

Date: April 16th

Time: 11:00 AM

Location: Ames 234

Speaker: Dr. Chongxuan Liu
Pacific Northwest National Laboratory, Richland,
Washington

Title: "Microscopic Diffusion in Subsurface Sediments:
Characterization and Modeling"

Abstract

Microscopic diffusion is one of major processes that impede the active remediation of contaminants in subsurface environments. Simultaneous effects of diffusion within particle grains, along with mineral dissolution and precipitation (or recrystallization) and reactive fluid flow, have been increasingly recognized in controlling diagenesis, mineral deposits, and chemical weathering of the Earth crustal rocks. Characterization of microscopic diffusion at sediment grain scales is, however, limited. This talk will describe our recent efforts using various spectroscopic and microscopic techniques (X-ray microprobe, X-ray adsorption, scanning electron microscopy, laser induced fluorescence spectroscopy, and nuclear magnetic resonance) to identify the diffusion of metals and radionuclides, and to characterize diffusion properties within sediment particle grains. A few modeling cases of microscopic diffusion with reactions will be presented and potential issues in advancing the modeling of diffusion processes at micron scales will be addressed, including charge coupling, electrical double layer effects, and chemical osmosis.