Inorganic Reference Standard

Catalog No: 456862T
Description: Rhodium ICP-MS Standard
Element: Rhodium (Rh)
SRM: 3144
Lot: 218105166
Matrix: 10% Hydrochloric acid
Hazards: *Refer to SDS for complete safety information*



Signal Word: Danger

Date Certified: Oct 29, 2018
Expiration: Oct 29, 2023
Density: 1.026 g/mL
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)

Certified Reference Material

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER AR-1463

ilac-MRA

Certified Concentration: 1000 µg/mL

Trace Elements in µg/mL

Ag	N/A	**Ce**	nd<0.2	**Gd**	nd<0.02	**Lu**	nd<0.02	**Pb**	nd<0.2	**Sc**	nd<0.02	**Ti**	**0.02**
Al	N/A	**Co**	N/A	**Ge**	nd<0.2	**Mg**	nd<0.02	**Pd**	nd<0.2	**Se**	nd<0.2	**Tl**	nd<0.2
As	nd<0.2	**Cr**	nd<0.02	**Hf**	nd<0.02	**Mn**	nd<0.02	**Pr**	nd<0.2	**Si**	nd<0.2	**Tm**	nd<0.02
Au	nd<0.02	**Cs**	N/A	**Hg**	nd<0.2	**Mo**	nd<0.02	**Pt**	nd<0.2	**Sm**	nd<0.2	**U**	nd<0.2
B	nd<0.2	**Cu**	N/A	**Ho**	nd<0.02	**Na**	**0.05**	**Rb**	N/A	**Sn**	N/A	**V**	nd<0.02
Ba	nd<0.02	**Dy**	nd<0.02	**In**	nd<0.2	**Nb**	nd<0.2	**Re**	N/A	**Sr**	nd<0.02	**W**	nd<0.2
Be	nd<0.02	**Er**	nd<0.02	**Ir**	nd<0.2	**Nd**	nd<0.02	**Rh**	*	**Ta**	N/A	**Y**	nd<0.02
Bi	nd<0.2	**Eu**	nd<0.02	**K**	nd<0.2	**Ni**	nd<0.02	**Ru**	nd<0.02	**Tb**	nd<0.02	**Yb**	nd<0.02
Ca	**0.06**	**Fe**	N/A	**La**	nd<0.02	**Os**	N/A	**S**	N/A	**Te**	nd<0.2	**Zn**	nd<0.02
Cd	nd<0.02	**Ga**	nd<0.02	**Li**	nd<0.02	**P**	N/A	**Sb**	nd<0.2	**Th**	nd<0.02	**Zr**	nd<0.02

This Certified Reference Material was verified in accordance with ISO/IEC 17025

This solution was assayed gravimetrically, using a balance calibrated against weight sets, ID #19305, traceable to NIST.

The gravimetric uncertainty for this product is ±0.24%. The CRM uncertainty is ±2.4%.

In order to verify the concentration(s), the final solution was checked by plasma emission spectroscopy (ICP) against material traceable to the above listed NIST SRM(s).

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as high purity acids and ASTM Type I 18 megohm deionized water.

All trace level elemental impurities were determined via plasma emission spectroscopy on the concentrate.

All glassware used in preparation is Class A.

All weights are traceable through NIST, Test No. 684/289871-17

All bottles are acid leached and triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware. Keep bottle tightly capped.

Certified By: Meigan O'Leary

Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

VWR International LLC, Radnor Corporate Center, Building One, Suite 200, 100 Matsonford Road Radnor, PA19087
VWR International bvba/sprl, Haasrode Research Park Zone 2020, Geldenaaksebaan 464, 3001 Leuven, Belgium

1. **Quality Standards:**

   ISO 17034:2016 – General Requirements for the Competence of Reference Material Producers

   ISO/IEC 17025:2017 – General Requirements for the Competence of Testing And Calibration Laboratories

   ISO 9001:2015 – Quality Management System – Requirements Eagle Registrations

2. **Intended Use:** The product covered by this certificate is designed for calibration or for use in quality control procedures for the specified chemical compounds listed on the reverse side. This product can be used for quantification and/or identification. This product can also be used as a reference material to validate analytical procedures, subject to the conditions under Section 7.

3. **Manufacturing:** All balances are calibrated daily using an in-house procedure with weights that are compared annually to master weights and traceable to NIST. The balances are also calibrated annually by an ISO/IEC 17025 accredited calibration laboratory. Please refer to the NIST test number listed on the front of this certificate. Class A glassware is used in the manufacture and quality control of all standards. Good Laboratory Practices have been used throughout the preparation of this Standard.

4. **Homogeneity:** This product is sufficiently homogeneous and any sample size would be within the uncertainty budget.

5. **Stability:** The manufacturer guarantees the stability of this solution through the expiration date stated on the label, when handled and stored according to the conditions stated on the label

6. **Uncertainty:** The uncertainty values as stated on the face of this certificate have been determined using the EURACHEM/CITAC Guide. We report a combined expanded uncertainty equal to the positive square root of the total variance of the uncertainty of the components using the following formula: $u_a = \sqrt{(u(\mathrm{V}))^2 + (u(\mathrm{m}))^2 + (u(\mathrm{IV}))^2 + (u(\mathrm{RO}))^2}$ This formula represents uncertainty components from the mass, volume, short-term stability, long-term stability and homogeneity factors associated with the production of this product. The expanded uncertainty, assumes a normal distribution and a coverage factor of k=2 is chosen using approximately a 95% confidence level.

7. **Legal Notice and Limit of Liability:** This product is for routine laboratory analysis and research purposes only. The company's liability will be limited to replacement of product or refund of purchase price. Notice of claims must be made within thirty (30) days from date of delivery.