**Exp.9: Recrystallization of acetanilide**

Solid organic compounds when isolated from organic reactions are usually impure; they are usually contaminated with small amounts of other compounds that are produced along with the desired compound. The purification of impure crystalline compounds is usually done by recrystallization from a suitable solvent or a mixture of solvents.

Liquids are customarily purified by distillation, while solids are purified by recrystallization (sometimes called simply crystallization). Insoluble impurities and colored impurities can be removed from hot solvent through the use of activated carbon and filtration.

Choosing a solvent for recrystallization:

The proper choice of a solvent is an important part of the art of crystallization. The ideal solvent should:

1. Be chemically inert toward the solute.

2. Dissolve the solute readily at its boiling point but sparingly at low temperatures (0 – 25 0C).

3. Dissolve impurities either very easily or not at all.

4. Be highly volatile so that it can readily be evaporated from the crystals.

5- Not be flammable, of low cost, and low toxicity

Practically, to choose a good solvent take about (0.1 gm) of the compound to be purified (a pure sample) and try to dissolve it in (1 ml) of the solvent;

1- if it dissolves in the cold solvent, the solvent will not be good for recrystallization

2- if it dissolves in the solvent with heating, the solvent will be good for recrystallization

3- if it does not dissolve in the solvent even with heating, the solvent will not be good for recrystallization.

Solvents extensively used for recrystallization include water, ethanol, chloroform, ether, acetone, and benzene

**Notes:**

1- If crystallization does not take place scratch the sides or the bottom of the container below the surface of the solution with in glass rod, add a small crystal of the pure compound, or evaporate some of solvent to induce the crystallization process.

2- The funnel, filter paper, and the container of the solution should be kept hot through out the filtration process to prevent the deposition of the crystals on the filter paper or on the neck of funnel. Therefore, it is recommended to wash the filter paper after completing the filtration process with a small amount of the hot solvent.

3- Use a minimum volume of the solvent to prevent the loss of the compound because large volumes of the solvent will keep most of the compound dissolved in it.