

National Institute of Advanced Industrial Science and Technology

National Metrology Institute of Japan



Reference Material Certificate

NMIJ CRM 3002-a
No. +++

Potassium Dichromate

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 standardization of titrants for oxidimetry and so on.

Certified Value

The certified value for this CRM is 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 %.

	Certified value, Mass fraction (%)	Expanded uncertainty, Mass fraction (%)
Oxidants expressed as potassium dichromate	99.974	0.015

Analysis

The certified value was determined by coulometric titration. The molar mass of potassium dichromate (294.1846) was calculated from the IUPAC atomic weight table (2007). A value of $96\,485.3399\text{ C mol}^{-1}$ was used for the Faraday constant (CODATA: 2006). A value of 2.68 g cm^{-3} (25 °C) was used as the density of potassium dichromate for air-buoyancy correction.

Metrological Traceability

The certified value was determined by the coulometric titration as a primary method of measurement and is traceable to the International System of Units (SI).

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 for one year from the date of shipment, provided that the material is stored in accordance with the instructions given in this certificate.

Sample Form

This CRM is in the form of a red powder at room temperature in a glass bottle (net mass 50 g).

Homogeneity

The homogeneity of this CRM was determined by coulometric titration analysis of 10 bottles, which were chosen by a stratified random sampling with the order of bottling. The homogeneity is reflected in the uncertainty of the certified value.

Instructions for Storage

This CRM should be stored at a temperature between 15 °C and 35 °C and at a relative humidity of 60 % or less in a clean place and shielded from light. It should not be affected by acids, bases, oxidants, reductants, organic substances and others.

Instructions for Use

This CRM should be dried for one hour at 150 °C without crushing and then held at room temperature for one hour in a silica-gel desiccator. The recommended minimum sample mass is 0.15 g or more for one analysis. The dried material should be used promptly after drying and should not be dried again.

Precautions for Handling

Careful attention should be paid to this material being a deleterious substance. Refer to the safety data sheet (SDS) on this CRM before use.

Preparation

The source material for this CRM was purchased from Wako Pure Chemical Industries, Ltd.

NMIJ Analysts

The technical and production managers for this CRM are HIOKI A. and the analyst is ASAKAI T.

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/>

Revision history

December 20, 2013: The expiration of this certificate was changed to "March 31, 2020" from "March 31, 2015."

The description on Mutual Recognition Arrangement (CIPM MRA) was added.

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

December 18, 2018: The description in "Expiration of Certification" was changed to "one year from the date of shipment."

Expanded uncertainty of certified value was changed to 0.015 %.

Sample