WELCOME

TO

This is an Education Platform

We provide Free PDF Notes and Videos Classes for Pharmacy Students

Web Site http://www.fdspharmacy.in/

You tube https://www.youtube.com/channel/UC77iEsiuZolU4pB8WAJIR5Q

What app https://chat.whatsapp.com/IzSgXtFEvhS4LN5xhUgq5z

Telegram https://t.me/+cvxm17xSloA4MjVl

Face book https://www.facebook.com/Fdspharmacy-1057643119944440/

E-mail fdspharmacyinfo@gmail.com

Diploma in Pharmacy 1st Year
Pharmaceutical Chemistry
Important Questions
Chapter 3 : Inorganic Pharmaceuticals

Questions	Page No
Q1. Write a brief note on Haematinics. With the examples.	3
Q2. Define Antaacids write any two example of Antaacid	6
Q3. What are Antimicrobial Agents .Give some Example.	8
Q4. Write note on Dental Product with example.	10
Q5. Write down the Various Medicinal Gases.	11

Chapter 3
Inorganic Pharmaceuticals
IMPORTANT Questions

Q1. Write a brief note on Haematinics. With the examples.

Ans.Haematinics

Haematinics are the drugs used to increase the the Concentration of haemoglobin (iron) in blood or used to cure anaemia mainly due to iron deficiency.

Examples

These agents are required for the formation of blood.
Some common examples of haematinics used in treatment of iron-deficiency anaemia are

1. Ferrous sulphate,
2. Ferrous fumarate,
3. Ferric ammonium citrate,
4. Ferrous ascorbate,
5. Carbonyl ion, etc.

1.Ferrous Sulphate ($FeSO_4.7H_2O$)

Ferrous sulphate, also known as green vitriol, contains not less than 98% of ferrous ion (Fe^{2+}) and not more than 103.3% of $FeSO_4.7H_2O$.

Preparation

It can be prepared by when iron pyrites are exposed to air and moisture

$$2FeS + 7O_2 + 2H_2O \longrightarrow 2FeSO_4 + 2H_2SO_4$$

Physical properties

Appearance : Pale, bluish green crystals or granules.
Odour : Odourless.
Taste : Saline and styptic (astringent or bitter).
Solubility : Soluble in water (43.5gm in 100gm of water at 150°C).
Acidic Nature : Its solution is acidic to litmus paper at pH about 3.7.

Pharmaceutical Formulations

Ferrous Sulphate Oral Solution, Ferrous Sulphate Tablets

Market Preparations

Fer-In-Sol ,FerrouSul , FeroSul ,Iron Supplement, Slow Fe

Storage Conditions

It should be store out of the children's reach and in child-resistant containers.

Uses

- It is a haematinic preparation most widely used for treating iron-deficiency anaemia.
- Ferrous sulphate coated with brownish yellow basic ferric sulpnae should not be used.
- It is also used in agriculture as an insecticide

2.Ferrous Fumarate

Ferrous fumarate is the fumarate salt form of the minera iron

Preparation

Anhydrous ferrous fumarate should be prepared by mixing a water-soluble ferrous salt and a water soluble salt of fumaric acid in aqueous medium at a temperature over about 70°C.

Physical Properties

- Appearance : Reddish-brown powder.
- Odour : Odorless powder.
- Solubility : Hardly soluble in water and very slightly soluble in alcohol.
- Nature : Basic in nature.

Pharmaceutical Formulations

Ferrous Fumarate and Folic Acid (Combination) Tablets, Ferrous Fumarate Syrup

Market preparations

Feosol, Ferra-TD, Fer-in-Sol

Storage Conditions

- It should be stored in clean, dry warehouse in the original unopened containers.
- It should be kept in cool condition.

Uses

- It is used to treat pernicious anaemia.
- It is used to treat iron deficiency anaemia.

3.Ferric Ammonium Citrate

It is a complex salt which contain 20.5 – 22.5 % of iron . It is the Scale Preparations of iron

Preparation

Ferric ammonium citrate (iron (III) ammonium citrate) is prepared by the **reaction of ferric hydroxide with citric acid, followed by treatment with ammonium hydroxide, evaporating, and drying**. The resulting product occurs in two forms depending on the stoichiometry of the initial reactants.

