

## **Observing ion interactions at charged solid-liquid interfaces using x-rays: From statics to dynamics\***

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The interaction of ions with charged solid-liquid interfaces is a critical feature for understanding the transport of contaminants in the environment due to reactions at mineral-water interfaces. The actual distribution of ions at the interfaces is normally obscured by the presence of the liquid phase. I will present recent results where we use X-ray based probes (e.g., x-ray reflectivity and resonant scattering) to observe the structures and interactions of ions at solid liquid interfaces through direct in-situ measurements. Examples will include metal ion adsorption (structure, thermodynamics and kinetics) at the muscovite-water interface, and heavy metal ion incorporation at the calcite- and dolomite-water interfaces. The results reveal the critical role of ion solvation in understanding adsorbed cation properties at mineral-water interfaces.

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