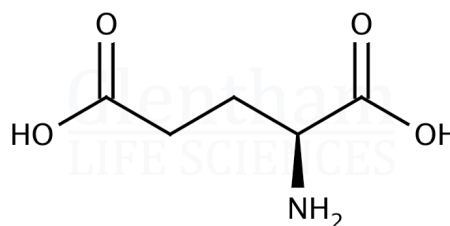


Certificate of Analysis

Product Name L-Glutamic acid
Glenthams Code GM3277
CAS Number 56-86-0
EINECS 200-293-7
MDL Number MFCD00002634
PubChem SID 310274214
Batch Number 325AVH

Molecular Weight 147.13
Molecular Formula $C_5H_9NO_4$
Storage Temp. +20°C



| Property | Specification | Batch 325AVH |
|---|--|----------------------------|
| Physical Description | White to almost white crystalline powder | White crystalline powder |
| Identification (IR) | To conform to standard | Conforms |
| Solubility (10% in 2M HCl) | Clear, colourless solution | Clear, colourless solution |
| Transmittance | ≥ 98.0% | Conforms |
| Specific Optical Rotation ([α] _D ²⁰) | +31.5 - +32.4 ° (c=10, 2M HCl) | +32.2° |
| pH | 3.0 - 3.5 | 3.4 |
| Heavy Metals (as Pb) | ≤ 10ppm | < 10ppm |
| Arsenic (As) | ≤ 1ppm | < 1ppm |
| Iron (Fe) | ≤ 10ppm | < 10ppm |
| Ammonium (NH ₄) | ≤ 0.02% | < 0.02% |
| Sulphate (SO ₄) | ≤ 0.02% | < 0.02% |
| Chloride (Cl) | ≤ 0.02% | < 0.02% |
| Other Amino Acids | None detected | Conforms |
| Any Individual Impurity (TLC) | ≤ 0.5% | Conforms |
| Total Impurities (TLC) | ≤ 2.0% | Conforms |
| Residue on Ignition | ≤ 0.1% | < 0.1% |
| Loss on Drying | ≤ 0.1% (105°C, 3h) | < 0.1% |
| Assay (Titration) | 99.0 - 101.0 % (dried basis) | 99.9% |
| Pharmacopoeia Specification(s) | USP, AII | Conforms |

Specification Version v1.2
Manufacture Date 2023-07-12
Re-Test Date 2032-09-29

Glenthams Life Sciences confirm that the above referenced product conformed to the information displayed in this document on the quality release date. Please check www.glenthams.com or contact us using the details above for the current version of this document.

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