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*A Century of Integrating Crops, Soils & Environment*  
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**Monday, November 5, 2007 - 9:30 AM**  
**91-1**

**Real-Time Surface-Chemistry of Arsenite Oxidation by Hydrous Manganese Oxide.**

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Arsenite (As(III)) oxidation to arsenate (As(V)) by manganese(IV) oxide is an important reaction impacting the natural cycling of As. The arsenite species is substantially more toxic and tends to bind more weakly to soils than As(V) does. Heterogeneous oxidation of As(III) on the surface of manganese oxides has been well characterized; however, the surface chemistry of the oxidation reaction remains poorly characterized, particularly during the initial phase of the oxidation reaction. Using quick-scanning X-ray absorption spectroscopy (Q-XAS), which allows the collection of X-ray absorption near edge structure (XANES) and extended X-ray absorption fine structure (EXAFS) spectra in 2 to 3 seconds, we have monitored the As oxidation state and local-binding environment during the oxidation reaction. We will present information on the oxidation rate of As(III), as well as changes in the Mn(IV) oxide structure and As binding environment. This information will further our understanding of As oxidation and mobilization processes.

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