

## Certificate of Analysis

Date of Testing: 2023-02-14 14:11:06  
 Date of Next Testing: 2027-02-13 14:11:06  
 Product Name: **L(+)-Glutamic acid**  
 CAS Number: 56-86-0  
 Specifications & Purity: from non-animal source,EP,JP,USP ; for cell culture,98.5 to 101.0%  
 Lot #: B2309082  
 SKU #: **G107510**  
 Analysis: **070058**

| Parameter  | Limit Values          | Result                |
|--|-----------------------|-----------------------|
| (As)Arsenic  | 0-1 (ppm)             | 0.06 ppm              |
| Sulfate(SO <sub>4</sub> <sup>2-</sup> )                  | 0-0.02 (%)            | 0.01 %                |
| PH test  | 3-3.5                 | 3.30                  |
| Loss on drying   | 0-0.1 (%)             | 0.05 %                |
| Ammonia (NH <sub>4</sub> )                               | 0-0.02 (%)            | 0.01 %                |
| Endonuclease Detection                                   | 0-0.1 (EU/g)          | 0.03 EU/g             |
| Iron(Fe)   | 0-10 (ppm)            | 5.00 ppm              |
| Assay  | 98.5-100.5 (%)        | 98.91 %               |
| Ignition Residue (as sulfate)                            | 0-0.1 (%)             | 0.03 %                |
| Chloride   | 0-0.02 (%)            | 0.00 %                |
| Heavy metal (as Pb)                                      | 0-10 (ppm)            | 6.00 ppm              |
| Assay(dry basis)   | 98.5-101 (%)          | 99.37 %               |
| Specific Rotation [α] <sub>20</sub> /D(C=10 in 1 M HCl)  | 31.5-32.4 (°)         | 31.51000°             |
| Ninhydrin-positive substances (other amino acids)        | Conforms              | Conforms              |
| Residual solvents  | complies              | complies              |
| Solubility,Colorless , Clear , 1.0 g to 10 ml of 2 M HCl | pass                  | Pass                  |
| Appearance (G107510)                                     | white powder          | White powder          |
| Infrared spectrum  | Conforms to Structure | Conforms to Structure |
| Cell Culture Test  | pass                  | Pass                  |



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

John Su  
QA & QC Manager