

Certificate of Analysis

Calcium ICP-MS Standard, 1000 ppm Ca in 3% HNO₃

Lot Number: 4312F17

Product Number: MSCA1KN

Manufacture Date: DEC 13, 2023

Expiration Date: JUN 2025

The certified value for this product is confirmed in independent testing by a second qualified chemist.

The final solution concentration is confirmed by AA, ICP, or ICP-MS, and is traceable to NIST Standard Reference Material 3109. All trace level elements were determined by ICP or ICP-MS.

Name	CAS#	Grade
Water	7732-18-5	
Nitric Acid	7697-37-2	
Calcium Carbonate	471-34-1	

Test	Specification	Result	NIST SRM#
Appearance	Colorless liquid	Passed	
Assay (vs. EDTA/Eriochrome Black T)	997-1003 ppm Ca	1000 ppm Ca	915

I=Spectral Interference N=Not Tested

Trace Elements by ICP or ICP - MS

All values reported in mg/L (ppm)

Aluminum (Al)	0.048 ppm	Lutetium (Lu)	< 0.0003 ppm	Terbium (Tb)	0.000 ppm
Antimony (Sb)	< 0.0001 ppm	Magnesium (Mg)	0.354 ppm	Thallium (Tl)	0.004 ppm
Arsenic (As)	< 0.0007 ppm	Manganese (Mn)	0.012 ppm	Thorium (Th)	0.003 ppm
Barium (Ba)	0.042 ppm	Mercury (Hg)	< 0.03 ppm	Thulium (Tm)	< 0.00002 ppm
Beryllium (Be)	0.009 ppm	Molybdenum (Mo)	0.048 ppm	Tin (Sn)	0.004 ppm
Bismuth (Bi)	0.012 ppm	Neodymium (Nd)	< 0.0002 ppm	Titanium (Ti)	0.005 ppm
Boron (B)	0.021 ppm	Nickel (Ni)	0.188 ppm	Tungsten (W)	< 0.0001 ppm
Cadmium (Cd)	0.000 ppm	Niobium (Nb)	0.006 ppm	Uranium (U)	< 0.00007 ppm
Cerium (Ce)	0.001 ppm	Osmium (Os)	< 0.003 ppm	Vanadium (V)	0.011 ppm
Cesium (Cs)	0.008 ppm	Palladium (Pd)	I	Ytterbium (Yb)	< 0.001 ppm
Chromium (Cr)	0.028 ppm	Phosphorus (P)	I	Yttrium (Y)	0.001 ppm
Cobalt (Co)	0.013 ppm	Platinum (Pt)	0.003 ppm	Zinc (Zn)	0.151 ppm
Copper (Cu)	0.039 ppm	Potassium (K)	0.124 ppm	Zirconium (Zr)	0.006 ppm
Dysprosium (Dy)	< 0.0001 ppm	Praseodymium (Pr)	< 0.00003 ppm		
Erbium (Er)	< 0.00007 ppm	Rhenium (Re)	< 0.00003 ppm		
Europium (Eu)	< 0.00008 ppm	Rhodium (Rh)	< 0.00003 ppm		
Gadolinium (Gd)	0.000 ppm	Rubidium (Rb)	< 0.00004 ppm		
Gallium (Ga)	0.003 ppm	Ruthenium (Ru)	< 0.00007 ppm		
Germanium (Ge)	0.012 ppm	Samarium (Sm)	< 0.002 ppm		
Gold (Au)	I	Scandium (Sc)	< 0.00008 ppm		
Hafnium (Hf)	0.004 ppm	Selenium (Se)	< 0.004 ppm		
Holmium (Ho)	< 0.0001 ppm	Silicon (Si)	I		
Indium (In)	0.000 ppm	Silver (Ag)	0.015 ppm		
Iridium (Ir)	0.001 ppm	Sodium (Na)	0.402 ppm		
Iron (Fe)	N	Strontium (Sr)	0.197 ppm		
Lanthanum (La)	0.000 ppm	Sulfur (S)	N		
Lead (Pb)	0.004 ppm	Tantalum (Ta)	0.059 ppm		
Lithium (Li)	0.003 ppm	Tellurium (Te)	I		

Specification	Reference
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Calcium Standard, 1000 ppm	EPA (200.8)
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Volumetric glassware complies with Class A tolerance requirements of ASTM E 288 and NIST Circular 434; it is calibrated before first use and recalibrated regularly in accordance with ASTM E 542 and NIST Procedure NBSIR 74-461. Balances are calibrated regularly with weights certified traceable to the NIST national mass standard. Thermometers and temperature probes are calibrated before first use and recalibrated regularly with a thermometer traceable to NIST standards. All products are prepared according to master documents that assure manufacture according to validated methods. Batch records document raw material traceability and production and testing history for each lot manufactured.

Part Number	Size / Package Type	Shelf Life (Unopened Container)
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MSCA1KN-100	100 mL natural LDPE	18 months
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Recommended Storage: 15°C - 30°C (59°F - 86°F)



Paul Brandon (12/13/2023)

Production Manager

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

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