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) was produced in accordance with the NMIJ’s management system and in compliance with ISO GUIDE 34:2000 and ISO/IEC 17025:2005. This CRM is intended for use in the calibration of instruments, and validation of analytical methods and instruments used for the quantification of dimethyarsinic acid.

Certified Value
The certified value for dimethyarsinic 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%.

<table>
<thead>
<tr>
<th>CAS No.</th>
<th>Certified value, Mass fraction (mg/kg)</th>
<th>Expanded uncertainty Mass fraction (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethylarsinic acid ((\text{CH}_3)_2\text{As(O)OH})</td>
<td>75-60-5</td>
<td>25.11</td>
</tr>
</tbody>
</table>

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 dimethyarsinic 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

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Date of Shipment: Xxxxxx, 2017

This CRM is in the form of a colorless and transparent liquid at ordinary temperature, and 10 mL 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. Dimethlyarsinic 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 kept in a clean place at a temperature between 15 °C and 35 °C 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 Method**
A high-purity dimethlyarsinic acid reagent powder was dissolved in water that was then dispensed into amber glass bottles (10 mL each).

**Information**
The density of this CRM measured using the peculiar vibration cycle method was 0.99709 g/cm³ (25 °C). 0.002 % of As(V) and 0.003 % of monomethylarsenic 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 K. Chiba, the production manager is T. Kuroiwa, and the analysts are T. Kuroiwa, T. Narukawa, K. Inagaki, I. Narushima and Y. Jimbo.

**Technical Information**
Customer registration on the NMIJ Website (given below) will facilitate notification of any revision of the information given above. 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, 2015

Ryoji Chubachi
President
National Institute of Advanced Industrial Science and Technology
If you have any questions about this CRM, please contact:
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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.”