1.2 Pharmaceutical Chemistry-II (Inorganic Chemistry)

Theory

An outline of important physical and chemical properties medicinal and pharmaceutical uses, storage conditions of the following classes of drugs included in the Indian Pharmacopoiea (The discussion of assays should be excluded).

1. Pharmaceutical Aids & Necessities:

(a) Acids & Bases- Hydroalcoholic acid, Sulphuric acid, Nitric acid, Phosphoric acid, Sodium Hydroxide, Strong ammonia solution, Soda Lime.

(b) Buffers- Standard buffer solutions.

(c) Anti-oxidants- Hypophosphorus acid, Sulphur dioxide, Sodium-bisulphite, Sodium metabisulphite, Sodium thiosulphate, Sodium nitrite, Nitrogen.

(d) Water- Purified water, Water for injection, sterile water for injection.

2. Gastro-intestinal Agents-

(a) Acidifying agents- Dilute hydrochloric acid.

(b) Antacids- Sodium bicarbonate, Aluminium hydroxide gel, Calcium carbonate, Milk of magnesia, Magnesium oxide, Magnesium trisilicate, Combination antacid preparations.

(c) Protectives & Adsorbents- Bismuth subcarbonate, Bismuth subgallate, Kaolin, Activated charcoal.

(d) Saline Cathartics- Sodium hydrogen phosphate, Sodium phosphate, Sodium potassium tartrate, Milk of magnesia, Magnesium sulphate.

3. Major Intra and Extra- cellular Electrolytes-

(a) Electrolytes used for replacement therapy- Sodium chloride and its preparations, Potassium chloride and its preparations, Potassium chloride and its preparations, Calcium Gluconate, Calcium Lactate, Dibasic calcium phosphate, Tribasic calcium phosphate, Magnesium Sulphate.

(b) Physiological acid-base balance and electrolytes used in acid-base therapy, Sodium acetate, Potassium acetate, Sodium potassium bicarbonate, Sodium dihydrogen phosphate, Sodium citrate, Ammonium Chloride.

4. Essential and trace ions-

(a) Iron and haematinics- Ferrous fumarate, Ferrous gluconate, Ferrous Sulphate, Iron-dextran injection, Ferric ammonium citrate.

(b) Mineral replacement- Iodine, Potassium iodide.

5. Topical agents-

(a) Protectives- Talc, Zinc oxide, Calamine, Titanium dioxide.

(b) Antimicrobials and astringents- Hydrogen peroxide solution, Potassium Permanganate, Iodine, Silver nitrate, Mild & strong silver protein, Yellow mercuric oxide, Ammoniated mercury, Sublimed sulphur, Precipitated sulphur, Boric acid, Antimony Potassium tartrate.

(c) Astringents- Aluminium hydrochloride, Alum, Zinc sulphate.

6. Sources of impurities in pharmaceutical substances, Limit tests for chloride, sulphate, iron, lead, heavy metals and arsenic included in Indian Pharmacopoeia.

7. Complexing and chelating agents- Disodium edentate, Dimercaprol.

8. Dental Products- Sodium fluoride, Calcium carbonate, Dibasic calcium phosphate.

9. Gases and vapours-

(a) Inhalant- Oxygen
(b) Anaesthetic gas- Nitrous oxide
(c) Respiratory stimulants- Aromatic spirit of ammonia, Ammonium carbonate, Carbon dioxide.

10. Radio Pharmaceuticals-

(a) Biological applications of radioactive drugs- Cobalt compounds, Gold compounds, Iodine preparations, Phosphorous preparations.
(b) Radio-opaque contrast media- Barium sulphate.

11. Miscellaneous Agents-

(a) Expectorants- Ammonium chloride, Potassium iodide.
(b) Antidotes- Sodium nitrate, Sodium thiosulphate, Activated charcoal, Light kaolin.

PRACTICALS

1. Limit tests for chloride, sulphate, iron and arsenic in inorganic pharmaceutical compounds.
2. Identification and purification tests of selected inorganic pharmaceutical compounds.

Books Recommended:

1. J.H. Block, E.B. Roche, T.O. Soine & C.O. Wilson, "Inorganic medicinal and pharmaceutical chemistry", Lea & Febiger.

2. N.C. Choudhary, "Pharmaceutical chemistry-I", Vallabh Prakashan, Delhi.

3. P. Gundu Rao, "Inorganic Pharmaceutical Chemistry", Vallabh Prakashan, Delhi.

4. H.K. Singh, V.K. Kapoor, "Basic and Pharmaceutical Chemistry", Vallabh Prakashan, Delhi.

5. R.D. Gupta, "A Text book of Analytical Chemistry for Degree Students", The National Book House, Jeoni Mandi, Agra.

6. Indian Pharmacopoeia, Govt. of India, Ministry of Health.

7. L.M. Atherden, Bently and Driver's, "A Textbook of Pharmaceutical Chemistry", Oxford University Press.

8. A.H. Backett and J.B. Stanlake, "Pharmaceutical chemistry", Part-I, The Anthlono Press, University of London.