

National Institute of Advanced Industrial Science and Technology

National Metrology Institute of Japan



Reference Material Certificate

NMIJ CRM 4004-a
No. +++

1,2-Dichloroethane

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 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-Dichloroethane	107-06-2	0.9997	0.0004

Analysis

The certified value was determined by the freezing point depression method with a differential scanning calorimeter (DSC) by using the stepwise scan method. The combined standard uncertainty of the certified value was estimated by combining standard uncertainties derived from purity determination, homogeneity test and stability test.

Metrological Traceability

The certified value is determined by the primary method of measurement, the freezing point depression method with a DSC. Scale of temperature of the DSC is calibrated with NIST SRM 1745 (indium) and NIST SRM 2225 (mercury), and scale of enthalpy of the DSC is calibrated with NIST SRM 2225 (mercury). And the scales are traceable to the International System of Units (SI). The certified value, therefore, is traceable to the SI.

Indicative Value

The indicative value of this CRM is the purity in the mass fraction, 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 molar mass of impurities. The uncertainty of this indicative 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.	Indicative value, Mass fraction (kg/kg)	Expanded uncertainty Mass fraction (kg/kg)
1,2-Dichloroethane	107-06-2	0.9998	0.0002

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 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.

Description of the Material

This CRM is in the form of a colorless and transparent liquid at ordinary temperature. This CRM of 15 mL of 1,2-dichloroethane 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 a clean place and protected from light

Instructions for Use

This CRM is for laboratory use only. The ampule should be allowed to warm to room temperature before opening and then they should be shaken well. The ampule, after being warmed to room temperature, are recommended to be opened in as a low humidity condition as possible since this CRM was purified by the drying. This CRM should be used promptly once the ampule is opened.

Precautions for Handling

Keep away from heat and ignition sources. Wear personal protective equipment such as safety glasses, safety mask and safety gloves when handling. Refer to the safety data sheet (SDS) on this CRM before use.

Preparation

This CRM was prepared by KANTO CHEMICAL CO., INC. The raw material of this CRM was purified through drying and distillation processes. Amber glass ampules were filled with the purified 1,2-dichloroethane in the argon gas atmosphere.

NMIJ Analysts

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

Collaborator

Before 2005, impurity analysis and stability monitoring were performed by National Institute of Technology and Evaluation.

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

Revision history

- March 17, 2005: This CRM is changed to “NMIJ CRM” from “NIMC CRM” and the description on Expiration of Certification was added.
- March 24, 2009: The expiration of this certificate was extended from “March 31, 2009.” to “March 31, 2018.”
The descriptions in Certified Value, Analysis and NMIJ Analysts were revised.
The descriptions on Metrological traceability and Mutual Recognition Arrangement under Meter Convention were added.
The description on Organizations of Sample Preparation and Characterization was deleted
- March 13, 2012: The description on Mutual Recognition Arrangement under Meter Convention was deleted.
- April 1, 2015: “Metrology Management Center” was renamed to “Center for Quality Management of Metrology.”
- February 21, 2017: The descriptions in Certified Value, Analysis and Indicative Value were revised.
The description in Expiration of Certification was changed to “one year from the date of shipment.”
The descriptions on Mutual Recognition Arrangement under Meter Convention and Collaborator were added.