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CERTIFICATE OF ANALYSIS

ERM®-CC016

Mineral oil contaminated waste material		
Compound	Certified value [1]	Uncertainty [2]
	Mass fraction in mg kg^{-1}	
Total petrol hydrocarbons (TPH)	3010	± 220

[1] Unweighted mean value of 13 accepted laboratory means using gas chromatography with flame ionisation detection (GC-FID) according to EN 14039 and ISO 16703. The certified value is traceable to the SI.

[2] Estimated expanded uncertainty *U* with a coverage factor of $k = 2$, corresponding to a level of confidence of about 95 %, as defined in the Guide to the expression of uncertainty in measurement, ISO, 1995.

This certificate is valid for a period of 12 months beginning with the dispatch of the material from BAM. The validity may be extended as further evidence of stability becomes available.

The minimum sample size for one determination is 10 g. The mass fraction of the mineral oil hydrocarbon content is related on sample intake (not on dry mass). The water content is 3,95 % (*Karl Fischer* titration) and remains stable if the material is handled as indicated below.

NOTE

European Reference Material ERM®-CC016 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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Berlin, 2008-06-09

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DESCRIPTION OF THE SAMPLE

The intended purpose of reference material ERM®-CC016 is the verification of analytical procedures for the determination of mineral oil hydrocarbons in waste and soils according to EN 14039 [1] and ISO 16703 [2] by GC-FID and for quality control in analytical laboratories.
The material ERM®-CC016 is a homogenised waste mixture consisting of different real-world contaminated constituents. After drying and fractionation by sieving, the sieve fractions < 500 µm of three single waste components were mixed and homogenised. After homogenisation the final waste mixture was subdivided into 262 units of 83 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.
The between-bottle homogeneity of the mineral oil content was demonstrated by analysis of variance (ANOVA) on 11 selected bottles (5 replicate analyses per bottle).
The period of validity of the certificate results from the initial stability study after storage of selected units of this reference material for up to 6 months at different temperatures. 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 the technical report.

PARTICIPANTS

The following laboratories, including three independent operator/equipment combinations at BAM, participated in the certification study using GC-FID for the determination of mineral oil hydrocarbons according to EN 14039 [1] and ISO 16703 [2]:

Laboratory	City / Country
Alcontrol Specials	Hoogvliet, The Netherlands
Bundesanstalt für Materialforschung und –prüfung (BAM-I.2)	Berlin, Germany
Bundesanstalt für Geowissenschaften und Rohstoffe	Hannover, Germany
Chemlab GmbH	Bensheim, Germany
Dr. Kaiser & Dr. Woldmann GmbH	Hamburg, Germany
Dr. Ronald Fischer AUb Chemische Analytik- und Umweltberatung	Leinatal, Germany
Dr. Weßling Laboratorien GmbH	Altenberge, Germany
Estonian Environmental Research Centre (EERC)	Tallinn, Estonia
Landeslabor Brandenburg	Potsdam, Germany
Landesumweltamt NRW, Fachbereich 22 – Organische Chemie	Düsseldorf, Germany
Latvian Environment Geology and Metrology Agency (LEGMA)	Ūrmala, Latvia
Limnologisches Institut Dr. Nowak	Ottersberg, Germany

SAFETY INFORMATION

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 AND STORAGE

The material has to be stored at -20°C in its original bottle. Before withdrawing a sub-sample 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 temperatures during transport and use.

TECHNICAL REPORT

A detailed technical report (paper copy) describing the production, general characterisation as well as the analytical procedures applied and the treatment of the analytical data during certification of ERM®-CC016 is available on request from BAM.

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REFERENCES

[1] EN 14039, Characterization of waste – Determination of hydrocarbon content in the range of C_{10} to C_{40} by gas chromatography. 2004

[2] ISO 16703, Soil Quality - Determination of hydrocarbon content in the range of C_{10} to C_{40} by gas chromatography. 2004

[3] Certification report ERM-CC016, The certification of the mass fraction of mineral oil hydrocarbons in solid waste. BAM, 2007

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

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