

### 19.1.3.4. Benzthiazide

Benzthiazide is an intermediate acting agent belonging to the class of thiazide diuretics.

**Molecular Formula:**  $C_{15}H_{14}ClN_3O_4S_3$

**IUPAC Nomenclature:** 3-(benzylsulfanylmethyl)-6-chloro-1,1-dioxo-4H-1λ<sup>6</sup>,2,4-benzothiadiazine-7-sulfonamide

**Properties:** Benzthiazide occurs as a fine white crystalline powder with a characteristic odour and bitter taste. It is insoluble in water; soluble in alkaline solution; freely soluble in dimethyl formamide solution; slightly soluble in acetone; and insoluble in ether and chloroform.

**Uses:** Benzthiazide is used for the treatment of high blood pressure and oedema.

**Stability and Storage Conditions:** Benzthiazide should be stored in well-closed containers at room temperature away from light.

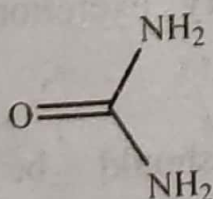
**Types of Pharmaceutical Formulation:** Tablets.

**Brand Names:** Exna and Ditide.

### 19.1.3.5. Urea

Urea is formed in the liver from ammonia produced when the amino acids undergo deamination. It is the major end product of protein catabolism and constitutes about one half of the total urinary solids.

#### Chemical Structure



**Molecular Formula:**  $NH_2CONH_2$

**IUPAC Nomenclature:** Urea

**Properties:** Urea occurs as white coloured crystals or pellets with a characteristic odour and saline taste. It is very soluble in water and alcohol; and insoluble in benzene.

**Uses:** Urea is used for hydrating skin, accelerating fibrin degradation, breaking down keratin, and for decreasing the thickness of stratum corneum. It is used as an antipruritic, and in scaling conditions such as ichthyosis.

**Stability and Storage Conditions:** Urea is hygroscopic in nature, thus should be stored in closed or sealed bags on pallets in cool, dry, well-ventilated areas.

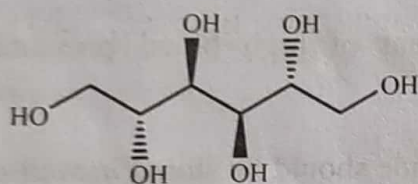
**Types of Pharmaceutical Formulations:** Creams, gels, and lotion.

**Brand Names:** Ureativ, Clobadis, and Lobate-s.

### 19.1.3.6. Mannitol

Mannitol is a naturally occurring alcohol in fruits and vegetables. It is used as an osmotic diuretic. It undergoes glomerulus filtration and poor renal tubule reabsorption, thus increases osmolarity of the glomerular filtrate.

#### Chemical Structure



Mannitol

**Molecular Formula:**  $C_6H_{14}O_6$

**IUPAC Nomenclature:** (2R,3R,4R,5R)-hexane-1,2,3,4,5,6-hexol

**Properties:** Mannitol occurs as white crystalline powder or free flowing granules with no odour and sweet taste. It is soluble in water and alcohol; and insoluble in ether.

**Uses:** Mannitol is used for producing diuresis before irreversible renal failure becomes established. It is also used for reducing intracranial pressure, in treating cerebral oedema, and for facilitating urinary excretion of toxic substances.

**Stability and Storage Conditions:** Mannitol should be stored at room temperature ( $15-30^\circ\text{C}$ ), and should not be frozen.

**Types of Pharmaceutical Formulations:** Infusions and injections.

**Brand Names:** Manitol and Neurotol-M.

### 19.1.3.7. Ethacrynic Acid

Ethacrynic acid is an unsaturated ketone derivative of aryloxyacetic acid without a sulfonamide substituent. It belongs to the class of loop diuretics.

**Molecular Formula:**  $C_{13}H_{12}Cl_2O_4$

**IUPAC**  
methylenebutanoyl)phenoxy]acetic acid

**Nomenclature:**

2-[2,3-dichloro-4-(2-

**Properties:** Ethacrynic acid occurs as a white crystalline solid. It is very slightly soluble in water; and soluble in organic solvents such as alcohol, chloroform, and benzene.

**Uses:** Ethacrynic acid is used for the treatment of high blood pressure and oedema caused by diseases like congestive heart failure, liver failure, and kidney failure.

**Stability and Storage Conditions:** Ethacrynic acid becomes less stable with an increase in pH, temperature, and time. It should be stored below  $40^{\circ}C$  (preferably between  $15-30^{\circ}C$ ) and should not be frozen.

**Types of Pharmaceutical Formulations:** Intravenous injection, tablet, and powder for solution.

**Brand Name:** Edecrin.