

# Certificate of Analysis

**ULTRAGrade™ Solution**  
**Cobalt ICP / ICP-MS Standard**  
**10000 µg/mL**

**Catalog Number:** ICP-127  
**Lot Number:** CL-5272  
**Lot Issue Date:** 12/19/2014  
**Expiration Date:** 01/31/2022

Starting Material: Cobalt (II) nitrate hexahydrate  
Starting Material Purity: 99.999%  
Starting Material Lot #: RM07861  
Matrix: 2% nitric acid in low TOC water (< 50 ppb)  
Atomic Weight Co: 58.93

**Certified Value:** 10007 ± 20 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 3113**

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

\* - element checked for  
ND - not detected

I - spectral interference  
D - detected

n - not checked for  
s - solution standard element

**Density of Solution (measured at 19.99°C ± 0.05°C):** 1.0346 g/mL



ISO 17025:2005  
Accredited  
A2LA  
Cert. No. 0851.01

ISO 9001:2000  
Registered  
TUV USA, Inc.  
Cert. No. 06-1004

  


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William J. Leary  
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