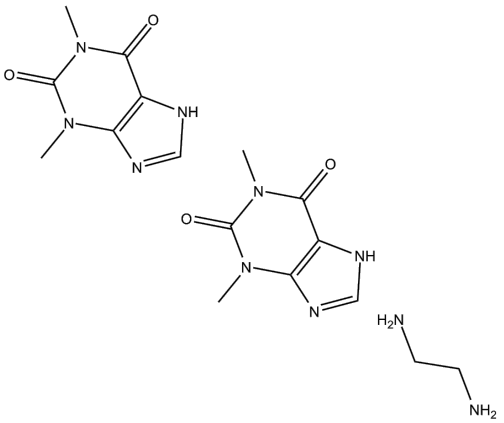
Product Data Sheet

Product Name: Aminophylline
Cat. No.: GC12764

Chemical Properties

Cas. No.	317-34-0		
Chemical Name	1,3-dimethyl-7H-purine-2,6-dione;ethane-1,2-diamine		
SMILES	CN1C2=C(C(=O)N(C1=O)C)NC=N2.CN1C2=C(C(=O)N(C1=O)C)NC=N2.C(CN)N		
Formula	$C_{16}H_{24}N_{10}O_4$	M.Wt	420.43
Solubility	≥ 14.45 mg/mL in Water with gentle warming, ≥ 13.48 mg/mL in DMSO with ultrasonic and warming, ≥ 16.933 mg/mL in EtOH with ultrasonic and warming	Storage	4°C, protect from light
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



Background

Aminophylline is a competitive nonselective phosphodiesterase inhibitor that is used to treat airway obstruction from asthma or COPD.Target: PhosphodiesteraseAminophylline is a compound of the

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bronchodilator theophylline with ethylenediamine in 2:1 ratio. The ethylenediamine improves solubility, and the aminophylline is usually found as a dihydrate. Aminophylline is less potent and shorter-acting than theophylline. Its most common use is in the treatment of airway obstruction from asthma or COPD. It is used off-label as a reversal agent during nuclear stress testing. Aminophylline is a nonselective adenosine receptor antagonist and phosphodiesterase inhibitor.Adenosine is an endogenous extracellular messenger that can regulate myocardial oxygen needs. It acts through cellular surface receptors which effect intracellular signalling pathways to increase coronary artery blood flow, slow heart rate, block atrioventricular node conduction, suppress cardiac automaticity, and decrease β-adrenergic effects on contractility. Adenosine also antagonizes chronotropic and ionotropic effects of circulating catecholamines. Overall, adenosine decreases the heart's rate and force of contraction, which increases blood supply to the cardiac muscle. Given specific circumstances this mechanism (which is intended to protect the heart) may cause atropine-resistant refractory bradyasystole. Adenosine's effects are concentration-dependent. Adenosine's receptors are competitively antagonized by methylxanthines such as aminophylline. Aminophylline competitively antagonizes the cardiac actions of adenosine at the cell surface receptors. Thus, it increases heart rate and contractility.

References:
[1]. Essayan DM. Cyclic nucleotide phosphodiesterases. J Allergy Clin Immunol. 2001 Nov;108(5):671-80.
[2]. Daly JW, et al. Adenosine receptors: development of selective agonists and antagonists. Prog Clin Biol Res. 1987;230:41-63.

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