

Product Data Sheet

Product Name: Probenecid Sodium

Cat. No.: GB30085

Chemical Properties

Cas. No. 23795-03-1

Chemical Name 4-[(Dipropylamino)sulfonyl]benzoic acid sodium salt

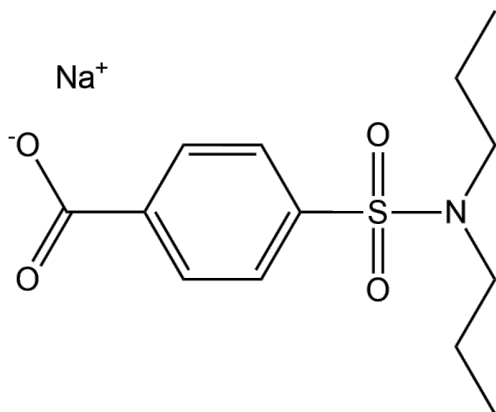
Formula $C_{13}H_{18}NNaO_4S$ M.Wt 307.341

Solubility Storage RT

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution: ship with blue ice. All other available size: ship with RT, or blue ice upon request.

Structure



Protocol

The following outlines the procedural steps for cell-based experiments utilizing probenecid as an anion transporter inhibitor to prevent the leakage of fluorescent probes; this protocol is provided for reference purposes only.

Specific details may be adjusted by consulting relevant literature or based on the specific requirements of the experiment.

1. Preparation of Stock Solution

Dissolve one vial (77 mg) of probenecid sodium in 10 mL of HHBS (1X Hank's solution supplemented

Caution: Product has not been fully validated for medical applications. For research use only.

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with 20 mM HEPES buffer, pH 7.0), ensuring complete dissolution to obtain a 25 mM stock solution. Aliquot the solution into single-use portions and store them at -20°C, protected from light; avoid repeated freeze-thaw cycles.

2. Experimental Procedure

2.1 Add 1 mL of the 25 mM probenecid stock solution to 9 mL of HHBS (1X Hank's solution with 20 mM HEPES buffer, pH 7.0) containing 0.02%–0.04% Pluronic F-127. Mix thoroughly to obtain a 2.5 mM probenecid working solution. 2.2 Add the calcium-sensitive fluorescent probe (dissolved in DMSO)—such as Fura-2 AM, Fluo-4 AM, or Fluo-8 AM—to the 2.5 mM probenecid sodium working solution, and mix well. At this stage, the staining working solution remains stable at room temperature for at least 2 hours.

Background

Probenecid Sodium, a benzoic acid derivative, is a classic inhibitor of organic anion transporters (OATs) ($K_i = 6.3, 9.0, \text{ and } 8.4 \text{ }\mu\text{M}$ for OAT1, OAT3, and OAT6, respectively; $IC_{50} = 0.67 \text{ }\mu\text{M}$ for OAT2); it exhibits very weak inhibitory activity against organic cation transporters OCT1 and OCT2 ($IC_{50} = 1.6 \text{ and } 1.7 \text{ mM}$). Organic anion transporters are located on the cell membrane and frequently efflux fluorescent probes from the cell, resulting in poor intracellular retention of the probes—a phenomenon that typically leads to high background signals in staining experiments. The use of probenecid inhibits transporter activity, thereby reducing the leakage of intracellular fluorescent probes; this is a commonly employed method for lowering fluorescent background levels in calcium assays. Probenecid acts as an agonist for the transient receptor potential channel protein TRPV2 ($EC_{50} = 31.9 \text{ }\mu\text{M}$) and can induce nociceptive behaviors in mice under inflammatory conditions. Furthermore, probenecid is an inhibitor of the multidrug resistance-associated protein 1 (MRP1); it blocks the MRP1 active site, thereby preventing the efflux of other active compounds and allowing these compounds to be retained within the cytoplasm, which enhances their therapeutic effects. Probenecid also functions as an inhibitor of the gap junction protein Pannexin-1.

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