

Glutathione

Glutathione is a tripeptide (γ-Glu-Cys-Gly) found in nearly all cells, where it acts as a major antioxidant and redox buffer. Its glutamate is linked through the side-chain gamma carboxyl, an unusual, non-standard peptide bond.



■ Hydrophobic ■ Acidic ■ Basic ■ Polar ■ Gly, Pro, Cys ■ Non-standard

Length	3 residues
Formula	C ₁₀ H ₁₇ N ₃ O ₆ S
Average mass	307.32 g/mol
Monoisotopic mass	307.0838 Da
Evidence	Early clinical studies
US status	Not an FDA-approved drug
WADA	Check the current Prohibited List

γ-Glu-Cys-Gly: the Glu is linked through its side-chain (γ) carboxyl, not a standard peptide bond.

Expected ions (monoisotopic)

[M+H] ⁺	[M+2H] ²⁺	[M+3H] ³⁺	[M+4H] ⁴⁺
308.0911	154.5492	103.3685	77.7782

What the COA should show

A glutathione certificate of analysis should confirm identity, ideally by mass spectrometry against the expected mass, and report purity by HPLC. The key quality issue is oxidation: the certificate should quantify reduced glutathione and the oxidized dimer GSSG separately, since GSH converts to GSSG on exposure to air and moisture. Other relevant impurities include cysteinylglycine, γ-glutamylcysteine and related degradation products. The material should be identified as reduced (GSH) or oxidized (GSSG) glutathione, and water content and heavy metals are commonly reported.

Storage and stability

Store glutathione powder tightly sealed, protected from moisture, light and air, at -20 °C for long-term research storage. Reduced glutathione oxidizes readily in solution, especially at neutral to basic pH and in the presence of trace metals, so prepare solutions fresh, use degassed buffers where oxidation matters, and consider a metal chelator in the buffer. Do not store reduced solutions for long periods.

Full entry, references and latest research: <https://peptidewiki.net/compounds/glutathione/>
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