

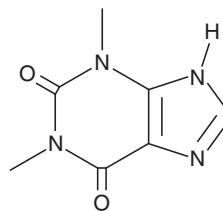
PRODUCT INFORMATION



Theophylline

Item No. 23760

CAS Registry No.: 58-55-9
Formal Name: 3,9-dihydro-1,3-dimethyl-1H-purine-2,6-dione
Synonyms: 1,3-Dimethylxanthine, NSC 2066
MF: C₇H₈N₄O₂
FW: 180.2
Purity: ≥98%
Supplied as: A solid
Storage: 4°C
Stability: ≥4 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Laboratory Procedures

Theophylline is supplied as a solid. A stock solution may be made by dissolving the theophylline in the solvent of choice, which should be purged with an inert gas. Theophylline is slightly soluble in organic solvents such as DMSO and methanol.

Description

Theophylline is a methylxanthine alkaloid that is a competitive inhibitor of phosphodiesterase (PDE; $K_i = 100 \mu\text{M}$).¹ It is also a non-selective antagonist of adenosine A receptors ($K_i = 14 \mu\text{M}$ for A₁ and A₂).² Theophylline induces relaxation of feline bronchiole smooth muscle precontracted with acetylcholine ($\text{EC}_{40} = 117 \mu\text{M}$; $\text{EC}_{80} = 208 \mu\text{M}$).³ Formulations containing theophylline have been used in the treatment of asthma and chronic obstructive pulmonary disease (COPD).

References

1. Butcher, R.W. and Sutherland, E.W. Adenosine 3',5'-phosphate in biological materials. I. Purification and properties of cyclic 3',5'-nucleotide phosphodiesterase and use of this enzyme to characterize adenosine 3',5'-phosphate in human urine. *J. Biol. Chem.* **237(4)**, 1244-1250 (1962).
2. Daly, J.W., Padgett, W., Shamim, M.T., *et al.* 1,3-Dialkyl-8-(*p*-sulfophenyl)xanthines: Potent water-soluble antagonists for A₁- and A₂-adenosine receptors. *J. Med. Chem.* **28(4)**, 487-492 (1985).
3. Leemans, J., Kirschvink, N., and Gustin, P. A comparison of *in vitro* relaxant responses to ipratropium bromide, β -adrenoceptor agonists and theophylline in feline bronchial smooth muscle. *Vet. J.* **193(1)**, 228-233 (2012).

WARNING

THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA

This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the [complete](#) Safety Data Sheet, which has been sent via email to your institution.

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