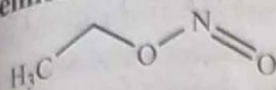


20.1.3.1. Ethylnitrite

Ethyl nitrite is a flavouring agent. It is an alkyl nitrite and may be prepared from ethanol.

Chemical Structure



Ethylnitrite

Molecular Formula: $C_2H_5NO_2$

IUPAC Nomenclature: Ethyl nitrite

Properties: Ethyl nitrite occurs as a clear, colourless to yellow liquid with a pleasant odour and a fruity taste. It is flammable in many vapour-air concentrations and has a flash point of $-31^\circ F$. It has lesser density than water and is also insoluble in it. It is miscible in ether and alcohol. Its vapours are narcotic at high concentrations and heavier than air. It creates toxic oxides of nitrogen while combustion.

Uses: Ethyl nitrite is used as a diaphoretic.

Stability and Storage Conditions: Ethyl nitrite on storage slowly decomposes to become acid and oxides of nitrogen form. It undergoes rapid decomposition in the presence of air, light, and moisture. It should be stored in tightly-closed containers away from light at a cool place.

Types of Pharmaceutical Formulations: Drops, globules, and granules.

Brand Names: Nitri Spiritus Dulcis and Witdulsies.

20.1.3.2. Glyceryl trinitrate

Glyceryl trinitrate (or nitroglycerine) is an organic nitrate exhibiting vasodilator activity. It causes smooth muscle relaxation by increasing cGMP concentration when it converts into nitric oxide in smooth muscle and activates guanylyl cyclase.

Molecular Formula: $C_3H_5N_3O_9$

IUPAC Nomenclature: 1,3-dinitrooxypropan-2-yl nitrate

Properties: Glyceryl trinitrate is a colourless to pale yellow coloured viscous liquid with a sweet and burning taste. It is slightly soluble in water; miscible with glacial acetic acid, nitrobenzene, and pyridine; and faintly soluble in petroleum ether, glycerol, and liquid petrolatum.

Uses: Glyceryl trinitrate is used as a prophylactic drug for treating angina and left ventricular failure. It is used for controlling hypertension during heart

surgery, and in congestive heart failure (unresponsiveness to general treatments). As a result of improved left ventricular function and reduced pulmonary arterial pressure, the drug can provide sudden relief of paroxysmal nocturnal dyspnoea.

Stability and Storage Conditions: Glyceryl trinitrate tablets are generally stable but should be dispensed in glass containers and protected from moisture, light, and temperature. Glyceryl trinitrate injections are colourless and stable in their intact ampoules. The solutions are not explosive and should be stored at room temperature but should not be frozen.

Types of Pharmaceutical Formulations: Capsules, ointment, injections, and tablets.

Brand Names: Nitrostat, Nitro-dur, Nitroquick, Nitro-bid, and Angistat.

20.1.3.3. Alpha Methyldopa

Alpha methyldopa is an α_2 -adrenergic agonist which has both central and peripheral nervous system effects. Its main use is as an antihypertensive agent.

Molecular Formula: $C_{10}H_{13}NO_4$

IUPAC Nomenclature: α -methyl-3-hydroxy-L-tyrosine

Properties: Alpha methyldopa is a colourless to white coloured crystalline powder with no odour and taste. It is soluble in isopropanol, ethanol and water; and insoluble in general organic solvents.

Uses: Alpha methyldopa is used for treating moderate to severe hypertension, such as those related with renal disease.

Stability and Storage Conditions: Alpha methyldopa remains stable in light and air. Methyldopa oral suspension should be stored in tightly-closed light-resistant containers below 26°C temperature, and protected from freezing. Methyldopa tablets should be stored in tightly-closed containers at less than 40°C temperature.

Types of Pharmaceutical Formulations: Tablet and suspension.

Brand Names: Aldopam, Alphadopa, and Dopagyt.

20.1.3.4. Guanethidine

Guanethidine is an antihypertensive agent which selectively inhibits the transmission in post-ganglionic adrenergic nerves.

Molecular Formula: $C_{10}H_{22}N_4$

IUPAC Nomenclature: 2-[2-(azocan-1-yl)ethyl]guanidine

Properties: Guanethidine occurs as a white to off-white coloured crystalline powder. It is very soluble in water; sparingly soluble in alcohol; and nearly insoluble in chloroform.

Uses: Guanethidine is used either alone or as an adjunct for treating moderate to severe hypertension and renal hypertension. Guanethidine may be used as an adjunct to anti-thyroid agents in treating hyperthyroidism and thyrotoxic crisis. Guanethidine is also used in eye drops for reducing intraocular pressure in glaucoma and for reducing lid retraction in thyroid disease.

Stability and Storage Conditions: Guanethidine should be stored away from heat in tightly-closed containers at room temperature.

Types of Pharmaceutical Formulations: Tablet and eye drops.

Brand Name: Ismelin.

20.1.3.5. Clofibrate

Clofibrate is a fibric acid derivative used for treating hyperlipoproteinemia type III and severe hypertriglyceridemia.

Molecular Formula: $C_{12}H_{15}ClO_3$.

IUPAC Nomenclature: Ethyl 2-(4-chlorophenoxy)-2-methylpropanoate.

Properties: Clofibrate is a colourless to pale yellow coloured liquid with a faint distinct odour and taste. It is insoluble in water, alcohol, and chloroform; and miscible with acetone and ether.

Uses: Clofibrate is used for primary dysbetalipoproteinemia (type III hyperlipidemia) which does not sufficiently respond to diet. This helps in controlling high cholesterol and high triglyceride levels.

Stability and Storage Conditions: Clofibrate gets affected by oxidation and gets easily hydrolysed. **Clofibrate liquid-filled capsules** should be stored in tightly-closed, light-resistant containers at below 40°C temperature (preferably at 15-30°C). The liquid filled capsules should not be frozen.

Types of Pharmaceutical Formulation: Capsule.

Brand Name: Atromid-S.

20.1.3.6. Quinidine

Quinidine is an optical isomer of quinine. It is extracted from the bark of cinchona tree and similar plant species. It suppresses the excitability of cardiac and skeletal muscles by blocking sodium and potassium currents through cellular membranes.

Molecular Formula: $C_{20}H_{24}N_2O_2$

IUPAC Nomenclature: (S)-[(2R,4S,5R)-5-ethenyl-1-azabicyclo[2.2.2]octan-2-yl]-(6-methoxyquinolin-4-yl)methanol.

Properties: Quinidine occurs as white coloured crystalline powder or crystals which are acquired from 2.5mol water of crystallisation. It is soluble in water and benzene; very soluble in methanol; and almost insoluble in petroleum ether.

Uses: Quinidine is used for treating persistent, life-threatening ventricular arrhythmias, like sustained ventricular tachycardia. It is taken via intravenous route for treating *Plasmodium falciparum* malaria.

Stability and Storage Conditions: Quinidine salts (e.g., quinidine gluconate, quinidine polygalacturonate, and quinidine sulphate) acquire a brownish tint when exposed to light, thus should be stored in tightly-closed, light-resistant containers. Quinidine solutions slowly become brown coloured upon exposure to light, thus should be stored at controlled room temperature.

Types of Pharmaceutical Formulations: Tablet and capsule.

Brand Names: Natcardin, Quinidex, Duraquin, and Cardioquin.