

## Certificate of Analysis

Date of Testing: 2022-11-29 09:24:51  
 Date of Next Testing: 2026-11-28 09:24:51  
 Product Name: **Tetramethylammonium hydroxide solution**  
 CAS Number: 75-59-2(water)  
 Specifications & Purity: Ultra pure,25% in H2O,for trace analysis  
 Lot #: K2224775  
 SKU #: **T131029**  
**Analysis: 152169**  
 Storage Temperature: Argon charged

Parameter	Limit Values	Result
Thallium (ICP)	0-0.5 (ppb)	0.00 ppb
Osmium (ICP)	0-0.5 (ppb)	0.00 ppb
Iridium (ICP)	0-1 (ppb)	0.00 ppb
Vanadium (ICP)	0-1 (ppb)	0.00 ppb
Magnesium(Mg)	0-0.5 (ppb)	0.00 ppb
Titanium(Ti)	0-1 (ppb)	0.00 ppb
Sodium(ICP)	0-10 (ppb)	0.00 ppb
Platinum(Pt)	0-0.5 (ppb)	0.00 ppb
Potassium(ICP)	0-10 (ppb)	0.00 ppb
Ruthenium (ICP)	0-0.5 (ppb)	0.00 ppb
Lead (ICP)	0-5 (ppb)	0.00 ppb
Tin(Sn)	0-0.5 (ppb)	0.00 ppb
Cerium(ICP)	0-0.5 (ppb)	0.00 ppb
Iron(ICP)	0-5 (ppb)	0.00 ppb
Rhodium(ICP)	0-0.5 (ppb)	0.00 ppb
Refractive index n20/D	1.381-1.383	1.38
Nickel(ICP)	0-1 (ppb)	0.00 ppb
Cadmium(Cd)	0-0.5 (ppb)	0.00 ppb
Palladium (ICP)	0-0.5 (ppb)	0.00 ppb
Ion chromatography (bromide)	0-50 (ppb)	0.00 ppb
Strontium(Sr)	0-0.5 (ppb)	0.00 ppb
Germanium (Ge)	0-0.5 (ppb)	0.00 ppb
Molybdenum (ICP)	0-0.5 (ppb)	0.00 ppb
Silver (Ag)	0-0.5 (ppb)	0.00 ppb
Concentration(Titration by 1M HCL)	24-26 (%)	24.96 %
Cobalt(ICP)	0-0.5 (ppb)	0.00 ppb

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Parameter	Limit Values	Result
Rubidium (ICP)	0-0.5 (ppb)	0.00 ppb
Density (20°C)	1.01-1.03	1.02
Indium (ICP)	0-0.5 (ppb)	0.00 ppb
Antimony (ICP)	0-0.5 (ppb)	0.00 ppb
Chromium (ICP)	0-1 (ppb)	0.00 ppb
Various guarantee label trace (ICP-MS)	0-10 (ppb)	0.00 ppb
total-iodine		
Copper(ICP)	0-0.5 (ppb)	0.00 ppb
ion chromatography (fluoride)	0-50 (ppb)	0.00 ppb
Calcium(Ca)	0-10 (ppb)	0.00 ppb
Manganese(ICP)	0-0.5 (ppb)	0.00 ppb
Gallium(Ga)	0-0.5 (ppb)	0.00 ppb
Zirconium(Zr)	0-1 (ppb)	0.00 ppb
Lithium (ICP)	0-0.5 (ppb)	0.00 ppb
Zinc(ICP)	0-1 (ppb)	0.00 ppb
ion chromatography (chloride)	0-50 (ppb)	0.00 ppb
Mercury(ICP)	0-0.5 (ppb)	0.00 ppb
Dimethyl Sulfoxide(NMR)	0-5 (ppb)	0.00 ppb
Selenium (ICP)	0-1 (ppb)	0.00 ppb
ion chromatography (nitrate)	0-250 (ppb)	0.00 ppb
Gold(Au)	0-1 (ppb)	0.00 ppb
Bismuth (ICP)	0-0.5 (ppb)	0.00 ppb
Barium (ICP)	0-0.5 (ppb)	0.00 ppb
Arsenic (ICP)	0-0.5 (ppb)	0.00 ppb
Beryllium (ICP)	0-0.5 (ppb)	0.00 ppb
ion chromatography (sulfate)	0-500 (ppb)	0.00 ppb
ion chromatography (phosphate)	0-50 (ppb)	0.00 ppb
Appearance (T131029)	Colorless to light yellow liquid or viscous liquid	Colorless to light yellow liquid or viscous liquid
Metal trace analysis by ICP-MS	corresponds to requirements	CORRESPONDS TO REQUIREMENTS
Proton NMR spectrum	Conforms to Structure	Conforms to Structure



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A handwritten signature in black ink that reads "John Su".

John Su  
QA & QC Manager