



# Certificate of Analysis

**ULTRAgrade™ Solution**  
**Cerium ICP / ICP-MS Standard**  
**1000 µg/mL**

**Catalog Number:** ICP-058  
**Lot Number:** R00397  
**Lot Issue Date:** 04/25/2013  
**Expiration Date:** 05/31/2020

Starting Material: cerium (III) nitrate hexahydrate  
Starting Material Purity: 99.99%  
Starting Material Lot #: BH02229  
Matrix: 2% nitric acid in low TOC water (< 50 ppb)  
Atomic Weight Ce: 140.13

### Certified Value: 1001 ± 2 µg/mL

This Certified Reference Material (CRM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system. The analyte concentration(s) were prepared and verified by an ISO Guide 34 / ISO 17025 accredited laboratory, and compared to calibration standards independently prepared using NIST SRM(s). The certified value and uncertainty value at the 95% confidence level for each analyte is determined gravimetrically.

Classical Wet Assay Method: Theoretical, based on gravimetric measurements

### Confirmation by Inductively Coupled Plasma Spectroscopy (ICP / ICP/MS) vs. NIST SRM 3110

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/NCCL Z-540-1 and ISO 9001.

### Trace Metallic Impurities in Solution Standard in µg/mL:

* Al <0.009 D	* Ga <0.005 ND	n Nb	n S
* Sb <0.005 ND	* Ge <0.005 D	n Os	n Ta
* As <0.005 ND	n Au	* Pd <0.005 ND	n Te
* Ba <0.005 D	n Hf	* P <0.005 ND	n Tb
* Be <0.005 ND	n Ho	* Pt <0.005 ND	* Tl <0.005 ND
* Bi <0.005 ND	* In <0.005 ND	* K <0.005 ND	n Th
* B <0.005 D	n Ir	* Pr <0.009 D	n Tm
* Cd <0.005 ND	* Fe <0.005 D	n Re	* Sn <0.005 ND
* Ca <0.006 D	* La <0.005 D	n Rh	* Ti <0.005 ND
s Ce	* Pb <0.005 D	n Rb	n W
n Cs	* Li <0.005 ND	n Ru	n U
* Cr <0.005 D	n Lu	* Sm <0.005 D	* V <0.005 ND
* Co <0.005 ND	* Mg <0.005 D	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 D
* Er <0.005 ND	* Mo <0.005 ND	* Ag <0.005 ND	* Zr <0.005 D
* Eu <0.005 ND	* Nd <0.005 D	* Na <0.005 D	
* Gd <0.005 ND	* Ni <0.005 D	* Sr <0.006 D	

\* - element checked for      l - spectral interference      n - not checked for  
ND - not detected              D - detected                      s - solution standard element

Density of Solution (measured at 20.00°C ± 0.05°C): 1.0107



ISO 9001 Registered Quality System - TUV USA

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