

**Name of the Material** : Multi Anion Standard I

**Material Code** : UME CRM 2281

**Issue Date** : 12.04.2023

**Revision Date** : 12.04.2023 (Revision history can be found on the last page)

**Validity Period of the Certificate** : 24 months from the sales date

**Certified Values** :

Parameter	Mass Fraction <sup>[1,2]</sup>	Uncertainty <sup>[2,3]</sup>	Unit
Cl <sup>-</sup>	999.2	2.1	mg/kg
NO <sub>3</sub> <sup>-</sup>	999.4	3.2	mg/kg
SO <sub>4</sub> <sup>-2</sup>	999.4	4.4	mg/kg

[1] The certified value was determined by using High Performance Ion Chromatography (HP-IC) and gravimetric solution preparation methods.

[2] The certified values and uncertainties are traceable to the International System of Units (SI).

[3] The expanded uncertainty of the 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".

**Sales Date**

  
**Assoc. Prof. Mustafa ÇETİNTAŞ**  
**Acting 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](http://www.ume.tubitak.gov.tr)

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### Informative Values

Parameter	Mass Fraction <sup>[1]</sup>	Uncertainty <sup>[2]</sup>	Unit
Density (20 °C)	1002.033	0.044	kg/m <sup>3</sup>

[1] Calculated from three independent measurements from each of the three different units.

[2] The expanded uncertainty is calculated from 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%.

### Description

The material is approximately 100 mL solution filled into high density polyethylene (HDPE) bottle after dissolution, dilution and homogenization of the KCl, KNO<sub>3</sub> and K<sub>2</sub>SO<sub>4</sub> salts. Detailed information about the preparation of the material can be found in the certification report.

### Intended Use

This material is intended to be used as a calibration standard for determination of Cl<sup>-</sup>, NO<sub>3</sub><sup>-</sup> and SO<sub>4</sub><sup>2-</sup> anions.

### Instructions for Use

Before opening the bottle, it should be allowed to equilibrate with the ambient temperature and shaken before opening the cap. All precautions should be taken to prevent contamination and evaporation during the use of the material.

The homogeneity of the solution for Cl<sup>-</sup>, NO<sub>3</sub><sup>-</sup> and SO<sub>4</sub><sup>2-</sup> has been proven by within-bottle and between-bottle homogeneity tests. The minimum sampling amount should be determined by the end user according to the measurement capability, taking into account the uncertainty of the working solution to be prepared.

This material can be safely dispatched under conditions where the temperature does not exceed 45 °C for up to 2 weeks, i.e. at ambient temperature without applying any cooling elements.

### Storage Conditions

The material should be stored at (+2 – +8) °C before and after use. TÜBİTAK UME cannot be held responsible for any changes that might happen to the material due to non-compliance with the instructions for use, and the storage conditions stated in the certificate.

### Safety Information

The material is manufactured for laboratory use only. General laboratory precautions should be followed during storage and use of the material. It is recommended to use and dispose of the material according to the existing safety rules. Please refer to the Safety datasheet (SDS) before any use of the material.

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### Participants

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

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

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

High Performance Ion Chromatography (HP-IC) and gravimetric solution preparation techniques were used in the characterisation study.

### Revision History

Date	Remarks
12.04.2023	First issue.