



Lab 2

"Dissolution rate Study; Noyes Whitney Equation"

Definitions

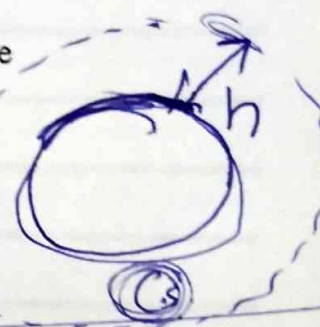
- Dissolution rate:**

It is the rate by which a solid drug passes into solution.

Dissolution rate is governed by the equation known as Noyes Whitney equation where

$$\frac{dC}{dt} = \frac{DS}{h} (C_s - C_0)$$

Diffusion coefficient (pointing to D)
Surface area (pointing to S)
Thickness (pointing to h)
Concentration in solution (pointing to C_s)
Concentration in bulk (pointing to C₀)



According to Noyes Whitney equation many factors affect the rate by which the drug molecules dissolve and diffuse in solution including:

- Particle size of the drug (inversely affect surface area; S)
- Stirring rate (inversely affect thickness of diffusion layer; h)
- Sink conditions (high difference in conc. between diffusion layer and bulk of dissolution medium ($C_s - C_0$))

Experiment

Effect of particle size and stirring rate on the dissolution rate of the model drug: Aspirin.

Procedure:

- In three conical flasks (X, Y & Z), introduce the dissolution media (100 ml distilled water).
- In conical flask X, put 0.5gm aspirin (fine) and swirl 10 times/min. till complete drug dissolution.
- In conical flask Y, put 0.5gm aspirin (coarse) and swirl 10 times/min. till complete drug dissolution.
- In conical flask Z, put 0.5gm aspirin (coarse) and swirl 20 times/min. till complete drug dissolution.
- Represent your results graphically by bars.
- Comment on your results.

fine → 17 min
Coarse (20 times/min) → 20 min
Coarse (10 times/min) → 22 min