



EINLADUNG

zum

VERA - SEMINAR

von

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Isotopic studies of the biogeochemistry of iron

The slow dissolution and low solubility of iron oxides in oxygen rich environments limit the turnover of iron and its availability to organisms. Several non-enzymatic processes are known to increase iron solubility and to accelerate iron oxide dissolution, all of which are used by microorganisms and plants to enhance iron bioavailability, namely, proton-promoted, ligand-promoted, and (photo-)reductive dissolution. We have studied iron isotope fractionation by these dissolution processes to elucidate the molecular mechanisms of the dissolution processes. Also, iron isotope ratios were measured in soil profiles in order to study the effect of biogeochemical processes on iron isotopes in complex natural systems.

Iron isotope fractionation was not observed during proton-promoted dissolution, indicating that the goethite was not isotopically zoned. A strong enrichment of lighter iron isotopes (^{54}Fe) relative to the bulk mineral was observed in the early stages of ligand controlled and reductive dissolution. We have modeled these observations using a modified Rayleigh process. Strong isotope fractionation was observed in soil profiles as a result of biogeochemical processes. In this presentation I will discuss if and how observations of isotope fractionation during iron oxide dissolution are useful for the elucidation of reaction mechanisms on the molecular scale and on the field scale.

Donnerstag, 15. März 2007, 16:30 Uhr

**1090 Wien, Währinger Str. 17, "Kavalierstrakt",
1. Stock, Seminarraum von VERA**