LabKings
Crown your labwork

# Certificate of Analysis

Rev 0

**Comment:**

| Catalog No: | Lot No: | Exp. Date: | Matrix: | Description: |
|---|---|---|---|---|
| LK1-G3400510201 | 1089430 | 15-Oct-2017 | 5% $HNO_3$ + Tr HF | ISO Guide 34 - Antimony 1,000 mg/L in 5% $HNO_3$ + 0.1% HF, 100 mL (Sb Metal) |

## Additional Information:

**Date Received:** _____

**Container:** 4 oz (125 mL) Narrow Mouth, LDPE clean

**Certified Value: 1000 ± 3 mg/L**

**Traceable to: NIST SRM 3102 Lot number: 990707**

**The certified value is based on gravimetric and volumetric preparation of this CRM. This CRM has been confirmed by inductively coupled plasma optical emission spectrometry (ICP-OES) using an internally developed method against an independent source which is directly traceable to NIST SRM**
**The uncertainty value is calculated for a 95% confidence interval with a *k* value of 2.**

## Intended Uses:

**This Certified Reference material, CRM, is intended for use as a calibration standard or a quality control standard for Inorganic Speetrometry Equipment such as ICP-OES, ICP-MS, AA, and XRF. It may also be used for various US EPA, NIOSH and ASTM methods relavent to the certified properties listed below.**

### Additional Information:

| | | | |
|---|---|---|---|
| **Element:** | **Antimony** | **Symbol:** | **Sb** |
| **Starting Material:** | **Antimony Metal** | **Material Purity:** | **99.9999** |
| **CAS No:** | **7440-36-0** | | |
| **Source Lot No:** | **7026.409.1P** | | |

## Method of Preparation:

**This standard was prepared gravimetrically using balances calibrated with NIST traceable weights (NIST Test Number 822/264157-00). Only calibrated Class A volumetric glassware was used to prepare this standard. Sub-boiled distilled acid and 18 megaohm deionized water were used to stabilize the product. All raw materials were checked for stoichiometry and purity prior to use. This standard has been spectrometrically certified by an independent source, which is directly traceable to NIST.**

## Packaging and Storage:

**The Solution should be kept trightly capped and stored under normal laboratory conditions. Pre-cleaned polyethlene bottles are used to package this material. Special storage information: Ambient**

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## Uncertified Values:

**Specific Gravity (measured at 22 C): 1.0612**

**Impurity values determined by ICP-MS. The data is based on a scan of the raw material. The values are reported in µg/L.**

**A = Major component, INT = Interferent from the major component.**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Li | <0.1 | Ca | <1.0 | Cu | 8 | Y | <0.1 | Cd | <0.1 | Ce | <0.1 | Ho | <0.1 | Re | <0.1 | Bi | 2 |
| Be | <0.1 | Ti | <0.1 | Zn | <0.1 | Zr | <0.1 | In | <0.1 | Pr | <0.1 | Er | <0.1 | Os | <0.1 | Th | <0.1 |
| B | <1.0 | V | <0.1 | Ga | <0.1 | Nb | <0.1 | Sn | <0.1 | Nd | <0.1 | Tm | <0.1 | Ir | <0.1 | U | <0.1 |
| Na | <1.0 | Cr | <0.1 | Ge | <0.1 | Mo | <0.1 | Sb | A | Sm | <0.1 | Yb | <0.1 | Pt | <0.1 | | |
| Mg | <1.0 | Mn | <0.1 | As | <0.1 | Ru | <0.1 | Te | <0.1 | Eu | <0.1 | Lu | <0.1 | Au | <0.1 | | |
| Al | <1.0 | Fe | <1.0 | Se | <0.1 | Rh | <0.1 | Cs | <0.1 | Gd | <0.1 | Hf | <0.1 | Hg | <0.1 | | |
| P | <1.0 | Co | <0.1 | Rb | <0.1 | Pd | <0.1 | Ba | <0.1 | Tb | <0.1 | Ta | <0.1 | Tl | <0.1 | | |
| K | <1.0 | Ni | 2 | Sr | <0.1 | Ag | <0.1 | La | <0.1 | Dy | <0.1 | W | <0.1 | Pb | 8 | | |

## Glassware Calibration:

**Only Class A glassware is used in the manufacture and quality control of Standards. All glassware is calibrated using NIST traceable weights.**

## Weights and Balance Calibration:

**Weights used perform daily checks on balances calibrated annually by the State of South Carolina Department of Agriculture Metrology Laboratory and are traceable to the National Institute of Standards and Technology (NIST).**
**Balances are checked daily in accordance to in house procedure O2-LB-004. Balances are calibrated annually by an ISO/IEC 17025:2005 and ISO Guide 34:2009 accredited metrology service.**

## Homogeneity:

**Homogeneity has been established in accordance with internal procedure O2-QS-10 and has a maximum uncertainty of 0.1%. This is consistent with the intended use of this CRM. The homogeneity of this product has been confirmed by procedures consistent with ISO/IEC Guide 17025:2005 and ISO Guide 34:2009. The homogeneity of this CRM is valid for sample sub-sizes that the end user can quantitatively reproduce.**

## Hazardous information:

**Refer to MSDS**

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## Calculation of Uncertainty

The following equations are used to calculate the value of the expanded uncertainty:
$U=ku_c$ U=Expanded Uncertainty, k= the coverage factor at the 95% confidence level, k=2, $u_c$ = the combined uncertainty
$u_c = \sqrt{\sum u_i^2}$ where $u_i$ are the individual uncertainty components for raw material, transportation, homogeneity, and shelf lif
While no significant uncertainty was detected in the replicates, a minimum contribution to uncertainty was added for homogeneity and long term stability as described in ISO Guide 35.

## Expiration Information:

The Stability of this product is based upon rigorous short term and long term testing of the solution for the certified value. These tests include the effect of temperature and packaging on the product. This standard is guaranteed until the expiration date listed above.

## Accreditation:

This standard was manufactured by an ISO 17025 Chemical Testing Lab (Certificate number 3031.01) and ISO Guide 34 Reference Material Producer (RMP) Certificate number 3031.02 accredited by The American Association of Laboratory Accreditation (A2LA). Manufacturer's Quality System audited and registered by NSF-ISR to ISO 9001:2008 (Certificate number IZ391-IS4).

| Manufactured By: | Certified By: | Released By: |
|---|---|---|
| Mark Filla | Zachary Spinelli | HuiChen Stavros, Ph.D. |
| Manufacture Date: 4/13/2016 | Certified Date: 4/13/2016 | Original Issue Date: 4/13/2016 |



LabKings B.V., Tappersweg 59, 2031 ER Haarlem, The Netherlands