

National Institute of Advanced Industrial Science and Technology

National Metrology Institute of Japan



Reference Material Certificate

NMIJ CRM 5123-a05

No. +++

Electrolytic Conductivity Standard Solution
Aqueous Solution of Potassium Chloride (0.01 mol kg⁻¹)

This certified reference material (CRM) was produced in accordance with the NMIJ's management system and in compliance with ISO GUIDE 34:2009 and ISO/IEC 17025:2005. This CRM is intended for use in electrolytic conductivity calibration.

Certified Value

The certified value of 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 %.

	Certified value, S m ⁻¹	Expanded uncertainty, S m ⁻¹
Electrolytic Conductivity (25 °C)	0.140 44	0.000 64

Analysis

The certified value of this CRM was determined from measurements of the geometry (length and cross-sectional area) of the glass cell for electrolytic conductivity and the impedance of the solution.

Metrological Traceability

The certified value of this CRM was determined on an absolute basis; the geometry (length and cross-sectional area) of the glass cell for electrolytic conductivity was calibrated with a coordinate measuring machine of NMIJ traceable to the International System of Units (SI), and a LCR meter for impedance measurements was calibrated on Japan Calibration Service System (JCSS). Therefore, the certified value is traceable to the SI.

Mutual Recognition Arrangement (CIPM MRA)

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 six months from the date of shipment or until March 26, 2022, whichever comes earlier, 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 solution. This CRM of ca. 250 mL in net volume is kept in a glass bottle.

Homogeneity

The electrolytic conductivities of several solutions subdivided from the originally prepared solution were compared with each

other. The repeatability was combined into the uncertainty of the certified value as the homogeneity. The homogeneity is reflected to the uncertainty of the certified value.

Instructions for Storage

The solution of this CRM should be kept in the glass bottle. This CRM should be stored in a clean atmosphere at a temperature between 15 °C and 30 °C.

Instructions for Use

The certified value of this CRM is electrolytic conductivity exactly at 25 °C within its uncertainty. Electrolytic conductivity typically changes by 2 % per 1 °C around at 25 °C; measurement uncertainty should be appropriately evaluated depending on the laboratory circumstances. The bottle should be opened after warming to room temperature. Prior to use, the bottle should be shaken gently to avoid the formation of air bubbles. This CRM should be used promptly once the bottle is opened.

Precautions for Handling

Refer to the safety data sheet (SDS) on this material before use.

Preparation

The prescribed amounts of potassium chloride were dissolved in the prescribed amount of pure water; the nominal molality is 0.01 mol kg⁻¹. The solution was in equilibrium with atmospheric carbon dioxide and divided into 250-mL glass bottles; each bottle contains ca. 250 mL of the solution.

NMIJ Analysts

The technical manager for this CRM is T. Miura, the production manager is T. Asakai, and the analysts are I. Maksimov, S. Onuma, T. Suzuki and T. Asakai.

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 26, 2018

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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