

# Certificate of Analysis

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

**Agilent Part Number: 5188-6564**
**Lot Number: 23-30VYY2**

| 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    | 9.90 µg/mL     | 3110*  | Ce <sub>2</sub> (CO <sub>3</sub> ) <sub>x</sub> ·x(H <sub>2</sub> O) | 99.99+             | Tl      | 7440-28-0 | 10.0 µg/mL    | 9.96 µg/mL     | 3158*  | TlNO <sub>3</sub>             | 99.99+             |
| Co      | 7440-48-4 | 10.0 µg/mL    | 9.91 µg/mL     | 3113*  | Co   | 99.99+             | Y       | 7440-65-5 | 10.0 µg/mL    | 10.1 µg/mL     | 3167a* | Y <sub>2</sub> O <sub>3</sub> | 99.99+             |
| Li      | 7439-93-2 | 10.0 µg/mL    | 9.87 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: 22-85VY, 22-150VY.

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

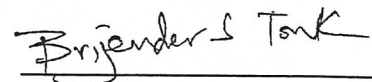
| Element | Conc. | Element | Conc. | Element | Conc. | Element | Conc. | Element | Conc. | Element | Conc. |
|---------|-------|---------|-------|---------|-------|---------|-------|---------|-------|---------|-------|
| Ag      | <0.1  | Cs      | 0.02  | Ho      | <0.01 | Nd      | <0.02 | Ru      | <0.2  | Te      | <0.6  |
| Al      | 0.5   | Cu      | <0.1  | In      | <0.03 | Ni      | 0.3   | Sb      | <0.07 | Th      | <0.01 |
| As      | <0.3  | Dy      | <0.01 | Ir      | <0.03 | P       | <100  | Sc      | <0.2  | Ti      | <0.3  |
| Au      | <0.2  | Er      | <0.01 | K       | <2    | Pb      | <0.04 | Se      | <0.6  | Tm      | <0.01 |
| B       | <0.9  | Eu      | 0.07  | La      | <0.07 | Pd      | <0.5  | Si      | <100  | U       | <0.01 |
| Ba      | <0.2  | Fe      | <2    | Lu      | <0.01 | Pr      | 0.09  | Sm      | <0.05 | V       | <0.04 |
| Be      | <0.5  | Ga      | 0.3   | Mg      | <0.1  | Pt      | <0.03 | Sn      | <0.1  | W       | <0.4  |
| Bi      | <0.03 | Gd      | <0.4  | Mn      | <0.4  | Rb      | <0.05 | Sr      | <0.2  | Yb      | <0.01 |
| Ca      | <8    | Ge      | <1    | Mo      | <0.1  | Re      | <0.02 | Ta      | <0.2  | Zn      | <0.4  |
| Cd      | <0.06 | Hf      | <0.01 | Na      | 2     | Rh      | <0.04 | Tb      | 0.7   | Zr      | <0.1  |
| Cr      | 0.3   | Hg      | <0.2  | 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:** July 15, 2016

**Date of expiration:** January 31, 2018


  
 QC Coordinator