TÜBİTAK
ULUSAL METROLOJİ ENSTİTÜSÜ

Certificate of the Reference Material

Referans Malzeme Üretimi
TS EN ISO 17034
AB-0001-RM

Name of the Material : Colemanite Certified Reference Material

Material Code : UME CRM 1205

Issue Date : 26.12.2017

Revision Date : 11.10.2021 (Revision history can be found on the last page)

Validity Period of the Certificate : One year from the sales date

Certified Values :

Parameter	Mass Fraction[1] g/100 g	Uncertainty[1,2] g/100 g	Parameter	Mass Fraction[1] mg/kg	Uncertainty[1,2] mg/kg
B[3]	12.2	0.6	Al[4]	448	43
Ca[4]	20.2	0.7	As[4]	14.8	1.8
Mg[4]	1.10	0.06	Fe[6]	215	29
Si[4]	2.01	0.13	Na[4]	290	24
Sr[3]	0.59	0.02	S[3]	780	40
LOI[5]	24.7	0.7			

[1] The certified values and the uncertainties are traceable to the International System of Units (SI).
[2] The expanded uncertainty of certified value includes characterization, homogeneity, stability components and is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 %. The standard uncertainty of measurement has been determined in accordance with “Guide to the Expression of Uncertainty in Measurement” (GUM).
[3] Certified value has been assigned based on the results produced by using ID-ICP-MS method.
[4] Certified value has been assigned based on the results produced by using independent ICP-MS and AAS methods.
[5] Loss on ignition (LOI) certified value has been assigned based on the gravimetric method with an ignition at 950 °C in accordance with TS 3245 standard.
[6] Certified value has been assigned based on the results produced by using independent ICP-MS and ID-ICP-MS methods.

TÜBİTAK UME, as a reference material producer, has been accredited by TÜRKAK according to TS EN ISO 17034 with the accreditation number AB-0001-RM.

Sales Date

Dr. Mustafa ÇETİNTAŞ
Director

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Description

The material is approximately 80 g of ground colemanite (<75 micrometer). More detailed information about the material and certification process is presented in the certification report.

Intended Use

This material is intended to be used for method validation of the determination of element mass fractions and loss on ignition in colemanite and quality control purposes.

Instructions for Use

The bottle must be shaken before opening for assurance of homogeneity. All precautions must be taken in order to prevent contamination and moisture uptake.

Minimum sample intake is 0.10 g for elements and 1.0 g for loss on ignition measurements.

Storage Conditions

The material should be stored at ordinary laboratory temperatures. TÜBİTAK UME cannot be held responsible for changes that might happen to the material at customer's premises due to noncompliance with the instructions for use, and the given storage conditions.

Safety Information

The material is for laboratory use only. Usual laboratory precautions apply during storage and usage. It is strongly recommended that the material must be handled and disposed according to the safety guidelines where applicable. Users are recommended to avoid inhalation of the powder material, and work under proper ventilation. Please refer to the Safety Datasheet before any use of the material.

Participants

Information about the laboratory participated in the characterization study is presented in the table below.

Laboratory	Address
TÜBİTAK UME	TÜBİTAK Gebze Yerleşkesi, Barış Mahallesi, Dr. Zeki Acar Caddesi No.1, 41470 Gebze - Kocaeli / Turkey

Methods and/or Techniques Used for the Determination of the Certified Values

Methods and techniques used in characterization studies are presented below.

Method/Technique	Parameter
Flame Atomic Absorption Spectrometry (FAAS)	Ca, Mg, Na, Si
Graphite Furnace Atomic Absorption Spectrometry (GFAAS)	Al
Hydride Generation Atomic Absorption Spectrometry (HGAAS)	As
Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Al, As, Ca, Fe, Mg, Na, Si
Isotope Dilution Inductively Coupled Plasma Mass Spectrometry (ID-ICP-MS)	B, Fe, S, Sr
Customized TS 3245 standard involving gravimetric measurement of mass loss after ignition at 950 °C	LOI

Revision History

Date	Remarks
26.12.2017	First publication
27.02.2018	LOI parameter recertified using an in-house method adapted from TS 3245 standard, and the uncertainties were updated. Sulfur (S) certified value was updated.
11.10.2021	Certificate is updated due to changes in the format of certificate for reference materials.