



# Trace Elements in the Environment: Biogeochemistry, Biotechnology, and Bioremediation

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## Trace Elements in the Environment: Biogeochemistry, Biotechnology, and Bioremediation

New analytical techniques have enhanced current understanding of the behavior of trace and ultratrace elements in the biogeochemical cycling, chemical speciation, bioavailability, bioaccumulation, and as applied to the phytoremediation of contaminated soils. Addressing worldwide regulatory, scientific, and environmental issues, *Trace Elements in the Environment* explores these frontiers, including biotechnological aspects of metal-binding proteins and peptides and phytoremediation strategies using trees, grasses, crop plants, aquatics, and risks to ecological and human health. Discussing trace elements in the holistic environment, this book covers advances in state-of-the-art analytical techniques, molecular biotechnology, and contemporary biotechnology that enhances knowledge of the behavior of trace elements in the biogeosphere and at the cellular and molecular level.

The editors and their hand-picked panel of contributors provide authoritative coverage of trace elements in the environment. They highlight cutting-edge applications of emerging strategies and technologies to the problems of trace elements in the environment. The editors discuss emerging areas such as bacterial biosorption of trace elements, processes, and applications of electroremediation of heavy metals-contaminated soils, application of novel nanoporous sorbents for the removal of heavy metals, metalloids, and radionuclides. The book focuses on the effects of increasing levels of trace elements on ecological and human health, evaluates the effectiveness of methods of phytoremediation, and covers risk assessment, pathways, and trace element toxicity.

Containing more than 150 illustrations, tables, photographs, and equations, the book's coverage spans the entire body of knowledge available about how and why plants interact with metals and other trace elements.

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