

ALADDIN SCIENTIFIC CORPORATION

14078 Meridian Parkway, Riverside, CA. 92518

Certificate of Analysis

| | |
|--------------------------|---------------------------|
| Date of Testing: | 2024-11-16 13:12:01 |
| Date of Next Testing: | 2028-11-15 13:12:01 |
| Product Name: | L(+)-Glutamic acid |
| CAS Number: | 56-86-0 |
| Specifications & Purity: | Ultra pure, ≥99.5%(NT) |
| Lot #: | K2407143 |
| SKU # | G103979 |
| Version | 0 |
| Analysis #: | 066806 |
| Storage Temperature: | Argon charged |

| Parameter | Limit Values | Result |
|--|----------------|------------|
| Nickel(Ni) | 0-5 (ppm) | 2.10 ppm |
| Ammonia (NH ₄) | 0-0.02 (%) | 0.01 % |
| Chloride (Cl ⁻) | 0-0.02 (%) | 0.01 % |
| Calcium(Ca) | 0-200 (ppm) | 12.06 ppm |
| Ignition Residue (as sulfate) | 0-0.05 (%) | 0.01 % |
| Cadmium(Cd) | 0-5 (ppm) | 2.03 ppm |
| Zinc(Zn) | 0-5 (ppm) | 2.15 ppm |
| Iron(Fe) | 0-5 (ppm) | 5.00 ppm |
| Potassium(K) | 0-50 (ppm) | 5.38 ppm |
| UV Absorbance 260nm | 0-0.1 | 0.06 |
| Bismuth(Bi) | 0-5 (ppm) | 2.17 ppm |
| UV Absorbance 280nm | 0-0.1 | 0.06 |
| Magnesium(Mg) | 0-5 (ppm) | 2.54 ppm |
| Lithium(Li) | 0-5 (ppm) | 1.39 ppm |
| Barium(Ba) | 0-5 (ppm) | 2.64 ppm |
| Specific Rotation [α] ₂₀ /D(c=5 in 5 M HCl) | 30.5-32.5 (°) | 31.80° |
| Purity((NT) | 99.5-100.5 (%) | 100.10 % |
| Sulfate(SO ₄ ²⁻) | 0-200 (ppm) | 100.00 ppm |
| Sodium(Na) | 0-200 (ppm) | 15.18 ppm |
| Manganese(Mn) | 0-5 | 3.06 |
| Aluminum(Al) | 0-5 (ppm) | 2.41 ppm |
| Cobalt(Co) | 0-5 (ppm) | 2.18 ppm |
| (Pb)Lead | 0-5 (ppm) | 1.26 ppm |
| Molybdenum(Mo) | 0-5 (ppm) | 1.52 ppm |
| Chromium(Cr) | 0-5 (ppm) | 1.38 ppm |

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| Parameter | Limit Values | Result |
|---|-----------------------|-----------------------|
| Strontium(Sr) | 0-5 (ppm) | 2.14 ppm |
| Copper(Cu) | 0-5 (ppm) | 2.25 ppm |
| foreign amino acids | 0-0.5 (%) | 0.25 % |
| Loss on drying | 0-0.05 (%) | 0.05 % |
| Appearance (G103979) | white powder | White powder |
| Infrared spectrum | Conforms to Structure | Conforms to Structure |
| Insoluble matter | pass | Pass |
| Solubility 1M HCl , soluble 1 M at 20°C, clear, colorless | pass | Pass |
| λ, 1 M in 1 M HCl | Pass | Pass |



John Su
QA & QC Manager