

EXPERIMENT NO. 3

Object: To study the effect of concentration on rate of filtration.

Requirement: Calcium carbonate, Water, Filter paper, Funnel, Measuring cylinder, Beaker, Glass rod

Theory: Filtration is a process of where by solid particles present in a suspension are separated from the liquid or gas employing a porous medium. Which retains the solid but allows the fluid to pass through the volume of the filtrate obtained through the filter paper per unit time is called “rate of filtration” can be given by mathematical equation.

$$dv/dt = K.A . P/\mu L - \text{darcy's law}$$

where, A = area of filter

P = pressure drop across the filter medium and cake

μ = viscosity of filtrate

L = thickness of cake

V = volume of the filtrate

T = time taken for filtration

K = constant for the filter medium and filter cake or resistance

Procedure:

1. Prepare 5% & 10% slurry of Calcium carbonate (50ml)
2. Filter the slurry with the help of filter paper.
3. Note the time taken for filtration and also determine the volume of filtrate.
4. Calculate the rate of filtration using formula:

$$\text{Rate of filtration} = \frac{\text{Volume of filtrate}}{\text{Time of filtration}}$$

Observation table:

Sl. No.	Sample	Volume of filtrate (ml)	Time of filtration (min)	Rate of filtration (ml/min)
1.	5% CaCO ₃ Sol.			
2.	10% CaO ₃ Sol.			

Result: The effect of concentration on rate of filtration was found to be inversely proportional.

Hence, the rate of filtration is inversely proportional to concentration, then, 10% sample has less rate of filtration as compared to 5% sample.