ALS Environmental Hawarden
Units 7-8 Manor Road
Hawarden CH5 3US

Method Summary

Determination of Total Polychlorinated Biphenyls (PCBs) as Aroclor 1254 in Soils

Scope and Range

Polychlorinated biphenyls (PCBs) are a group of 209 different chlorinated biphenyl congeners that can be grouped as ten homologues. These homologues are isomers exhibiting the same levels of chlorination (i.e. dichlorobiphenyl, trichlorobiphenyl, tetrachlorobiphenyl, etc).
The ability to detect, identify and quantify the presence of PCBs in food, crops, natural waters, air and animals is essential to understand their impact on the environment and our food supply.
PCBs are classified as carcinogenic compounds and are monitored in a wide range of environmental matrices.
This method describes a procedure for the detection and quantification of the total PCBs in a sample as Aroclors (multi-component mixtures), normally as Aroclor 1254. Alternative Aroclors may be used to identify and quantify the level of contamination, namely Aroclor 1016, Aroclor 1221, Aroclor 1232, Aroclor 1242, Aroclor 1248, Aroclor 1260 or Aroclor 1262.
This method is applicable for analysis of soils, oils and sediments.

The LOD is set at 35µg/kg for all analytes based on 5g of dried soil being used for extraction. The LOD will increase if less sample is available for extraction and/or dilutions are required.
The linear range for the method is to 0.035µg/ml to 10.0µg/ml in the extract, which equates to 35.0µg/kg to 10000µg/kg in the soil sample.

Principle

Preparation and Extraction
5g of dried and crushed sample is weighed into a 40ml vial, 2g of copper is added followed by 10ml of hexane:acetone (1:1). The vial is capped with a screw top and shaken manually to dislodge the sample into the solvent. The samples are then put onto an end-over-end shaker for 45 minutes, and then centrifuged to separate the extract. 1ml of extract is then transferred to a 2ml vial and capped. The samples are spiked with 10±0.1µl of working internal standard before being loaded onto the instrument.
Analysis
Samples are analysed on a Gas Chromatographic system, equipped with an auto-sampler unit and a Mass Selective Detector (MSD) capable of detecting the PCB component target/qualifier ions.

Interferences

Solvents, reagent glassware and other sample processing hardware may yield artefacts and/or interferences to sample analysis. All these materials must be demonstrated to be free from interferences under the conditions of the analysis. This is undertaken by analysis of method blanks.
Interferences co-extracted from the sample will vary considerably from source to source. If analysis of an extracted sample is prevented due to interferences, it may be necessary to clean up by column chromatography. If this does not remove the interference then the detection limit should be raised.