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# Certificate of Analysis

## CERTIFIED REFERENCE MATERIAL FOR ICP-MS

**SmartTune Solution for Standard ELANs/DRC-e - 9 components; 10mg/l each of Ba ; Be ; Ce ; Co ; In ; Mg ; Pb ; Rh ; U in HNO3 1%**

Lot N: XXXXXX Ref N: N8125040.L1 Certification Date:XXXXXX
Barcode: XXXXXXXX

| Component | Certified Value and uncertainty [mg/l] | Metrological traceability |
|---|---|---|
| Ba | 10.039 ± 0.028 (y) | NIST SRM No 3104a Lot 140909 |
| Be | 10.080 ± 0.037 (y) | NIST SRM No 3105a Lot 090514 |
| Ce | 10.075 ± 0.030 (y) | NIST SRM No 3110 Lot 090504 |
| Co | 9.999 ± 0.030 (y) | NIST SRM No 3113 Lot 000630 |
| In | 10.023 ± 0.035 (y) | NIST SRM No 3124a Lot 110516 |
| Mg | 10.070 ± 0.023 (y) | NIST SRM No 3131a Lot 140110 |
| Pb | 9.994 ± 0.034 (y) | NIST SRM No 3128 Lot 101026 |
| Rh | 9.994 ± 0.049 (y) | NIST SRM No SLRHC Lot 85028739 |
| U | 10.007 ± 0.032 (y) | NIST SRM No 3164 Lot 080521 |

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* 1.002 g/cm$^3$ at 20°C

| Starting Material, Purity* | Batch |
|---|---|
| $BaCO_3$ 99.9955% | 82104214 |
| $Be_4O(C_2H_3O_2)_6$ 99.996% | 82105228 |
| $Ce(NO_3)_3$ 99.999% | 82089634 |
| Co 99.994% | 82094232 |
| In 99.995% | 82094508 |
| $Mg(NO_3)_2$ 99.999 | 82104788 |
| $Pb(NO_3)_2$ 99.997% | 82103965 |
| $RhCl_3$ 99.99 | 82109547 |
| $UO_2(OOCCH_3)_2$ 99.97% | 82094751 |

* *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 6 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.*

DOMINIQUE DUTSCHER SAS

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**

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*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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