

FORMULATION OF SUSPENSIONS

- The approaches commonly used in the preparation of physically stable suspensions fall into two categories
 1. The use of a structured vehicle to maintain deflocculated particles in suspension
 2. The application of the principles of flocculation to produce flocs that, although they settle rapidly, are easily re-suspended with a minimum of agitation.

- A disadvantage of deflocculated systems is that formation of a compact cake when the particles eventually settle.
- It is for this reason that the formulation of flocculated suspensions has been advocated.
- Optimum physical stability and appearance will be obtained when the suspension is formulated with flocculated particles in a structured vehicle of the hydrophilic colloid type.
- Whatever approach is used, the product must
 - (a) *flow readily* from the container
 - (b) *possess a uniform distribution of particles in each dose.*

WETTING OF PARTICLES

- The initial dispersion of an insoluble powder in a vehicle is an important step in the manufacturing process and requires further consideration.
- Powders sometimes are added to the vehicle, particularly in large-scale operations, by dusting on the surface of the liquid.
- It is frequently difficult to disperse the powder owing to an adsorbed layer of air, minute quantities of grease, and other contaminants.
- The powder is not readily wetted, and although it may have a high density, it floats on the surface of the liquid.

- Finely powdered substances are particularly susceptible to this effect because of entrained air, and they fail to become wetted even when forced below the surface of the suspending medium.
- The wettability of a powder can be ascertained easily by observing the contact angle that powder makes with the surface of the liquid.
- The angle is approximately 90° when the particles are floating well out of the liquid.
- A powder that floats low in the liquid has a lesser angle, and one that sinks obviously shows no contact angle.
- Powders that are not easily wetted by water and accordingly show a large contact angle, such as sulfur, charcoal, and magnesium stearate, are said to be hydrophobic.
- Powders that are readily wetted by water when free of adsorbed contaminants are called *hydrophilic*. *Zinc oxide, talc, and* magnesium carbonate belong to the latter class.

- Surfactants are quite useful in the preparation of a suspension in reducing the interfacial tension between solid particles and a vehicle.
- As a result of the lowered interfacial tension, the advancing contact angle is lowered, air is displaced from the surface of particles, and wetting and deflocculation are promoted.