EXPERIMENT (3)

# Recrystallization

**The purpose**

The purpose of recrystallization is to purify the compounds from impurities.

**Theory:**

Recrystallization is a very important purification technique for purifying solid organic its also used to manufacture the correct crystal 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, crystals will form.

**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 does, it should not dissolve it at room temperature.
2. a good solvent should be a better solvent for any impurities than it is for the desired compound at room temperature.
3. The solvent has a low boiling point, which makes it easier to remove solvent traces from the purified solute crystals
4. It must not react with desired compound.
5. Should be not expensive.

## Procedure:

1. Weight 0.5 g of the impure benzoic acid .
2. Dissolve in 5 ml or more if necessary of hot water ( the suitable solvent) in the beaker.
3. Boil the mixture in a hotplate with stirring until the substance has dissolved completely .
4. Remove any insoluble impurities by filtration; ignore the filter paper. figure1

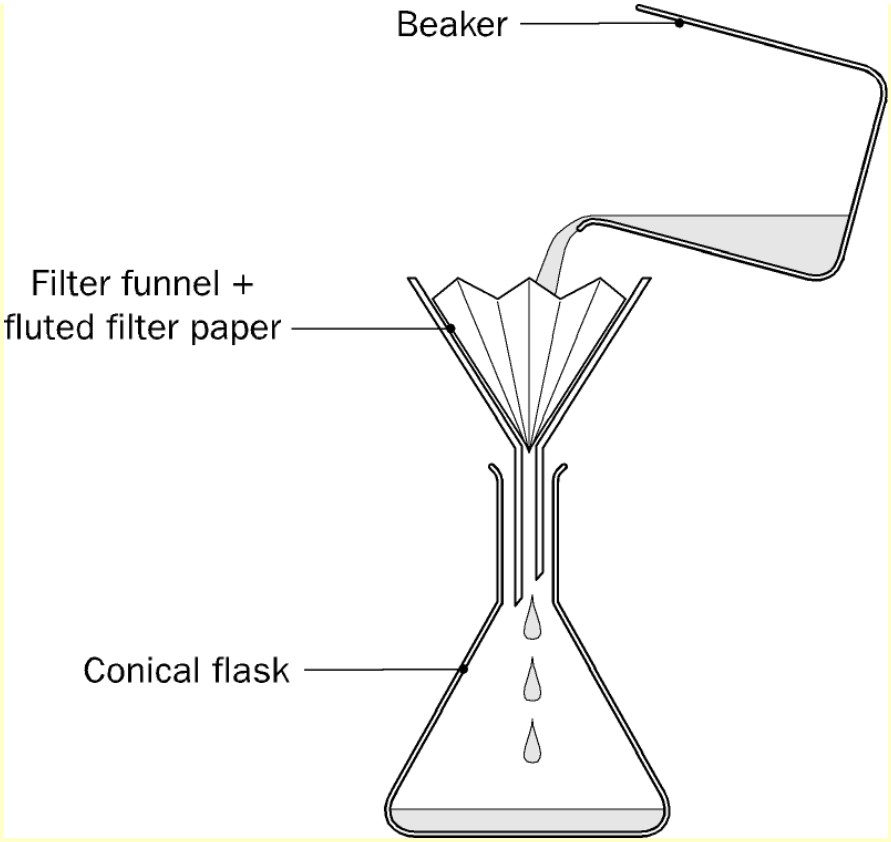


figure1

5. Allow the filtrate to cool to crystallize the desired compound from the solution;
6. Filter the solution to isolate the purified benzoic acid, after drying ,weight the pure benzoic acid and calculate the ***percentage yield*** from the following:

$$\text{Percentage yield} = \frac{\text{Mass of pure sample (after recrystallisation)}}{\text{Mass of impure sample (before recrystallisation)}} \times 100$$

## Questions:.

**1-What action could you take if some of the crystals formed on the filter paper or in the leg of the funnel during the hot filtration?**

Boiling water would have to be dropped on to the crystals using a dropping pipette to dissolve them. The filtrate would then contain more than the minimum quantity of boiling solvent to

keep the substance dissolved. In order to avoid low yields due to the substance remaining dissolved after cooling, it would be necessary to boil off most of the extra solvent before allowing the filtered solution to cool.

**2-What action could you take if some of the crystals did not formed?**