Certified Reference Material

BAM-U015b

Mineral Oil Contaminated Sediment

Certified Value

Measurand	Mass fraction[1)] in mg/kg	Uncertainty *U*[2)] in mg/kg
Total petrol hydrocarbon (TPH)	920	100

1) Unweighted mean value of 14 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 12 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 2.5 % (*Karl Fischer* titration) and remains stable if the material is handled as indicated below.

Material Description

The material BAM-U015b is a fresh water sediment sampled from River Elbe, near the city of Magdeburg, Germany. The contamination with various pollutants including mineral oils originates from chemical and pharmaceutical industry in the region. After drying, sieving and homogenisation, the fraction < 125 µm was subdivided into units of 73 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-U015b 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-U015b 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, including three independent operator/equipment combinations at BAM, participated in the certification study using GC/FID for the determination of TPH according to ISO 16073:2005:

Analysen Service GmbH - Umwelt- und Öllabor Leipzig	04277	Leipzig
Analytik Institut Rietzler GmbH	90471	Nürnberg
ARGUS Umweltbiotechnologie GmbH	12277	Berlin
BAM Bundesanstalt für Materialforschung und -prüfung, AG 1.21	12489	Berlin
BAM Bundesanstalt für Materialforschung und -prüfung, AG 1.23	12489	Berlin
chemlab - Gesellschaft für Analytik und Umweltberatung mbH	64625	Bensheim
Freie und Hansestadt Hamburg - Institut für Hygiene und Umwelt	20539	Hamburg
GDF SUEZ E&P DEUTSCHLAND GMBH	29416	Steinitz
ICA - Institut für Chemische Analytik GmbH	04229	Leipzig
IfE - Analytik GmbH	04347	Leipzig
Institut Koldingen GmbH	31157	Sarstedt
WESSLING Laboratorien GmbH	30625	Hannover
WESSLING Laboratorien GmbH	82061	Neuried
WESSLING Laboratorien GmbH	69190	Walldorf

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-U015b are ISO 16703:2005 and the calibration standard BAM-K010 mentioned for this purpose therein.

Literature

R. Becker, H.-G. Buge, W. Bremser, BAM-U015b, Certification report

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

Accepted as BAM-CRM on August 30, 2011

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