HIGH-PURITY STANDARDS
www.highpuritystandards.com

P.O. Box 41727
Charleston, SC 29423
Phone (843) 767-7900
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Certificate of Analysis

Product Description:

Name: ICP-MS-6020 CLP-M
Part Number: **ICP-MS-6020**
Lot Number: **SAMPLE**
Matrix: 4% HNO_3 + Tr HF
Purity: 99.98% - 99.9999%

Certified Values:

Element	(µg/mL)	SRM ID	SRM Lot#	Element	(µg/mL)	SRM ID	SRM Lot#
Al	20.0 ± 0.1	3101a	060502	Pb	0.50 ± 0.01	3128	101026
Sb	6.00 ± 0.06	3102a	061229	Mg	500 ± 3	3131a	050302
As	1.00 ± 0.01	3103a	100818	Mn	1.50 ± 0.02	3132	050429
Ba	20.0 ± 0.2	3104a	070222	Ni	4.00 ± 0.04	3136	120619
Be	0.50 ± 0.01	3105a	090514	K	500 ± 3	3141a	051220
Cd	0.50 ± 0.01	3108	060531	Se	0.5 ± 0.5	3149	100901
Ca	500 ± 3	3109a	050825	Ag	1.00 ± 0.01	3151	992212
Cr	1.00 ± 0.01	3112a	030730	Na	500 ± 3	3152a	120715
Co	5.00 ± 0.05	3113	000630	Tl	1.00 ± 0.01	3158	993012
Cu	2.50 ± 0.03	3114	011017	V	5.00 ± 0.05	3165	992706
Fe	10.00 ± 0.05	3126a	051031	Zn	2.00 ± 0.02	3168a	120629

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

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.

Preparation of working standard solution: To obtain the Contract Required Detection Limits (CRDL) of the elements approved for ICP-MS Method 6020 CLP-M, a 100-fold dilution should be prepared prior to analysis. The final solution should contain the elements at the concentrations listed below.

Element	(µg/L)	Element	(µg/L)	Element	(µg/L)	Element	(µg/L)
Al	200	Ca	5000	Mg	5000	Na	5000
Sb	60	Cr	10	Mn	15	Tl	10
As	10	Co	50	Ni	40	V	50
Ba	200	Cu	25	K	5000	Zn	20
Be	5	Fe	100	Se	5		
Cd	5	Pb	5	Ag	10		

Intended Use:

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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: **January 22, 2014**

Shipped Date:

Expiration Date:

Certificate Issue Date: **January 24, 2014**

Quality Information:

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

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

Angel Sellers
Quality Manager

High-Purity Standards is certified to ISO 9001:2008 and accredited to ISO/IEC 17025:2005 and ISO Guide 34:2009.

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