



# Certificate of Analysis

**ULTRAGrade™ Solution**  
**Zirconium ICP Standard**  
**10000 µg/mL**

**Catalog Number:** ICP-140  
**Lot Number:** J00507  
**Job Number:** J00008396  
**Lot Issue Date:** 05/22/2008  
**Expiration Date:** 07/31/2015

**Starting Material:** Zirconyl Nitrate Hydrate  
**Starting Material Purity:** 99.99%  
**Starting Material Lot No.:** BH00995  
**Matrix:** 1% nitric acid in low TOC water (< 50 ppb)  
**Atomic Weight Zr:** 91.22

### Certified Value: 10000 ± 20 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 3169

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 <0.150 ND | * Ga <0.005 ND | n Nb           | n S            |
| * Sb <0.005 ND | n Ge           | n Os           | n Ta           |
| * As <0.005 ND | n Au           | n Pd <0.005 ND | n Te           |
| * Ba <0.005 ND | * Hf <0.750 D  | * 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 ND  | n Ir           | n Pr           | n Tm           |
| * Cd <0.005 ND | * Fe <0.100 D  | n Re           | * Sn <0.005 ND |
| * Ca <0.050 D  | * La <0.005 ND | n Rh           | * Ti <0.005 ND |
| n Ce           | * Pb <0.005 ND | n Rb           | n W            |
| n Cs           | * Li <0.005 ND | n Ru           | n U            |
| * Cr <0.005 ND | n Lu           | n Sm           | * V <0.005 ND  |
| * Co <0.005 ND | * Mg <0.010 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 ND |
| * Er <0.005 ND | * Mo <0.005 ND | * Ag <0.005 ND | s Zr           |
| * Eu <0.005 ND | n Nd           | * Na <0.005 ND |                |
| * 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

**Density of Solution** (measured at 22.0°C ± 0.5): 1.029 g/mL



ISO 9001 Registered Quality System – TUV USA

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