→ 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 :-

→ $MgSO_4$ 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 mgso4 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 effect the third hydrogen of phosphoric acid & causes the formation of disodium hydrogen phosphate.

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$$H_3PO_4 + Na_2CO_3 \longrightarrow Na_2HPO_4 + H_2O + CO_2.$$

→ 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 H_2SO_4, yields Ca. sulphate & monobasic Cal. phosphate, the former is precipitated while the latter remains in soln

$$Ca_3(PO_4)_2 + 2H_2SO_4 \longrightarrow Ca(H_2PO_4)_2 + 2CaSO_4.$$

→ 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.

$$Ca(H_2PO_4)_2 + Na_2CO_3 \longrightarrow CaHPO_4 + Na_2HPO_4 + CO_2 + H_2O.$$

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

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Properties :—

→ Colourless transparent crystals.
→ Saline taste
→ Odorless
→ Strongly effloresces in air.
→ Soluble in water but insoluble in alcohol.

→ on heating over 300° it is converted in to Sod. pyrophosphate.

$$2Na_2HPO_4 \xrightarrow{\Delta} Na_4P_2O_7 + H_2O.$$

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.

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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 10ml 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 b/w 57 %, to 61 %. It is determined on 0.5 g by drying in an oven at 130°C taking care to avoid spattering

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Storage :- stored in tightly closed containers.

Dose :- 2 to 16 g.

Uses :- used as saline laxative
- cathartic & buffering agent
(Pharmaceutical aid).

Bentonite I.P :-

Formula :- $Al_2O_3 . 4SiO_2 . H_2O$:

→ It is a colloidal hydrated aluminium silicate which occurs naturally
→ It is obtained from naturally occuring 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 exchange -ble 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.

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~~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) p^H :- p^H of 2% suspension in water is 9 - 10.5

2) Gel formation :- 6g of bentonite

↓

0.3g of light MgO mixed thoroughly

↓

add to 200ml of H_2O in 500ml stoppered cylinder

↓

agitated for 1hr.

↓

then take 100 ml 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 top 2gms of bentonite sample in devided portions up on the surface of water (100ml) contained in 100ml capacity glass stopped

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cylinder.

→ 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) Fineness of powder :—

2gm of bentonite sample is sprinkled on 20ml of H_2O contained in a mortar. It is allowed to swell. Then the swollen mass is dispersed evenly with a pestle & diluted to H_2O to 100ml. 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.

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5) Loss on drying :—

When bentonite is dried to constant weight at 105°C, it should not loss less than 5% & not more than 12% of its weight.

6) Incompatabilities :—

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

Uses :— → good pharmaceutical aid.

→ 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.

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

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, reducing gritty & coarse particles.

→ It should not contain dispersing agents. (48)

Properties :- → light white powder.

→ Uncutous to touch (Soft).

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

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

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

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

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.

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Properties :- → soft, whitish powder.
→ odourless, tasteless
→ insoluble in H_2O, org. solvents, mineral acids & alkali.

Limits :- limits of alkaline, acids, As, heavy metals, Cl^-, Fe^{+2}, SO_4^{-2}, soluble matter & moisture.
→ Tests are also included for determining adsorptive power, swelling power.

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

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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.
→ this term is specific for preparations which are to be applied to living tissues.
→ Antiseptic agents 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 with out causing any harm to the tissues of the host.
→ they can be applied to almost all tissues of the body & may be

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