

Hydra II_{AA}

Application Note # 1062



The Determination of Mercury in Soils, Sediments and Sludges by U.S. EPA Method 245.5 Cold Vapor Atomic Absorption Spectroscopy

Introduction

Mercury is a toxic element found throughout the environment. The natural abundance of mercury in most soils is usually quite low (0.08 ppm)¹; however, elevated levels of mercury may be found in areas where gold mining, chlor-alkali production or paper manufacture has taken place. Also, leakage from landfills where objects high in mercury (such as auto parts, batteries, fluorescent bulbs, medical products, thermometers, and thermostats) have been disposed can result in high mercury concentrations in soil. In some cases significant mercury concentrations in soil result from atmospheric deposition. Regardless of the source, the runoff of soil with high mercury levels threatens any nearby waters, any fish that inhabit these waters, and the wildlife & people who consume the native fish. To protect the environment and ensure public safety, many laboratories are involved in monitoring mercury in soils, sediments and sludges. This note provides the details for the operation of the Hydra II_{AA} according to EPA method 245.5, the reference method for the determination of mercury in soils, sediments and sludges by cold vapor atomic absorption spectroscopy.

Instrumentation

The analysis was performed using the Hydra II_{AA} shown in Figure 1. The Hydra II_{AA} includes an extended range spectrometer, a high-capacity autosampler, variable speed peristaltic pump, serpentine gas/liquid separator, and flow-through rinse. The tri-cell optical design allows the analyst to select the optimum system sensitivity, achieving either part-per-trillion detection limits or linearity in excess of 1 part-per-million. This flexibility delivers optimum results for both clean water and contaminated soil analyses. The autosampler design addresses issues of recurring QC volume with built-in reservoirs for repetitive checks and sample capacity with up to 270 sample locations available. Its 5-channel peristaltic pump precisely delivers sample and reductant solutions under computer control while actively removing system waste solutions.



Figure 1: Hydra II AA

¹¹ "[Mercury-containing Products](http://www.epa.gov/epaoswer/non-hw/reduce/epr/products/mercury.htm)". United States Environmental Protection Agency (EPA). <http://www.epa.gov/epaoswer/non-hw/reduce/epr/products/mercury.htm>.