

GEOC 36

Kinetics and mechanisms of metal sorption at the soil mineral/water interface: The continuum from adsorption to precipitation

Donald L. Sparks, Plant and Soil Sciences Department, University of Delaware, 531 S. College Avenue, Townsend Hall, Room 153, Newark, DE 19717-1303

A basic understanding of the kinetics and mechanisms of metal sorption on natural systems such as soils and soil components (e.g., clay minerals, metal oxides, and humic substances) is necessary to accurately determine the speciation, mobility, and bioavailability of metals in the environment. Ideally, one should make investigations over a range of spatial and temporal scales and environmental conditions. Using these approaches, major advances have occurred in our understanding of metal sorption mechanisms at the mineral/water interface. For example, it has been shown that metal sorption often results in a continuum of processes ranging from adsorption to precipitation to mineral transformations. This paper will focus on the continuum with particular emphasis on factors affecting metal precipitate formation and their occurrence in natural soils.

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