

SELECTIVITY OF ARSENOBETAINE USING FIELD PORTABLE X-RAY FLUORESCENCE. **Blair Coffey**, Jennifer Scott, and Iris Koch. Royal Military College of Canada, Department of Chemistry and Chemical Engineering, Environmental Sciences Group, PO Box 17000, Station Forces, Kingston, ON K7K 7B4, Canada. (blaire.coffey@rmc.ca)

Arsenic is a widely distributed element within the environment. This metalloid can be found in a variety of chemical forms. Arsenic is commonly known as a poison and carcinogen; however, arsenic compounds display different toxicities. Generally, inorganic arsenic forms, including arsenite and arsenate, are more toxic. Organoarsenic compounds, specifically those in the pentavalent form, are less toxic. One organoarsenic compound, arsenobetaine (AB), exhibits non-toxic properties. AB is predominantly found in marine organisms and less commonly found in the terrestrial environment with the exception of fruiting bodies (or mushrooms) of some terrestrial fungi species. Currently, AB's role and formation in mushrooms is unknown. It is hypothesized that AB acts as an osmolyte within the mushroom. This presentation examines potential abiotic formation pathways for AB. One proposed pathway involves exposing trimethylarsine oxide to a haloacetic acid in the presence of glutathione. To investigate this pathway, various synthetic reactions were conducted. These reactions were analyzed for arsenic speciation using HPLC-ICP-MS targeting AB. Additionally, a field portable x-ray fluorescence-based method was developed to provide real-time analysis of AB in solid and liquid samples. This method was verified using synchrotron-based x-ray absorption near edge structure analysis at the Advanced Photon Source in Chicago, IL.