19 - Advances in spatially-resolved tender-energy X-ray absorption spectroscopy at NSLS and NSLS-II

Paul Northrup[1,2]*, paul.northrup@stonybrook.edu, Donald Sparks*[3]*. (1) Department of Geosciences, Stony Brook University, Stony Brook, New York 11793, United States, (2) National Synchrotron Light Source, Brookhaven National Laboratory, Upton, New York 11973, United States, (3) Department of Plant and Soil Sciences, University of Delaware, Newark, Delaware 19716, United States*

XAS has long been useful for element-specific characterization of local structure and electronic state in crystalline and non-crystalline materials. Near-edge spectral structure (XANES) is useful in determining oxidation state and coordination species; extended fine structure (EXAFS) provides more detailed structural information within ~8A. XAS of elements lighter than Ti, however, has been much less applied due to lack of optimized facilities and experimental challenges in the "tender" energy range 1-5 keV. Moreover, classic XAS employs large (mm) spot size and requires uniform samples, posing challenges for heterogeneous systems. Recent improvements in the NSLS Beamline X15B facility have enabled high-quality XAS in the tender energy range, at 0.25-1.0mm spatial resolution, in a non-vacuum sample environment. A newly-funded (NSF Earth Sciences and DOE Geosciences) project is adding microfocusing at X15B, to bring high-performance tender-energy XAS and XRF to the microscale. Microbeam capabilities are expected by early Summer 2013. NSLS-II is a new state-of-the-art synchrotron under construction; the tender-energy microspectroscopy facility developed at X15B will be transferred to NSLS-II to be operational by late 2014.

Sunday, April 7, 2013 01:05 PM
Advances in Understanding the Chemistry of Light Elements at Environmental Interfaces (01:00 PM - 04:30 PM)
Location: Morial Convention Center
Room: 209

Close Window