

National Institute of Advanced Industrial Science and Technology

National Metrology Institute of Japan



Reference Material Certificate

NMIJ CRM 4203-a
No. +++ γ -HCH in 2,2,4-Trimethylpentane

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 equipment as well as in accuracy control of equipment, and validation of analytical methods/equipment, for quantification of chlorinated pesticides by means of gas chromatograph/mass spectroscopy, gas chromatography, high-performance liquid chromatography, and the like.

Certified Value

The certified value of this CRM is mass fraction of γ -HCH 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 %.

	CAS No.	Certified value, Mass fraction (mg/kg)	Expanded uncertainty Mass fraction (mg/kg)
(1 α , 2 α , 3 β , 4 α , 5 α , 6 β)-hexachloro cyclohexane (γ -HCH)	58-89-9	10.05	0.19

Analysis

The certified value of this CRM is determined by the synthesized value of γ -HCH obtained by the gravimetric blending method and the purity of γ -HCH obtained by the gas-chromatograph flame ionization detector (GC-FID).

The uncertainty of the certified value is estimated by combining the purity of γ -HCH, the variation of synthesis through the gravimetric blending method, and the uncertainties derived from the homogeneity and the stability of this CRM.

Metrological Traceability

The certified value of this CRM is traceable to the International System of Units (SI) as it is calculated by multiplying the synthesized value of γ -HCH obtained by the gravimetric blending method by the purity of this CRM.

Mutual Recognition Arrangement under Meter Convention

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 from the date of shipment to March 31, 2023, 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 and transparent liquid at room temperature. This CRM of ca. 1 g in net volume is kept in a 2-mL amber ampule in the argon gas ambience.

Homogeneity

The homogeneity was determined by sampling ten ampules randomly from the subdivided 140 ampules and by quantifying γ -HCH by the GC-FID. The uncertainty derived from the evaluated homogeneity was incorporated in the uncertainty of the certified value. This CRM, therefore, is homogeneous within the range of the uncertainty of its certified value.

Instructions for Storage

This CRM should be stored at a temperature between 15 °C and 25 °C, and shielded from light.

Instructions for Use

This CRM should be used promptly once the ampule is opened.

Precautions for Handling

Care must be taken against fire and ventilation. Wear a protective mask, protective gloves, etc. This CRM, which contains substance designated as specified chemical substance, should be handled in accordance with the Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc., and should be stored and disposed of in accordance with the Waste Management and Public Cleansing Act. Refer to the safety data sheet (SDS) on this CRM before use.

Preparation

This CRM was synthesized by diluting the constituent, whose purity was determined by the above-described purity determination method, with 2,2,4-trimethylpentane by using the gravimetric blending method. About 1 g of this CRM was packed into a 2-mL amber ampule in the argon gas ambience.

Technical Information

Density of this CRM is 0.6918 g/mL (20 °C).

NMIJ Analysts

The technical and production manager for this CRM is MAEDA T., the production manager is ISHIKAWA K. and the analysts are ISHIKAWA K., IHARA T., SHIMIZU Y., OTSUKA S., OHTE Y. and BAO X.

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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National Metrology Institute of Japan,

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1-1-1 Umezono, Tsukuba, Ibaraki 305-8563, Japan
Phone: +81-29-861-4059; Fax: +81-29-861-4009, <https://unit.aist.go.jp/nmij/english/refmate/>

Revision history

April 22, 2010: Items related to Class I Specified Chemical Substances were added to “Precautions for Handling.”

March 21, 2013: The limit of validity of the certificate was extended from “December 31, 2013” to “March 31, 2023.”

Uncertainty of the certified value was changed based on the result of stability monitoring.

Description on “Mutual Recognition Arrangement under Meter Convention” was added.

April 1, 2015: “Metrology Management Center” was renamed to “Center for Quality Management of Metrology.”

Sample