Actinomycin D
from Streptomyces sp.

Product Numbers A 1410, A 4262, A 9415, A 5156

Storage Temperature 2-8 °C

CAS NUMBER: 50-76-0

Synonyms: Dactinomycin; Actinomycin IV; Actinomycin C₁

Molecular formula: C₆₂H₈₆N₁₂O₁₆
Molecular weight: 1255.42

Melting point: decomposes at 241.5-243 °C

E₁% (244nm) = 281 (methanol)
E₁% (441nm) = 206 (methanol)
E₉₅ (240 nm) = 34.1 (methanol)
E₉₅ (443 nm) = 24.4 (methanol)

[α]D: −315° (c = 0.25% in methanol)

Product Description
Actinomycin D is an antineoplastic antibiotic that inhibits cell proliferation. It is a cytotoxic inducer of apoptosis against tumor cells. The compound inhibits the proliferation of cells in a nonspecific way by forming a stable complex with double-stranded DNA (via deoxyguanosine residues), thus inhibiting DNA-primed RNA synthesis. It also causes single-strand breaks in DNA.

Actinomycin D has been shown to be an inhibitor of the minus-strand transfer step in reverse transcription and therefore is used in studying and suppressing HIV-replication. It has also been shown to suppress programmed cell death of PC12 cells induced by etoposide, an inhibitor of topoisomerase II.

It is used in cell culture as a selection agent. Actinomycin D binding to yeast in ribosomal RNA has been studied. The sensitivity of various strains of E.coli to Actinomycin D and the mechanism of binding has been studied. The structure was determined by atomic structure and amino acid sequence.

Actinomycin D is an antibiotic used for its antineoplastic properties in the treatment of various malignant neoplasms including Wilm’s tumour, and the sarcomas. Adverse effects include bone marrow depression and gastrointestinal toxicity; it is extremely irritating and extravasation produces severe tissue damage.

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
Actinomycin D is sold as red shiny crystals and in solution it is a clear liquid. Sigma tests solubility of A1410, A4262, A9415 in acetonitrile or acetone at 10 mg/mL. It is soluble in DMSO at a minimum of 1 mg/mL. Several references claim slight solubility in water (about 0.5 mg/mL).

Storage/Stability
The powder is hygroscopic and sensitive to light. When stored sealed and protected from light and moisture, at 2-8 °C, Actinomycin D remains unchanged (as tested by HPLC) for at least 15 months.

Dilute solutions of Actinomycin D are very sensitive to light. This product tends to adsorb to plastic and glass on standing in solution. For these reasons, unused dilute solutions should be discarded and not stored for further use. However, frozen aliquots of a concentrated stock solution are expected to be stable for at least a month at −20 °C.
**A1410 Actinomycin D 98%**
Lyophilized powder with a purity of 98% (HPLC)

**A4262 Actinomycin D 95%**
Lyophilized powder with a purity of 95% (HPLC)

**A9415 Actinomycin D, cell culture tested**
Lyophilized powder with purity of 95% (HPLC). For cell culture applications, actinomycin D is used as a selection agent and is used in banding techniques to differentiate between different regions of chromosomes. Suggested working concentrations is 1 µg/mL.

**A5156 Actinomycin D-Mannitol**
Lyophilized powder containing 1 mg of actinomycin D (98% purity) and 49 mg of Mannitol. It is soluble in water at 20 mg/mL.

**References**