

Method Number: TM 418

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Method Summary**Determination of Mercury in Soils by Acid Digestion and CVAF****Scope and Range**

This method is suitable for the determination of trace level Mercury in soils. The range of the method is 0.19mg/kg - 20mg/kg.

References

none

Principle

Preparation and Extraction:

Soil samples submitted to the laboratory are prepared for analysis by drying and crushing. A sub-sample of the soil is taken and dried and crushed in accordance with in-house method PM-024 *Homogenisation and Preparation of Soil Samples*.

A 1g portion of the dried crushed sample is weighed into a plastic digitube and the weight recorded in Labware.

The sample is digested in a mixture of 2.5ml nitric acid and 7.5ml hydrochloric acid for 90 minutes at 110°C, before being diluted to 50 ml with de-ionised water. A further 100x dilution is then performed on the extract.

Samples are treated with hydrochloric acid and potassium bromide/bromate solution to generate bromine, which oxidises all mercury compounds present to Hg(II). Excess bromine is removed by ascorbic acid immediately prior to analysis. Hg(II) is reduced to Hg(0) by tin (II) chloride.

Analysis:

Elemental mercury vapour is stripped from solution by an argon gas carrier stream. Moisture is removed from the sample gas stream, and the dry mercury vapour is detected by atomic fluorescence spectrometry.

Interferences

Suppression of the fluorescence signal may be caused by:

Anions which complex strongly with mercury, e.g. sulphide, iodide and bromide (the potassium bromide-bromate digestion reagent causes no suppression if applied as directed)

Noble metals e.g. gold, silver and platinum, which amalgamate with mercury vapour.