Acros Organics BV (Thermo Fisher Scientific)
Janssen Pharmaceuticalaan 3a
Geel,
2440, Belgium

# CERTIFICATE OF ANALYSIS

Thermo Fisher Scientific's Quality System has been found to conform to Quality Management System Standard ISO9001:2015 by Intertek. Certificate Number. 2317548

| | |
|---|---|
| Catalogue Number | 13266 |
| Lot Number | A0481787 |
| Description | L-Serine,99% |
| CAS Number | 56-45-1 |
| Quality Test/Release Date | 01/Apr/2026 |
| Suggested retest date | 01/Apr/2031 |
| Country of Origin | CHINA |
| Declaration of Origin | synthetic |
| BSE/TSE | Not directly derived from or manufactured with any animal byproducts in any way (Including but not limited to fermentation or nutrient broth, catalysts, enzymes). |

| Result Name | Units | Specifications | Test Value |
|---|---|---|---|
| Appearance (Color) | | White | White |
| Appearance (Form) | | Crystalline powder or crystals or needles | Crystalline powder |
| Infrared spectrum | | Conforms | Conforms |
| Titration with HClO4 | % | 98.5 to 101.5 | 99.6 |
| Other amino acids | % | =<0.5 (TLC) | =<0.5 (TLC) |
| Loss on drying | % | =<0.2 (105°C, 3 hrs) | 0.06 (105°C, 3 hrs) |
| Heavy metals (as Pb) | ppm | =<10 | =<10 |
| Sulfated ash | % | =<0.1 | =<0.001 |
| Specific optical rotation | | +14.4° to +16.0° (20°C, 589 nm) (c=10, 2 N HCl) | +14.8° (20°C, 589 nm) (c=10, 2 N HCl) |
| Chloride (Cl) | ppm | =<200 | =<200 |
| Sulfate (SO4) | ppm | =<200 | =<200 |
| Ammonium (NH4) | ppm | =<200 | =<200 |
| Arsenic (As) | ppm | =<1 | =<1 |
| Iron (Fe) | ppm | =<10 | =<10 |
| UV transmittance | % | >=95 (c=10, H2O, 430 nm) 1 cm cell | 99.3 (c=10, H2O, 430 nm) 1 cm cell |
| pH | | 5.0 to 6.5 (2.5 % at 25°C) | 5.9 (2.5 % at 25°C) |

Geert Torfs
Supervisor, QC

Products are processed under ISO 9001:2015 quality management systems and samples are tested for conformance to the noted specifications. Certain data may have been supplied by third parties. We disclaim the implied warranties of merchantability and fitness for a particular purpose, and the accuracy of third-party data or information associated

Note: The data listed is valid for all package sizes of this lot of this product, expressed as an extension of the catalogue number listed above.

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with the product. Products are for research and development use only. Products are not for direct administration to humans or animals. It is the responsibility of the final formulator or end user to determine suitability, and to qualify and/or validate each product for its intended use.

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