

PHARMACEUTICS QP No.-09

Topic cover

- 1. Matter, properties of matter** States of matter, change in the state of matter, latent heat and vapor pressure, sublimation-critical point, eutectic mixtures, gases, aerosols- inhalers, relative humidity, liquid complexes, liquid crystals, glasses state, solid crystalline and amorphous polymorphism.
- 2. Micromeritics and powder rheology** Particle size and distribution, average particle size number and weight distribution, particle number, method of determining particle size and volume, optical microscopy, sieving, sedimentation, determining surface areas, 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 tension, spreading coefficient, adsorption and liquid interfaces, surface active agents, HLB classification, solubilization, detergency, absorption at solid interfaces, solid gas and solid liquid interfaces, complex films, electrical properties of interfaces.
- 4. Viscosity and rheology** Newtonian systems, law of flow, kinematics viscosity, effect of temperature, non Newtonian systems, pseudoplastics, dilatant, plastic, thixotropy in formulations, determination of viscosity and thixotropy by capillary, falling ball, rotational viscometer, application of rheology in pharmacy
- 5. Dispersion systems** a. Colloidal dispersions: Definition, types, properties of colloids, protective colloids, application of colloids in pharmacy. b. Suspensions and emulsions: Interfacial properties of suspended particles settling in suspension, theory of sedimentation, effect of Brownian movement, sedimentation of flocculated particles, sedimentation parameters, wetting of particles, significance of electrical properties in dispersions, controlled flocculation, flocculation in structured vehicles, rheological considerations, emulsions: types, theories, physical stability.
- 6. Complexation** Classification of complexes, methods of preparations and analysis, applications.

7. Buffer Buffer equations and buffer capacity in general. Buffers in pharmaceutical systems, preparations and stability, buffered isotonic solutions. Measurements of tonicity calculations and methods of adjusting isotonicity.

8. Solubility

- a) Miscibility-influence of foreign substances
 - b) Three component systems
 - c) Dielectric constant and solubility
 - d) Solubility of solids in liquids
 - e) Ideal and non-ideal solutions
 - f) Solvation and association in solutions
 - g) Solubility of salts in water
 - h) Solubility of slightly soluble and weak electrolyte
 - i) Calculating solubility of weak electrolytes as influenced by pH, influence of solvents on the solubility of drugs
 - j) Combined effect of pH and solvents, distribution of solutes between immiscible solvents, effect of ionic dissociation and molecular association on partition, extraction, and preservatives action of weak acids in emulsions, drug action and distribution co-efficient.
- b. Concepts of dissolution and diffusion.