EXPERIMENT 1

AIM: Recrystallization of benzoic acid from hot water.

Theory:

Recrystallization is a very important purification technique for purifying solid organic compounds. It is also used to manufacture the crystals with proper size and shape. An impure solid may be purified by first dissolving it in the minimum quantity of a boiling solvent. Insoluble impurities are then removed by rapid filtration of the hot mixture. The filtrate is next allowed to cool slowly till crystals get formed.

Benzoic acid is a crystalline solid has high solubility in hot water. An impure sample of benzoic acid is dissolved in hot water and then filtered to remove insoluble impurities.

Properties of the solvent

**The solvent must be chosen so that to have the following properties:**

1. It dissolves the organic compound at the solvent boiling point; it should not dissolve it at room temperature.
2. The solvent has a low boiling point, which makes it easier to remove solvent traces from the purified solute crystals
3. It must not react with desired compound.
4. It should be not expensive.

Requirements:

Crude sample of benzoic acid, 100 ml measuring flask, 250 ml beaker, funnel, a glass rod, a trough, filter paper, tripod stand, wire gauze and Bunsen burner.

Procedure:

1. Take about 2g of the crude sample of benzoic acid in a 250ml beaker
2. Boil ~100 ml of water in a conical flask.
3. Add the boiling water in small aliquots to the crude sample with till it entirely gets dissolved.
4. Heat the solution till the volume reduces to 70-80%.
5. Filter the hot solution using Whatman filter paper placed in a funnel.
6. Collect the clear filtrate in another beaker.
7. Allow the filtrate to cool at room temp. Now cool it by placing the beaker in a trough filled with cold water.
8. Separate the crystals by filtering or decanting the solution. Wash the crystals with cold water, dry the crystals and record the weight.

Beaker

Filter funnel +
fluted filter paper

Conical flask
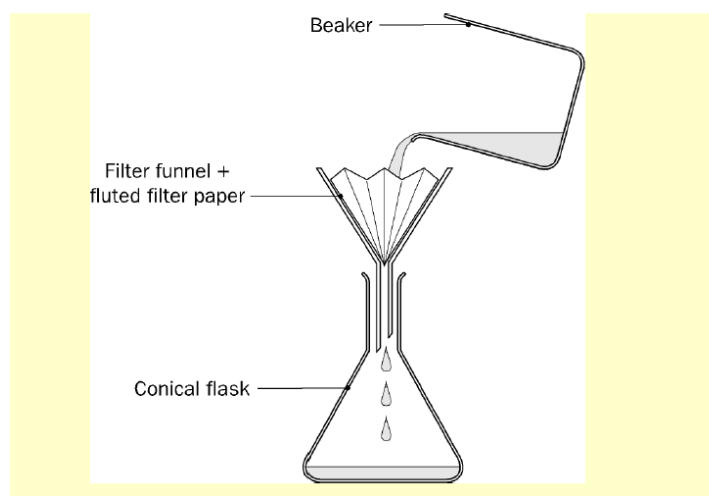
Result
The crystals of benzoic acid are shining white.

Yield = …………. g

$$\% \text{ Yield } = \frac{\text{Mass of benzoic acid after recrystaliisaztion}}{\text{Mass of benzoic acid taken}} \times 100$$