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Product Information

4,4'-Diisothiocyanatostilbene-2,2'-disulfonic acid disodium salt

Product Number **D 3514**

Storage Temperature 2-8 °C

Product Description

Molecular Formula: $C_{16}H_8N_2Na_2O_6S_4$

Molecular Weight: 498.5

CAS Number: 67483-13-0

λ_{max} : 220 nm, 265 nm¹

Extinction coefficient: $E^M = 3$ (280 nm)¹

$E^{mM} = 54$ (342 nm, water)

Fluorescent properties

Excitation wavelength: 342 nm

Emission wavelength: 418 nm

Synonym: DIDS

This product binds covalently (irreversibly) to the outer surface of human erythrocyte membrane protein, functioning as an anion transport inhibitor. It also can be used to cross-link membrane anion transport sites.¹ DIDS does not block an adenosine 3',5'-cyclic monophosphate (cAMP)-regulated chloride conductance in pancreatic duct cells.²

Extracellular ATP activates a P2-type purinergic receptor (purinoceptor) in rat parotid acinar cells which increases the intracellular free calcium ion concentration via transport through an ATP-sensitive cation channel.³ This ATP-stimulated ⁴⁵Ca ion intake was blocked by DIDS, but not by a stilbene disulfonate compound lacking isothiocyanate groups. The IC₅₀ value (using DIDS) is approximately 35 μ M.⁴

Reactive Blue 2, a noncovalent purinergic antagonist, blocks the covalent binding of DIDS to the plasma membrane in these rat cells, thus suggesting that the isothiocyanate compounds interact with the ATP binding site of the P2 purinoceptor and that the isothiocyanate groups are important in blocking the nucleotides to this purinoceptor.⁴

Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions

This product is soluble in 0.1 M KHCO₃ (50 mg/ml) yielding a hazy, yellow-green solution. This may require heat for complete solubilization. DIDS is also soluble in DMSO.

Storage/Stability

Isothiocyanates are unstable in water and should not be stored in aqueous solutions.

References

1. Lepke, S., et al., A study of the relationship between inhibition of anion exchange and binding to the red blood cell membrane of 4,4'-diisothiocyanato stilbene-2,2'-disulfonic acid (DIDS) and its dihydro derivative (H2DIDS). *J. Membrane Biol.*, **29**, 147-177 (1976).
2. Gray, M.A., et al., cAMP-regulated whole cell chloride currents in pancreatic duct cells. *Am. J. Physiol.*, **264**, C591-602 (1993).
3. Soltoff, S. P., et al., ATP activates a cation-permeable pathway in rat parotid acinar cells. *Am. J. Physiol.*, **262**, C934-940 (1992).
4. Soltoff, S.P., et al., Blockade of ATP binding site of P2 purinoceptors in rat parotid acinar cells by isothiocyanate compounds. *Biochem. Pharmacol.*, **45**, 1936-1940 (1993).

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