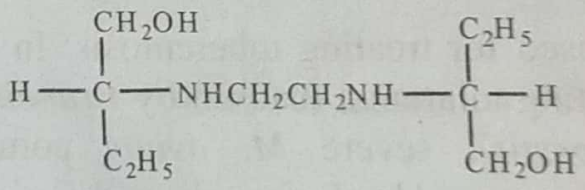
5.1.3.5. Ethambutol

Ethambutol (EMB or E) is a bacteriostatic anti-mycobacterial drug used fo treating tuberculosis. Generally, it is used along with isoniazid, rifampicin an pyrazinamide.

Chemical Structure



Ethambutol

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Molecular Formula: $C_{10}H_{24}N_2O_2$

IUPAC Nomenclature: (2S)-2-[2-[[(2S)-1-hydroxybutan-2-yl]amino] ethylamino] butan-1-ol

Properties: Ethambutol occurs as a white crystalline powder with no or a slight odour and a bitter taste.

It has a 1:1 solubility in water, 1:4 in alcohol, 1:850 in chloroform, and 1:9 in methyl alcohol; and is slightly soluble in ether.

Uses: Ethambutol along with an anti-tubercular drug is used for treating tuberculosis.

Stability and Storage Conditions: Ethambutol is sensitive to light and moisture, thus should be stored at room temperature (20-25°C).

Types of Pharmaceutical Formulations: Granules and tablets.

Brand Names: Acutate, Anticox-3, Bicox-E, and Cavibutol-H.

5.1.3.6. Thioacetazone

Thioacetazone is a thiosemicarbazone anti-mycobacterial. It acts against the isoniazid resistant strains of *Mycobacterium tuberculosis*.

Molecular Formula: $C_{10}H_{12}N_4OS$

IUPAC Nomenclature: N-[4-[(E)-(carbamothioylhydrazinylidene) methyl]phenyl]acetamide

Properties: Thioacetazone occurs as minute and pale yellow crystals with no odour and a bitter taste.

It is soluble in hot alcohol; sparingly soluble in cold alcohol; and insoluble in water, acetone, benzene, carbon tetrachloride, chloroform, carbon disulphide, and petroleum ether.

Uses: Thioacetazone is used for controlling, treating, preventing and improving tuberculosis.

Stability and Storage Conditions: Thioacetazone is sensitive to heat and light, thus should be stored away from heat and direct light at room temperatures.

It should not be frozen if not required by package insert.

Types of Pharmaceutical Formulations: Tablet.

Brand Names: INAT, Thiazina, and Thisozide.

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5.1.3.7. Ethionamide

Ethionamide is a nicotinamide derivative having antibacterial activity, and for treating tuberculosis.

Molecular Formula: $C_8H_{10}N_2S$

IUPAC Nomenclature: 2-ethylpyridine-4-carbothioamide

Properties: Ethionamide occurs as a yellow coloured, non-hygrosc crystalline compound with a sulphide odour. It is soluble in methanol ethanol; and insoluble in water and ether.

Uses: Ethionamide is used for treating tuberculosis resistant to isoniazid rifampicin.

Storage Conditions: Ethionamide should be stored in tight containers controlled room temperature (20-25°C).

Types of Pharmaceutical Formulation: Tablet.

Brand Names: Ethatyl, Ethide, Myobid, Trecator, and Trecator-SC.

5.1.3.8. Cycloserine

Cycloserine is a broad spectrum antibiotic which is used along with other an tubercular drugs as a second line agent for treating drug-resistant tuberculosis.

Molecular Formula: $C_3H_6N_2O_2$

IUPAC Nomenclature: (4R)-4-amino-1, 2-oxazolidin-3-one

Properties: Cycloserine is a white to pale yellow coloured crystalline pow with a faint or no odour. It is soluble in water; and slightly soluble in metha and propylene glycol.

Uses: Cycloserine is used with other drugs for treating the *Mycobacteri* Avium Complex (MAC) and also tuberculosis.

Storage Conditions: Cycloserine should be stored at room temperature.

Types of Pharmaceutical Formulations: Capsule and tablets.

Brand Names: Cyserin, Novaserine (250 mg), Cyclokox, Cyclo (250mg), MDSerine, and Myser.

5.1.3.9. Pyrazinamide

Pyrazinamide is a synthetic pyrazinoic acid amide derivative having bactericid properties. It is specifically active against slowly multiplying intracellular bacil

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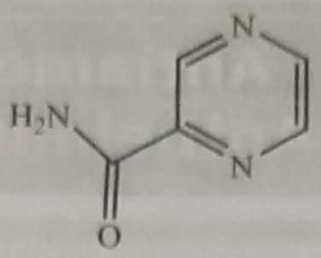
Chemical Structure



Pyrazinamide

Molecular Formula: $C_5H_5N_3O$

IUPAC Nomenclature: Pyrazine-2-carboxamide

Properties: Pyrazinamide occurs as a white crystalline powder with a bitter taste and no odour. It is soluble in chloroform and methylene chloride; less soluble in benzene; and sparingly soluble in water.

Uses: Pyrazinamide is used with other anti-tubercular drugs for initial treatment of active tuberculosis in adults and children.

Storage Conditions: Pyrazinamide should be stored in well-closed containers having a child-resistant closure. It should be kept at controlled room temperatures (15-30°C).

Types of Pharmaceutical Formulations: Tablet and syrup.

Brand Names: Kemiron, Copyrazin, Actizid, and Macrozide.

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