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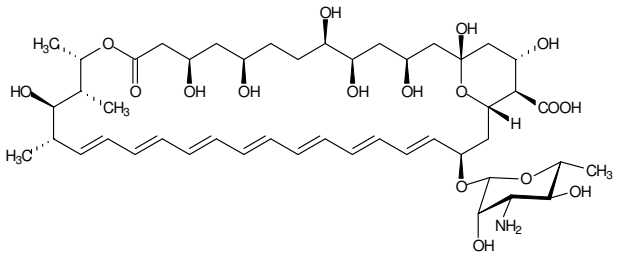
10042 Amphotericin B from Streptomyces ssp.

CAS number: 1397-89-3

Product Description



Appearance: Powder ranging in color from yellow to orange, with purity specified as approximately 80% by HPLC.[1]
Molecular formula: $C_{47}H_{73}NO_{17}$
Molecular weight: 924.09 g/mol
λ_{max}: 406, 382, 363, 345 nm.
Amphotericin B does not melt sharply but decomposes gradually above 170°C.[2]
Pk_1: 5.5[3]
Pk_2: 10.0.[3]

Amphotericin B is a mixture of antifungal polyenes produced by certain strains of Streptomycetes nodosus.[2] The name of the drug is derived from the amphoteric behavior of the drug, because of a carboxyl group on the main ring and a primary amino group on the mycosamine ring.[6] It appears to act mainly by interfering with the permeability of cell membrane of sensitive fungi. It induces the loss of low molecular weight substances from cells, possibly by forming channels as a result of complexing membrane sterols. Minimum inhibitory concentrations range from 0.03 to 1 µg/ml for a variety of organisms including (but not limited to) strains of Candida, Rhizopus, Asperigillus, Coccidioides. It is inactive against bacteria, rickettsia and viruses. It has been administered by intravenous infusion as a colloidal complex or in liposomes.[4,7]

Comprehensive analytical data can be found in a variety of references.[3,8,9]

Preparation Instructions
A mixture of dimethylformamide: 1 M HCl (3:1) may be used, giving a clear yellow to brown solution at 50 mg/ml.[1] Amphotericin B is essentially insoluble in water at pH 6 to 7, but soluble at pH 2 or 11 at about 0.1 mg/ml. It is soluble in DMF at 2-4 mg/ml, in DMF + HCl at 60-80 mg/ml and in DMSO at 30-40 mg/ml.[2] Sodium deoxycholate has been used to prepare a colloidal suspension in water.[4]

For cell culture use, a stock solution of 2.5 mg/ml in DMSO can be prepared. Of this stock, 1 ml of the stock added to a liter of culture medium.[5] It is advised to check reference literature for possible incompatibilities in solution; when a deoxycholate colloidal suspension is mixed with 0.9% NaCl or other electrolyte solution, amphotericin will precipitate.[4] Sterilization should be by γ-irradiation or filtration through teflon membrane filters; Amphotericin B should not be autoclaved.

Solutions in DMSO or in water (pH 4-10) are stable at 2-8 C for weeks, or much longer if frozen and stored in the absence of air and light.[2,5]

Storage/Stability
When the compound is stored at 2-8°C and protected from light, purity (HPLC) should be essentially unchanged for at least three years.

References

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4. Martindale: The Extra Pharmacopoeia, 30th ed. (Pharmaceutical Press, 1993), 315-318.
5. Sigma Cell Culture Department.
6. The Pharmacological Basis of Therapeutics, 8th ed., Goodman and Gilman, Eds. (Pergamon Press, 1990), p. 1165.
7. Data for Biochemical Research, 3rd ed. (Oxford Press, 1989), 296-297.
8. Analytical Profiles of Drug Substances, 6, K. Florey, Ed. (Academic Press, 1977), pp.1-42.
9. Advances in Lipid Research, 14, 127 (1976).