

261 - Arsenic mobilization in the critical zone: Oxidation by manganese oxide minerals

Jason S. Fischel¹, fischelj@udel.edu, **Matthew H. Fischel**¹, **Brandon J. Lafferty**², **Donald L. Sparks**¹. (1) Department of Plant and Soil Sciences and the Center for Critical Zone Research, University of Delaware, Newark, DE 19716, United States, (2) Engineer Research & Development Center, U.S. Army Corps of Engineers, Vicksburg, MS 39180, United States

Manganese(IV) oxides are one of the main redox catalysts in the subsurface environment. Their highly reactive surfaces allow manganese (Mn) oxides to oxidize trace metals such as arsenic from the mobile and toxic arsenite [As(III)], to a less mobile and toxic form, arsenate [As(V)]. In natural systems two main types of Mn oxides can be found, biogenic and abiotic. Five Mn oxide minerals were reacted under identical conditions with equal concentrations of Mn and As(III). All five Mn oxides exhibited a biphasic oxidation reaction, with biogenic Mn oxides being the least reactive. Next, arsenic concentration, pH, and temperature were varied with the two most reactive Mn oxides, HMO and acid birnessite. Only higher arsenic concentrations decreased reactivity, due to passivation. Understanding the reactivity of naturally occurring Mn oxide minerals provides key insights to the chemical processes that regulate manganese oxidation in the environment and the remediation of arsenic contaminated ecosystems.

Wednesday, August 22, 2012 06:00 PM

[General Posters \(06:00 PM - 08:00 PM\)](#)

Location: Pennsylvania Convention Center

Room: Hall D

*ACS does not own copyrights to the individual abstracts. For permission, please contact the author(s) of the abstract.

[Close Window](#)