

National Institute of Advanced Industrial Science and Technology

National Metrology Institute of Japan



Reference Material Certificate

NMIJ CRM 3007-a(02)

No. +++



Sodium Oxalate

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 titrants for oxidimetry and so on.

Certified Value

The certified value of 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 (%)
Reductants expressed as sodium oxalate	99.965	0.030

Analysis

The certified value of this CRM was determined by both oxidimetric coulometric titration and gravimetric titration. At first, the concentration of a Ce(IV) solution was determined by oxidimetric coulometric titration with electrogenerated Fe(II); then, the Ce(IV) solution was added in excess to sodium oxalate, and its excess was gravimetrically titrated with a Fe(II) solution whose concentration was determined by gravimetric titration with the Ce(IV) solution. The molar mass of sodium oxalate (133.9985) was calculated from the IUPAC atomic weight table (2007). A value of $96\,485.339\,9\text{ C mol}^{-1}$ was used for the Faraday constant (CODATA: 2006). A value of 2.34 g cm^{-3} (25 °C) was used as the density of the sodium oxalate for air-buoyancy correction.

Metrological Traceability

The certified value of this CRM was determined by 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 white powder at room temperature in a glass bottle (net mass 50 g).

Homogeneity

The homogeneity of the CRM was determined by coulometric titration analysis of 10 bottles, which were chosen by 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, at relative humidity of 60 % or less, and shielded from light.

Instructions for Use

This CRM should be dried for two hours at 105 °C without crushing and then held at room temperature for one hour in a desiccator with silica gel. The recommended minimum sample mass is 0.2 g or more for one analysis. The dried material should be used promptly after drying and should not be dried again. Moreover, it was confirmed that the purity value under the drying condition of one hour at 200 °C was no significant difference from that under the drying condition of two hours at 105 °C.

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 of this CRM was purchased from KANTO CHEMICAL CO., INC., Japan.

NMIJ Analysts

The technical manager for this CRM is MIURA T., the production manager is ASAKAI T., and the analysts 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:
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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

November 12, 2014: The limit of validity of the certificate was extended to “March 31, 2019” from “March 31, 2016.”

November 12, 2014: The 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.”

May 30, 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 0.030 %.

Sample