JOINT RESEARCH CENTRE
Directorate F – Health, Consumers and Reference Materials

CERTIFICATE OF ANALYSIS

IRMM-009

Mg in 0.2 M HNO_3			
	Certified value [1)]	Certified uncertainty [2)]	Unit
$n(^{25}Mg)/n(^{24}Mg)$	0.126 63	0.000 13	mol/mol
$n(^{26}Mg)/n(^{24}Mg)$	0.139 32	0.000 26	mol/mol

1) The certified values are based on the values of NIST SRM-980, based on isotope-dilution thermal ionisation mass spectrometry.

2) The uncertainty is the expanded uncertainty of the certified value with a coverage factor k = 2 corresponding to a level of confidence of about 95 % estimated in accordance with ISO/IEC Guide 98-3, Guide to the Expression of Uncertainty in Measurement (GUM:1995), ISO, 2008.

This certificate is valid for three years after purchase.

Sales date:

The material is a true solution and is therefore regarded homogeneous.

Geel, March 2000
Latest revision: August 2018

Signed:

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Indicative Values

	Value	Uncertainty [3]	Unit
Isotope amount fractions [1]			
$n(^{24}Mg)/n(Mg)$	0.789 92	0.000 18	mol/mol
$n(^{25}Mg)/n(Mg)$	0.100 028	0.000 094	mol/mol
$n(^{26}Mg)/n(Mg)$	0.110 05	0.000 18	mol/mol
Isotope mass fractions [2]			
$m(^{24}Mg)/m(Mg)$	0.779 52	0.000 19	g/g
$m(^{25}Mg)/m(Mg)$	0.102 830	0.000 098	g/g
$m(^{26}Mg)/m(Mg)$	0.117 65	0.000 19	g/g

1) Calculated from certified amount ratios.

2) Calculated from the certified amount ratios and the atomic masses given in "Additional Material Information".

3) The uncertainty is the expanded uncertainty of the certified value with a coverage factor $k = 2$ corresponding to a level of confidence of about 95 % estimated in accordance with ISO/IEC Guide 98-3, Guide to the Expression of Uncertainty in Measurement (GUM:1995), ISO, 2008.

Additional Material Information

	Molar mass [g/mol]	Uncertainty [g/mol]
Mg	24.304 98	0.000 36
^{24}Mg	23.985 041 87	0.000 000 52
^{25}Mg	24.985 837 00	0.000.000 52
^{26}Mg	25.982 593 00	0.000 000 52

The molar mass of Mg was calculated from the certified isotopic amount composition and the molar masses of the individual isotopes. The molar masses of the individual isotopes were taken from: G Audi and A H Wapstra, The 1993 atomic mass evaluation, Nucl Phys A565 (1993) 1-65.

Uncertainties given are two times the standard deviation error listed in Nucl Phys A565 (1993) 1-65.

DESCRIPTION OF THE SAMPLE

The Isotopic Reference Material IRMM-009 has been prepared from dissolution of NIST SRM-980. IRMM-009 comes in a flame-sealed quartz ampoule containing about 1.3 µmol/g Mg in 4 mL of a chemically stable nitric acid solution. The molarity is about 0.2 M.

ANALYTICAL METHODS USED FOR CERTIFICATION

Isotope dilution thermal ionisation mass spectrometry (ID-TIMS) (SRM-980) described in E.J. Catanazaro et al, J Research NBS 70A, No 6 (1966), 453-458

PARTICIPANTS

European Commission, Joint Research Centre (JRC), Institute for Reference Materials and Measurements (IRMM), Geel, Belgium

SAFETY INFORMATION

Classified as dangerous according to the criteria of Regulation (EC) No 1272/2008

H319, Eye irritation category 2: Causes serious eye irritation.

H315, Skin irritation category 2: Causes skin irritation.

P-statements

P280: Wear protective gloves and eye protection/face protection.
P264: Wash hands thoroughly after handling.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P302 + P352: IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313: If eye irritation persists: Get medical advice/attention.

INSTRUCTIONS FOR USE AND INTENDED USE

This material is intended to be used as isotopic spike for isotope-dilution mass spectrometry.
Dispose in accordance with good laboratory practice.

STORAGE

The material should be stored at 18 °C ± 5 °C in the dark.
However, the European Commission cannot be held responsible for changes that happen during storage of the material at the customer's premises, especially of opened samples.

LEGAL NOTICE

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