

Ectoine

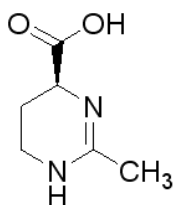
Catalog Number **E2271**

Store at Room Temperature

CAS RN 96702-03-3

Synonyms: Thp(B); 1,4,5,6-Tetrahydro-2-methyl-4-pyrimidine carboxylic acid; (S)-2-Methyl-1,4,5,6-tetrahydropyrimidine-4-carboxylic acid

Product Description



Molecular formula: C₆H₁₀N₂O₂

Molecular weight: 142.16

Ectoine is a cyclic tetrahydropyrimidine organic osmolyte, which was discovered in the halophilic bacterium *Ectothiorhodospira halochloris*.¹ It is the most abundant solute produced by aerobic heterotrophic eubacteria and has been extensively characterized as an osmoprotectant and stabilizer for cells and biomolecules.

Ectoine is considered a member of the small molecule chaperones family (SMCs).² SMCs accumulate to high intracellular concentrations, preventing the misfolding/denaturation of proteins and other labile macromolecules.³ Ectoine preserves enzymes and whole cells against harmful conditions such as freezing, drying, or heating. This molecule, among other compatible solutes, possesses the ability to conserve the proteolytic activity of trypsin and chymotrypsin.² It has been shown to induce heat shock proteins and downregulate proinflammatory signals in human keratinocytes.³ It is not toxic to the cellular environment, even at concentrations as high as 100 mM.⁴

Ectoine strongly inhibits the Aβ₄₂ amyloid formation *in vitro*, reducing the toxicity to human neuroblastoma cells.⁴ Aβ₄₂ was found to be the most predominant proteolytic fragment found in amyloid plaques, thus, ectoine may act as a potential inhibitor associated with neurodegenerative diseases.⁴

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions

Ectoine is soluble in methanol (0.3 M) and in water (4 M).

Storage/Stability

Store the product desiccated at room temperature. Under these conditions the product is stable for at least 3 years.

References

- Galinski, E.A., *et al.*, 1,4,5,6-Tetrahydro-2-methyl-4-pyrimidinecarboxylic acid. A novel cyclic amino acid from halophilic phototrophic bacteria of the genus *Ectothiorhodospira*. *Eur. J. Biochem.*, **149**, 135 - 139 (1985).
- Kanapathipillai, M. *et al.*, Ectoine and hydroxyectoine inhibit aggregation and neurotoxicity of Alzheimer's β-amyloid. *FEBS Letters*, **579**, 4775-4780 (2005).
- Kolp, S. *et al.*, Compatible solutes as protectants for zymogens against proteolysis. *Biochim. Biophys. Acta*, **1764**, 1234-1242 (2006).
- Buommino, E. *et al.*, Ectoine from halophilic microorganisms induces the expression of hsp70 and hsp70B' in human keratinocytes modulating the proinflammatory response. *Cell stress & chap.*, **10**, 197-203 (2005).

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