

# Certificate of Analysis

**Barium ICP Standard, 1000 ppm Ba in 3% HNO<sub>3</sub>**

**Lot Number:** 4402M82

**Product Number:** PBA1KN

**Manufacture Date:** FEB 21, 2024

**Expiration Date:** AUG 2025

The certified value for this product is confirmed in independent testing by a second qualified chemist. The uncertainty associated with the certified value is ± 0.5% relative, which is the sum of the estimated errors due to the purity of the raw material, the volumetric preparation of the solution, and transpiration of the solution through the container wall.

The final solution concentration is confirmed by AA, ICP, or ICP-MS, and is traceable to NIST Standard Reference Material 3104a. All trace level elements were determined by ICP or ICP-MS.

Name	CAS#	Grade
Water	7732-18-5	
Nitric Acid	7697-37-2	
Barium Nitrate	10022-31-8	

Test	Specification	Result	NIST SRM#
Appearance	Colorless liquid	Passed	
Assay (vs. EDTA/Metalphthalein)	995-1005 ppm Ba	1000 ppm Ba	915

## Trace Elements by ICP or ICP - MS

I=Spectral Interference N=Not Tested

All values reported in mg/L (ppm)

Aluminum (Al)	< 0.0009 ppm	Lead (Pb)	0.0019 ppm	Strontium (Sr)	0.0557 ppm
Antimony (Sb)	I	Lithium (Li)	0.0872 ppm	Sulfur (S)	I
Arsenic (As)	0.2016 ppm	Lutetium (Lu)	0.0016 ppm	Tantalum (Ta)	0.0124 ppm
Beryllium (Be)	0.0109 ppm	Magnesium (Mg)	< 0.0007 ppm	Tellurium (Te)	I
Bismuth (Bi)	0.0178 ppm	Manganese (Mn)	0.0540 ppm	Terbium (Tb)	0.0016 ppm
Boron (B)	0.2708 ppm	Mercury (Hg)	< 0.03 ppm	Thallium (Tl)	I
Cadmium (Cd)	< 0.00007 ppm	Molybdenum (Mo)	0.0142 ppm	Thorium (Th)	0.0157 ppm
Calcium (Ca)	0.2869 ppm	Neodymium (Nd)	0.0063 ppm	Thulium (Tm)	0.0013 ppm
Cerium (Ce)	0.0078 ppm	Nickel (Ni)	0.0362 ppm	Tin (Sn)	< 0.0002 ppm
Cesium (Cs)	0.1022 ppm	Niobium (Nb)	< 0.00008 ppm	Titanium (Ti)	< 0.001 ppm
Chromium (Cr)	< 0.00006 ppm	Osmium (Os)	0.0086 ppm	Tungsten (W)	< 0.0001 ppm
Cobalt (Co)	0.0051 ppm	Palladium (Pd)	< 0.0004 ppm	Uranium (U)	0.0010 ppm
Copper (Cu)	N	Phosphorus (P)	I	Vanadium (V)	< 0.00004 ppm
Dysprosium (Dy)	0.0027 ppm	Platinum (Pt)	0.0021 ppm	Ytterbium (Yb)	< 0.001 ppm
Erbium (Er)	0.0022 ppm	Potassium (K)	< 0.00002 ppm	Yttrium (Y)	0.0136 ppm
Europium (Eu)	0.5339 ppm	Praseodymium (Pr)	0.0017 ppm	Zinc (Zn)	N
Gadolinium (Gd)	0.0225 ppm	Rhenium (Re)	0.0001 ppm	Zirconium (Zr)	< 0.002 ppm
Gallium (Ga)	N	Rhodium (Rh)	< 0.00003 ppm		
Germanium (Ge)	0.0213 ppm	Rubidium (Rb)	0.0138 ppm		
Gold (Au)	< 0.0005 ppm	Ruthenium (Ru)	< 0.00007 ppm		
Hafnium (Hf)	0.0020 ppm	Samarium (Sm)	0.0220 ppm		
Holmium (Ho)	0.0019 ppm	Scandium (Sc)	0.0175 ppm		
Indium (In)	< 0.00003 ppm	Selenium (Se)	I		
Iridium (Ir)	0.0008 ppm	Silicon (Si)	I		
Iron (Fe)	< 0.001 ppm	Silver (Ag)	0.3938 ppm		
Lanthanum (La)	< 0.00004 ppm	Sodium (Na)	< 0.02 ppm		

Specification	Reference
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Barium ICP Standard, 1 mL = 1 mg Ba (1,000 ppm Ba) Ba(NO <sub>3</sub> ) <sub>2</sub> in 3% HNO <sub>3</sub>	EPA (200.7)
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This standard is guaranteed to be stable and accurate provided the product is kept tightly capped and stored under normal laboratory conditions. Balances are calibrated using NIST traceable weights whose verification of maintenance and recalibration is documented per in-house Standard Operating Procedures. Class A glassware is also calibrated and routinely rechecked per in-house Standard Operating Procedures. Trace metal analyzed acids and Trace Metals Analyzed Water are used in the manufacture of this product. Triple cleaned containers are used in the manufacture of this product.

Part Number	Size / Package Type	Shelf Life (Unopened Container)
PBA1KN-100	100 mL natural LDPE	18 months

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**Recommended Storage:** 15°C - 30°C (59°F - 86°F)



Paul Brandon (02/21/2024)

Production Manager

This document is designed to comply with ISO Guide 31 "Reference Materials -- Contents of Certificates and Labels."

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