

EXPERIMENT NO. 2

AIM:

To construct drying curve for calcium carbonate.

REQUIRMENTS:

- ❖ Petridish
- ❖ hot air oven
- ❖ calcium carbonate
- ❖ weighing balance
- ❖ spatula

PRINCIPLE:

To behaviour of drying of solid is explained by drying curve. The time required for drying a batch of weight of martial in a dry air can be estimated with the help of drying curve. Drying is a mass transfer process consists of the removal of water or other solvent by evaporations from a solid, semisolid or liquid. This process is obtained used as final production steps before, packing products.

PROCEDURE:

- ❖ Take a clean Petridish without Lid and consider it's weight as W_1 gm
- ❖ Note the area of petridish
- ❖ Take 10gm calcium carbonate in a clean petridish and consider its weight as W_2 gm
- ❖ Prepare slurry by adding water consider it's weight as W_3 gm
- ❖ Heat petridish in hot air oven at temperature of 70°C
- ❖ Note down the weight of the sample after every 15 minutes.
- ❖ Continue drying until there is no change in weight of the sample is obtained
- ❖ Determine percentage moisture content and drying rate by using following formula
- ❖ Percentage moisture = $\frac{W_3 - W_2}{W_3 - W_1} \times 100$

❖ Drying content = $\frac{W3-W2}{\text{area of petridish}} \times 100$

REPORT:

- ❖ The construction of drying curves of calcium carbonate was determined
- ❖ The percentage moisture content is =

Calculation:

Weight of empty petridish (w_1) gm =

Weight of empty petridish + sample (w_2) gm =

Weight of empty petridish + sample + water (w_3) gm =

Weight of empty petridish + sample + water + (w_4) gm =

(After drying at different time interval)

$$MC_1 \text{ (moisture content at 0 time)} = \frac{W3-W1}{W2-W1}$$

$$MC_2 \text{ (moisture content at 15 minutes time)} = \frac{W4-W2}{W2-W1}$$

$$\text{Average moisture content} = \frac{MC1 + MC2}{2}$$

$$\text{Rate of drying} = \frac{W3-W2}{\text{area} \cdot A \text{ petridish}} \times \text{time}$$