

**187 - Mechanisms of ferrihydrite-organic matter complex formation via adsorption and coprecipitation**

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Organic matter (OM)-mineral complexation plays a critical role in soil carbon (C) sequestration. Ferrihydrite with its high surface area, contributes significantly to OM complexation in soils and sediments. Ferrihydrite-OM complexes can be formed by either adsorption or coprecipitation. In this presentation, we investigated the extent and mechanisms of organic matter adsorption and coprecipitation with ferrihydrite using dissolved organic matter extracted from a forest litter layer. Applying near edge X-ray absorption fine structure (NEXAFS) spectroscopy at the C edge and Fourier transform infrared (FTIR) spectroscopy, we compared the chemical fractionation of the organic matter and the mechanisms of ferrihydrite-OM complex formation. Scanning transmission X-ray microscopy (STXM) combined with NEXAFS spectroscopy at the C and Fe edges was employed to study the spatial distribution, macromolecular structure, and chemical composition of the adsorbed and coprecipitated OM at the nanometer-scale. Such studies will advance our understanding of C stabilization processes in natural environments.

**Wednesday, April 10, 2013 03:00 PM**

[Advances in Understanding the Chemistry of Light Elements at Environmental Interfaces \(01:00 PM - 04:25 PM\)](#)

**Location: Morial Convention Center**

**Room: R05**

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