

Product Information

Spermine tetrahydrochloride for molecular biology

Catalog Number **S1141**
Store at Room Temperature

CAS RN: 306-67-2
71-44-3 (free base)

Molecular Formula: C₁₀H₂₆N₄ • 4HCl
Molecular Weight: 348.18

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

Melting Point: 312 - 314.5 °C¹

Product Description

This product is suitable for DNA precipitation from low salt aqueous buffers. It has been tested for the absence of proteases and nucleases.

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 an 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.² A review of the role of spermine and other polyamines in affecting RNA structure and protein function has been published.³

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.^{4,5,6} Spermine has also been utilized in chromosome isolation and in the aggregation of chromatin.^{7,8} It may be used as a building block for the preparation of gene transfer agents.^{9,10} The complexation of spermine with DNA to form particles with diameter <100 nm has been studied.¹¹ Spermine has been used in the crystallization of DNA.^{12,13}

It has been reported that spermine interacts with the glycine binding site associated with the N-methyl-D-aspartate receptor complex.¹⁴ 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.¹⁵ In acute hippocampal slices, 1 mM spermine exerts a neuroprotective effect by blocking the NMDA receptor and voltage-activated Ca²⁺ channels.¹⁶ The effect of spermine on MK-801 binding to recombinant N-methyl-D-aspartate receptors has been investigated.¹⁷

Proteins and protein complexes have been crystallized using spermine.^{18,19} Other applications of spermine include its use as a matrix in MALDI-MS for analysis of glycoconjugates and oligonucleotides.^{20,21}

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

This product is soluble in water (100 mg/ml), yielding a clear, colorless to light yellow solution.

Storage/Stability

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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