



Approved by General Administration of Quality Supervision,

Inspection and Quarantine of the People's Republic of China

GBW08605

Certificate of Certified Reference Material

Arsenic in Water

Sample Number:

Date of Certification:

Date of Expiration:

Producer: National Institute of Metrology

Address: No.18,Beisanhuan donglu Beijing

Tel: +86-10-64524710

Fax: +86-10-64524716

e-mail: crm-service@nim.ac.cn

1. Description of Material & Intended Use

This certified reference material (CRM) is mainly intended for calibration of measurement instruments, validation and evaluation of analytical methods, quality control on measurement process and technology arbitration and certificate assessment on analytical results in the process of trace analysis for arsenic element in drinking water, waste water and natural water.

2. Preparation

The starting materials of this reference material, primary reagent arsenic trioxide (As_2O_3) with accurately known purity and high purity sulfuric acid (H_2SO_4), are diluted with organic-component-free water in clean room at $20^\circ\text{C} \pm 2^\circ\text{C}$ by using gravimetric method. The water is purified for three times by using reverse osmosis method, ion exchange method and quartz distiller.

The sulfuric acid of 0.2% (V/V) is used as the protective agent for trace element arsenic and the elements in the matrix are close to the actual water samples, they are K^+ 2.2mg/L, Na^+ 23mg/L and Cl^- 37mg/L.

3. Traceability and certification

The purity of As_2O_3 was determined using constant current coulometry method which can be traceable to the national primary standard on the purity of primary reagent of China. The preparing value (formulated value) of concentration, checked with inductively coupled plasma-atomic emission spectroscopy (ICP-AES) method, is considered as the certified value of the concentration of this CRM.

The traceability of the certified value is ensured by using measurement methods and measuring instruments that meet the requirements of metrology.

4. Certified value and uncertainty

The certified value and the expanded uncertainty of the CRM are as follows:

Code	Certified value $/ \mu\text{g}\cdot\text{g}^{-1}$	Expanded uncertainty $/ \mu\text{g}\cdot\text{g}^{-1}, k=2$
GBW08605	0.500	0.008

Contributions from purity of materials, sample weighing for high purity materials and solution and change of temperature were considered in uncertainty evaluation of the reference material.

5. Homogeneity and Stability Testing

According to the requirement of national criterion for primary certified reference materials, the homogeneity and stability testing were carried out through random sampling by using ICP-AES method.

The *F*-test method was used and no statistically significant difference among bottles was observed. The reference material is in good homogeneity and stability.

The stability of this RM is regularly monitored by NIM. Any change of the certified value during this period will be informed to the customers in time.

6. Instructions for use

- This certified reference material is sealed up in glass ampoules and each unit contains about 20ml of the standard solution.
- This certified reference material should be kept in cool and clean place. Prior to use, the CRM should be thoroughly mixed by inverting the ampoule.
- This certified reference material should be used one time after being opened and **CANNOT** be used repeatedly. And it should be prevented from contamination while using.
- The relationship between the density of solution and temperature are as follows:

Temperature / °C	5	10	15	20	25	30	35
Density / g·cm ⁻³	1.0032	1.0029	1.0023	0.0013	1.0002	0.9987	0.9971

STATEMENT

1. The CRM is only limited in use of scientific research and analytical measurement. Any loss caused by improper use and storage by customer will not be respond by maker.
2. Please check the kind, number and package as soon as the sample arriving. The compensate do not relate to any loss except for the CRM.
3. The maker only answer for the intact certificate with CRM cachet of nim. Please keep the certificate appropriately.
4. Please contact with technical consultant section, if more information related to the use of the CRM is needed.

National Institution of metrology P.R. China

Address: No. 18 East Road North San Huan, Beijing Post Code: 100013

Tel for distribution: +86(10)64524710. Tel for technical consultation: +86(10)64524776

Fax: +86(10) 64524716. Website: www.nim.ac.cn ; www.ncrm.org.cn