

**41 - Real-time characterization of heterogeneous As(III) oxidation by hydrous manganese(IV) oxide using quick-scanning X-ray absorption spectroscopy (Q-XAS)**

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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. Our methodology uses a novel flow-through column system packed with hydrous manganese(IV) oxide (HMO) coated sand. A 1 mM As(III) solution is introduced into the column, and the oxidation and retention of As on the HMO mineral surface is followed in real time, using quick-scanning X-ray absorption spectroscopy (Q-XAS). Using the X-ray absorption near-edge structure (XANES) spectra, we found that initially, only As(V) is retained on the mineral surface. However, eventually, As(III) is also retained on the HMO mineral surface. Additionally, three distinct As-surface species are observed during the course of the experiment, using the extended portion of the spectra.

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