VSL
Dutch Metrology Institute

CERTIFICATE

Number C1535310

Reference material of nitric oxide in nitrogen

Description

Primary reference gas mixture (PRM), cylinder number APEX 1236602.
The cylinder contains a mixture of nitric oxide in nitrogen.
The PRM is contained in a passivated aluminium cylinder. The cylinder has a water volume of 5 L and is pressurized to 12.3 MPa.
Cylinder outlet conforms to DIN 1 specifications.

Method of preparation

Gravimetric preparation in accordance with ISO 6142-1:2015.

Result

Component	Amount fraction [mol/mol]	Uncertainty [mol/mol]
Nitric oxide	19.98×10^{-6}	0.10×10^{-6}

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95 %. The standard uncertainty of measurement has been determined in accordance with the GUM 'Evaluation of measurement data - Guide to the expression of uncertainty in measurement'.

Traceability

The values on this certificate are traceable to VSL Primary Standards.

Safety information

The cylinder should be handled with care and by experienced personnel in a laboratory environment suitably equipped for the safe handling of gaseous materials.

Instructions for use

The gas mixture can be used to validate and/or calibrate analytical methods and equipment.
Do not use the cylinder in case the cylinder pressure is below 1 MPa.
Further instructions regarding the handling of calibration gases can be found in ISO 16664:2017.

Expiry date

This certificate is valid until 3 October 2021.

Delft, 29 October 2018
VSL B.V.

J.I.T. van Wijk
Senior Metrologist

VSL Dutch Metrology Institute

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Institute

CERTIFICATE

VSL is het Nationaal Metrologisch Instituut (NMI) van Nederland en levert in die hoedanigheid herleidbaarheid van meetresultaten naar internationaal geaccepteerde meetstandaarden. Het bestaan van een gezamenlijk vertrouwen in juiste productspecificaties en productcontrole is van fundamenteel belang om aan internationale, geharmoniseerde wetgeving op het gebied van handel, kwaliteit, gezondheid, veiligheid en milieu te kunnen voldoen. Gestandaardiseerde en gelijkwaardige metingen die herleidbaar zijn naar internationaal geaccepteerde standaarden zijn hierbij essentieel.

Dit certificaat is in overeenstemming met de kalibratie- en meetmogelijkheden (CMC's) die opgenomen zijn in Appendix C van de wederzijdse erkenningsovereenkomst (MRA), opgesteld door het Internationaal Comité voor Maten en Gewichten (CIPM). In het kader van de MRA, erkennen alle deelnemende instituten de geldigheid van elkaars kalibratie- en meetcertificaten voor de grootheden, bereiken en meetonzekerheden zoals gespecificeerd in Appendix C (details op http://www.bipm.org).

VSL is geaccrediteerd door de RvA (Raad voor Accreditatie) voor kalibraties tegen de vereisten vastgelegd in de ISO/IEC 17025 (accreditatiescope K999), voor het organiseren van interlaboratoriumonderzoeken tegen de vereisten vastgelegd in de ISO/IEC 17043 (accreditatiescope R006) en voor het produceren van referentiematerialen tegen de vereisten vastgelegd in ISO Guide 34 alsmede tegen de relevante vereisten vastgelegd in de ISO/IEC 17025 (accreditatiescope P002). De accreditaties verzekeren dat aan alle eisen van de betrokken norm(en) is voldaan en dat er op regelmatige basis audits plaatsvinden.

CIPM MRA

CALIBRATION
RvA K 999

PROF. TESTING
RvA R 006

Reference Mat.
RvA P 002

VSL is the National Metrology Institute (NMI) of the Netherlands. As such, it provides direct traceability of measurement results to internationally accepted measurement standards. The existence of mutual confidence in product specifications and product control is of fundamental importance in order to fulfill international, harmonized legislation on trade, quality, health, safety and environment. In this respect, standardized and equivalent measurement units and traceability to internationally accepted standards are essential.

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 (for details see http://www.bipm.org).

VSL is accredited by the RvA (Dutch Accreditation Council) for calibrations against the requirements as laid down in ISO/IEC 17025 (accreditation scope K999), for organizing proficiency tests against the requirements as laid down in ISO/IEC 17043 (accreditation scope R006) and for producing reference materials against the requirements as laid down in ISO Guide 34 and the relevant requirements of the ISO/IEC 17025 (accreditations scope P002). The accreditations ensure that all requirements of the standard(s) involved are met and that audits conducted are on a regular basis.

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Your reference	Our reference	Date
1011-16300/10002986	15353 SO	05-11-2018

Subject
Certificate

Dear,

Herewith we send you the certificate with the results according to your order.

With kind regards,

Inge Baay
VSL

Sales & Planning Dpt. Calibration & Reference Materials
vsl@vsl.nl