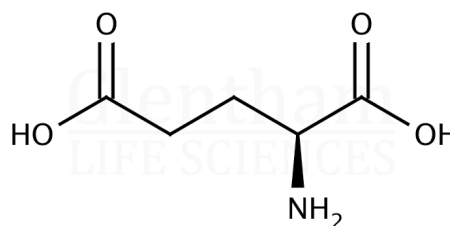


## Certificate of Analysis

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] <sub>D</sub> <sup>20</sup> )	+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 <sub>4</sub> )	≤ 0.02%	< 0.02%
Sulphate (SO <sub>4</sub> )	≤ 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 2023-09-29

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](http://www.glenthams.com) or contact us using the details above for the current version of this document.

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