STREPTOZOTOCIN MIXED ANOMERS
Sigma No. S0130

CAS NUMBER: 18883-66-4
SYNONYM: Streptozocin

PHYSICAL DESCRIPTION:

Appearance: White to yellow powder
Molecular formula: C₈H₁₅N₃O₇
Molecular weight: 265.2
Melting point: Decomposes at 115°C if anhydrous.¹ Although Sigma does not determine a value, water content should be ≤ 3%.²
E₅₀₀(228nm) = 6.36 (ethanol)
Optical rotation: +39°(equilibrium of α, β anomers in H₂O, 25°C)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 1 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. 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. 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). 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). It has been used for the treatment of malignant insulinoma; very precise assays for this drug have been developed.

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

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

REFERENCES:

2. Sigma quality control or supplier information.

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