Physical Properties

Appearance : Bright and brownish-red scales
Solubility : Highly soluble in water, but insoluble in alcohol
Taste : Slightly astringent in taste

Pharmaceutical Formulations

Ferric Ammonium Citrate Tablets , Ferric ammonium citrate solution

Market Preparations

Deriton ,Geritol Liquid , Iron, Vitamin and Min Supplement

Storage Conditions

- It should be stored in original package to protect it from light.
- It should not be stored above 30 °C.

Uses

- It acts as a haematinic agent.
- It is used as a source of iron for treating iron-deficiency anaemia.

4.Ferrous ascorbate

Ferrous ascorbate is an iron supplement which is used in the treatment of low iron levels in the blood. Ascorbic acid increases the absorption of iron from the stomach.

Preparation

The present invention provides an improved and industrially feasible earth metal salts or its hydroxides are reacted with ferrous sulfate to get corresponding ferrous salts, which are reacted with ascorbic acid in an aqueous medium at slightly acidic or neutral condition followed by filtration to get ferrous ascorbate

Pharmaceutical Formulations

- Ferrous Ascorbate Capsules
- Ferrous Ascorbate Syrups

Market Preparation

- Ascofer Cap 275mg
- Solufer syrup 150ml
- Iron Ascorbate Caps

Storage Conditions

- It should be kept away from direct contact with heat, air and light because it may damage the medicines.

Uses

- Iron deficiency aneamia.
- Anemia due to chronic kidney disease.

5.Carbonyl Iron

Carbonyl iron is an iron replacement product. Iron is obtained from the foods we eat. Red blood cells are produced with the help of iron that carries oxygen via the blood to tissues and then to organs.

Pharmaceutical Formulations

- Tablet
- Oral Suspension

Market Preparations

- Feosol (Carbonyl Fe)
- Icar Pediatric
- Icar C
- Irco

Storage Condition

It should be stored in an airtight container at room temperature. Keep away from children

Uses

- As a dietary iron supplement.
- To treat iron deficiency anaemia.

Q2. Define Antaacids write any two example of Antaacid

Ans.

- Antacids are such substances which are used to neutralise the excess amount of acid in our stomach.

Ideal Properties

- It should be non-absorbable
- It should not cause constipation.
- It should act rapidly for a prolonged time period.
- Its pH should lie within the range of 4-6.

Classification

1) **Systemic antacids (absorbable)**
2) **2)Non-systemic antacids (non-absorbable)**

some common examples of antacids:

1. Aluminium hydroxide gel,
2. Sodium bicarbonate,

1. Aluminium Hydroxide Gel

Preparations of aluminium hydroxide gel should not have less than 3.5% and not more than 4.4% w/w of aluminium oxide (Al_2O_3).

Preparation

It can be formed by treating an aluminium salt (e.g, aluminium chloride or sulphate) with ammonium hydroxide.

$AICl_3 + 3NH_4OH \longrightarrow Al(OH)_3 + 3NH_4CI$

Physical Properties

Appearance : white amorphouse solid
Odour : Odourless.
Solubility : It is insoluble in water and ethanol, but soluble in acids and alkalis solutions.

Pharmaceutical Formulation

- Oral Suspension

Market Preparations

- AlternaGEL
- Nephrox
- Amphojel

Storage Conditions

It should be stored in well-closed containers and freezing should be avoided. It can be dispensed in blue or amber coloured bottles.

Uses

- To treat peptic ulcer, gastritis, peptic oesophagitis, gastric hyperactivity, and hiatal hernia,
- To protect the skin

2.Sodium Bicarbonate

Sodium Bicarbonate is not having less than 99% and not more than 101% of $NaHCO_3$.

Preparation

A similar method is used for the production of sodium bicarbonate on commercial scale. The soda ash (mined in the form of ore trona) is dissolved in water and treated with carbon dioxide. From this method, sodium bicarbonate is obtained as a solid precipitate.

$Na_2CO_3 + CO_2 + H_2O \longrightarrow 2NaHCO_3$

Physical Properties

- Appperance : white crystalline powder
- Odour : odourless
- Stability : It is stable only in dry air.
- Solubility : soluble in water and insoluble in other solvent like alcohol.

Pharmaceutical Formulations

- Injectable Solution
- Tablet

Market Preparations

- Sellymin
- Brioschi
- Sodium Bicarbonate
- Neut

Storage Condition

lt should be stored in well-closed containers.

Uses

- Aqueous solution of sodium bicarbonate is used as an antacid which is given orally to treat acid indigestion and heartburn.
- It is used in urinary alkalinisation for treating uric acid renal stones.

