

Cathartics

- ❖ Cathartics are drugs which bring about defecation.
- ❖ They are beneficial in constipation and expulsion of intestinal parasites.
- ❖ They are used for clearing bowels before surgery.
- ❖ Purgatives and laxatives are also acts as mild cathartics.
- ❖ They acts by four different mechanisms

1. **Stimulants** – These drugs act by local irritation on intestinal tract and stimulation of peristalsic activity.

Ex- Senna, Rhubarb, Cascara, Phodophyllum, cater oil, bisacodyl.

2. **Bulk purgative** - These drugs are able to increase bulk of intestinal contents. These are cellulose or non-digestable materials which swell when wet and increase bulk stimulate peristalsis.

Eg. Methyl cellulose, sodium CMC, ispagol.

3. Lubricants

- ❖ In constipation, contents of intestine become hard because of absorption of water by body, so there is a difficulty to clear the bowels.
- ❖ These drugs acts as lubricants and cause smooth clearing of the fecal material.

Ex- Liquid paraffin, glycerin, mineral oils

4. Saline cathartics

- ❖ These drugs acts by increasing the osmotic load of intestine by absorbing large quantity of water and stimulate peristalsis.
- ❖ Poorly absorbable cations like Ca, Mg and anions like SO_4 , PO_4 are contributing this effect.
- ❖ They are inorganic water soluble agents and taken with plenty of water.

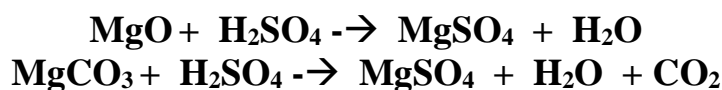
- ❖ Ex- Magnesium hydroxide, Mag. Sulphate, Sod. Phosphate, Sod.pot. Tartrate, pot.bitartrate, mercurous chloride.

Magnesium sulphate (MgSO₄ 7H₂O)

Syn; Epsom Salt

Preparation:

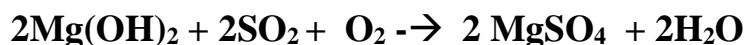
1. **Laboratory method** - Dissolving magnesium oxide or magnesium carbonate in dil sulphuric acid and evaporating the filtered solution to crystallization.



2. Action of dil. Sulphuric acid on the native carbonate (magnesite). The solution is filtered. The filtrate is evaporated to crystallization



3. Sulphur dioxide and air are passed through the suspension of magnesium hydroxide



Uses:

- Cathartic
- Osmotic laxative
- It is chief ingredient of glycerin of magnesium sulphate which is applied to reduce swelling.
- Treatment of electrolyte deficiency
- Used in the assay of calcium gluconate to improve the accuracy
- Used in the preparation of milk of magnesia

Storage condition:

It should be stored in air tight container.

2. Sodium orthophosphate Na_2HPO_4

Preparation

1. From sodium carbonate

- ❖ By adding sodium carbonate to a hot solution of phosphoric acid.
- ❖ Sodium carbonate fails to affect the third hydrogen of phosphoric acid and causes the formation of disodium hydrogen phosphate.
- ❖ The solution is neutralized, concentrated and the crystals are separated out by centrifuging washed and dried.



2. From Calcium phosphate

- ❖ Calcium phosphate treated with sulphuric acid yields calcium sulphate and monobasic calcium phosphate the former is precipitated while the latter remains in solution.



- ❖ The above mixture after the addition of boiling water is filtered. Now the filtrate is treated with **sodium carbonate**, **dibasic calcium phosphate** gets deposited leaving sodium ortho phosphate in solution.



Storage: Stored in tightly closed container.

Uses - Saline laxative & Cathartic and buffering agent (Pharmaceutical agent)

Assay – It is assayed by acidimetry

Kaolin

- ❖ Kaolin or china clay is a plastic raw material, particularly consisting of the clay mineral kaolinite.
- ❖ The chemical formula is **$\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2 \cdot 2\text{H}_2\text{O}$** (39.5% Al_2O_3 , 46.5% SiO_2 , 14.0% H_2O).

- ❖ Its main component is kaolinite; in addition, it frequently contains quartz, mica, feldspar, illite, and montmorillonite.
- ❖ Kaolinite is made up of tiny sheets and it is formed by rock weathering. It has some cation exchange capacity.

Preparation

- ❖ Kaolin is formed under acidic conditions through weathering or hydrothermal changes of feldspars, and other aluminosilicates.
- ❖ It can form independent weathered kaolin deposits, kaolinite clays or may be a compound of kaolinite sandstones.

Properties

- ❖ The 1:1 platelets of kaolinite are held together strongly via hydrogen bonding between the OH of the octahedral layer and the oxygen of the tetrahedral layer.
- ❖ Due to this strong reaction these platelets do not expand when hydrated and kaolinite only has external surface area.
- ❖ Kaolinite has very little isomorphic substitution of Al for Si in the tetrahedral layer. Accordingly, it has a low cation exchange capacity.
- ❖ Kaolinite easily adsorbs water and forms a plastic, paste-like substance.

Uses

- ❖ Due to its adsorbent capability and lack of primary toxicity, kaolin is considered a simple and effective to prevent the adverse effects exerted by many toxic agents.
- ❖ Kaolin based medication often combined with pectin is commonly used as a palliative for diarrhoea and digestive problems in humans.

Bentonite

- ❖ Bentonite is a rock or a clay base industrial material.
- ❖ it is a rock formed of highly colloidal and plastic clays composed mainly of montmorillonite, a clay mineral of the smectite group and can be considered alternative raw materials.

Properties

- ❖ Their good capability to bind water and mineral nutrients and protect them from washing up is a useful prerequisite for enhancement of soil fertility.
- ❖ In contrast to kaolin, three layer structure complexes of montmorillonite allow also internal absorption of ions into the interlayer sheets.

Uses

- ❖ It is an excellent adsorptive materials of heavy metals and bacteria and toxic and anti nutritive agents.