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The experts in custom-made Certified Reference Materials

Certificate of Analysis

CERTIFIED REFERENCE MATERIAL FOR ICP-MS

Solution of Nickel(Ni) concentration 10 mg/l Matrix: 2% HNO3

Lot N: XXXXXX
Barcode: XXXXXXXX

Ref N: M438.2NP.L1.L1

Certification Date:XXXXXX

Component	Certified Value and uncertainty [mg/l]	Metrological traceability
Ni	9.978 ± 0.045 (a)	NIST SRM No 3136 Lot 120619

Notes:
(a) WQP 5.15.1.1 *The certified value was obtained using ICP/OES or ICP/MS calibration*

Density* 1.005 g/cm^3 at 20°C

Starting Material	Batch
$Ni(NO_3)_2$ 99.999%	82085285

* *These values are not certified*

Storage Conditions: Store under normal laboratory conditions, at temperatures between 15° to 25°C

Shelf-life: XXXXXXXXXX

Date of opening: ……..

(Recommended period of use should not exceed 12 months from date of opening)

Concept of Certification and traceability statement:

This certified reference material is produced using a high purity starting material, acid from sub-boiling and 18 MOhm deionized water.
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the 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 EA 4/02
Property of the result of a measurement whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties (ISO VIM)
The metrological traceability is assured through calibration on ICP/MS . The calibration curve is drawn using a series of standard solutions prepared from a certified reference material traceable to SI of NIST (SRM) or BAM (CRM). All contributions in relation to the certification of standard solutions are considered when evaluating the uncertainty.
The measurement results are traceable to SI. All analytical balances used for the preparation of the solution are calibrated yearly under an in-house procedure with analytical weights, traceable to DKD, and are checked daily.
Class A laboratory glassware is used.
The results from temperature measurement are traceable to SI. The thermometers used for solution's calibration are calibrated from an ISO 17025 accredited laboratory. The ambient conditions are controlled with a hygrometer calibrated from an ISO 17025 accredited laboratory.

Intended use: *For Laboratory Use Only*

Calibration of ICP/MS, ICP/OES
Preparation of "working reference samples"
This statement is not intended to restrict the use for other purposes.
Validation of analytical methods
Detection limit and linearity studies

Instructions for the correct use of this reference material:

This certified reference material can be used directly or can be diluted in an appropriate high purity matrix. Only a clean class A glassware should be used. Do not pipet from container. Obtained concentration (in mg/l) after dilution is a result from the multiplication of certified value of CRM concentration and the CRM's volume used for dilution and divided into the flask's volume used for dilution.

Stability and storage:

This CRM is with a guaranteed stability until ±0.5% of the certified concentration within its shelf life. Stability is guaranteed, provided that the solution is kept in its original packaging, tightly closed stored, as written in the section: Storage Conditions..

Hazardous situation:

The normal laboratory safety precautions should be observed when working with this CRM. Further details for the handling of this CRM are available as

PROPRIÉTÉ DE DUTSCHER SAS

CPAchem Ltd
www.cpachem.com
e-mail: info@cpachem.com; tel.:+359 42 60 77 16
for France, Belgium and Switzerland:
e-mail: acsd2@wanadoo.fr; tel.:01 30 57 57 32 / fax: 01 30 57 57 33

safety data sheet.

Level of homogeneity:
The material was tested for homogeneity by analyzing randomly selected samples according to an in-house procedure. The level of homogeneity proved satisfactory for a sample volume of 20 ml. The uncertainty incorporates the sample standard deviation combined with the uncertainty calculated from homogeneity and stability studies.
To ensure sufficient homogeneity of the sample prior to use thoroughly mix by inversion.

Names of certifying officers:

Laboratory: Tihomir Stoyanov

Manager: Krassimira Taralova

This document QF 5.17.1/1 version 1 is designed and the certified value(s) and uncertainty(ies) are determined in accordance with ISO Guide 31, ISO Guide 35,and Eurachem / CITAC Guides

This certificate relates solely to the lot number given above.
All processes (including generating of this certificate) are completely controlled by the specialized Computer-Aided-Manufacturing (CAM) software.

This Certified Reference Material was produced under a quality management system that is:
- Registered to ISO 9001 Quality Management System (Lloyd's Register Quality Assurance Ltd Cert No 0039638)
- Accredited according to ISO/IEC 17025 – Testing (ANAB Cert No AT-1836)
- Accredited according to ISO 17034 - Reference Material Producer (ANAB Cert No AR-1835)

Trace impurities in the actual solution reported in ppm:

(all values below are nominal and not certified)

Ag	<0.000004	Cu	<0.00001	La	<0.0000004	Pt	<0.000002	Tb	<0.0000001
Al	<0.00002	Dy	<0.0000002	Li	<0.00002	Rb	<0.003	Te	<0.00001
As	<0.00003	Er	<0.0000001	Lu	<0.0000001	Re	<0.0000009	Th	<0.0000002
Au	<0.00002	Eu	<0.0000001	Mg	<0.000006	Rh	<0.0000002	Ti	<0.00004
B	<0.0002	Fe	<0.001	Mn	<0.000005	Ru	<0.000002	Tl	<0.000002
Ba	<0.000004	Ga	<0.000001	Mo	<0.000004	S	<0.009	Tm	<0.0000001
Be	<0.000002	Gd	<0.000001	Na	<0.00003	Sb	<0.000001	U	<0.0000002
Bi	<0.000001	Ge	<0.00001	Nb	<0.0000006	Sc	<0.000009	V	<0.000005
Ca	<0.002	Hf	<0.0000007	Nd	<0.0000006	Se	<0.0008	W	<0.000001
Cd	<0.000002	Hg	<0.00002	Ni	*	Si	<0.003	Y	<0.0000005
Ce	<0.002	Ho	<0.0000003	P	<0.002	Sm	<0.0000001	Yb	<0.0000003
Co	<0.00001	In	<0.000002	Pb	<0.000005	Sn	<0.000003	Zn	<0.00002
Cr	<0.00001	Ir	<0.000001	Pd	<0.000008	Sr	<0.000002	Zr	<0.000004
Cs	<0.0005	K	<0.003	Pr	<0.001	Ta	<0.0000009		

DOMINIQUE DUTSCHER SAS