Q3. What are Antimicrobial Agents .Give some Example.

Ans.

Anti-Microbial Agents

- Chemicals or agents that are used to kill or to inhibit the growth of microorganism (bacteria, fungi, or protozoans) are known as antimicrobial.
- They are either Microbicidal (kill microbes) or microbiostatic (prevent the growth of microbes) in nature.
- Antimicrobial substance like disinfectants are generally used to clean non – living objects

Example

- Silver nitrate,
- Hydrogen peroxide,
- Bleaching powder, etc

Silver Nitrate

Silver nitrate (or lunar caustic) is a soluble chemical compounds, having not less than 99.5 % and not more than the equivalent of 100.5% of AgNo3

Preparation

It is prepared bu dissolving metallic silver in cold and dilute nitric acid

$Ag + 2HNO_3 \longrightarrow AgNO_3 + NO_2 + H_2O$

Physical Properties

- Apperance : Colourless or White crystals.
- Odour : Odoueless
- Taste : Bitter in taste
- Solubility : Solubile in boiling alcohol, Water , Slightly soluble in alcohol

Pharmaceutical Formulations

- Topical Solution
- Applicator Sticks

Market Preparations

- Avoca Flexible Caustic Applicator
- Silver Nitrate

Storage Conditions

It should be stored in amber coloured bottles in a cool and dark place.

Uses

- It is used as a disinfectant, astringent, and an irritant.
- In cosmetics, it is used to dye eyebrows, eye lashes, and hair.

Hydrogen Peroxide

Preparation

A thick paste of barium peroxide is added to ice-cold water. This mixture is added to a calculated volume of

Ice-cold dilute sulphuric acid. The solution is filtered and the insoluble sulphate is separated.

$BaO_2 + H_2SO_4 \longrightarrow BaSO_4\downarrow + H_2O_2$

Physical Properties

- Apperance : Colourless
- Odour : Odourless
- Solubility : It is soluble in ether and insoluble in water.

Pharmaceutical Formulation

- Solution

Market Preparations

- Eskata
- Orajel Antiseptic Mouth Sore Rinse , Proxacol
- Peroxyl

Storage Conditions

- It should be stored in light-resistant containers.
- It is kept in a dark and cool place.

Uses

- It is used as a disinfectant, anti-infective, and deodorant.
- It is used to clean septic sockets and root canals in dentistry.
- It is available as ear drops used for removing wax.

Bleaching Powder or Chlorinated Lime [CaoCl (Cl) H2O]

Chlorinated lime is also known as calcium hypochlorite and bleaching powder. It should not have less than 30.0% w/w of available chlorine

Preparation

Bleaching powder is prepared by **passing dry chlorine gas over dry slaked lime**. The reaction being essentially:

$2Ca(OH)2+2Cl2 \rightarrow Ca(OCl)2+CaCl2+2H2O.$

Properties

- It is a dull white powder with a characteristic odour.
- After being exposed to air it absorbs moisture and decomposes slowly.

Pharmaceutical Formulations

1) Powder 2) Liquid

Market Preparations

1) Haktiman 2) Vikram 3) Lion

Storage Conditions

It should be stored in a well-closed containers and kept in a cool place away from moisture and heat.

Uses

- It is used as a bleaching agent.
- It is used as an antiseptic.
- It is used as a cleaning solution for patients.

Q4. Write note on Dental Product with example.

Ans.DENTAL PRODUCTS

- At the present time dental products of different category are available which are used to maintain dental health and hygiene.
- Dental decay and other dental problems mainly caused by poor oral hygiene.
- Inorganic compounds which are used as dental products or in dentistry can be categorised under the following heads
    - Cleaning agents,
    - Dentifrices,
    - Anticaries agents/fluorides,
    - Desensitising agent,
    - Cements and fillers,
    - Oral antiseptics and astringents, and
    - Polishing/abrasive agents.

Examples

- Calcium carbonate,

Calcium Carbonate

Calcium carbonate is a chemical compound with the chemical formula $CaCO_3$.

Preparation

$CaCO_3$ is obtained by using carbon dioxide and slaked lime as raw materials.

Properties

It is a fine white powder, and is soluable in dilute acids .

Pharmaceutical Formulation

- Tablet
- Chewables

Market preparations

Tums, Tums freshers, Tums kids, etc

Storage condition

It stored in well closed containers.

