



# Certificate of Analysis

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

**Catalog Number:** ICP-125  
**Lot Number:** J00797  
**Job Number:** J00008752  
**Lot Issue Date:** 08/25/2008  
**Expiration Date:** 10/31/2015

**Starting Material:** Manganese (II) Nitrate  
**Starting Material Purity:** 99.999%, 99.999%  
**Starting Material Lot No.:** BH00576, NT04530  
**Matrix:** 2% nitric acid in low TOC water (< 50 ppb)  
**Atomic Weight Mn:** 54.94

**Certified Value:** 10006 ± 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 3132**

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
* Ba	<0.005	ND	n Hf			* P	<0.005	ND
* Be	<0.005	ND	n Ho			* Pt	<0.005	ND
* Bi	<0.005	ND	* In	<0.005	ND	* K	<0.005	ND
* B	<0.005	ND	n Ir			n Pr		n Th
* Cd	<0.005	ND	* Fe	<0.050	D	n Re		n Tm
* Ca	<0.030	D	* La	<0.005	ND	n Rh		* Sn
n Ce			* Pb	<0.005	ND	n Rb		* Ti
n Cs			* Li	<0.005	ND	n Ru		n W
* Cr	<0.050	D	n Lu			n Sm		n U
* Co	<0.005	ND	* Mg	<0.180	D	n Sc		* V
* Cu	<0.005	ND	s Mn			* Se	<0.005	ND
n Dy			* Hg	<0.005	ND	* Si	<0.100	D
* Er	<0.005	ND	* Mo	<0.005	ND	* Ag	<0.005	ND
* Eu	<0.005	ND	n Nd			* Na	<0.005	ND
* Gd	<0.005	ND	* Ni	<0.005	ND	* Sr	<0.005	ND
								n Yb
								n Zn
								n Zr

\* - 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°C): 1.028 g/mL



ISO 9001 Registered Quality System – TUV USA

  
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