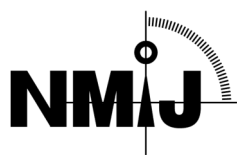


National Institute of Advanced Industrial Science and Technology

National Metrology Institute of Japan



Reference Material Certificate

NMIJ CRM 3409-a01

Nitrogen in Argon (10 $\mu\text{mol/mol}$)

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 calibration of instruments.

Certified Value

The certified value for nitrogen in 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 %.

	CAS No.	Certified value, Amount-of-substance fraction ($\mu\text{mol/mol}$)	Expanded uncertainty, Amount-of-substance fraction ($\mu\text{mol/mol}$)	Cylinder Number
Nitrogen	7727-37-9	10.46	0.84	CPB16417

Analysis

The certified value is the amount-of-substance fraction calculated in accordance with ISO 6142-1:2015 for the gravimetric method. The uncertainty was evaluated from the uncertainties in weighing, molar masses, source gas purities, and the verification method using a gas chromatograph-mass spectrometry.

Metrological Traceability

This CRM was prepared by the gravimetric method (ISO 6142-1:2015) at NMIJ using a mass comparator, mass pieces, and source gases that were traceable to the International System of Units (SI). Therefore, the certified value is also traceable to the SI.

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 supplied in an aluminum alloy cylinder with an inner volume of approximately 9.5 L. The specification of the cylinder outlet is W22-14-threads right. The pressure of this CRM in the cylinder is above 6 MPa (35 °C).

Instructions for Storage

This CRM should be stored in compliance with high pressure gas regulations and other relevant laws. This CRM should not be exposed to sunlight. This CRM should be stored at a temperature below 40 °C and in a well-ventilated area. This CRM should be secured with chain to prevent it falling. Refer to the safety data sheet (SDS) on this CRM for storage.

Instructions for Use

This certificate is valid when residual pressure of this CRM is at 1.5 MPa or more gauge pressure. It is recommended that sufficient substitution of residual gas in a regulator, valves, piping, measuring instruments, and so on with this CRM before use.

To avoid contamination, we recommend checking leakage from the joints of piping.

Precautions for Handling

This CRM should be handled in accordance with a law of high pressure gas regulations. This CRM is a simple asphyxiant that should only be handled in a well-ventilated area. This CRM should be returned to the Center for Quality Management of Metrology of AIST after use or after the expiry date. Refer to the SDS on this CRM before use.

Preparation

This CRM is prepared from commercially available high-purity nitrogen and argon by NMIJ using a gravimetric method in accordance with ISO 6142-1:2015.

NMIJ Analysts

The technical manager for this CRM is SHIMOSAKA T., the production manager is SHIMOSAKA T., and the analysts are SHIMOSAKA T. and TAKADA K.

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/>

National Institute of Advanced Industrial Science and Technology

National Metrology Institute of Japan



Reference Material Certificate

NMIJ CRM 3409-a02

Nitrogen in Argon (10 $\mu\text{mol/mol}$)

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 calibration of instruments.

Certified Value

The certified value for nitrogen in 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 %.

	CAS No.	Certified value, Amount-of-substance fraction ($\mu\text{mol/mol}$)	Expanded uncertainty, Amount-of-substance fraction ($\mu\text{mol/mol}$)	Cylinder Number
Nitrogen	7727-37-9	10.07	0.84	CPB32032

Analysis

The certified value is the amount-of-substance fraction calculated in accordance with ISO 6142-1:2015 for the gravimetric method. The uncertainty was evaluated from the uncertainties in weighing, molar masses, source gas purities, and the verification method using a gas chromatograph-mass spectrometry.

Metrological Traceability

This CRM was prepared by the gravimetric method (ISO 6142-1:2015) at NMIJ using a mass comparator, mass pieces, and source gases that were traceable to the International System of Units (SI). Therefore, the certified value is also traceable to the SI.

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 supplied in an aluminum alloy cylinder with an inner volume of approximately 9.5 L. The specification of the cylinder outlet is W22-14-threads right. The pressure of this CRM in the cylinder is above 6 MPa (35 °C).

Instructions for Storage

This CRM should be stored in compliance with high pressure gas regulations and other relevant laws. This CRM should not be exposed to sunlight. This CRM should be stored at a temperature below 40 °C and in a well-ventilated area. This CRM should be secured with chain to prevent it falling. Refer to the safety data sheet (SDS) on this CRM for storage.

Instructions for Use

This certificate is valid when residual pressure of this CRM is at 1.5 MPa or more gauge pressure. It is recommended that sufficient substitution of residual gas in a regulator, valves, piping, measuring instruments, and so on with this CRM before use.

To avoid contamination, we recommend checking leakage from the joints of piping.

Precautions for Handling

This CRM should be handled in accordance with a law of high pressure gas regulations. This CRM is a simple asphyxiant that should only be handled in a well-ventilated area. This CRM should be returned to the Center for Quality Management of Metrology of AIST after use or after the expiry date. Refer to the SDS on this CRM before use.

Preparation

This CRM is prepared from commercially available high-purity nitrogen and argon by NMIJ using a gravimetric method in accordance with ISO 6142-1:2015.

NMIJ Analysts

The technical manager for this CRM is SHIMOSAKA T., the production manager is SHIMOSAKA T., and the analysts are SHIMOSAKA T. and TAKADA K.

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/>