

Astringents

- Astringents are locally applied protein precipitants which have a low cell permeability so that the action is limited essentially to the cell surface and the interstitial spaces.
- The action does not result in the death of the cell, only the permeability of the cell membrane is reduced.

Astringents are therapeutically used as

- (i) Styptic, to arrest haemorrhage (to stop bleeding from small cuts) by promoting coagulation of blood and constricting small capillaries;
- (ii) antiperspirant to decrease sweating by constricting pores at the surface of the skin;
- (iii) to reduce inflammation by restriction of the blood supply to the surface of mucous membranes;
- (iv) promote healing and toughen the skin;
- (v) deodorant by virtue of interaction with odorous fatty acids liberated or produced by the action of bacteria on lipids in sweat and by an action suppressing bacterial growth, partly due to a decrease in pH; and
- (vi) direct action on skin to remove unwanted tissue (this requires a higher concentration or a stronger protein precipitant, often termed as corrosive).

ALUM

Alum :- $\text{KAl}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$

Mol wt :- 474.33

(Aluminium Potassium Sulphate) Mol wt. 453.33

(Aluminium Ammonium Sulphate), Mol Wt:- 474.39

Alum can be either the ammonium or the potassium salt & should be labeled on container which salt is present.

Preparation:-

official alums are prepared by adding a hot, concentrated solution of either potassium or ammonium sulphate to a hot solution of an equimolecular proportion of aluminium sulphate.

The alums separate out as crystals on cooling.

Properties:-

Colour:- colourless

Nature:- large crystals, crystalline fragments or as a white powder.

odour:- odourless

taste:-with a sweetish strongly astringent taste.

Solubility:- Alums are freely soluble in water, but slowly dissolve in glycerin, and insoluble in alcohol.

Chemical properties:-

Acidic to litmus

When heated, it melts and at about 200°C loses its water of crystallization with the formation of the anhydrous salt.

Storage:-To be stored in airtight containers.

Uses:-

- Alum precipitates proteins and is a powerful astringent.
- Dilute solutions (1 to 4%) have been used as astringent mouthwashes and gargles but they have a destructive action on teeth.
- A 2% solution has been used for application to the skin to reduce excessive perspiration.
- Stronger solutions (5 to 10%) are used to harden skin by athletes, especially as footbath to toughen the skin of the feet.
- strong solution is used as a styptic for minor cuts and abrasions.
- (0.5 to 5%), lotions and douches, some vulvovaginal cleansing and deodorant preparations.

ZINC SULPHATE

Chemical formula :- $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$

Synonym:- White Vitriol

Preparations

- For industrial scale, zinc sulphide is heated in presence of air under specified conditions. the heated mass is dissolved in hot water, filter the solution concentrated for crystallization.
 - metallic zinc granules are digested with H_2SO_4 .
 - The sol is filtered & treated with chlorine to oxidize any ferrous impurity into ferric sulphate which is then ppted by hydroxide & removed.
- the filtrate is concentrated & crystallized

Properties:-

- Colour:- colorless,
- Nature:-transparent crystals or as crystalline powder.
- Odour:- is odourless
- taste:- metallic and astringent.
- Solubility:- very soluble in water. It is freely soluble in glycerin, but is insoluble in alcohol it
- Chemical Properties:-
 - Aqueous solutions of zinc sulphate are acid to litmus
 - It forms double salts with ammonium & Potassium Sulphate
 - When strongly heated it decomposes
 - Storage It should be stored in tightly closed containers.
 - Incompatibility :-It is incompatible with alkali carbonates and hydroxides and with astringent infusions and decoctions.

USES:-

- Zinc ions exhibit mild germicidal astringent & styptic action
- (the action is dependent due to slow release of zinc ions from salt or sol.)
- Insoluble zinc ions used in topical agents as protectives.
- ZnSO₄ sol 0.1-1% used ophthalmic
- Internally it is used as an emetic
- Insoluble Zn complex are mainly used in bandages, adhesive, tapes etc.