

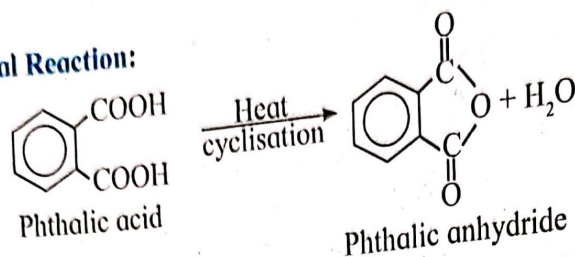
Activity No.1

Date: / /

Aim: To prepare phthalic anhydride.

Theory: Phthalic acid is a dicarboxylic acid which on heating loses a water molecule and undergo cyclisation reaction to form phthalic anhydride.

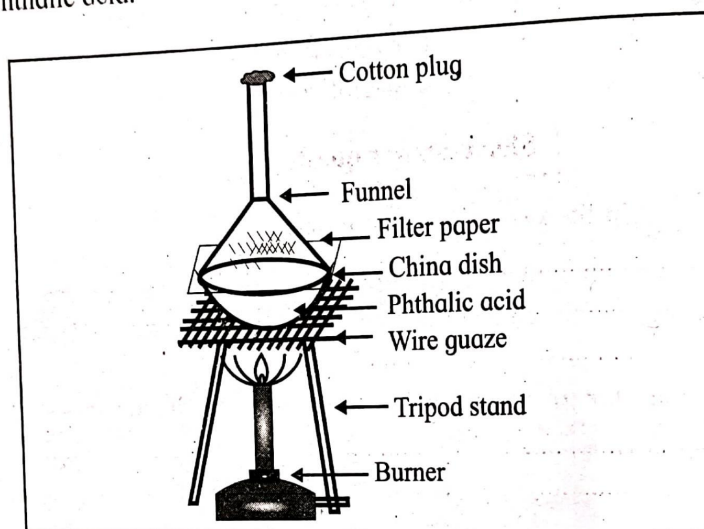
Chemical Reaction:



Apparatus: Evaporating dish, funnel, cotton, tripod stand, wire gauze, pair of tongs, filter paper, etc.

Chemicals: Phthalic acid.

Diagram:



Procedure:

1. Take 2 g of phthalic acid in a dry evaporating dish.
2. Cover the dish with filter paper having number of small holes in the centre.
3. Keep an inverted funnel on the filter paper and close nozzle of the funnel with cotton plug. Place evaporating dish on the tripod stand with wire gauze as shown in above Fig.
4. Now heat the china dish slowly and carefully on low flame.
5. After sometime the acid sublimes and anhydride collects on the inner side of the funnel.
6. Stop heating and remove the funnel carefully with pair of tongs and cool.
7. Collect the crystals of phthalic anhydride on the paper and weigh it.

Result:

1. Colour of the crystals = white
2. Shape of the crystals = Needle
3. Yield of phthalic anhydride = 0.5 g

Remark and sign of teacher:

MCQ

Select [✓] the most appropriate answer from given alternatives of each sub question.

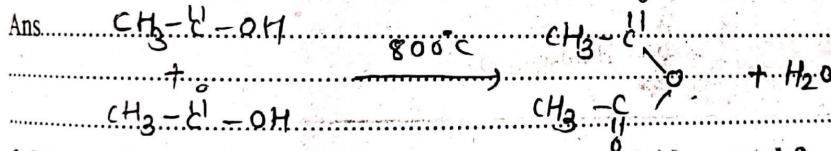
1. Phthalic acid is -----
 a. monocarboxylic acid
 c. tricarboxylic acid
 ✓ b. dicarboxylic acid
 d. polycarboxylic acid
2. Phthalic anhydride is obtained by the process known as -----
 a. decomposition
 ✓ c. sublimation
 b. dehydration
 d. distillation
3. Phthalic acid undergo ----- during preparation of phthalic anhydride
 ✓ a. dehydration
 c. dehalogenation
 b. decarboxylation
 d. dehydrohalogenation
4. Shape of crystals of phthalic anhydride is -----
 ✓ a. needle
 c. triclinic
 b. hexagonal
 d. monoclinic
5. Formation of phthalic anhydride takes place by ----- process/reaction.
 a. isolation
 c. decomposition
 ✓ b. cyclisation
 d. diazotization

Short answer questions

1. Why cotton plug is used in the process of sublimation?

Ans. The cotton plug slows down the rise of the warm gases and prevent their escape during sublimation so that they get more time to condensed.

2. Write chemical equation for preparation of acetic anhydride from acetic acid.



3. What is the colour and shape of phthalic anhydride crystals?

Ans. colourless (white) having needle like shape.

4. Why slow heating is required to the contents during process of sublimation?

Ans. In process of sublimation, at low temp. and low pressure, solid matter by pass liquid phase and converted directly from solid to gas easily.

5. Why filter paper is used with small holes in the centre during preparation of phthalic anhydride?

Ans. Because after slow heating of phthalic acid sublimes and phthalic anhydride formed rises through the holes in the filter paper and condensed on the inner side of funnel and filter paper.

Remark and sign of teacher: