



Glenn T. Seaborg Center Special Seminar

Synchrotron-based X-ray Methods in Nuclear Waste Research

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Building 70A, Room 3377

Prerequisite to any reliable prediction of the long term safety of nuclear waste disposal and reduction of nuclear waste toxicity is advanced knowledge of the specific chemical and physical properties of the actinide elements. Improvement of knowledge concerning processes determinant in actinide geochemistry such as colloid generation/stability and solid/liquid interface reactions and concerning optimization of partitioning processes -as part of partitioning and transmutation (P&T) or partitioning and conditioning (P&C) strategies for alleviating waste radiotoxicity- is partially driven by increasing sophistication of available instrumentation and methods, including state-of-the-art synchrotron-based Xray techniques. The Institute for Nuclear Waste Disposal of the Karlsruhe Institute of Technology has a dedicated synchrotron research program, including a dedicated beamline for actinide research at its synchrotron source ANKA, for actinide speciation investigations. In this presentation a number of examples from this actinide speciation program will be presented, which are selected to highlight various aspects integral to this research approach: spatially resolved hard X-ray investigations into the nanometer regime (including new developments in ptychographic tomography), combination of experiment with theory, and combination of synthetic and various spectroscopic techniques.

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