

# Certificate of Analysis

## ICP-MS Stock Tuning Solution (100 mL)

**Agilent Part Number: 5188-6564**
**Lot Number: 1-211YJY2**

Analyte	CAS#	Labeled Conc.	Measured Conc.	SRM	Start Mat'l Formula	Start Mat'l Purity	Analyte	CAS#	Labeled Conc.	Measured Conc.	SRM	Start Mat'l Formula	Start Mat'l Purity
Ce	7440-45-1	10.0 µg/mL	10.0 µg/mL	3110*	Ce <sub>2</sub> (CO <sub>3</sub> ) <sub>3</sub> ·x(H <sub>2</sub> O)	99.99+	Tl	7440-28-0	10.0 µg/mL	9.97 µg/mL	3158*	TlNO <sub>3</sub>	99.99+
Co	7440-48-4	10.0 µg/mL	9.97 µg/mL	3113*	Co	99.99+	Y	7440-65-5	10.0 µg/mL	9.97 µg/mL	3167a*	Y(NO <sub>3</sub> ) <sub>3</sub> ·6H <sub>2</sub> O	99.99+
Li	7439-93-2	10.0 µg/mL	9.99 µg/mL	3129a*	Li <sub>2</sub> CO <sub>3</sub>	99.99+							

\* - indicates NIST SRM

† - indicates CRM (when NIST SRM is not available)

**Purity grades:**

Starting Materials: Shown above

Matrix:

 2% HNO<sub>3</sub>: HNO<sub>3</sub> (CAS No. 7697-37-2) high purity grade

**Traceability:**

This standard has been produced gravimetrically and volumetrically using ISO 9001 quality procedures. Agilent ICP / ICP-MS Spectrometer was used to determine the concentration of the main elements via NIST SRMs shown above, as well as the impurities. Other reference standards used: 1-138YJ, 5-180MKB, 1-137YJ, 49-150CR.

**Trace Metallic Impurities in the Actual Solution, in µg/L, via Agilent ICP-MS Analysis, results are accurate to ±10%:**

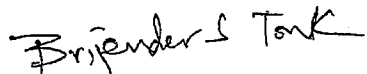
Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.
Ag	<0.2	Cs	<0.02	Ho	<0.1	Nd	<0.01	Ru	<0.06	Te	<0.4
Al	1	Cu	<0.3	In	<0.01	Ni	0.3	Sb	<0.02	Th	<0.04
As	<0.9	Dy	0.1	Ir	<0.09	P	<100	Sc	<0.1	Ti	<0.2
Au	<0.04	Er	<0.01	K	0.7	Pb	<0.07	Se	<2	Tm	<0.01
B	<2	Eu	<0.01	La	0.06	Pd	<0.1	Si	<100	U	<0.01
Ba	<0.2	Fe	2	Lu	<0.01	Pr	0.2	Sm	<0.01	V	<0.5
Be	<0.1	Ga	<0.5	Mg	0.2	Pt	<0.02	Sn	<0.04	W	<0.4
Bi	<0.01	Gd	<0.2	Mn	<0.2	Rb	<0.06	Sr	<0.03	Yb	<0.01
Ca	3	Ge	<0.2	Mo	<0.5	Re	<0.01	Ta	<0.1	Zn	2
Cd	<0.03	Hf	<0.01	Na	0.6	Rh	<0.04	Tb	<0.4	Zr	<0.1
Cr	0.3	Hg	<0.1	Nb	<0.2						

Balances are calibrated regularly with weight sets traceable to NIST.

Agilent reference standards are guaranteed stable and accurate to ±0.5% of measured analyte concentration. This uncertainty is at 95% confidence interval, a coverage factor of 2. For these solutions we use the highest purity acids applicable, 18 megohm double deionized water and acid-leached, triple rinsed bottles. All glassware used is class A. This standard was manufactured following the guidelines set forth under ISO 17025 and ISO Guide 34 regulations.

**Date of release:** March 31, 2019

**Date of expiration:** September 30, 2020


  
 QC Coordinator