Microbially Isted Dissolution Of Minerals And Its Use

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3. How are minerals formed?The Immunity Fix Webinar with Dr James DiNicolantonio **Best Protein Foods for Longevity Ranked** ~~Why You Need More Salt in Your Diet~~ *Protein to Energy Diet for Fat Loss with Dr Ted Naiman* **How Much Liver Should You Eat** ~~How to Balance Acidosis When Eating Meat - New Book The Mineral Fix~~ **Rock and Mineral Identification** Q\u0026A The Mineral Fix Livestream *Geology 4 (Minerals)*

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Abiotic Degradation of Chlorinated Solvents in Subsurface Environments

NPK-University Soil Microbiology With Harley Smith*Microbially Isted Dissolution Of Minerals*

This research area includes the study of the processes (both inorganic and microbially mediated ... processes that occur at mineral surfaces during water-rock interaction - adsorption, catalysis, ...

Aqueous and Environmental Geochemistry

ZERT was a US Department of Energy funded project (award numbers DE-FC26-04NT42262, DE-FE0000397) focusing on basic science and technology development relevant to geologic carbon sequestration. The ...

The Zero Emission Research and Technology Collaborative (ZERT)

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In the past 15 years, there has been steady growth in work relating to the microbial iron cycle. It is now well established that in anaerobic environments coupling of organic matter utilization to Fe reduction is a major pathway for anaerobic respiration. In iron-rich circumneutral environments that exist at oxic-anoxic boundaries, significant progress has been made in demonstrating that unique groups of microbes can grow either aerobically or anaerobically using Fe as a primary energy source. Likewise, in high iron acidic environments, progress has been made in the study of communities of microbes that oxidize iron, and in understanding the details of how certain of these organisms gain energy from Fe-oxidation. On the iron scarcity side, it is now appreciated that in large areas of the open ocean Fe is a key limiting nutrient; thus, a great deal of research is going into understanding the strategies microbial cells, principally phytoplankton, use to acquire iron, and how the iron cycle may impact other nutrient cycles. Finally, due to its abundance, iron has played an important role in the evolution of Earth’s primary biogeochemical cycles through time. The aim of this Research Topic is to gather contributions from scientists working in diverse disciplines who have common interests in iron cycling at the process level, and at the organismal level, both from the perspective of Fe as an energy source, or as a limiting nutrient for primary productivity in the ocean. The range of disciplines may include: geomicrobiologists, microbial ecologists, microbial physiologists, biological oceanographers, and biogeochemists. Articles can be original research, techniques, reviews, or synthesis papers. An overarching goal is to demonstrate the environmental breadth of the iron cycle, and foster understanding between different scientific communities who may not always be aware of one another’s work.

Microbial communities and their multi-functionalities play a crucial role in the management of soil and plant health, and thus help in managing agro-ecology, the environment and agriculture. Microorganisms are key players in N-fixation, nutrient acquisition, carbon sequestration, plant growth promotion, pathogen suppression, induced systemic resistance and tolerance against stresses, and these parameters are used as indicators of improved crop productivity and sustainable soil health. Beneficial belowground microbial interactions in the rhizosphere help plants combat abiotic challenges in the unfavourable environmental conditions of native soils. These microorganisms and their products offer potential solutions for agriculture in problematic areas since they are able to degrade xenobiotic compounds, pesticides and toxic chemicals and help remediate heavy metals in the rhizosphere and so make deteriorated soils suitable for crop production. This book compiles the latest research on the role of microbes in the rhizosphere and agro-ecology, covering interaction mechanisms, microbe-mediated crop production, plant and soil health management, food and nutrition, nutrient recycling, land reclamation, clean water systems, agro-waste management, biodegradation, bioremediation, biomass and bioenergy, sanitation and rural livelihood security. It is a comprehensive reference resource for agricultural activists, policymakers, environmentalists and advisors working for governments, non-governmental organizations and industries, helping them update their knowledge of this important, but often neglected, research area.

