



# Certificate of Analysis

**ULTRAgrade™ Solution**  
**Lutetium ICP Standard**  
**10000 µg/mL**

**Catalog Number:** ICP-171  
**Lot Number:** J01234  
**Job Number:** J00009262  
**Lot Issue Date:** 12/22/2008  
**Expiration Date:** 01/31/2016

**Starting Material:** Lutetium Oxide  
**Starting Material Purity:** 99.998%  
**Starting Material Lot No.:** BH01164  
**Matrix:** 1% nitric acid in low TOC water (< 50 ppb)  
**Atomic Weight Lu:** 174.99

**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 3130a**

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 | n | Nb |        |    | n | S  |        |    |
| * | Sb | <0.005 | ND | n | Ge |        |    | n | Os |        |    | n | Ta |        |    |
| * | As | <0.005 | ND | n | Au |        |    | * | Pd | <0.005 | ND | n | Te |        |    |
| * | Ba | <0.005 | ND | 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 | ND | n | Ir |        |    | n | Pr |        |    | n | Tm |        |    |
| * | Cd | <0.005 | ND | * | Fe | <0.005 | ND | n | Re |        |    | * | Sn | <0.005 | ND |
| * | Ca | <0.100 | 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 | s | Lu |        |    | n | Sm |        |    | * | V  | <0.005 | ND |
| * | Co | <0.005 | ND | * | Mg | <0.005 | ND | n | Sc |        |    | * | Yb | <0.010 | D  |
| * | Cu | <0.005 | ND | * | Mn | <0.005 | ND | * | Se | <0.005 | ND | * | Y  | <0.100 | D  |
| 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 | <0.005 | 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 21.5°C ± 0.5): 1.025 g/mL



ISO 9001 Registered Quality System – TUV USA

  
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