

PHARMACEUTICS - I

(Physical Pharmacy)

1. Matter, Properties of Matter:

State of matter, change in the state of matter, latent heats and vapour pressure, sublimation - critical point, Eutectic mixtures, gases, aerosols - inhalers, relative humidity, liquid, complexes, liquid crystals, glassy state, solids - crystalline, amorphous and polymorphism.

2. Micrometric and Powder Rheology:

Particle size and distribution, average particle size, number and weight distribution, particle number, methods for determining particle volume, optical microscopy, sieving, sedimentation, measurement, particle shape, specific surface, methods for determining surface area, permeability, adsorption, derived properties of powders, porosity, packing arrangement, densities, bulkiness, and flow properties.

3. Surface and Interfacial Phenomenon

Liquid interface, surface and interfacial tensions, surface free energy, measurement of surface and interfacial tensions, Spreading coefficient, adsorption at liquid interfaces, surface active agents, HLB classification, solubilization, detergency, adsorption at solid interfaces, solid-gas and solid-liquid interfaces, complex films and electrical properties of interface.

4. Viscosity and Rheology:

Newtonian systems, Law of flow, kinematic viscosity, effect of temperature, non-Newtonian systems, pseudoplastic, dilatant, plastic, thixotropy in formulation, determination of viscosity, capillary, falling ball, rotational viscometers, thixotropy,

5. Dispersion Systems:

Colloidal Dispersions:-

Definition, types, properties of colloids, protective colloids, applications of colloids in pharmacy.

Suspensions and Emulsions:

Interfacial properties of suspended particles, settling in suspensions, theory of sedimentation, effect of Brownian movement, sedimentation of flocculated particles, sedimentation parameters, wetting of particles, controlled flocculation, flocculation in structured vehicles, rheological considerations.

Emulsions - types, theories, physical stability.

6. Complexation:

Classification of complexes, methods of preparation and analysis, applications.

7. Kinetics and Drug Stability:

General considerations and concepts, half-life determination, Influence of temperature, light, solvent, catalytic species and other factors, Accelerated stability study, expiration dating.

8. Buffers :

Buffer equations and buffer capacity in general, buffers in pharmaceutical systems, preparation, stability, buffered isotonic solutions, measurements of tonicity, calculations and methods of adjusting isotonicity.