



Certificate of Analysis

ULTRAGrade™ Solution
Aluminum ICP / ICP-MS Standard
1000 µg/mL

Catalog Number: ICP-013
Lot Number: CM-1795
Lot Issue Date: 04/13/2015
Expiration Date: 05/31/2022

Starting Material: aluminum nitrate nonahydrate
Starting Material Purity: 99.999%
Starting Material Lot #: RM07806
Matrix: 2% nitric acid in low TOC water (< 50 ppb)
Atomic Weight Al: 26.98

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 3101a

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:

s	Al		*	Ga	<0.005	D	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	D	n	Re		*	Sn	<0.005	ND	
*	Ca	<0.005	ND	*	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	<0.005	ND	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	n	Zr		
*	Eu	<0.005	ND	n	Nd		n	Na	<0.010	D					
*	Gd	<0.005	ND	*	Ni	<0.005	ND	*	Sr	<0.005	ND				

* - element checked for I – 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): 1.0150 g/mL



ISO 9001 Registered Quality System – TUV USA

William J. Leary
Quality Assurance Manager