

SOLID-STATE SPECIATION ANALYSIS USING SYNCHROTRON-BASED X-RAY ABSORPTION SPECTROSCOPIC METHODS. **Iris Koch**, Blaire Coffey, David Patch, Antoine Hnain, Jennifer Scott, Ken Reimer, Kela Weber. Royal Military College of Canada, Department of Chemistry and Chemical Engineering, 12 Verité Ave, 17000 Station Forces, Kingston, ON K7K 7B4, Canada. Andre Castillo. Queen's University, Department of Chemistry, 90 Bader Lane, Kingston, ON K7L 3N6, Canada. Debora Meira, Zou Finfrock. CLS@APS sector 20, Canadian Light Source Inc., 44 Innovation Boulevard, Saskatoon, Saskatchewan S7N 2V3, Canada. (koch-i@rmc.ca)

The necessity of determining the speciation of elements in understanding their toxicology, chemistry and environmental fate is undisputed. One of the difficulties in determining the speciation of elements in solid samples using conventional analytical methods is the complete characterization of the element, because extraction methods are usually required that may not be capable of removing all the element unchanged from the sample. Synchrotron-based x-ray absorption spectroscopy (XAS) can be used to examine samples in the solid state, both dried and fresh, often with cryogenic conditions to prevent chemical changes during analysis. We have used XAS in our group for many applications, including the speciation analysis of arsenic, silver, and other elements. The presentation will summarize recent developments in this area, including the feasibility of high energy resolution fluorescence detection for differentiation arsenic compounds that normally have indistinguishable spectra when using x-ray absorption near edge structure analyses. An outreach study at the Advanced Photon Source investigating changes in the elemental speciation in socks will also be described.