

Certificate of the Reference Material

Page 1 / 4

Name of the Material : Elements in Spring Water
Material Code : UME CRM 1201
Issue Date : 30.07.2013
Revision Date : 18.09.2019 (Revision history can be found on the last page)
Validity Period of the Certificate : 5 years from the sales date
Certified Values :

Element	Mass Fraction ^[1] (µg/kg)	Uncertainty ^[2] (µg/kg)	Element	Mass Fraction ^[1] (mg/kg)	Uncertainty ^[2] (mg/kg)
As	6.50	0.38	Al	0.102	0.005
Cd	3.95	0.15	B	0.476	0.023
Co	9.60	0.30	Ba	0.313	0.014
Cr	34.6	1.2	Ca	3.91	0.14
Cu	83.1	2.6	K	0.410	0.028
Fe	45.6	2.7	Mg	0.867	0.033
Mn	14.5	0.5	Na	3.13	0.11
Ni	16.8	0.7	Zn	0.104	0.005
P	96.4	5.7			
Pb	14.7	0.4			
Sb	5.37	0.59			
Sn	1.50	0.08			
Sr	21.9	1.1			

[1] Calculated from the unweighted mean of the accepted results submitted by the laboratories using different methods. The certified values 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 GUM "Guide to the Expression of Uncertainty in Measurement".

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

The following pages are an integral part of the certificate. The use of current certificate is customers' responsibility.

Most recent certificate can be downloaded from www.ume.tubitak.gov.tr.

Informative Values

Parameter	Value
Density (22 °C)	1.0083 g/cm ³ [1]

[1] The value is based on three independent replicates of three units from one laboratory.

Description

The material is in a high density polyethylene plastic bottle containing about 100 mL of spring water. The content is acidified to have a final concentration of about 2% HNO₃ (w/v). Additional information is given in the certificate report.

Intended Use

This material is intended to be used for method validation of the determination of element mass fractions in spring waters 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 degradation or contamination with air intact. Minimum sample intake is 0.25 mL for all analytes. The material can be safely dispatched at ambient temperature where the temperature does not exceed 60 °C and the transportation period of 4 weeks.

Storage Conditions

The material should be stored at (18 ± 4) °C in dark.

TÜBİTAK UME cannot be held responsible for changes that might happen to the material at customer's premises due to noncompliance of the instructions for use, and the storage conditions given in the certificate.

Safety Information

Usual laboratory precautions apply. It is strongly recommended that the material must be handled and disposed according to the safety guidelines where applicable.

Please refer to the Safety Datasheet before any use of the material.

Participants

Information about the laboratories participated in the characterization study are given in the following table.

Laboratory	Address
AEM Çevre Laboratuvar Analiz Tic. A.Ş.	Bağlarbaşı Mah. Feyzullah Cad. No:119 Maltepe / Istanbul, Turkey
ALS-Czech	ALS Czech Republic, s.r.o. Na Harfě 336/9, 190 00, Praha 9, Czechia
ALS-Scandinavia	ALS Scandinavia AB Aurorum 10 SE-977 75 Luleå, Sweden
AST Çevre Ölçüm ve Analiz Laboratuvarı	Yeniyol Sk. Etap İş Merkezi B Blok D:10 K:3 Acıbadem Kadıköy / Istanbul, Turkey
ÇEVRE Analiz Gıda ve Endüstriyel Analiz Laboratuvarları	Merkez Mh. Tatlıpınar SokNo:13 K:2/A Kağıthane / Istanbul, Turkey
TÜBİTAK BUTAL	Gaziakdemir Mah. Merinos Cad. No:11 16190 Osmangazi / Bursa, Turkey
TÜBİTAK UME	TÜBİTAK Gebze Yerleşkesi Barış Mah. Dr. Zeki Acar Cad. No:1, 41470 Gebze / Kocaeli, Turkey
UBA WIEN	Umweltbundesamt GmbH Spittelauer Lände 5 1090 Wien, Austria
VASYD	Box 191, 201 21 Malmö, Sweden

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

Techniques used in the characterisation studies are given in the following table.

Method/Technique	Parameter
Graphite Furnace Atomic Absorption Spectrometry (GFAAS)	As, Ba, Cd, Cr, Cu, Ni, Pb
Flame Atomic Absorption Spectrometry (FAAS)	Mg, Na, Zn
Atomic Emission Spectrometry (AES)	Al, B, Ba, Co, Cu, Fe, K, Mg, Na, Ni, P, Sr, Zn
Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Al, As, B, Ba, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, P, Pb, Sb, Sn, Sr, Zn
Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES)	Al, B, Ba, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, P, Pb, Sr, Zn

Revision History

Date	Remarks
30.07.2013	First issue.
08.11.2018	Certificate is updated due to format change of the document.
18.09.2019	Information about shipping conditions is added. Certificate is updated due to changes in the format of certificate for reference materials.