

# Certificate of Analysis

## Initial Calibration Verification Standard

**Agilent Part Number: 5183-4682**
**Lot Number: 3-03MKBY2**

Analyte	CAS#	Labeled Conc.	Measured Conc.	SRM	Start Matl Formula	Start Matl Purity	Analyte	CAS#	Labeled Conc.	Measured Conc.	SRM	Start Matl Formula	Start Matl Purity
Ca	7440-70-2	1000 µg/mL	998 µg/mL	3109a*	CaCO <sub>3</sub>	99.99+	Cr	7440-47-3	10.0 µg/mL	9.91 µg/mL	3112a*	Cr(NO <sub>3</sub> ) <sub>3</sub> ·9H <sub>2</sub> O	99.99+
Fe	7439-89-8	1000 µg/mL	993 µg/mL	3125a*	Fe	99.99+	Cu	7440-50-8	10.0 µg/mL	10.1 µg/mL	3114*	Cu	99.99+
K	7440-09-7	1000 µg/mL	989 µg/mL	3141e*	KNO <sub>3</sub>	99.99+	Mn	7439-98-5	10.0 µg/mL	9.96 µg/mL	3132*	Mn	99.99+
Mg	7439-85-4	1000 µg/mL	996 µg/mL	3131a*	Mg	99.99+	Mo	7439-98-7	10.0 µg/mL	9.87 µg/mL	3134*	MoO <sub>3</sub>	99.99+
Na	7440-23-5	1000 µg/mL	993 µg/mL	3152a*	NaHCO <sub>3</sub>	99.99+	Ni	7440-02-0	10.0 µg/mL	9.93 µg/mL	3136*	Ni	99.99+
Sr	7440-24-8	100 µg/mL	100 µg/mL	3163a*	SrCO <sub>3</sub>	99.99+	Pb	7439-92-1	10.0 µg/mL	9.96 µg/mL	3128*	PbO	99.99+
Ag	7440-22-4	10.0 µg/mL	10.0 µg/mL	3151†	Ag	99.99+	Sb	7440-36-0	10.0 µg/mL	9.95 µg/mL	3102a*	Sb	99.99+
Al	7429-90-5	10.0 µg/mL	9.94 µg/mL	3101a*	Al	99.99+	Se	7782-49-2	10.0 µg/mL	9.93 µg/mL	3149*	Se	99.99+
As	7440-38-2	10.0 µg/mL	9.99 µg/mL	3103a*	As	99.99+	Th	7440-29-1	10.0 µg/mL	9.93 µg/mL	3159*	Th(NO <sub>3</sub> ) <sub>4</sub> ·4H <sub>2</sub> O	99.99+
Ba	7440-39-3	10.0 µg/mL	9.92 µg/mL	3104a*	BaCO <sub>3</sub>	99.99+	Ti	7440-28-0	10.0 µg/mL	9.87 µg/mL	3158*	TiNO <sub>3</sub>	99.99+
Be	7440-41-7	10.0 µg/mL	10.0 µg/mL	3105a*	BeO(CH <sub>3</sub> COO) <sub>2</sub>	99.99+	U	7440-51-1	10.0 µg/mL	9.94 µg/mL	3164*	UO <sub>2</sub> (NO <sub>3</sub> ) <sub>2</sub> ·6H <sub>2</sub> O	99.99+
Cd	7440-43-9	10.0 µg/mL	9.90 µg/mL	3108*	Cd	99.99+	V	7440-82-2	10.0 µg/mL	9.99 µg/mL	3165*	NH <sub>4</sub> VO <sub>3</sub>	99.99+
Co	7440-48-4	10.0 µg/mL	9.85 µg/mL	3113*	Co	99.99+	Zn	7440-66-8	10.0 µg/mL	9.99 µg/mL	3168a*	Zn	99.99+

\* - indicates NIST SRM

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

**Purity grades:**

Starting Materials: Shown above

Matrix:

 5% HNO<sub>3</sub>: HNO<sub>3</sub> (CAS No. 7897-37-2) high purity grade

Tr. Tart. Acid: Tart. Acid (CAS No. 87-89-4) 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: CL12-151YP, CL12-123YP.

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

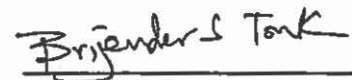
Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.	Element	Conc.
Au	<0.01	Eu	0.7	In	0.1	P	<1000	Ru	0.4	Te	0.3
B	<10	Ga	0.3	Ir	0.02	Pd	<30	Sc	0.2	Tl	<10
Bi	0.2	Gd	0.2	La	1	Pr	0.1	Si	<500	Tm	<0.01
Ce	2	Ge	<5	Lj	<2	Pt	0.4	Sm	0.2	W	0.8
Cs	0.03	Hf	0.05	Lu	0.01	Rb	30	Sr	<0.2	Y	0.3
Dy	0.1	Hg	0.8	Nb	<0.01	Re	0.1	Ta	<0.01	Yb	0.04
Er	0.02	Ho	<0.01	Nd	0.5	Rh	3	Tb	0.02	Zr	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: November 15, 2016

Date of expiration: May 31, 2018


  
 QC Coordinator