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ProductInformation

STREPTOZOTOCIN MIXED ANOMERS
Sigma No. S0130

beta form   open-chain form   alpha form
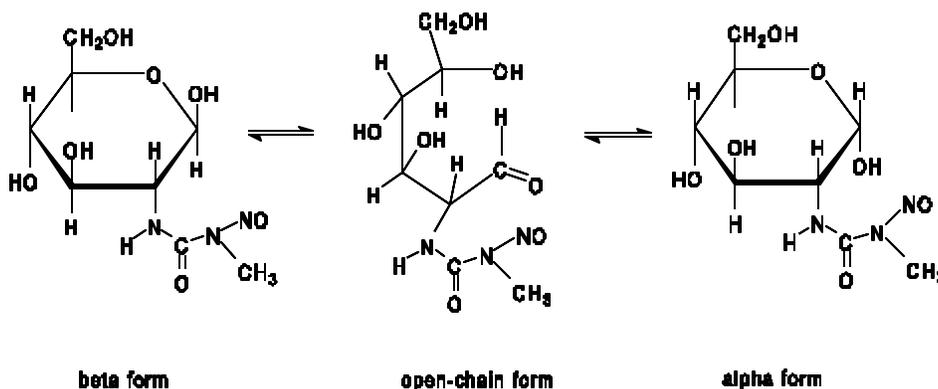
CAS NUMBER: 18883-66-4
SYNONYM: Streptozocin

PHYSICAL DESCRIPTION:

Appearance: White to yellow powder
Molecular formula: $C_8H_{15}N_3O_7$
Molecular weight: 265.2
Melting point: Decomposes at 115EC if anhydrous.[1] Although Sigma does not determine a value, water content should be # 3%.[2]
E^{mM}(228nm) = 6.36 (ethanol)
Optical rotation: +39E(equilibrium of α, ß anomers in H_2O, 25EC)[1]

Please consult the Material Safety Data Sheet about the properties of this material as a potential carcinogen, mutagen and toxic chemical.

STORAGE / STABILITY AS SUPPLIED:

If the product is stored frozen and protected from moisture and air, it is stable for approximately 2 years. (After 12 year, a sample changed from 94.9% α-anomer to 94.7%, as measured by HPLC.)[2]

SOLUBILITY / SOLUTION STABILITY:

Streptozotocin is soluble in water, the lower alcohols and in ketones. This product dissolves in water at 50 mg/mL to give a light yellow solution, from clear to slightly hazy. Aqueous solutions rapidly undergo mutarotation to an equilibrium mixture of alpha- and beta-anomers.

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SOLUBILITY / SOLUTION STABILITY:

Maximum solution stability is at pH 4, with stability decreasing rapidly at higher or lower pH. Freshly prepared solutions are clear and have a light straw color. On standing, they take on a yellow to brown color and effervesce, indicating decomposition.[2,3] Solutions should be prepared just before use, since the product is unstable.

GENERAL REMARKS:

This product is an antineoplastic antibiotic produced by the growth of a Streptomyces achromogenes variant or by synthesis. It may affect glucose metabolism. It is used mainly in the treatment of pancreatic (islet-cell) tumors.[4] Burcelin et al. used intravenous injection of streptozotocin in rats at a dose of 65 mg/kg body weight to induce diabetes (using cold 0.1 M citrate buffer pH 4.5).[5] In rats and dogs, diabetes was induced using intravenous dosage of 50 mg/kg (using 1-2% w/v solutions in saline buffered with citrate dextrose solution at pH 5.0).[3] It has been used for the treatment of malignant insulinoma; very precise assays for this drug have been developed.[6]

Streptozotocin does not cross the blood-brain barrier, but its metabolites are found in cerebral spinal fluid.[4] Its biological half-life in cell culture medium was shown to be approximately 19 minutes.[7]

The antileukemic effects of streptozotocin and its analogs have been reported.[8] Streptozotocin has been shown to be a potent methylating agent that reacts with DNA *in vitro* to form methylated purines.[9] A review article addressed a number of antineoplastic antibiotics, including streptozotocin.[10] A useful handbook offered several references for use in animal studies.[11]

REFERENCES:

1. *Merck Index*, 12th ed., #8991 (1996).
2. Sigma quality control or supplier information.
3. Rakieten, N. et al., *Cancer Chemother. Reports*, No. 29, 91-98 (1963).
4. *Martindale: The Extra Pharmacopoeia*, 29th ed., (Pharmaceutical Press, 1989), p. 649.
5. Burcelin, R. et al., *Biochem. J.*, 291, 109-113 (1993).
6. Oles, P.J., *J. Pharmaceutical Sci.*, 67 (9), 1300 (1978).
7. Jensen, E.M. et al., *J. Natl. Cancer Inst.*, 59, 941-944 (1977).
8. Bhuyan, B.K. et al., *Cancer Chemother. Reports,* Part 1, 45 (6), 709-720 (1972).
9. Bennett, R.A. and Pegg, A.E., *Cancer Research,* 41, 2756-2790 (1981).
10. Cheng, C.C. and K.-Y. Zee-Cheng, *J. Pharmaceutical Sci.*, 61, 485-501 (1972).
11. *Drug Dosage in Laboratory Animals: A Handbook*, 3rd ed., R.E. Borchard et al., eds. (CRC Press, 1992).