

Certificate of Analysis

Name: ICP-MS-Multielement Standard B
Part Number: **ICP-MS-B**
Lot Number: **SAMPLE**
Matrix: 2% HNO₃
Purity: 99.99% - 99.9995%

Certified Values:

Element	($\mu\text{g/mL}$)	SRM ID	SRM Lot#	Element	($\mu\text{g/mL}$)	SRM ID	SRM Lot#
Ce	10.00 \pm 0.06	3110	090504	Pr	10.0 \pm 0.1	3142a	990501
Dy	10.00 \pm 0.06	3115a	990504	Sm	10.00 \pm 0.06	3147a	892911
Er	10.00 \pm 0.06	3116a	000831	Sc	10.0 \pm 0.1	3148a	100701
Eu	10.00 \pm 0.06	3117a	120705	Tb	10.00 \pm 0.06	3157a	100518
Gd	10.00 \pm 0.06	3118a	992004	Th	10.0 \pm 0.1	*	
Ho	10.00 \pm 0.06	3123a	090408	Tm	10.0 \pm 0.1	3160a	790912
La	10.00 \pm 0.06	3127a	890402	Yb	10.00 \pm 0.06	3166a	790512
Lu	10.00 \pm 0.06	3130a	100503	Y	10.00 \pm 0.06	3167a	120314
Nd	10.0 \pm 0.1	3135a	992803				

The Certified values are based on gravimetric and volumetric preparation, and verified against SRM 3100 series via inductively coupled plasma optical emission spectrometry (ICP-OES) using an internal laboratory developed method. The uncertainty in the certified value is calculated for a 95% confidence interval and coverage factor k is about 2.

* Refer to Traceability Information, Section d

Density: 1.010 g/mL \pm 0.002 g/mL @ 21.4°C

Preparation Information:

The standard is generally manufactured from CRM single element solutions that were prepared using the methods developed at NIST for SRM Spectrometric Standard Solutions under appropriate laboratory conditions. Sub-boiling distilled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is as noted above in 18 megaohm deionized water.

Stability of this product is based upon rigorous short term and long term testing of the solution for the certified value. This testing includes, but is not limited to, the effect of temperature and packaging on the product.

Intended Use:

The CRM is intended for use as a calibration standard and QC control for instruments such as ICPOES, ICPMS, AAS and XRF, and validation of analytical methods. It also can be used in EPA, ASTM and other methods.

Traceability Information:

The traceability of this standard is maintained through an unbroken chain of comparisons to appropriate standards with suitable procedure and measurement uncertainties. The maintenance of the base and derived units of International System of Units (SI) with traceability of measurement results (contemporary metrology) to SI ensures their comparability over time as follows.

a. **Standard Weight and Analytical Balance**

The standard weights (NBS weights Inventory No 20231A) are calibrated every two years by South Carolina Metrology Laboratory that is a participant in "NIST Weights and Measures Measurement Assurance Program" with a certificate of measurement traceability to NIST primary standards. The balances are calibrated yearly by the ISO 17025 accredited metrology service, and are verified weekly by an in-house method using standard weights.

b. **Volumetric Device**

The calibration of volumetric vessels is checked annually using the ASTM method E542.

c. **Thermometer**

The standard thermometers are calibrated every year by the ISO 17025 accredited metrology service. The thermometers used in-house are verified against the standard thermometers yearly.

d. **Calibration Standards**

The Calibration Standards are traceable to SRM 3100 Series Spectrometric Standard Solutions or second sources.

Packaging and Storage Conditions:

The standard is packaged in a pre-cleaned polyethylene bottle. To maintain the integrity of this product, the solution should be kept tightly capped and stored under normal laboratory conditions.

Refer to Material Safety Datasheet (MSDS) for hazardous information.

Expiration Information:

The expiry date is guaranteed to be valid for twelve months from the shipping date provided. For this reason, standards from the same lot may have different expiration dates.

Preparation Date: June 8, 2015

Shipped Date:

Expiration Date:

Certificate Issue Date: July 7, 2015

Quality Information:



ISO/IEC 17025:2005 Accreditation
Certificate Number AT-1529



Angel Sellers
Quality Manager



ISO Guide 34:2009 (RMP) Accreditation
Certificate Number AR-1436

NOTICE: HPS products are intended for laboratory use only. All products should be handled and used by trained professional personnel. The responsibility for the safe handling and use of these products rests solely with the buyer and/or user. The data and information as stated was furnished by the manufacturer of the product. The information provided in this certificate pertains only to the lot number specified. None of the information provided in this certificate may be used, reproduced or transmitted in any form or by any means without written approval from High Purity Standards.