

National Institute of Advanced Industrial Science and Technology

National Metrology Institute of Japan



Reference Material Certificate

NMIJ CRM 4022-b
No. +++

Diethyl Phthalate

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 primarily intended for use in calibrating analytical instruments. It is also intended for 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)
Diethyl Phthalate	84-66-2	0.9974	0.0010

Analysis

The certified value was determined by freezing point depression method with the adiabatic calorimeter by using fractional melting method. The combined standard uncertainty was estimated by the combination of standard uncertainties due to purity determination, homogeneity test, and stability test.

Metrological Traceability

The certified value is determined by the freezing point depression method with the adiabatic calorimeter and is traceable to the International System of Units (SI). Temperature (platinum resistance thermometer), voltage (digital multi-meter) and resistance (standard resistor) of the adiabatic calorimeter were calibrated and they were traceable to the 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)
Diethyl Phthalate	84-66-2	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 and 1.5 mL of diethyl phthalate is kept in an amber glass ampule with argon gas.

Instructions for Storage

This CRM should be stored at a temperature between $-25\text{ }^{\circ}\text{C}$ and $-15\text{ }^{\circ}\text{C}$ in a clean place and shielded 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 and then shaken well 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. Use only with adequate ventilation. Wear personal protective equipment such as safety glasses, safety mask and safety gloves in handling. Handle the CRM according to the Safety Data Sheet (SDS) on this CRM.

Preparation

This CRM was synthesized, purified and subdivided by Wako Pure Chemical Industries, Ltd. This CRM was purified by vacuum distillation. 1.5 mL each of diethyl phthalate was filled into an amber glass ampule in argon atmosphere.

NMIJ Analysts

Technical manager for this CRM is KATO K. The production manager is SHIMIZU Y. and the analysts are SHIMIZU Y., IHARA T., ISHIKAWA K., KITAMAKI Y., OHTE Y., OTSUKA S., BAO X., YAMAZAKI T., NAKAMURA S., and KUROE M.

Collaborator

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

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:
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Tel: +81-29-861-4059; <https://unit.aist.go.jp/nmij/english/refmate/>

Revision history

March 22, 2006:	The expiration of this certificate was changed to "March 31, 2012" from "May 31, 2006".
March 16, 2011:	The expiration of this certificate was changed to "March 31, 2017" from "March 31, 2012".
April 1, 2015:	"Metrology Management Center" was renamed to "Center for Quality Management of Metrology."
November 12, 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.
January 25, 2024	Expanded uncertainties in "Certified Value" and "Indicative Value" was changed.