RICCA CHEMICAL COMPANY®

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Certificate of Analysis

Copper ICP-MS Standard, 1000 ppm Cu in 3% HNO_3

Lot Number: 4402D55 **Product Number:** MSCU1KN

Manufacture Date: FEB 02, 2024
Expiration Date: JUL 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 3114. All trace level elements were determined by ICP or ICP-MS.

Name	CAS#	Grade
Water	7732-18-5	
Nitric Acid	7697-37-2	
Copper	7440-50-8	

Test	Specification	Result	NIST SRM#
Appearance	Blue liquid	Passed	
Assay (vs. EDTA/Murexide)	995-1005 ppm Cu	1000 ppm CU	915

I=Spectral Interference N=Not Tested

Trace Elements by ICP or ICP - MS

All values reported in mg/L (ppm)

Aluminum (Al)	< 0.0009 ppm	Lutetium (Lu)	< 0.0003 ppm	Terbium (Tb)	< 0.00003 ppn
Antimony (Sb)	< 0.0001 ppm	Magnesium (Mg)	0.016 ppm	Thallium (Tl)	0.068 ppm
Arsenic (As)	< 0.0007 ppm	Manganese (Mn)	< 0.00002 ppn	Thorium (Th)	< 0.0002 ppm
Barium (Ba)	0.007 ppm	Mercury (Hg)	< 0.03 ppm	Thulium (Tm)	< 0.00002 ppn
Beryllium (Be)	0.005 ppm	Molybdenum (Mo)	0.002 ppm	Tin (Sn)	0.007 ppm
Bismuth (Bi)	0.002 ppm	Neodymium (Nd)	< 0.0002 ppm	Titanium (Ti)	0.021 ppm
Boron (B)	0.005 ppm	Nickel (Ni)	0.006 ppm	Tungsten (W)	0.026 ppm
Cadmium (Cd)	0.003 ppm	Niobium (Nb)	0.002 ppm	Uranium (U)	< 0.00007 ppn
Calcium (Ca)	0.675 ppm	Osmium (Os)	< 0.003 ppm	Vanadium (V)	I
Cerium (Ce)	0.001 ppm	Palladium (Pd)	0.229 ppm	Ytterbium (Yb)	< 0.001 ppm
Cesium (Cs)	0.114 ppm	Phosphorus (P)	I	Yttrium (Y)	0.002 ppm
Chromium (Cr)	0.002 ppm	Platinum (Pt)	0.003 ppm	Zinc (Zn)	0.053 ppm
Cobalt (Co)	0.005 ppm	Potassium (K)	I	Zirconium (Zr)	0.002 ppm
Dysprosium (Dy)	< 0.0001 ppm	Praseodymium (Pr)	< 0.00003 ppn		
Erbium (Er)	< 0.00007 ppn	Rhenium (Re)	N		
Europium (Eu)	< 0.00008 ppn	Rhodium (Rh)	0.047 ppm		
Gadolinium (Gd)	< 0.0002 ppm	Rubidium (Rb)	< 0.00004 ppn		
Gallium (Ga)	0.017 ppm	Ruthenium (Ru)	0.000 ppm		
Germanium (Ge)	< 0.0003 ppm	Samarium (Sm)	< 0.002 ppm		
Gold (Au)	0.060 ppm	Scandium (Sc)	0.002 ppm		
Hafnium (Hf)	0.002 ppm	Selenium (Se)	I		
Holmium (Ho)	< 0.0001 ppm	Silicon (Si)	I		
Indium (In)	N	Silver (Ag)	0.012 ppm		
Iridium (Ir)	0.000 ppm	Sodium (Na)	0.662 ppm		
Iron (Fe)	0.609 ppm	Strontium (Sr)	< 0.00006 ppn		
Lanthanum (La)	< 0.00004 ppn	Sulfur (S)	I		
Lead (Pb)	0.001 ppm	Tantalum (Ta)	0.075 ppm		
Lithium (Li)	< 0.03 ppm	Tellurium (Te)	0.057 ppm		

Specification	Reference
Copper Standard, 1000 ppm	EPA (200.8)

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)
MSCU1KN-100	100 mL natural LDPE	18 months

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

Paul Brandon (02/02/2024)
Production Manager
This document is designed to comply with ISO Guide 31 "Reference Materials -- Contents of Certificates and Labels."