

→ It should give a clear & colorless solution

Acidity & alkalinity :-

→ 1g of  $MgSO_4$  is dissolved in 10ml of  $H_2O$ . This solution is neutral to litmus solution.

Storage :- kept in tightly closed - containers.

Action & uses :-

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→  $MgSO_4$  is given orally in dilute solutions ✓

→ About 5g gives rise to laxative effect ✓

→ Due to bitter & nauseating taste it is given in fruit juices ✓

→ The M of acid is that  $MgSO_4$  does not get absorbed from intestinal tract & thus retains sufficient water with in the lumen.

→ The hydrostatic pressure is able to promote motor activity of peristalsis of bowel.

→ Usual dose is 10-15g. Patients

→ It is used with care for patients of impaired renal function.

→: Sodium Sulphate :- Sod. orthophosphate

Formula :-  $Na_2HPO_4 \cdot 12H_2O$ .

M. wt :- 358.14

Syn :- Disodium hydrogen phosphate.

→ It is dodecahydrate of disodium hydrogen orthophosphate.

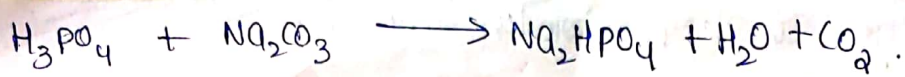
→ It contain not less than 98.5% not more than 101.0% of  $Na_2HPO_4$  which is calculated with reference to standard preparation.

Preparation :-

① It may be obtained by adding sodium carbonate to a hot soln of phosphoric acid.

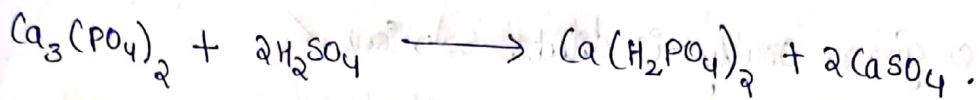
→ Sodium carbonate fails to affect the third hydrogen of phosphoric acid & causes the formation of disodium hydrogen phosphate.





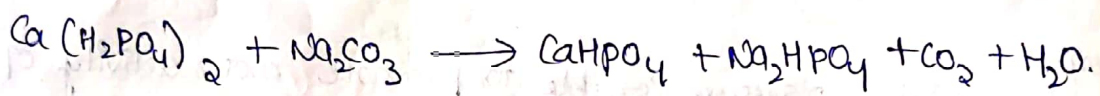
→ the soln is neutralised, concentrated & the crystals are separated out by centrifuging, washed & dried.

(2) also obtained from Ca-phosphate which on being treated in correct portions with  $\text{H}_2\text{SO}_4$ , yields Ca-sulphate & monobasic Ca-phosphate, the former is precipitated while the latter remains in soln



→ the above mixture after addition of boiling water is filtered

→ Now the filtrate is treated with sodium carbonate when dibasic Ca-phosphate gets deposited leaving sodium phosphate in soln



→ the soln is filtered off. The crystals of sod-phosphate are obtained by concentrating the solution & ultimate crystallization.

Properties :-

→ colourless transparent crystals.

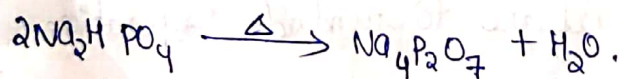
→ saline taste

→ odorless

→ strongly effloresces in air.

→ soluble in water but insoluble in alcohol.

→ on heating over  $300^\circ$  it is converted into sod. pyrophosphate.



Identification :- Its 10% w/v solution gives reactions which are characteristic of sodium & phosphate.

Reaction :- Its 2% soln has pH b/w 9 to 12.

Tests for purity :- It is tested for alkalinity As, Ca, Mg, heavy metals, chloride sulphate and loss on drying heavy metals.



chloride sulphate and loss on drying heavy metals; It should not be more than 10 ppm

Reducing substances :- 0.5 gm of substance is dissolved in 10 ml of 0.1N  $H_2SO_4$ . To it add 0.25 ml of 0.1N  $KMnO_4$ . Now this heated on a water bath for 5 mins.

→ the red colour should not get completely discharged.

Loss on drying :- It should be 57% to 61%. It is determined on 0.5 g by drying in an oven at  $130^\circ C$  taking care to avoid sputtering.

Storage :- stored in tightly closed containers.

Dose :- 2 to 16 g.

Uses :- used as saline laxative  
- cathartic & buffering agent

(Pharmaceutical acid).

Bentonite I.P :-

Formula :-  $Al_2O_3 \cdot 4SiO_2 \cdot H_2O$

→ It is a colloidal hydrated aluminium silicate which occurs naturally

→ It is obtained from naturally occurring sources.

→ when the bentonite is subjected to analysis, it is found that it is an aluminosilicate having  $SiO_2$ ,  $Al_2O_3$ ,  $Fe_2CO_3$ ,  $CaO$ ,  $MgO$ , & some Na & potassium

→ in an acid solution the metallic ions have been readily exchangeable for hydrogen ions & for this reason, bentonite could not be readily maintained in an acidic medium.

