

## Product Information

**$\alpha$ -AMANITIN**  
 from *Amanita phalloides*  
 Sigma Prod. No. A2263

**CAS NUMBER:** 23109-05-9

**SYNONYM:**  $\alpha$ -Amatoxin

**PHYSICAL DESCRIPTION:**

Appearance: white to light yellow powder

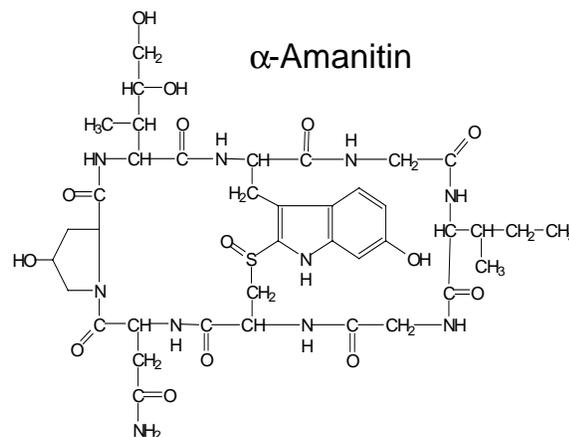
Molecular formula:  $C_{39}H_{54}N_{10}O_{14}S$

Molecular weight: 919.0

Melting point: 254-255°C<sup>1</sup>

$E^M(310\text{nm}) = 13,500$  (water)<sup>2</sup>

Structure:<sup>1</sup>  $\alpha$ -amanitin differs structurally from  $\beta$ -amanitin in that it has an amide rather than a carboxyl group.



**STORAGE / STABILITY AS SUPPLIED:**

When stored frozen in the dark, retained samples were found to be greater than 99% by HPLC after two years.

**SOLUBILITY / STABILITY OF SOLUTIONS:**

Sigma does not test routinely  $\alpha$ -amanitin for solubility due to the hazardous nature of the material. It does dissolve at 1 mg/mL in water when tested by HPLC. It is reportedly soluble in water, methanol and ethanol.<sup>3</sup>

It is suggested to prepare a stock solution at 1 mg of  $\alpha$ -amanitin per mL of water; this stock solution should be kept frozen in aliquots (-20°C or below). Dilution with the appropriate buffer should be done immediately before use. The solution can be checked for intactness of  $\alpha$ -amanitin by UV spectrometry, where it should show the typical absorption spectrum<sup>4</sup> ( $\epsilon^M = 13,500$  at 310 nm in water).<sup>2</sup>

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**SOLUBILITY / STABILITY OF SOLUTIONS:**

$\alpha$ -Amanitin is destroyed by concentrated acids (sulfuric acid or hydrochloric acid) and by concentrated sodium hydroxide. Glassware may be quickly decontaminated by washing in sulfuric acid/chromic oxide cleaning solution.<sup>4</sup>  $\alpha$ -Amanitin is also destroyed by soaking contaminated materials in 5% sodium hypochlorite solution (full-strength household bleach).<sup>11</sup>

**This product is extremely toxic. Be aware of the risks and be familiar with safety procedures before you use this product.**

**GENERAL REMARKS:**

Among the various families of mushroom, the "true poisonous mushrooms" are of the genus Amanita. Not all the members of this genus are highly poisonous, but Amanita phalloides, the "green death cap" mushroom, contains a variety of compounds that are toxic for mammalian organisms. In this group, amatoxins and phallotoxins are two families of cyclic peptides that act on cytoplasmic or nuclear cell components. The amatoxins, one of which is  $\alpha$ -amanitin, inhibit transcription of eukaryotic cells when present in nanomolar concentrations.<sup>5</sup>

In molecular biology applications,  $\alpha$ -amanitin has become a tool in probing RNA-synthesis, since it has been shown to be a specific inhibitor of RNA Polymerase II.<sup>6-10</sup>

**REFERENCES:**

1. *Merck Index*, 12th Ed., #387 (1996).
2. Wieland, T. and Faulstich, H., *Critical Reviews in Biochemistry*, 5, 185-260 (1978).
3. *Data for Biochemical Research*, 3rd Ed., Dawson, R.M.C. et al., eds. (Oxford Press, 1986), 257-258.
4. Supplier information.
5. Wieland, T., *Science*, 159, 946-952 (1968). "Poisonous Principles of Mushrooms of the Genus Amanita."
6. Kedinger, C. et al., *Biochem. Biophys. Res. Commun.*, 38, 165-171 (1970). " $\alpha$ -Amanitin: A Specific Inhibitor..."
7. Seifart, K.H. et al., *Arch. Biochem. Biophys.*, 151, 519-532 (1972). "Multiple RNA Polymerase Species from Rat Liver Tissue..."
8. Huet, J. et al., *Proc. Natl. Acad. Sci.*, 72, 3034-3038 (1975). "Dissociation of two polypeptide chains from yeast RNA polymerase A."
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11. Sigma Material Safety Data Sheet.

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**ADDITIONAL REFERENCES / REVIEW ARTICLES:**

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Zahler, A.M. and Prescott, D.M., *Nucleic Acids Research*, 17, 6299-6317 (1989). "DNA Primase and the replication of the telomeres in *Oxytricha nova*."

Wieland, T., *Int. J. Peptide Protein Res.*, 22,257-276 (1983). "The toxic peptides from Amanita mushrooms."

Culliton, B.J., *Science*, 185, 600-601 (1974). "The Destroying Angel: A Story of a Search for an Antidote."

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