



Certificate of Analysis

ULTRAGrade™ Solution
Cesium ICP Standard
1000 µg/mL

Catalog Number: ICP-055
Lot Number: G00300A
Job Number: J00005673
Lot Issue Date: 05/30/2008
Expiration Date: 07/31/2015

Starting Material: Cesium Carbonate
Starting Material Purity: 99.995%
Starting Material Lot No.: BH00238
Matrix: 2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Cs: 132.91

Certified Value: 1000 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001:2000 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The certified value and uncertainty value, at the 95% confidence level, for each analyte determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP-MS) vs. NIST SRM 3111a

ULTRA uses purified acids, 18 megohm double deionized water, calibrated Class A glassware & meticulously cleaned bottles in the manufacturing of ULTRAGrade standards. Balances used in the manufacturing of this standard are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001

Trace Metallic Impurities in Solution Standard in µg/mL:

* Al <0.005 ND	* Ga <0.005 ND	n Nb	n S
* Sb <0.005 ND	n Ge <0.005 ND	n Os	n Ta
* As <0.005 ND	n Au	n Pd <0.005 ND	n Te
* Ba <0.020 D	n Hf	* P <0.005 ND	n Tb
* Be <0.005 ND	n Ho	* Pt <0.005 ND	n Tl <0.005 ND
* Bi <0.005 ND	* In <0.005 ND	* K <0.005 ND	n Th
* B <0.005 ND	n Ir	n Pr	n Tm
* Cd <0.010 D	* Fe <0.005 ND	n Re	* Sn <0.005 ND
* Ca <0.005 ND	* La <0.005 ND	n Rh	n Ti <0.005 ND
n Ce	* Pb <0.005 ND	* Rb <0.050 D	n W
s Cs	* Li <0.020 D	n Ru	n U
* Cr <0.005 ND	n Lu	n Sm	* V <0.005 ND
* Co <0.005 ND	* Mg <0.005 ND	n Sc	n Yb
* Cu <0.005 ND	* Mn <0.005 ND	* Se <0.005 ND	n Y
n Dy	* Hg <0.005 ND	* Si <0.005 ND	* Zn <0.005 ND
* Er <0.005 ND	* Mo <0.005 ND	* Ag <0.005 ND	n Zr
* Eu <0.005 ND	n Nd	* Na <0.010 D	
* Gd <0.005 ND	* Ni <0.005 ND	* Sr <0.005 ND	

* - element checked for
ND - not detected

i - spectral interference
D - detected

n - not checked for
s - solution standard element

Analyzed Density of Solution (measured at 21.0°C ± 0.5°C): 1.011 g/mL



William J. Leary
Quality Assurance Manager

ISO 9001 Registered Quality System – TUV USA