Chemistry Class 11 NCERT Solutions: Chapter 12 Organic Chemistry Some Basic Principles and Techniques Part 11

Q: 19. Describe the method, which can be used to separate two compounds with different solubilities in a solvent S.

Answer:

Fractional Crystallisation is the method used for separating two compounds with different solubilities in a solvent S. The process of fractional Crystallisation is carried out in four steps.

(A) Preparation of the solution:

The powdered mixture is taken in a flask and the solvent is added to it slowly and stirred simultaneously. The solvent is added till the solute is just dissolved in the solvent. This saturated solution is then heated.

(B) Filtration of the solution:

The hot saturated solution is then filtered through a filter paper in a China dish.

(C) Fractional Crystallisation:

The solution in the China dish is now allowed to cool. The less soluble compound crystallises first, while the more soluble compound remains in the solution. After separating these crystals from the mother liquor, the latter is concentrated once again. The hot solution is allowed to cool and consequently, the crystals of the more soluble compound are obtained.

(D) Isolation and Drying:

These crystals are separated from the mother liquor by filtration. Finally, the crystals are dried.

Q: 20. What is the difference between distillation, distillation under reduced pressure and steam distillation?

Answer:

The differences among distillation, distillation under reduced pressure, and steam distillation are given in the following table.

	Distillation	Distillation Under Reduced Pressure	Steam Distillation
1	It is used for the purification of compounds	This method is used to	It is used to purify an organic compound, which

	that are associated with non3volatile impurities or those liquids, which do not decompose on boiling. In other words, distillation is used to separate volatile liquids from non3volatile impurities or a mixture of those liquids that have sufficient difference in boiling points.	purify a liquid that tends to decompose on boiling. Under the conditions of reduced pressure, the liquid will boil at a low temperature than its boiling point and will, therefore, not decompose.	is steam volatile and immiscible in water. On passing steam, the compound gets heated up and the steam gets condensed to water. After some time, the mixture of water and liquid starts to boil and passes through the condenser. This condensed mixture of water and liquid is then separated by using a separating funnel.
2	Mixture of petrol and kerosene is separated by this method.	Glycerol is purified by this method. It boils with decomposition at a temperature of 593 K. At a reduced pressure, it boils at 453 K without decomposition.	A mixture of water and aniline is separated by steam distillation.

Distillation Types and Properties