Certified Reference Material

BAM-U114

Total Cyanide in Soil

ausverkauft / out of stock

Certified Value

Measurand	Mass fraction[1)] in mg/kg	Uncertainty U[2)] in mg/kg
Total cyanide according to ISO 11262:2011	23.1	1.3

[1)] Unweighted mean value of 12 laboratory means which were corrected to the dry mass content of the material after drying to constant mass at (105 ± 2) °C.

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

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

Date of dispatch:

The minimum amount of sample to be used for the determination of total cyanide is 5 g.

Material Description

The CRM is available as a powder with particle sizes below 125 µm and is supplied in 100 mL brown glass bottles containing (66 ± 1) g.

The starting material was a sandy soil collected from a stockpile excavated during a remediation campaign on the area of a former gasworks in the Berlin region. The raw material was dried at ambient air to constant mass and afterwards the fraction passing a 2 mm screen was ground in a ball mill (with grinding bowls and balls made of zirconia) completely to particle sizes below 125 µm. Homogenisation and bottling of the ground material were performed using a spinning riffler.

Determination of main matrix constituents of the bottled material performed at BAM by semi-quantitative X-ray fluorescence analysis gave the following non-certified results:

Element	Si	Al	Ca	Fe	K
Mass fraction in %	36.4	1.8	1.4	0.8	0.8

Further informative analytical results characterising the sample matrix:

Parameter	Mass fraction in %	Analytical method
Dry mass content at 105 °C	99.4	ISO 11465
Loss on ignition at 550 °C	2.7	EN 12879
Organic carbon (TOC)	1.4	ISO 10694
Inorganic Carbon (TIC)	0.2	ISO 10694

pH values in water and $CaCl_2$ solution (according to ISO 10390): 8.8 and 8.1, respectively.

Recommended Use

The intended purpose of reference material BAM-U114 is the verification of analytical results obtained for the mass fraction of total cyanide in soils and soil-like materials applying the standardised procedure ISO 11262:2011. As any reference material, it can also be used for routine performance checks (quality control charts) or validation studies.

Handling

The material should be used as it is from the bottle. However, before taking a sub-sample a re-homogenisation by manual shaking of the closed bottle is strongly recommended.

When determining the content of total cyanide, the analytical protocol prescribed by ISO 11262:2011 must strictly be followed. All analytical results have to be corrected for dry mass content of the material which should be determined according to ISO 11465:1993 using a separate sub-sample. The value given in the table above (99.4 %) should be regarded as being indicative only.

Transport and Storage

CRM BAM-U114 can be shipped at ambient temperature. Upon receipt the material has to be stored at a temperature below 25 °C in its original tightly closed bottle. Although the stability of the reference material is not affected by short periods of handling at ambient temperature, the bottle shall be left unclosed as short as possible. Care should be taken to avoid moisture pick up once the bottle is opened.

Participating Laboratories

The following laboratories participated in the certification study:

Agrolab Labor GmbH, 84079 Bruckberg

ALS Analytiklabor Schirmacher GmbH, 21079 Hamburg

Analytik Institut Dr. Rietzler & Kunze GmbH & Co. KG, 09599 Freiberg

BAM Bundesanstalt für Materialforschung und -prüfung, Fachbereich 1.6, 12489 Berlin

BEGA.tec – Abteilung Labor, 10829 Berlin

Chemisches Labor Dr. Barbara Graser, 97453 Schonungen

DEKRA Industrial GmbH, Labor für Umwelt- und Produktanalytik, 06118 Halle (Saale)

EUROFINS Umwelt Ost GmbH, Niederlassung Freiberg, 09633 Halsbrücke/Tuttendorf

GEO-data GmbH, 30827 Garbsen

Landesamt für Natur, Umwelt u. Verbraucherschutz NRW, Fachgebiet 65.1, 45699 Herten
Lobbe Entsorgung West GmbH & Co. KG, 58642 Iserlohn
SGS Institut Fresenius GmbH, 45699 Herten

Metrological Traceability

It is important to note that the certified mass fraction of total cyanide in reference material BAM-U114 is operationally-defined referring to the analytical protocol prescribed by ISO 11262:2011. The photometric determination of the liberated cyanide is traceable to the International System of Units (SI) via calibration using substances with certified analyte content.

References

Certification Report „CRM BAM-U114“ (H. Scharf, BAM, March 2012)
(Download: BAM-homepage (www.bam.de) via links <Reference Materials> and <Cerificates and reports>)

Guidelines for the production of BAM reference materials (BAM, June 2006)
(http://www.bam.de/en/fachthemen/referenzmaterialien/referenzmaterialien_medien/bam_rm_guidelines.pdf)

ISO/IEC Guide 98-3:2008: Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurement (GUM)

ISO 11262:2011: Soil quality – Determination of total cyanide

ISO 11465:1993: Soil quality – Determination of dry matter and water content on a mass basis. Gravimetric method

Accepted as BAM-CRM on May 15, 2012

BAM Bundesanstalt für Materialforschung und -prüfung

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