

Uranium (VI) Complexation studied by Time-Resolved Laser-Induced Fluorescence Spectroscopy

Sarah E. Herbison Gallaher, Cecile Reybet-Degat, Heino Nitsche

The behavior of uranium in the environment is important for understanding the potential for its migration and transport in the geosphere. In aqueous solution, the uranium(VI) dioxo cation may complex with organic and inorganic ligands and may also sorb to organic and inorganic surfaces. In environmental systems typical ligands include carboxylic groups of humic and fulvic acids. Sorption to metal oxide and bacterial surfaces are also possible.

As true environmental systems are very complex, we are first studying simple carboxylic acids as model compounds. Time-Resolved Laser-Induced Fluorescence spectroscopy (TRLFS) is used to study the uranium (VI) system. TRLFS is a direct method of determining species specific information. Fluorescence spectra from uranium (VI) and uranium(VI) complexes were used to determine the stability constants at low ionic strengths needed evaluating . Preliminary results with hydrolysis products indicate consistency with literature values.