

Product Information

Spermine

Product Number **S3256**

Store at 2-8 °C

Product Description

Molecular Formula: C₁₀H₂₆N₄

Molecular Weight: 202.34

CAS Number: 71-44-3

Melting Point: 55 - 60 °C¹

28 - 30 °C²

Synonym: N,N'-bis(3-aminopropyl)-1,4-butanediamine

Spermine is a naturally occurring polyamine that occurs in all eukaryotes, but is rare in prokaryotes. It is essential for cell growth in both normal and neoplastic tissue.¹ Spermine is formed through the addition of a aminopropyl group to spermidine by spermine synthase. Spermine is strongly basic in character, and in aqueous solution at physiological pH, all of its amino groups will be positively charged.³ A review of the role of spermine and other polyamines in affecting RNA structure and protein function has been published.⁴

Spermine is commonly used in molecular biology and biochemistry research. The polycationic character of spermine in solution allows for its use in the precipitation of DNA of >100 base pairs in length from low salt aqueous buffers, and for the isolation of DNA from pulse field gels.^{5,6,7} Spermine has also been utilized in chromosome isolation and in the aggregation of chromatin.^{8,9} It may be used as a building block for the preparation of gene transfer agents.^{10,11} The complexation of spermine with DNA to form particles with diameter <100 nm has been studied.¹² Spermine has been used in the crystallization of DNA.^{13,14}

It has been reported that spermine interacts with the glycine binding site associated with the N-methyl-D-aspartate receptor complex.¹⁵ Spermine has been shown to inhibit the conversion of L-arginine to L-citrulline by neuronal nitric oxide synthase in cytosolic preparations of rat cerebellum and cultured cerebellar granule neurons.¹⁶ In acute hippocampal slices, 1 mM spermine exerts a neuroprotective effect by blocking the NMDA receptor and voltage-activated Ca²⁺ channels.¹⁷ The effect of spermine on MK-801 binding to recombinant N-methyl-D-aspartate receptors has been investigated.¹⁸

Proteins and protein complexes have been crystallized using spermine.^{19,20} Other applications of spermine include its use as a matrix in MALDI-MS for analysis of glycoconjugates and oligonucleotides.^{21,22}

Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions

This product is soluble in water (50 mg/ml), yielding a clear, colorless to light yellow solution.

Storage/Stability

Store at 2-8 °C. Solutions of spermine free base are readily oxidized. Solutions are most stable if prepared in degassed water and stored in frozen aliquots, under argon or nitrogen gas.

References

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