

National Institute of Advanced Industrial Science and Technology

National Metrology Institute of Japan



Reference Material Certificate

NMIJ CRM 4038-a

No. +++

1,2-Dichloropropane



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 analytical instruments, quality control of analytical instruments, and validation of analytical techniques and instruments.

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 %.

Substance	CAS No.	Certified Value, Amount-of-Substance Fraction (mol/mol)	Expanded Uncertainty, Amount-of-Substance Fraction (mol/mol)
1,2-Dichloropropane	78-87-5	0.999	0.004

Analysis

The certified value of this CRM was determined by freezing point depression method with differential scanning calorimeters (DSC) by using stepwise scan method. The combined standard uncertainty was estimated by the combination of standard uncertainties due to purity determination, homogeneity and stability.

Metrological Traceability

The certified value of this CRM was determined by a primary method of measurement, the freezing point depression method with the DSC. Scales of temperature and enthalpy of the DSC were calibrated with NIST SRM 2225 (Mercury), NIST SRM 2232 (Indium) and NMIJ CRM 5401-a (cyclohexane), and temperature and enthalpy were traceable to the International System of Units (SI). The certified value, therefore, is traceable to the SI.

Indicative Value

The purity in the mass fraction is given in the table below. The purity in the mass fraction was obtained by converting the purity in the amount-of-substance fraction using the average molecular weight of impurities. The uncertainty of this indicative 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 %.

Substance	CAS No.	Indicative value, Mass fraction (kg/kg)	Expanded uncertainty Mass fraction (kg/kg)
1,2-Dichloropropane	78-87-5	0.999	0.002

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

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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 one year from the date of shipment, 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 1,2-dichloropropane in the form of a colorless and clear liquid at room temperature. This CRM of ca. 15 mL in net volume is kept in an amber glass ampule with argon gas.

Instructions for Storage

This CRM should be stored at temperatures of $-15\text{ }^{\circ}\text{C}$ to $-25\text{ }^{\circ}\text{C}$ in clean place and protected from light.

Instructions for Use

This CRM is for laboratory use only. The ampules of this CRM should be allowed to warm to room temperature before opening. This CRM should be used promptly once the ampule is opened.

Precautions for Handling

Keep away from heat and ignition sources. Avoid breathing vapor. Be careful of ventilation. Wear a mask, gloves, and other personal protective equipment when handling. Refer to the safety data sheet (SDS) on this CRM before use.

Preparation

This CRM was purified and subdivided by KANTO CHEMICAL CO., INC. This CRM was purified by distillation and drying, then phenol was put into the purified 1,2-dichloropropane as a stabilizer. Fifteen milliliters each of 1,2-dichloropropane was filled into the amber glass ampules in argon atmosphere.

NMIJ Analysts

The technical manager for this CRM is KATO K. The production manager is SHIMIZU Y. The analysts are SHIMIZU Y., IHARA T., ISHIKAWA K., KITAMAKI Y., OHTE Y., OTSUKA S., BAO X., YOSHIMURA E. and FUJIKI N.

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.

Note

Stability test until 2005 was performed by National Institute of Technology and Evaluation.

April 1, 2020

ISHIMURA Kazuhiko
President

National Institute of Advanced Industrial Science and Technology

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If you have any questions about this CRM, please contact:
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Revision history

January 7, 2015: The description in “Expiration of Certification” was changed to “one year from the date of shipment.”
The description on Mutual Recognition Arrangement under Metre Convention was added.
April 1, 2015: “Metrology Management Center” was renamed to “Center for Quality Management of Metrology.”
September 29, 2022: Expanded uncertainty in “Certified Value” was changed.

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