Advances in speciation analysis of metalloids by HPLC-ICPMS

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We describe the use of high-pressure liquid chromatography coupled to an inductively coupled plasma mass spectrometer and a mass spectrometer for the measurement of As, Se, Hg and Sb species in food and vitamin supplements. Five modes of using coupled ICPMS systems; HPLC-ICPMS, HPLC-HG-ICPMS, Cryogenic trapping ICPMS, in-situ Cryogenic trapping ICPMS and GC-ICPMS are described and their application. Two classes of metalloid species are described; “Easy” and Hard” to extract and measure by HPLC-ICPMS. Measurements described include, Arsenic species: arsenobetaine, arsenoribosides, As bound to phytochelatins, As-lipids and 10 minor As species including thio-As species. Selenium species: include those produced by animals; selenocysteine and selenomethionine and plants such as Se-methyl selenomethionine, Se-methyl selenocysteine, , y-glutamyl-Se-methyl selenocysteine, methylselenide and dimethyldiselenide. Mercury species: inorganic Hg and methyl Hg. Antimony species: antimonite and antimonate. Problems with extracting species from sample matrices and preserving the integrity of species are discussed as well as the use of standardless measurement of species