Denture Cleaners

A dentures cleaner 9 also termed denture cleanser) is used to clean dentures when they are out of the mouth.

Properties

- Non-toxic
- Easy to remove
- Harmless to patient if accidentally spilled/splashed
- Harmless to denture base materials, denture teeth and soft liners
- Long shelf life and cheap

Pharmaceutical Formulations

- Liquid Solutions
- Powders , Pastes , Tablets

Market Preparations

Polient ,Corega, Secure

Storage Conditions

It should be stored in hygienic place

Uses .

- They fight bad breath with its antibacterial ingredients.
- The adhesive locks out any food particles from getting between the gum and the denture.

Mouth Washes

Mouthwashes are concentrated, clear aqueous solution having a pleasant taste that is used to clean and deodorise the mouth or buckle cavity.

Preparation

Dissolve the benzoic acid in the chloroform, add the glycerin and mix. Dissolve the cinnamon, peppermint and phenol in alcohol and mix two solutions together.Mix for two hours, chill and filter.

Properties

- It should be quick in action and potent enough to show its intended action at specific dilution.
- Flavour must be strong enough to mask foul smell of mouth.
- It should have an acceptable taste, in most cases, sweet taste is considered.
- Low cost of production.

Pharmaceutical Formulations

Oral solution

Market Preparations

- Colgate , Closeup , Freshclor

Storage Condition

Mouthwashes should be supplied in a well closed air tight plastic container having screw cap

Uses

- It is used as an antiseptic/antibacterial.
- It is used as cooling and refreshing action.

Q5. Write down the Various Medicinal Gases.

Ans.

MEDICINAL GASES

- Gases like oxyger and water and food are therapeutically significant and essential for the maintenance of living organisms.
- Among oxygen, food and water (the three basic needs of life), oxygen deficiency leads to death most rapidly.
- In case of many diseases and intoxication, intereferin with normal oxygenation of blood or tissues, oxygen therapy is required.

oxygen (O_2)

- Mol. wt-32.0
- Oxygen is a living gas, constituting one-fifth by weight of air in its free form. It contains not less than 99.0% of v/v of O_2

Preparation

Laboratory Method: Electrolysis of aqueous solutions of alkalis or acids liberates oxygen. Here, H^+ drifts to the cathode, accepts an electron and converts into a neutral atom forming hydrogen molecules whereas, OH^- discharges at anode forming water and oxygen.

Physical Properties

It is a colourless, odourless, and tasteless gas which supports combustion.

Pharmaceutical Formulation

- Medical gas

Market Preparation

- EZ-Ox

Storage Conditions

It is stored and supplied in metallic cylinders under pressure with a pressure gauge.

Uses

- It is used for treating hypoxia.
- It is used in anaesthesia.
- It is used for treating carbon monoxide poisoning.

Carbon Dioxide

Carbon dioxide with not less than 99.0% W/w of CO_2 is stored and compressed in metal cylinders.

Preparation

It is obtained when carbon containing compounds likecoal, coke, oil, etc., are burned with an excess of oxygen.

$C + O_2 \longrightarrow CO_2$

Physical Properties

It is a heavy, colourless, odourless gas with a faintly acidic taste. It can be liquefied under water, is soluble in water.

Pharmaceutical Formulation

- Medical gas

Market Preparation

- Carbon dioxide

Storage Conditions

It is stored and supplied in metal cylinders in compressed form.

Uses

- It is inhaled to be used as a respiratory stimulant which stimulates the respiratory and cardio accelerator centres.
- Mixture of carbon dioxide and oxygen are used for treating carbon monoxide poisoning.

Nitrous Oxide

Nitrous oxide contains not less than 99.0% v/v of N_2O. It is also known as laughing gas because if inhaled an exhilarating/ exciting effect is produced.

Preparation

When sulfamic acid is heated with 73% nitric acid solution, pure nitrous oxide is liberated.

Physical Properties

It is a colourless, non-flammable gas, with a pleasant and slightly sweet odour and taste.

Pharmaceutical Formulation

- Medical gas

Market Preparation

- Nitrous Oxide

Storage condition

- It is stored and supplied in metal cylinders.

Uses

- It is used as an anaesthetic.
- Mixture of oxygen and nitrous oxide in 65:35 ratio is used in myocardial infarction.
- It is used as a good analgesic. In low concentration, it reduces the sensitivity of pain.
- In high concentration, it has a stimulating effect on the nervous system as it is a laughing gas.