

**130 - Real-time sorption and precipitation of nickel on clay minerals: An in situ Quick-EXAFS investigation**

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Chemical reactions of transition metals at the clay-water interface can proceed so quickly it is difficult to identify incipient sorbed species. However, these species are the foundation for subsequent toxic metal sorption. Additionally, surface precipitation could occur on time scales similar to adsorption. Our objective is to determine in real-time and at the molecular scale the kinetics and speciation of nickel sorption on Al-rich clay minerals utilizing Quick-EXAFS spectroscopy and a custom built flow cell.

Research was conducted at X18B (NSLS) with the monochromator set to Q-EXAFS mode and oscillating at 0.5Hz. This frequency, along with rapid data collection, yields 4,000 data points per EXAFS scan per second or 14.4 million data points for 3600 EXAFS scans/hour. Clean fluorescence EXAFS data can be collected in less than 5 minutes. We compare EXAFS spectra collected during the reaction from zero minutes to several hours and identify nickel speciation changes.

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[Approaching the Surface: Interrogating Chemical Interactions at the Mineral-Water Interface \(01:00 PM - 05:30 PM\)](#)

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