



Certificate of Analysis

ULTRAGrade™ Solution
Titanium ICP Standard
10000 µg/mL

Catalog Number: ICP-122
Lot Number: J00349
Job Number: J00008203
Lot Issue Date: 04/04/2008
Expiration Date: 05/31/2015

Starting Material: Ammonium Hexafluorotitanate
Starting Material Purity: 99.998%
Starting Material Lot No.: BH00150
Matrix: 2% nitric acid, with trace hydrofluoric acid, in low TOC water (< 50 ppb)
Atomic Weight Ti: 47.90

Certified Value: 10012 ± 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 3162a

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 <0.050 D | * 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 | 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 <0.010 D | n Re | * Sn <0.005 ND |
| * Ca <0.010 D | * La <0.005 ND | n Rh | s Ti |
| 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 <0.300 D | * 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 ± 0.5°C): 1.029 g/mL



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Quality Assurance Manager

ISO 9001 Registered Quality System – TUV USA