CERTIFICATE OF ANALYSIS

ERM®-CC009

Pentachlorophenol in soil

Certified Values		
	Certified value [1)]	Uncertainty [2)]
Compound	Mass fraction in mg/kg	
Pentachlorophenol (PCP)	2.91	± 0.23

[1)] Unweighted mean value of 5 laboratory means using three different chromatographic methods combined with four detection principles (see below). The values are traceable to the SI (Système International d'Unités) via calibration using sufficiently pure substances.

[2)] Estimated expanded uncertainty *U* with a coverage factor of about *k*=2, corresponding to a level of confidence of 95 %, as defined in the Guide to the expression of uncertainty in measurement, ISO, 1993.

This certificate is valid for a period of 12 months beginning with the dispatch of the reference material from BAM.

The minimum sample size for one determination is 5 g.

NOTE

European Reference Material ERM®-CC009 was originally certified as BAM-U009. It was produced and certified under the responsibility of Bundesanstalt für Materialforschung und –prüfung (BAM) according to the principles laid down in the technical guidelines of the European Reference Materials® co-operation agreement between BAM-LGC-IRMM. Information on these guidelines is available on the Internet (http://www.erm-crm.org).

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DESCRIPTION OF THE SAMPLE

The intended purpose of reference material ERM®-CC009 is application in research, validation of analytical procedures for the determination of Pentachlorophenol (PCP) in soil according to E DIN ISO 14154 [1] by GC-ECD or alternative methods and for quality assurance in analytical laboratories.

The starting material was an anthropogenic contaminated sandy soil contaminated with PCP and collected on a former sawmill site in Northern Germany. The preparation steps of the reference material included air drying, mixing with uncontaminated soil, sieving (63 – 125 µm) and homogenisation.

The reference material comes in 50 ml brown glass bottles each containing 30 g of soil. The screw caps with PTFE-inserts are sealed by shrinking foil.

The within- and among-bottle-homogeneity was demonstrated by analysis of variance on 8 out of 256 bottles (4 replicate analyses per bottle).

The initial stability study after storage of selected units of the reference material at different temperatures revealed a shelf life of several years when kept at 4°C or lower. On storing the reference material at higher temperatures up to a maximum of 23°C, a deterioration of the content of PCP has to be taken into consideration. Therefore – starting with the date of sale of the reference material – the validity of the certificate expires after 12 months. Periodical investigations on the stability of this material will be carried out in order to keep this information up to date.

The tests for homogeneity and stability are described in detail in a technical report (see next page).

PARTICIPANTS AND ANALYTICAL METHOD USED FOR CERTIFICATION

The BAM in-house certification study involved 5 independent measuring stations using different analytical procedures as shown in the following table:

BAM-laboratory	Extraction method	Extraction solvent	Analytical method
I.21	Accelerated solvent extraction	Cyclohexane/Acetone (1:1)	GC/ECD
I.22	Sonication	Cyclohexane/Acetone (1:1)	GC/ECD
I.22	Sonication	Cyclohexane/Acetone (1:1)	GC/MS
I.23	Accelerated solvent extraction	Methanol	CE/UV
I.23	Accelerated solvent extraction	Methanol	HPLC/MS

Specific remarks on the procedures for extraction and analysis can be found in the certification report.

SAFETY INFORMATION

ERM®-CC009 contains the hazardous compound PCP with a mass fraction < 5 mg/kg. Proper use of the reference material is essential for avoiding potential harm to the user.
It is strongly recommended to handle and dispose the reference material in accordance with the guidelines for hazardous materials legally in force at the site of end use and disposal.

INSTRUCTIONS FOR USE

Prior to removal of sub-samples the bottle has to have reached room temperature. Thereafter, the bottle is to be closed tight and stored at 4°C or lower in the dark. The stability of the reference material is not affected by short periods of handling at ambient temperature during transport and use.

STORAGE

The reference material must be stored in its original bottles at 4°C or lower in the dark.

TECHNICAL REPORT

A detailed technical report (paper copy; in German) describing the production, general characterisation as well as the analytical procedures applied and the treatment of the analytical data during certification of ERM®-CC009 is available on request from BAM.

LEGAL NOTICE

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REFERENCES

[1] E DIN ISO 14154, 1998, Soil quality - Determination of selected phenols and chlorophenols - Gas-chromatographic method

Supply of Reference Materials by Bundesanstalt für Materialforschung und –prüfung:

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