Certified Reference Material

BAM-U021

Mineral Oil Contaminated Soil

Certified Value

Measurand	Mass fraction[1)] in mg/kg	Uncertainty *U*[2)] in mg/kg
Total petrol hydrocarbon (TPH)	3560	260

1) Unweighted mean value of 13 laboratory means using gas chromatography with flame ionisation detection (GC/FID) according to **ISO 16703:2005**.

2) Estimated expanded uncertainty *U* with a coverage factor of $k = 2$, corresponding to a confidence level of approximately 95 %, as defined in the Guide to the Expression of Uncertainty in Measurement, ISO, 2008.

This certificate is valid for a period of 24 months beginning with the dispatch of the reference material from BAM.

Date of dispatch: Sample No.:

The minimum sample size for one determination is 5 g. The mass fraction of TPH is related to sample intake (not to dry mass). The water content is 0.6 % (drying loss at 105 °C) and remains stable if the material is handled as indicated below.

Material Description

The material BAM-U021 is a sandy soil sampled at a remediation facility for contaminated soil in Berlin, Germany. After drying, sieving and homogenisation, the fraction < 125 µm was subdivided into units of 63 g which were filled in brown glass bottles with screw caps equipped with PTFE-inserts and sealed with shrinking foil. The material is stored at BAM at -20 °C until dispatch. Details on the preparation and characterisation procedure are specified in the certification report.

Recommended Use

The intended purpose of reference material BAM-U021 is the verification of analytical procedures for the determination of TPH in soils and sediments according to ISO 16703:2005 by GC/FID and for quality control in analytical laboratories.

Handling

It is strongly recommended to handle and dispose of the reference material in accordance with the guidelines for hazardous materials legally in force at the site of end use and disposal.

Transport and Storage

BAM-U021 can be shipped at ambient temperature. Upon receipt the material has to be stored at -20 °C in its original bottle. Before withdrawing a subsample the bottle has to have reached ambient temperature. Thereafter, the bottle is to be closed tightly and stored at -20 °C. The stability of the reference material is not affected by short periods of handling at ambient temperature during transport and use.

Participating Laboratories

The following laboratories participated in the certification study using GC/FID for the determination of TPH according to ISO 16073:2005:

ALBO-tec – Technologiezentrum f. Analytik u. Bodenmechanik	D-45473	Mülheim/Ruhr
Analytik Institut Dr. Rietzler & Kunze GmbH & Co. KG	D-09599	Freiberg
BAM Bundesanstalt für Materialforschung und -prüfung, FB	D-12489	Berlin
Chemisches Labor Dr. Wirts + Partner	D-30559	Hannover
Deutsche Bahn AG	D-14774	Brandenburg
Eurofins Umwelt Ost GmbH	D-09633	Halsbrücke
GDF SUEZ E&P DEUTSCHLAND GMBH	D-29410	Salzwedel
ICA - Institut für Chemische Analytik GmbH	D-04229	Leipzig
PWU Potsdamer Wasser- und Umweltlabor GmbH & Co. KG	D-14473	Potsdam
Südsachsen Wasser GmbH	D-09125	Chemnitz
UCL Umwelt Control Labor GmbH	D-24111	Kiel
Umweltlabor der Stadtentwässerung Schweinfurt	D-97424	Schweinfurt
WESSLING Laboratorien GmbH	D-30625	Hannover

Metrological Traceability

The mineral oil content is defined by the method employed for its determination. The certified value is the mass fraction of mineral oil obtained by the analytical procedure according to ISO 16703:2005 in relation to the certified calibration standard BAM-K010. Thus, the stated references for BAM-U021 are ISO 16703:2005 and the calibration standard BAM-K010 mentioned for this purpose therein.

Literature

R. Becker, A. Buchholz, BAM-U021, Certification report (http://www.rm-certificates.bam.de/de/rm-certificates_media/rm_cert_environment/bam_u021repe.pdf)

BAM:2006 “Guidelines for the Production of BAM Reference Materials“ http://www.bam.de/en/fachthemen/referenzmaterialien/referenzmaterialien_medien/bam_rm_guidelines.pdf

ISO 16703:2005: ”Soil Quality - Determination of content of hydrocarbon in the range of C_{10} to C_{40} by gas chromatography”

ISO/IEC Guide 98:2008: “Uncertainty of measurement.” ISO, Geneva 2008

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