

14.1.3.1. Theophylline

Theophylline is a natural alkaloid derivative of xanthine. It is isolated from the plants, *Camellia sinensis* and *Coffea arabica*.

Molecular Formula: $C_7H_8N_4O_2$

IUPAC Nomenclature: 1,3-dimethyl-7H-purine-2,6-dione

Properties: Theophylline occurs as a white coloured crystalline powder with a bitter taste and no odour. It is slightly soluble in water, ethanol, ether, chloroform, and alcohol; and soluble in hot water and alkaline solutions.

Uses: Theophylline is used as bronchodilator in acute and chronic asthma, chronic obstructive lung diseases, and acute bronchospasm. It also has diuretic action. It is also used as a respiratory stimulant in neonatal apnoea. It is a cardiac stimulant and is used in left ventricular failure.

Stability and Storage Conditions: Theophylline gets affected by light, thus should be stored in well-filled, tightly-closed, light-resistant containers.

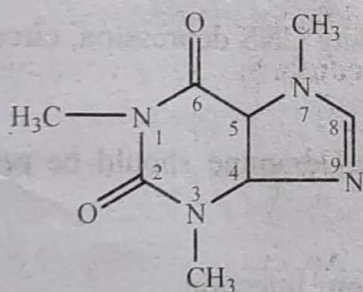
Types of Pharmaceutical Formulations: Capsule, syrups, tablets, intravenous injections, and suppositories.

Brand Names: Broncordil, Delin, Deriphyllin, and Asthmagen.

14.1.3.2. Caffeine

Caffeine is a methylxanthine which naturally occurs in some beverages and is also used as a pharmacological agent.

Chemical Structure



Caffeine

Molecular Formula: $C_8H_{10}N_4O_2$

IUPAC Nomenclature: 1,3,7-trimethylpurine-2,6-dione

Properties: Caffeine occurs as white prismatic crystals which are hexagonal in shape. It has a bitter taste and is odourless. It is soluble in water, alcohol, acetone, pyridine, and pyrrole; and slightly soluble in petroleum ether.

Uses: Caffeine is used for managing fatigue, orthostatic hypotension, and for treating apnoea of prematurity in infants. It acts as a CNS stimulant, increases alertness, and produces agitation. It also relaxes smooth muscles, stimulates diuresis, stimulates cardiac muscle, and is also useful in some types of headache.

Storage Conditions: Caffeine should be stored at room temperature (15-30°C) in well-closed containers.

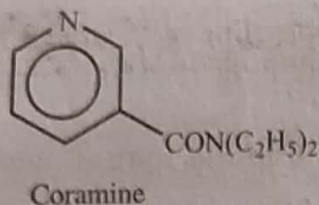
Types of Pharmaceutical Formulations: Solution, injections, and tablets.

Brand Names: Cafirate, Primicaf, and Zeecold.

14.1.3.3. Coramine

Coramine (or nikethamide) stimulates the CNS. Earlier it was used for treating barbiturate overdose. But now it is of no value for such purposes and may be harmful.

Chemical Structure



Molecular Formula: $C_{10}H_{14}N_2O$

IUPAC Nomenclature: N,N-diethylpyridine-3-carboxamide

Properties: Coramine occurs as a crystalline solid or a clear light yellow coloured viscous liquid. It has a bitter taste followed by faint sensation of warmth. It is miscible with water, alcohol, and chloroform.

Uses: Coramine is used for overcoming CNS depression, circulatory failure, and respiratory depression.

Stability and Storage Conditions: Coramine should be refrigerated in well-closed light-resistant containers.

Type of Pharmaceutical Formulation: Injection.

Brand Names: Nikethamide.

14.1.3.4. Dextro-amphetamine

Dextroamphetamine stimulates the CNS and exerts its physiological effect.

Molecular Formula: $C_9H_{13}N$

IUPAC Nomenclature: (2S)-1-phenylpropan-2-amine

Properties: Dextroamphetamine occurs as a colourless liquid. It is slightly soluble in water; and soluble in ethanol and ether.

Uses: Dextroamphetamine is used for treating Attention Deficit Hyperactivity Disorder (ADHD). It is also used for treating narcolepsy and attention deficit disorders and hyperactivity in children.

Stability and Storage Conditions: Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Recommended storage temperature is -20°C . Dextroamphetamine should be kept in tightly-closed, dry, and well-ventilated areas at temperature -20°C . Once opened, the containers should be properly sealed and kept in upright position to prevent leakage.

Types of Pharmaceutical Formulations: Tablet, solution, and capsule.

Brand Names: Dexedrine, Dextrostat, Zenzedi, and ProCentra.