

National Institute of Advanced Industrial Science and Technology

National Metrology Institute of Japan



Reference Material Certificate

NMIJ CRM 4228-a

No. +++



Water in Anisole/Diethylene Glycol Dimethyl Ether (1 mg/g)

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 validating analytical methods and instruments, and calibrating instruments during quantification of water by Karl Fischer (KF) titration.

Certified Value

The certified value for this CRM is concentration (mass fraction of water in anisole/diethylene glycol dimethyl ether) 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, Mass fraction (mg/kg)	Expanded uncertainty Mass fraction (mg/kg)
Water	7732-18-5	996	20

Analysis

The certified value of this CRM is the weighted mean of the analytical results obtained by coulometric and volumetric KF titrations, where the reciprocal of the uncertainty of the result obtained by each method was used as the weight.

Metrological Traceability

The certified value of this CRM was determined by two validated methods mentioned above. As the calibration solutions for the measurements were prepared from ultrapure water, the purity of which was evaluated by the freezing point depression method (primary method of measurement) in NMIJ, and prepared gravimetrically using a JCSS-calibrated balance, the certified value is traceable to the International System of Units (SI).

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 a mixed solution of anisole and diethylene glycol dimethyl ether. This CRM is in the form of a clear liquid and it of ca. 8 mL in net volume is sealed in an amber glass ampule.

Instructions for Storage

This CRM should be stored in a clean place at a temperature between 15 °C and 30 °C and shielded from light.

Instructions for Use

This CRM is for laboratory use only. Before opening the ampule shake gently, and leave to stand for several minutes. To avoid

sample evaporation, and moisture sorption or desorption, this CRM should be used promptly once the ampule is opened. Samples should be taken from the ampule using a gas-tight syringe.

Precautions for Handling

Keep away from heat and ignition sources. Wear personal protective equipment such as safety glasses, safety mask, and protective gloves when handling this CRM. The use, handling, storage and disposal of this CRM should be conducted according to laws regulating the components of this CRM. Refer to the safety data sheet (SDS) on this CRM before use.

Preparation

This CRM was prepared by Kanto Chemical Co., Inc. by mixing 90.5 % anisole and 9.5 % diethylene glycol dimethyl ether gravimetrically. Water was then added to achieve a concentration of 1 mg/g. The amber glass ampule was filled with 8 mL of the solution.

Technical Information

The density of this CRM at the time of certification was 0.9848 g/cm³ (25 °C), 0.9895 g/cm³ (20 °C) and 0.9942 g/cm³ (15 °C).

NMIJ Analysts

The technical manager and production manager for this CRM is TAKATSU A. and INAGAKI S., respectively. Analytical measurements for the certification of this CRM were performed at NMIJ by INAGAKI S., NUMATA M., HANARI N. and IWASAWA R.

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; Fax: +81-29-861-4009, <https://unit.aist.go.jp/nmij/english/refmate/>