

National Institute of Advanced Industrial Science and Technology

## National Metrology Institute of Japan



## Reference Material Certificate

NMIJ CRM 5122-b02

No. +++

Electrolytic Conductivity Standard Solution  
–Aqueous Solution of Potassium Chloride (0.1 mol kg<sup>-1</sup>)

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 electrolytic conductivity.

**Certified Value**

The certified value of this CRM is given in the table below. The uncertainty of the certified value is the expanded uncertainty obtained by multiplying the combined standard uncertainty by a coverage factor ( $k$ ) of 2, and it is the half-width of an interval estimated to have a level of confidence of approximately 95 %.

Property	Certified value S m <sup>-1</sup>	Expanded uncertainty S m <sup>-1</sup>
Electrolytic Conductivity (25 °C)	1.2849	0.0065

**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 at 25.000 °C ± 0.014 °C ( $k = 2$ ).

**Metrological Traceability**

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

**Mutual Recognition Arrangement under Metre Convention**

The certified value of this CRM is recognized for international equivalence based on the Mutual Recognition Arrangement under the Metre Convention (CIPM MRA). The calibration measurement capability (CMC) of NMIJ related to this CRM is registered in the Key Comparison Database (KCDB) (see <https://www.bipm.org/kcdb/>) of the International Bureau of Weights and Measures (BIPM).

**Expiration of Certification**

This certificate is valid for 6 months from the date of shipment or until November 11, 2028, whichever comes earlier, provided that this CRM remains unopened and is stored in accordance with the instructions given in this certificate.

**Description of the Material**

This CRM is aqueous solution of potassium chloride (0.1 mol kg<sup>-1</sup>). This CRM is in the form of a colorless and transparent liquid at ordinary temperature, and approximately 250 mL is kept in a glass bottle sealed in a plastic bag.

Date of Shipment: XXXXX XX, 20XX

5122b02-241219-241219

#### Instructions for Storage

This CRM should be kept in the glass bottle sealed in a plastic bag. This CRM should be stored in a clean place at a temperature between 15 °C and 30 °C.

#### Instructions for Use

This CRM should be opened after reaching to room temperature. Prior to use, the bottle should be shaken gently to be homogenized avoiding 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 CRM before use.

#### Preparation

The prescribed amount of potassium chloride was dissolved in the prescribed amount of pure water; the nominal molality was 0.1 mol kg<sup>-1</sup>. The solution was equilibrated with atmospheric carbon dioxide and then divided into glass bottles; each bottle contains approximately 250 mL of the solution.

#### NMIJ Analysts

The technical manager for this CRM is ASAKAI T., the production manager is HIBINO Y., and the analyst is HIBINO Y.

#### Information

If substantive technical changes occur that affect the certification before the expiration of this certificate, NMIJ will notify the registered customers. 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.

December 19, 2024

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, <https://unit.aist.go.jp/nmij/english/refmate/>