

# Certificate of Analysis

## Cesium ICP Standard, 10,000 ppm Cs in 5% HNO<sub>3</sub>

**Lot Number:** 4303F60

**Product Number:** PCS10KN

**Manufacture Date:** MAR 10, 2023

**Expiration Date:** AUG 2024

This is a single element solution that was prepared volumetrically to contain the certified value reported. The uncertainty associated with the certified value 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 3111a. All trace level elements were determined by ICP or ICP-MS.

Name	CAS#	Grade
Water	7732-18-5	
Nitric Acid	7697-37-2	
Cesium Nitrate	7789-18-6	

Test	Specification	Result	NIST SRM#
Appearance	Colorless liquid	Passed	
Cesium (Cs)	9950-10050 ppm	10000 ppm	3111

### Trace Elements by ICP or ICP - MS

I=Spectral Interference N=Not Tested

All values reported in mg/L (ppm)

Aluminum (Al)	0.3204 ppm	Lead (Pb)	< 0.00003 ppm	Strontium (Sr)	< 0.00006 ppm
Antimony (Sb)	< 0.0001 ppm	Lithium (Li)	< 0.03 ppm	Sulfur (S)	I
Arsenic (As)	< 0.0007 ppm	Lutetium (Lu)	< 0.0003 ppm	Tantalum (Ta)	0.0164 ppm
Barium (Ba)	< 0.0001 ppm	Magnesium (Mg)	N	Tellurium (Te)	0.0085 ppm
Beryllium (Be)	< 0.0001 ppm	Manganese (Mn)	< 0.00002 ppm	Terbium (Tb)	< 0.00003 ppm
Bismuth (Bi)	0.0021 ppm	Mercury (Hg)	< 0.03 ppm	Thallium (Tl)	0.0553 ppm
Boron (B)	I	Molybdenum (Mo)	0.0154 ppm	Thorium (Th)	0.0002 ppm
Cadmium (Cd)	I	Neodymium (Nd)	< 0.0002 ppm	Thulium (Tm)	< 0.00002 ppm
Calcium (Ca)	N	Nickel (Ni)	< 0.0001 ppm	Tin (Sn)	< 0.0002 ppm
Cerium (Ce)	< 0.00003 ppm	Niobium (Nb)	< 0.00008 ppm	Titanium (Ti)	< 0.001 ppm
Chromium (Cr)	< 0.00006 ppm	Osmium (Os)	< 0.003 ppm	Tungsten (W)	< 0.0001 ppm
Cobalt (Co)	< 0.00002 ppm	Palladium (Pd)	0.0018 ppm	Uranium (U)	< 0.00007 ppm
Copper (Cu)	< 0.00005 ppm	Phosphorus (P)	I	Vanadium (V)	< 0.00004 ppm
Dysprosium (Dy)	< 0.0001 ppm	Platinum (Pt)	< 0.00003 ppm	Ytterbium (Yb)	< 0.001 ppm
Erbium (Er)	< 0.00007 ppm	Potassium (K)	N	Yttrium (Y)	< 0.00009 ppm
Europium (Eu)	< 0.00008 ppm	Praseodymium (Pr)	< 0.00003 ppm	Zinc (Zn)	< 0.0003 ppm
Gadolinium (Gd)	0.0156 ppm	Rhenium (Re)	< 0.00003 ppm	Zirconium (Zr)	< 0.002 ppm
Gallium (Ga)	< 0.0006 ppm	Rhodium (Rh)	< 0.00003 ppm		
Germanium (Ge)	< 0.0003 ppm	Rubidium (Rb)	N		
Gold (Au)	< 0.0005 ppm	Ruthenium (Ru)	< 0.00007 ppm		
Hafnium (Hf)	0.0010 ppm	Samarium (Sm)	< 0.002 ppm		
Holmium (Ho)	< 0.0001 ppm	Scandium (Sc)	< 0.00008 ppm		
Indium (In)	< 0.00003 ppm	Selenium (Se)	< 0.004 ppm		
Iridium (Ir)	< 0.00007 ppm	Silicon (Si)	< 0.007 ppm		
Iron (Fe)	< 0.001 ppm	Silver (Ag)	< 0.0004 ppm		
Lanthanum (La)	< 0.00004 ppm	Sodium (Na)	< 0.02 ppm		

Specification	Reference
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<p>Cesium ICP, 10K ppm in HNO<sub>3</sub></p> <p>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.</p>	<p>EPA (200.7)</p>
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Part Number	Size / Package Type	Shelf Life (Unopened Container)
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<p>PCS10KN-100</p>	<p>100 mL natural LDPE</p>	<p>18 months</p>
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**Recommended Storage:** 15°C - 30°C (59°F - 86°F)



Paul Brandon (03/10/2023)

Production Manager

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

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