Properties :- → very fine, pale buff or cream coloured powder

→ odourless

→ free from grit & has slightly earthy taste.



~~14/11/17~~ → Almost insoluble in water, but swells twelve times when it is added to water.

→ It neither dissolves nor swells in org solvents.

Identification :- when a sample of bentonite is fused with anhydrous Sodium Carbonate & extracted with water followed by repeated extractions with dil. HCl, it yields a residue of silica & the acid solution after neutralization which gives characteristic of Aluminium.

Tests for purity :-

1) pH :- pH of 2% suspension in water is 9-10.5

2) Gel formation :- 6g of bentonite

↓  
0.3g of <sup>light</sup> MgO mixed thoroughly

↓  
add to 200ml of H<sub>2</sub>O in 500ml stoppered cylinder

↓  
agitated for 1hr.

↓  
then take 100ml mixture, take in to 100ml cylinder

↓  
cylinder allowed to 24 hrs

↓  
clear supernatant liquid appearing on the surface

↓  
The clear supernatant not more than 2ml.

3) swelling factor :- It is measured by dropping from the <sup>top</sup> 2g of bentonite sample in divided portions upon the surface of water (100ml) contained in 100ml capacity glass stoppered



→ each portion is allowed to get settled before the next is added.

→ Bentonite swells up at the bottom & it should occupy an apparent volume of not less than 24 ml.

4) Fitness of powder :-

2 gm of bentonite sample is sprinkled on 20 ml of  $H_2O$  contained in a mortar. It is allowed to swell. Then the swollen mass is dispersed evenly with a pestle & diluted with  $H_2O$  to 100 ml. The suspension is poured through a NO. 200 sieve & sieve is washed thoroughly with  $H_2O$ .

→ The test passes if no grit is felt when fingers are rubbed over the wire mesh of sieve.

5) Loss on drying :-

when bentonite is dried to constant weight at  $105^\circ C$ , it should not lose less than 5% & not more than 12% of its weight.

6) Incompatibilities :-

Its suspension have been affected by electrolytes. It cannot be readily used in acidic media because metallic ions been exchangeable for hydrogen ions.

Uses :- → good pharmaceutical acid.

→ used as protective colloid to stabilize emulsions.

→ Mainly it is used for suspend other insoluble powder.

→ used as emulsifier.

→ used as a base for pharmaceutical preparations includes plaster & ointments.



→ It is an ingredient of calamine lotion I.P which is used as protective.

Light Kaolin :-

Light Kaolin I.P :-

Preparation :- It is different from heavy kaolin in degree of purity & particle size.

→ It is prepared from heavy kaolin by elutriation, removing gritty & coarse particles.

→ It should not contain dispersing agents.

Properties :- → light white powder.

→ Unctuous to touch (soft).

Limits :- It should be tested for coarse particles and fine particles.

Uses :- → adsorbent for toxic substances from G.I.T & lay to provide bulk by swelling with water in conditions of diarrhoea.

→ Also used in poultices, dusting powders, toilet powders & as filtering aid.

Storage :- It should be stored in a well closed container.

Heavy Kaolin I.P :-

Occurance :- This is a purified form of a natural clay having an approximate composition  $Al_2O_3 \cdot 2SiO_2 \cdot H_2O$ .

→ Natural kaolin is contaminated with carbonates of  $Ca^{+2}$  &  $Mg^{+2}$  & ferric oxide.

→ This can be easily removed by treatment of HCl followed by filtration, washing, drying.



Properties :-  $\rightarrow$  soft, whitish powder.  
 $\rightarrow$  colourless, tasteless.  
 $\rightarrow$  insoluble in H<sub>2</sub>O, org. solvents, mineral acids & alkali.

Limits :- limits of alkaline, acids, As, heavy metals,  $Cl^-$ ,  $Fe^{+2}$ ,  $CO_3^{2-}$ , soluble matter & moisture.  
 $\rightarrow$  Tests are also included for determining absorptive power & swelling power.

Storage :- It should not be stored in well closed & containers.

14/11/17

## Antimicrobial agents :-

These are the chemicals & their preparations which help in reducing or preventing infection due to microbes.

### Classification of antimicrobial agents :-

#### 1) Antiseptics :-

These are the substances that are able to kill or prevent the growth of micro-organisms.

$\rightarrow$  This term is specific for preparations which are to be applied to living tissues.

$\rightarrow$  Antiseptic agents ~~other~~ oppose the sepsis, putrefaction or decay of the damaged or exposed tissue by inhibiting microbial multiplication & metabolic activities or by killing the pathogenic micro-organisms.

\* An ideal antiseptic should destroy bacteria, spores, fungi, viruses or other any infective agent without causing any harm to the tissues of the host.

$\rightarrow$  They can be applied to almost all tissues of the body & may be