

National Institute of Advanced Industrial Science and Technology

## National Metrology Institute of Japan



## Reference Material Certificate

NMIJ CRM 7913-a  
No. +++

## Dimethylarsinic Acid Solution

This certified reference material (CRM) is produced in accordance with the NMIJ's management system and is in compliance with ISO 17034 and ISO/IEC 17025. This CRM is intended for use in the calibration of instruments, and validation of analytical methods and instruments used for the quantification of dimethylarsinic acid.

**Certified Value**

The certified value for dimethylarsinic acid in this CRM is given in the table below. The uncertainty of the certified value is the half-width of the expanded uncertainty interval calculated using a coverage factor ( $k$ ) of 2, which gives a level of confidence of approximately 95 %.

	CAS No.	Certified value, Mass fraction (mg/kg)	Expanded uncertainty Mass fraction (mg/kg)
Dimethylarsinic acid (CH <sub>3</sub> ) <sub>2</sub> As(O)OH	75-60-5	25.11	0.70

**Analysis**

The certified value of this CRM was weighted mean of the results of the following analytical methods. The weighted mean of arsenic concentration was converted to dimethylarsinic acid concentration.

- (1) Microwave assisted digestion / Inductively coupled plasma mass spectrometry (ICP-MS)
- (2) Microwave assisted digestion / High resolution ICP-MS
- (3) Microwave assisted digestion / High performance liquid chromatography – ICP-MS (HPLC-ICP-MS)
- (4) Directly / ICP-MS

**Metrological Traceability**

The certified value was determined by the methods with NMIJ 7912-a (As(V) solution). Therefore, the certified value is traceable to the International System of Units (SI).

**Mutual Recognition Arrangement under Meter Convention**

This certificate is consistent with the calibration and measurement capabilities (CMCs) that are included in Appendix C of the Mutual Recognition Arrangement (MRA) drawn up by the International Committee for Weights and Measures (CIPM). Under the MRA, all participating institutes recognize the validity of each other's calibration and measurement certificates for the quantities, ranges and measurement uncertainties specified in Appendix C (as for Appendix C of MRA, see <http://kcdb.bipm.org/AppendixC/default.asp>).

**Expiration of Certification**

This certificate is valid for one year from the date of shipment, provided that the material remains unopened and is stored in accordance with the instructions given in this certificate.

**Sample Form**

This CRM is in the form of a colorless and transparent liquid at ordinary temperature, and 10 mL in net volume is kept in an

amber glass bottle.

**Homogeneity**

The homogeneity of this CRM was determined by analyzing 10 bottles hierarchical-randomly selected from the 400 bottles. Dimethylarsinic acid was determined by HPLC-ICP-MS. The homogeneity is reflected in the uncertainty of the certified value.

**Instructions for Storage**

This CRM should be stored at a temperature between 5 °C and 35 °C in a clean place and shielded from light.

**Instructions for Use**

- 1) Be careful to a disassembly of a cap with the opening.
- 2) The bottle should be opened after gently shaking at room temperature.
- 3) After opening, take care to avoid contamination. Also, it is desirable to use up this CRM as quickly as possible.
- 4) The minimum sample amount is 0.15 mL for the determination of dimethylarsinic acid.
- 5) The bottle must be sealed as tightly as possible for storage after opening.

**Precautions for Handling**

Wear a mask, gloves, and other protective equipment during handling. Handling, storage, and disposal of this CRM obey the Poisonous and Deleterious Substances Control Law. Refer to the safety data sheet (SDS) on this CRM before use.

**Preparation**

A High-purity dimethylarsinic acid reagent powder was dissolved in water that was then dispensed into amber glass bottles (10 mL each).

**Technical Information**

The density of this CRM measured using the peculiar vibration cycle method was 0.99709 g/cm<sup>3</sup> (25 °C). 0.002 % of As(V) and 0.003 % of monomethylarsonic acid against the total arsenic mass function were found by HPLC-ICP-MS, and they are reflected in the uncertainty of the certified value.

**NMIJ Analysts**

The technical manager is CHIBA K., the production manager is KUROIWA T., and the analysts are KUROIWA T., NARUKAWA T., INAGAKI K., NARUSHIMA I. and JIMBO Y.

**Information**

If substantive technical changes occur that affect the certification before the expiration of this certificate, NMIJ will notify the registered customer. Customer registration on the NMIJ Website (given below) will facilitate notification. Technical reports regarding this CRM can be obtained from the contact details given below.

**Reproduction of Certificate**

In reproducing this certificate, it should be clearly indicated that the document is a copy.

April 1, 2020

ISHIMURA Kazuhiko  
President

National Institute of Advanced Industrial Science and Technology

If you have any questions about this CRM, please contact:  
National Institute of Advanced Industrial Science and Technology,  
National Metrology Institute of Japan,  
Center for Quality Management of Metrology, Reference Materials Office,  
1-1-1 Umezono, Tsukuba, Ibaraki 305-8563, Japan  
Phone: +81-29-861-4059; Fax: +81-29-861-4009, <https://unit.aist.go.jp/nmij/english/refmate/>

Revision history

August 10, 2012: Expiration date was extended from “March 31, 2014” to “March 31, 2019.”

April 1, 2015: “Metrology Management Center” was renamed to “Center for Quality Management of Metrology.”

November 20, 2017: The description in “Expiration of Certification” was changed to “one year from the date of shipment.”

Sample