ABSTRACT

DEVELOPING A SYSTEM FOR THE DETERMINATION OF VOLATILE ORGANO-SELENO COMPOUNDS UNDER FIELD-LIKE CONDITIONS

Selenium is found occurring in soil at concentrations rarely exceeding 2 mg/kg. In the places where it is found in high concentrations, it can become a toxin of concern. This is typically true when it is found as selenate, a water soluble form, which can move though ecosystems. It can be converted to a less harmful organic compound through methylation by soil microbes and plants. The main emphasis of the work was the development of a method for the determination of volatile Se produced under field conditions. This included the optimization of a volatilization chamber for the collection of the gaseous Se. In addition, three analytical techniques, of HG-AAS, GC/MS, and GC/FID, were evaluated. The techniques will be evaluated using efficiency, reproducibility, and sensitivity as primary factors. The best technique was determined to be GC/MS due the ability to quantify and qualify the compounds.

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