage of the fundamentals of important geochemical cycles (C, N, P, S)
- Atmospheric chemistry
- Soil geochemistry
- The roles of stable isotopes in environmental analysis
- Radioactive and radiogenic isotopes as environmental tracers and environmental contaminants
- Principles and examples of instrumental analysis in environmental geochemistry

The text concludes with a case study of surface water and groundwater contamination that includes interactions and reactions of naturally-derived inorganic substances and introduced organic compounds (fuels and solvents), and illustrates the importance of interdisciplinary analysis in environmental geochemistry.

Readership: Advanced undergraduate and graduate students studying environmental/low T geochemistry as part of an earth science, environmental science or related program.

Additional resources for this book can be found at:
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Editorial Review

Review

“A useful acquisition for libraries serving undergraduate and graduate earth science programs. Summing Up: Recommended. Upper-division undergraduates, graduate students, and faculty.” (*Choice*, 1 December 2014)

From the Back Cover

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About the Author

Peter Crowley Ryan is Professor of Geology and Environmental Studies at Middlebury College where he teaches courses in environmental geochemistry, hydrology, sedimentary geology and interdisciplinary environmental science. He received a Ph.D. in geology at Dartmouth College, an M.S. in geology from the University of Montana and a B.A. in earth sciences from Dartmouth College. He has served as Director of

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