

National Institute of Advanced Industrial Science and Technology

National Metrology Institute of Japan



Reference Material Certificate

NMIJ CRM 3404-d01



Oxygen

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 the calibration of instruments in oxygen determination.

Certified Value

The certified value of this CRM, oxygen purity in amount-of-substance fraction, 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)	Cylinder Number
Oxygen	7782-44-7	1.000000	9×10^{-6}	PLQ36232

Analysis

The certified value was determined by the paramagnetic oxygen analyzer which was calibrated by standard gases prepared from CRM oxygen (NMIJ CRM 3404-a05) with a dynamic blending method using mass flow controllers.

Metrological Traceability

The paramagnetic oxygen analyzer was calibrated using calibration gases prepared by diluting the CRM oxygen whose amount of subtraction is traceable to the International System of Units. The mass flow controllers were calibrated using JCSS. Therefore, the certified value is traceable to SI.

Mutual Recognition Arrangement under Metre Convention

The certified value(s) of this CRM is recognized for international equivalence based on the Mutual Recognition Arrangement under the Metre Convention (CIPM MRA). The calibration measurement capability (capabilities) (CMC) of NMIJ related to this CRM is (are) 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 this CRM is stored in accordance with the instructions given in this certificate.

Description of the material

This CRM is supplied in a manganese steel cylinder with an inner volume of 47 L. Specification of an outlet of the cylinder is W22-14thread right (male). A pressure of this CRM is above 12 MPa.

Instructions for Storage

This CRM should be stored in compliance with regulations for high-pressure gases. Temperature of this CRM should be kept below 40 °C and the CRM should be stored at a place with good ventilation. Since oxygen gas supports combustion, do not use

Date of Shipment: Xxxxx xx, 20xx

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fire near the cylinder and do not place any flammable objects nearby. Refer to the safety data sheet (SDS) on this CRM.

Instructions for Use

It is recommended that residual gases in regulators, valves, piping, measuring instruments and so on should be sufficiently substituted with this CRM before use. It is recommended to confirm that there is no leakage from joints of piping. When the pressure inside the cylinder becomes less than 2 MPa, stop use of this CRM.

Precautions for Handling

Do not use fire near the cylinder and do not place any flammable objects nearby. Use the CRM at a place with good ventilation. Do not use any oils and other flammable objects to valves, pipings, measuring instruments and so on. If there are the oils and the flammable objects, remove them. Use this CRM in compliance with regulations of high-pressure gas and so on. Use the CRM according to the SDS. This CRM should be returned to Center for Quality Management of Metrology of AIST after use or after the expiry date of this certificate.

Preparation

A highly pure oxygen gas, which is commercially available, was filled into a manganese steel cylinder with an inner volume of 47 L by Japan Fine Products.

NMIJ Analysts

The technical manager for this CRM is SHIMOSAKA T., the production manager is SHIMOSAKA T., and the analyst is SHIMOSAKA T.

Information

If substantive technical changes occur that affect the certification before the expiration of this certificate, NMIJ will notify the registered customers. 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.

March 25, 2021

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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