

ALADDIN SCIENTIFIC CORPORATION

14078 Meridian Parkway, Riverside, CA. 92518

Certificate of Analysis

Date of Testing: 2025-10-28 17:35:57

Date of Next Testing: 2029-04-10 17:35:57

Product Name: **Piperazine**

CAS Number: 110-85-0

Specifications & Purity: UltraBio™, anhydrous, ≥99%(T)

Lot #: J2522307

SKU #: **P755827**

Version: **1**

Analysis #: **690808**

Storage Temperature: Protected from light, Room temperature, Argon charged

Parameter	Limit Values	Result
Assay(Titration by HCL,1M)	98.5-101.5 (%)	99.69900 %
Water by Karl Fischer	0-1 (%)	0.80250 %
Aluminium(Al)	0-5 (ppm)	0.10000 ppm
Barium(Ba)	0-5 (ppm)	0.10000 ppm
Bismuth(Bi)	0-5 (ppm)	0.20000 ppm
Calcium(Ca)	0-10 (ppm)	4.50000 ppm
Cadmium(Cd)	0-5 (ppm)	0.20000 ppm
Cobalt(Co)	0-5 (ppm)	0.10000 ppm
Chromium(Cr)	0-5 (ppm)	0.10000 ppm
Copper(Cu)	0-5 (ppm)	0.10000 ppm
Iron(Fe)	0-5 (ppm)	0.10000 ppm
Potassium(K)	0-50 (ppm)	20.00000 ppm
Lithium(Li)	0-5 (ppm)	0.10000 ppm
Magnesium(Mg)	0-5 (ppm)	0.10000 ppm
Manganese(Mn)	0-5 (ppm)	0.10000 ppm
Molybdenum(Mo)	0-5 (ppm)	0.10000 ppm
Sodium(Na)	0-50 (ppm)	10.00000 ppm
Nickel(Ni)	0-5 (ppm)	0.10000 ppm
Lead(Pb)	0-5 (ppm)	0.10000 ppm
Strontium(Sr)	0-5 (ppm)	0.10000 ppm
Zinc(Zn)	0-5 (ppm)	0.10000 ppm
Arsenic traces(MHS-AAS)	0-0.1 (ppm)	0.00500 ppm
Total sulfur as SO4 (ICP)	0-50 (ppm)	10.00000 ppm
Chloride (Cl-)	0-50 (ppm)	20.00000 ppm
PH(Solution)	11.0-12.5	11.50000

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Parameter	Limit Values	Result
UV-ABS.at 260 nm	0-0.035	0.01400
UV-ABS.at 280 nm	0-0.01	0.00900
Appearance(P755827)	Colorless or White Powder or Crystals or Flakes	Colorless or White Powder or Crystals or Flakes
Proton NMR spectrum	Conforms to Structure	Conforms to Structure
Solubility(0.258 G IN 30 ML H ₂ O(0.1 M)),clear colorless	Pass	Pass
Residue (filter test)	no residue	no residue

A handwritten signature in black ink that reads "John Su".John Su
QA & QC Manager