

GRAND CHALLENGES GREAT SOLUTIONS

ASA, CSSA, & SSSA International Annual Meeting
Nov. 2-5, 2014 | Long Beach, CA

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150-20 Formation Mechanisms for Chromium Hydroxide Precipitation on Mineral Surfaces: The Impact on Contaminant Mobility in the Soil Environment.

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Monday, November 3, 2014: 3:20 PM

Long Beach Convention Center, Room 104B

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Jason Fischel, University of Delaware, Newark, DE and Donald L Sparks, 221 Academy Street Ste 250, University of Delaware, Newark, DE

In order to understand the long-term bioavailability of inorganic pollutants such as chromium(Cr) it is essential to quantify their cycling, stability, and sorption state. In the environment nontoxic Cr(III) is the preferred species, however, manganese(IV) oxides and industrial activity can transform nontoxic Cr(III) into carcinogenic Cr(VI). Mn oxides can also help immobilize chromium as surface precipitates, resulting in surface passivation of the manganese oxides and a reduction in redox capacity. This process has profound implications to reduce the formation of chromate, sequester free chromium, and minimize the risk of environmental contamination. Despite the significance of Cr in the environment, the current understanding of these reactions is very limited. Our research seeks to address these deficiencies by elucidating the mechanisms of chromium oxidation on manganese surfaces. Additional studies will focus on Cr(VI) desorption from contaminated soils. Synchrotron-based X-ray absorption fine structure spectroscopy (XAFS) is the only technique that can differentiate chromium phases which are essential to understanding their long term environmental stability.

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