Inorganic Contaminant Interactions with Soil Minerals and Its Characterization. (S09-hesterberg153805-Oral)

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Abstract:

Increasingly stringent environmental regulations and in-situ soil remediation approaches provide motivation for quantitatively predicting and controlling the long-term dissolution of inorganic contaminants such as trace elements in soils. The majority of a trace element is bound in one or more solid-phases, which may include species adsorbed on minerals or organic matter, surface precipitates, mineral precipitates, or mixed-metal co-precipitates. This presentation will illustrate the importance of solid-phase speciation in soil contaminant remediation, and review various speciation approaches. X-ray based spectroscopic methods such as XAFS, fluorescence micro-probe, and micro-XAFS have provided quantitative speciation analysis of trace elements in soils. Interpretation of results from these techniques is augmented by research on model systems and detailed characterization of soil matrix properties. Molecular-level characterization of soil species of inorganic contaminants should ultimately improve our ability to apply chemical principles (thermodynamics and kinetics) to more accurately predict long-term contaminant fate.

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Presentation Information:

Presentation Date: Wednesday, November 13, 2002
Presentation Time: 8:20 am

Keywords:

trace metals, remediation, speciation, XAFS spectroscopy