

# Certificate of Analysis

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

**Agilent Part Number: 5188-6564**
**Lot Number: 51-237CRY2**

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	9.99 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	10.1 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	9.96 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	10.0 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: 1-210YJ, 1-211YJ, 5-180MKB, 1-138YJ.

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

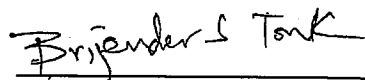
Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.
Ag	<1	Cs	<0.03	Ho	0.04	Nd	<0.01	Ru	<0.02	Te	<0.05
Al	1	Cu	<0.08	In	<0.02	Ni	<0.2	Sb	<0.05	Th	<0.01
As	<0.7	Dy	0.1	Ir	<0.02	P	<100	Sc	<0.08	Ti	<0.1
Au	<0.03	Er	<0.01	K	0.3	Pb	0.04	Se	<4	Tm	<0.01
B	<0.7	Eu	<0.01	La	0.07	Pd	<0.02	Si	<100	U	<0.01
Ba	<0.05	Fe	2	Lu	<0.01	Pr	0.2	Sm	<0.01	V	<0.07
Be	<0.02	Ga	0.4	Mg	0.2	Pt	<0.02	Sn	<0.04	W	<0.1
Bi	<0.2	Gd	0.3	Mn	<0.2	Rb	<0.01	Sr	<0.04	Yb	<0.01
Ca	4	Ge	<0.4	Mo	<0.1	Re	<0.01	Ta	<0.3	Zn	0.1
Cd	<0.03	Hf	<0.01	Na	1	Rh	<0.1	Tb	<0.3	Zr	<0.3
Cr	<0.2	Hg	<0.09	Nb	<0.05						

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:** May 15, 2019

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


  
 QC Coordinator