

**99 - Sulfate adsorption on ferrihydrite studied by sulfur K-edge EXAFS spectroscopy and differential PDF analyses**

**Mengqiang Zhu**<sup>1</sup>, [mzhu@lbl.gov](mailto:mzhu@lbl.gov), Paul Northrup<sup>2</sup>, Donald L. Sparks<sup>3</sup>, Glenn A. Waychunas<sup>1</sup>. (1) Earth Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA 94720, United States, (2) Environmental Science, Brookhaven National Laboratory, Upton, NY 11973, United States, (3) Plant and Soil Sciences, University of Delaware, Newark, DE 19713, United States

Sulfate adsorption on iron oxides is an important environmental chemical process. However, the adsorption topology has remained unclear. We have determined the S-Fe distances in the sulfate sorption complexes on ferrihydrite in 0.1 M NaNO<sub>3</sub> solution at pH 4 using sulfur K-edge X-ray absorption spectroscopy and differential X-ray pair distribution functions (d-PDF). The S XANES spectrum had a pre-edge peak characteristic of S-O-Fe linkages, suggesting sulfate inner-sphere complexes. S EXAFS fitting indicated a S-Fe inter-atomic distance of  $3.16 \pm 0.06$  Å. Fitting of the spectrum of K-jarosite resolved a S-Fe distance of  $3.19 \pm 0.05$  Å, in agreement with the 3.22 Å distance in the jarosite crystal structure, demonstrating the reliability of the S EXAFS fittings. The d-PDF analysis of the sorption samples revealed a S-Fe distance of  $3.25 \pm 0.02$  Å, consistent with the EXAFS result. Ongoing research and calculations are investigating the adsorption topology based on these results.

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