

## **Promoted dissolution of schwertmannite by siderophores: implications for transport of chromium**

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Schwertmannite is a poorly crystalline Fe(III)-hydroxide formed in acidic sulfate-rich aqueous environment and is an effective scavenger of chromate, arsenate and some divalent heavy metals[1]. However, the instability of schwertmannite in natural systems was mainly attributable to the presence of organic substances. schwertmannite will progressively transform into other thermodynamically stable mineral phases, releasing appreciable amount of acidity and schwertmannite-bonded trace metals. Siderophores, a class of biogenic ligands with high affinities for Fe(III), promote the dissolution of metal ions from sparingly soluble mineral phases. However, little is known about the promoted dissolution of schwertmannite by siderophores and the fate of chromium in this process[2].

Batch experiments were conducted to investigate that the behavior of chromium in the dissolution of schwertmannite effected by siderophores. The newly formed minerals were characterized by X-ray diffraction, scanning electron microscopy and X-ray photo electron spectroscopy. Results showed that Cr and Fe will release from schwertmannite in the dissolution of schwertmannite. Then Cr will resorption onto the newly formed minerals which were testified to be a mixture with goethite and ferrihydrite. The results of this study can help yield new perspective for understanding the mobility and fate of Cr in the environment, and are availing to design remediation strategies for Cr-contamination.

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[1] Vithana et al. (2014) Chem. Geol. 372, 1-11.

[2] Reichard et al. (2007) Geochim. Cosmochim. Acta 71(23): 5635-5650.