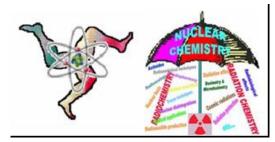Contribution ID: **81**   Type: **oral presentation**

Simultaneous speciation analysis of arsenic, antimony and selenium in natural waters by HPLC, SPE and solvent extraction coupled to neutron activation

Friday 23 September 2011 11:00 (20 minutes)

Simultaneous speciation neutron activation analysis (SSNAA) technique is being developed in our laboratory over the last 20 years or so. This technique can be reliably used for the simultaneous determination of not only various species of a single element but also species of other elements present in the same sample. Almost all speciation techniques consist of two steps. The first step involves the separation of species from the sample followed by the second step of element-specific detection. A neutron activation analysis (NAA) method in combination with high-performance liquid chromatography (HPLC) was developed first for the determination of low levels of five arsenic species, namely As(III), As(V), monomethylarsonic acid (MMA), dimethylarsinic acid (DMA), and arsenobetaine (AsB) in water samples. Organically bound arsenic (OBAs) and total arsenic levels were also measured. The detection limits of the HPLC-NAA method were found to be between 0.005 and 0.12 ng/mL for OBAs and total arsenic, respectively, using the Dalhousie University SLOWPOKE-2 reactor facility. These methods were then extended to include the determination of arsenic, antimony and selenium species, namely As(III), As(V), Sb(III), Sb(V), and Se(IV), in natural water samples by solvent extraction using APDC/MIBK and by solid-phase extraction (SPE) using HDBDC/XAD-4. Details of all three methods will be presented along with the concentrations of various species measured in natural waters.

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