Bundesanstalt für Materialforschung und -prüfung (BAM)

Certified Reference Material

BAM-U019a

Polychlorinated biphenyls in soil

Certified Values

Measurand	Mass fraction [1] in mg/kg	Uncertainty [2] in mg/kg
PCB-28	0.157	0.021
PCB-52	1.67	0.23
PCB-101	1.8	0.4
PCB-118	1.48	0.16
PCB-138	1.02	0.13
PCB-153	0.84	0.19
PCB-180	0.213	0.030

[1] Unweighted mean value of 10 laboratory means.

[2] Estimated expanded uncertainty U with a coverage factor of $k = 2$, corresponding to a level of confidence of approx. 95 %, as defined in the Guide to the expression of uncertainty in measurement, (GUM, ISO/IEC Guide 98-3:2008) [1].

This certificate is valid for a period of 12 months starting 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 fractions of the PCB congeners are related to sample intake (not to dry mass). The water content is (1.30 ± 0.03) % and remains stable if the material is handled as indicated below.

Instructions for Use

BAM-U019a is explicitly meant only to be used in analytical laboratories. The intended purpose of reference material BAM-U019a is the verification of analytical procedures such as [2 – 4] for the determination of PCB congeners in soils and sediments.

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

Material description

Reference material BAM-U019a was obtained from a contaminated site in the surroundings of Berlin, Germany. The specific location displayed an aged contamination originating from unknown sources. After air-drying, sieving and homogenisation, the fraction < 125 µm was subdivided into units of 81 g which were filled in amber 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 procedures are specified in the certification report.

Transport and Storage

BAM-U019a can be shipped at ambient temperature. Upon receipt the material must be stored at -20 °C in its original bottle. Before taking a subsample the bottle has to have reached ambient temperature. Thereafter, the bottle must 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.

Metrological Traceability

All certified values refer to the extractable amount of the PCB congeners and are conventional to this extent. In order to ensure traceability of the extractable content as defined above, certified calibration were employed by the participants.

Participating Laboratories

ALBO-tec	Mülheim an der Ruhr
Analysen Service GmbH	Leipzig
Bundesanstalt für Materialforschung und -prüfung (BAM)	Berlin
CAL GmbH & Co. KG	Darmstadt
CLG Chemisches Labor Dr. Graser KG	Schonungen
Dr. Ronald Fischer AUb	Bad Berka
GBA Gesellschaft für Bioanalytik mbH	Pinneberg
GEO-data GmbH	Garbsen
Infraserv GmbH & Co. Höchst KG	Frankfurt am Main
VKTA - Strahlenschutz, Analytik & Entsorgung Rossendorf e.V.	Dresden

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Technical Report

A detailed technical report describing the analytical procedures and the treatment of the analytical data used to certify BAM-U019a is available on request or can be downloaded from the BAM website (www.bam.de).

Literature

[1] ISO/IEC Guide 98-3:2008. Uncertainty of measurement - Part 3: Guide to the expression of uncertainty in measurement (GUM:1995) ISO, Geneva, Switzerland.

[2] ISO 10382:2009: Soil quality - Determination of organochlorine pesticides and polychlorinated biphenyls – Gas-chromatographic method with electron capture detection.

[3] EN 15308:2016: Characterization of waste - Determination of selected polychlorinated biphenyls (PCB) in solid waste by using capillary gas chromatography with electron capture or mass spectrometric detection.

[4] EN 16167:2012: Soil, treated biowaste and sludge - Determination of polychlorinated biphenyls (PCB) by gas chromatography with mass selective detection (GC-MS) and gas chromatography with electron-capture detection (GC-ECD).

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Bundesanstalt für Materialforschung und -prüfung (BAM)

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BAM holds an accreditation as a reference material producer according to ISO Guide 34 in combination with ISO/IEC 17025. This accreditation is valid only for the scope as specified in the certificate D-RM-11075-01-00.
DAkkS is a signatory of the multilateral agreement (MLA) between EA, ILAC and IAF for mutual acceptance.

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