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Certificate of Analysis

CERTIFIED REFERENCE MATERIAL FOR ICP-MS

Universal Data Acquisition Standard 1 - 17 components; 10mg/l each of Ce ; Dy ; Er ; Eu ; Gd ; Ho ; La ; Lu ; Nd ; Pr ; Sm ; Sc ; Tb ; Th ; Tm ; Y ; Yb in HNO3 5%

Lot N: XXXXXX
Barcode: XXXXXXXX

Ref N: N9300232.L5

Certification Date:XXXXXX

Component	Certified Value and uncertainty [mg/l]	Metrological traceability
Ce	9.966 ± 0.033 (y)	NIST SRM No 3110 Lot 090504
Dy	10.066 ± 0.027 (y)	NIST SRM No 3115a Lot 990504
Er	10.079 ± 0.026 (y)	NIST SRM No 3116a Lot 000831
Eu	10.115 ± 0.030 (y)	NIST SRM No 3117a Lot 120705
Gd	10.080 ± 0.027 (y)	NIST SRM No 3118a Lot 992004
Ho	10.045 ± 0.030 (y)	NIST SRM No 3123a Lot 090408
La	10.002 ± 0.024 (y)	NIST SRM No 3127a Lot 890402
Lu	10.030 ± 0.026 (y)	NIST SRM No 3130a Lot 100503
Nd	10.019 ± 0.031 (y)	NIST SRM No 3135a Lot 992803
Pr	10.045 ± 0.027 (y)	NIST SRM No 3142a Lot 990501
Sm	10.079 ± 0.028 (y)	NIST SRM No 3147a Lot 892911
Sc	10.044 ± 0.023 (y)	NIST SRM No 3148a Lot 100701
Tb	10.092 ± 0.034 (y)	NIST SRM No 3157a Lot 100518
Th	10.104 ± 0.051 (y)	CPA CRM No SLTHN Lot 85026025
Tm	10.048 ± 0.034 (y)	NIST SRM No 3160a Lot 790912
Y	10.001 ± 0.005 (y)	NIST SRM No 3167a Lot 120314
Yb	10.044 ± 0.022 (y)	NIST SRM No 3166a Lot 140114

Notes:
(y) WQP 5.15.1.24 *The certified value was obtained by a weighted mean of the results of two independent calibration methods among: Classical Volumetric,Primary Gravimetric, Instrumental (ICP/OES, ICP/MS or IC)*

Density* 1.019 g/cm^3 at 20°C

Starting Material, Purity*	Batch
$Ce(NO_3)_3$ 99.999%	82078447
Dy_2O_3 99.997%	82044527
Er_2O_3 99.99%	82024048
Eu_2O_3 99.995%	82044824
Gd_2O_3 99.999%	82071301
Ho_2O_3 99.99%	82062026
La_2O_3 99.999%	82010560
Lu_2O_3 99.995%	82072537
Nd_2O_3 99.99%	82070328
Pr_6O_{11} 99.995%	82068424
Sm_2O_3 99.995%	82068363
Sc_2O_3 99.991%	82082963
Tb_4O_7 99.99%	82067601
$Th(NO_3)_4$ 99.95%	82082055
Tm_2O_3 99.995%	82075071
Y_2O_3 99.987%	82100803
Yb_2O_3 99.99%	82085483

CERTIFIED ISO 9001
ANAB ANSI National Accreditation Board ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER
C.P.A. chem Ltd is accredited to ISO 17034 and ISO/IEC 17025

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

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** 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”
Validation of analytical methods
Detection limit and linearity studies
This statement is not intended to restrict the use for other purposes.

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.The laboratory performs stability tests according to MQP 5.14.1 therefore solutions with one and the same bar-code number might have different expiration dates.

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 safety data sheet.

Level of homogeneity:

This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous.
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)

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