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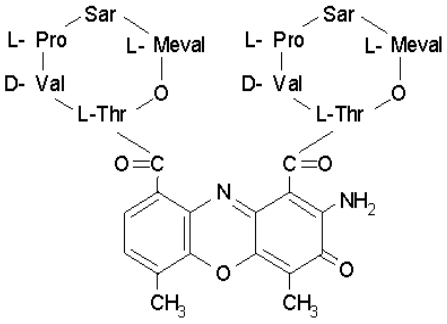
ProductInformation

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 C_1



Molecular formula: $C_{62}H_{86}N_{12}O_{16}$
Molecular weight: 1255.42

Melting point: decomposes at 241.5-243 °C [1]
$E_{1\%}$ (244nm) = 281 (methanol) [1]
$E_{1\%}$ (441nm) = 206 (methanol) [1]
E_{mM} (240 nm) = 34.1 (methanol) [2]
E_{mM} (443 nm) = 24.4 (methanol) [2]
$[\alpha]^{28}_{D}$: –315° (c = 0.25% in methanol) [1]

Product Description
Actinomycin D is an antineoplastic antibiotic that inhibits cell proliferation. It is a cytotoxic inducer of apoptosis against tumor cells.[3] 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.[4,5,6]

Actinomycin D has been shown to be an inhibitor of the minus-strand transfer step in reverse transcription [7,8] 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. [9]

It is used in cell culture as a selection agent. Actinomycin D binding to yeast in ribosomal RNA has been studied.[10] The sensitivity of various strains of E.coli to Actinomycin D and the mechanism of binding has been studied.[11,12] 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. [4]

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 [4,5,13] 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.[1] This product tends to adsorb to plastic and glass on standing in solution.[13] 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

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