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Product Information

CAFFEINE (ANHYDROUS)

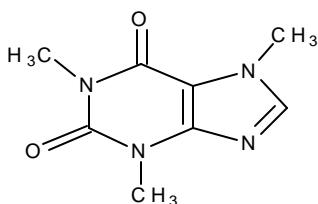
Product Number **C0750**

Storage Temperature RT

CAS #: 58-08-2

Synonyms: 1,3,7-trimethylxanthine;

Methyltheobromine; 3,7-dihydro-1,3,7-trimethyl-1H-purine-2,6-dione



Product Description

Appearance: white powder

Molecular Formula: $C_8H_{10}N_4O_2$

Molecular Weight: 194.2

Melting point: 238°C¹

Sublimes above 178°C at atmospheric pressure, but will sublime at 160-165°C at 1 mm Hg

Extensive analytical data have been published.²⁻⁴

$pK_a = 14.0$ at 25°C⁴

$E^{mM}(272\text{ nm}) = 9.3-9.4$ (0.1 M HCl)⁵

The product is synthetic, prepared according to the Taub synthesis method.⁶

A popular central nervous system (CNS) stimulant. Caffeine is a well-known drug commonly used as a mild stimulant, found in dietary sources such as coffee, tea, and cocoa. It is believed to act through adenosine receptors and monoamine neurotransmitters.⁷ It is an adenosine receptor antagonist and adenosine 3',5'-cyclic monophosphate (cAMP) phosphodiesterase inhibitor.^{8,9} Thus, levels of cAMP increase in cells following treatment with caffeine.¹⁰ It has been reported to affect cellular calcium levels, releasing calcium from intracellular stores.¹¹ It overrides the cell cycle effects of various chemicals such as protease inhibitors, thereby preventing apoptosis¹²⁻¹⁴; and it has been shown to inhibit cellular DNA repair mechanisms.^{15,16}

Precautions and Disclaimer

Keep tightly sealed.

Preparation Instructions

The solubility in ethanol is 1 g in 66 ml (approx. 15 mg/ml).¹ Caffeine is also soluble in water (approx. 16 mg/ml at room temperature, 200 mg/ml at 80°C, or 666 mg/ml in boiling water. Solubility in water is increased by adding dilute acid (e.g. HCl or citric acid).^{1,4} Caffeine is decomposed by strong bases.⁴

Storage/Stability

Stored at room temperature this product has a shelf-life of 4 years. Solutions in organic solvents (e.g. methanol or ethanol) are stable at 2-8°C for several years.⁵

References

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