The use of microorganisms and their metabolic products to stimulate oil production is currently receiving renewed interest worldwide. This technique involves the injection of selected microorganisms into the reservoir and the subsequent stimulation and transportation of their in situ growth products, in order that their presence will aid in further reduction of residual oil left in the reservoir after secondary recovery is exhausted. Although unlikely to replace conventional microbial enhanced oil recovery, this unique process seems superior in many respects. Self-duplicating units, namely the bacteria cells, are injected into the reservoir and by their in situ multiplication they magnify beneficial effects. This new approach to enhancement of oil recovery was initiated in 1980 and the first results were published in the proceedings of two international conferences. This book evolved from these conferences, and was designed to encompass all current aspects of microbial enhanced oil recovery: the development of specific cultures, increase of the population for field application, various methods for field applications and the results, and the environmental concerns associated with this newly developed technology. It provides a comprehensive treatise of the subject, and is arranged to show the laboratory development of microbes suited to microbial enhanced oil recovery and the perpetuation of the special cultures in a petroleum reservoir. Thus, this book has specific usefulness in the laboratory, the oilfield and the classroom. Although not written as a text book, it can be used as a reference volume for graduate studies in enhanced oil recovery.

In response to low iron availability in the environment most microorganisms synthesize iron chelators, called siderophores. Bacteria and fungi produce a broad range of structurally diverse siderophores, all of which show a very high affinity for ferric ions. This book presents an up-to-date overview of the chemistry, biology and biotechnology of these iron chelators. Coverage ranges from an introductory chapter to siderotyping to applications in human and plant health.

Microbes can respire on metals. This seemingly simple finding is one of the major discoveries that were made in the field of microbiology in the last few decades. The importance of this observation is evident. Metals are highly abundant on our planet. Iron is even the most abundant element on Earth and the forth most abundant element in the Earth’s crust. Hence, in some environments iron, but also other metals or metalloids, are the dominant respiratory electron acceptors. Their reduction massively drives the carbon cycle in these environments and establishes redox cycles of the metallic electron acceptors themselves. These redox cycles are not only a driving force for other biotic reactions but are furthermore necessary for initiating a number of geochemically relevant abiotic redox conversions. Although widespread and ecologically influential, electron transfer onto metals like ferric iron or manganese is biochemically challenging. The challenge is to transfer respiratory electrons onto metals that occur in nature at neutral pH in the form of metal oxides or oxihydroxides that are effectively insoluble. Obviously, it is necessary that the microbes specially adapt in order to catalyze the electron transfer onto insoluble electron acceptors. The elucidation of these adaptations is an exciting ongoing process. To sum it up, dissimilatory metal reduction has wide-spread implications in the field of microbiology, biochemistry and geochemistry and its discovery was one of the major reasons to establish a novel scientific field called geomicrobiology. Recently, the discovery of potential applications of dissimilatory metal reducers in bioremediation or current production in a microbial fuel cell further increased the interest in studying microbial metal reduction.

Biotechnology of Metals: Principles, Recovery Methods and Environmental Concerns deals with all aspects of metal biotechnology in different areas, such as biogenesis, biomaterials, biomimetic strategies, biohydrometallurgy, mineral biobeneficiation, electrobioleaching, microbial corrosion, human implants, concrete biocorrosion, microbiology of environment pollution, and bioremediation. As the technology of this interdisciplinary science has diversified over the last five years, this book provides a valuable source for scientists and students in a number of disciplines, including geology, chemistry, metallurgy, microbiology, chemical engineering, environment, civil engineering, and biomedical engineering. Offers comprehensive coverage of an interdisciplinary subject Outlines the role of microbiology and biotechnology in mining, metallurgy, waste disposal and environmental control Covers new topics, such as biogenesis, biomaterials processing, the role of micro-organisms in causing corrosion, and much more Presents scientifically illustrated experimental research methods in metals biotechnology

Praise for the Serial "This series has consistently presented a well-balanced account if progress in microbial physiology...Invaluable for teaching purposes." - AMERICAN SCIENTIST Advances in Microbial Physiology was first published in 1967, and under the pioneering editorship of Professor Tony Rose, with the collaboration at various times of John Wilkinson, Gareth Morris and Dave Tempest, the series has become immensely successful and influential. The editors have always striven to interpret microbial physiology in the broadest possible context and have never restricted the contents to "traditional" views of whole cell physiology. Robert Poole was appointed as the new editor following the untimely death of Tony Rose. Under Professor Poole's editorship, Advances in Microbial Physiology continues to publish topical and important reviews, and to interpret physiology as widely as in the past by including all material that contributes to the understanding of how microorganisms and their component parts work. This continues to be the real challenge of microbial physiology.

The interaction of the lithosphere and hydrosphere sets the boundary conditions for life, as water and the nutrients extracted from rocks are essential to all known life-forms. Water-rock interaction also affects the fate and transport of pollutants, mediates the long-term cycling of fluids and metals in the earth's crust, impacts the migration and