

Chemistry Study Materials for Class 9 (NCERT Based notes of Chapter -02)

Ganesh Kumar

Date:- 22/05/2021

IS MATTER AROUND US PURE

EXERCISE QUESTIONS PAGE NO. 28 to 30

Q1. Which separation techniques will you apply for the separation of the following?

(a) Sodium chloride from its solution in water.

(b) Ammonium chloride from a mixture containing sodium chloride and ammonium chloride.

(c) Small pieces of metal in the engine oil of a car.

(d) Different pigments from an extract of flower petals.

(e) Butter from curd.

(f) Oil from water.

(g) Tea leaves from tea.

(h) Iron pins from sand.

(i) Wheat grains from husk.

(j) Fine mud particles suspended in water.

Answer:

(a) Sodium chloride from its solution in water → Evaporation

(b) Ammonium chloride from a mixture containing sodium chloride and ammonium chloride → Sublimation

- (c) Small pieces of metal in the engine oil of a car → Centrifugation or filtration or decantation
- (d) Different pigments from an extract of flower petals → Chromatography
- (e) Butter from curd → Centrifugation
- (f) Oil from water → Using separating funnel
- (g) Tea leaves from tea → Filtration
- (h) Iron pins from sand → Magnetic separation
- (i) Wheat grains from husk → Winnowing
- (j) Fine mud particles suspended in water → Centrifugation

Q2. Write the steps you would use for making tea. Use the words solution, solvent, solute, dissolve, soluble, insoluble, filtrate and residue.

Answer: First, water is taken as a solvent in a saucer pan. This water (solvent) is allowed to boil. During heating, milk and tea leaves are added to the solvent as solutes. They form a solution. Then, the solution is poured through a strainer. The insoluble part of the solution remains on the strainer as residue. Sugar is added to the filtrate, which dissolves in the filtrate. The resulting solution is the required tea.

Q3. Pragma tested the solubility of three different substances at different temperatures and collected the data as given below (results are given in the following table, as grams of substance dissolved in 100 grams of water to form a saturated solution).

Substance Dissolved	Temperature in K				
	283	293	313	333	353
Potassium nitrate	21	32	62	106	167
Sodium chloride	36	36	36	37	37
Potassium chloride	35	35	40	46	54
Ammonium chloride	24	37	41	55	66

(a) What mass of potassium nitrate would be needed to produce a saturated solution of potassium nitrate in 50 grams of water at 313 K?

(b) Pragma makes a saturated solution of potassium chloride in water at 353 K and leaves the solution to cool at room temperature. What would she observe as the solution cools? Explain.

(c) Find the solubility of each salt at 293 K. Which salt has the highest solubility at this temperature?

(d) What is the effect of change of temperature on the solubility of a salt?

Answer:

(a) At 313 K, 62 grams of Potassium nitrate dissolved in 100 grams of water.

So to produce a saturated solution of potassium nitrate in 50 grams

of water, we need $\frac{62}{100} \times 50 = 31$ grams of potassium nitrate

100

(b) Some soluble potassium chloride will separate out in the form of crystals at room temperature because the solubility of potassium chloride will decrease with decrease in temperature.

(c)

(i) Solubility of Potassium nitrate at 293 K is 32 grams.

(ii) Solubility of Sodium chloride at 293 K is 36 grams.

(iii) Solubility of Potassium chloride at 293 K is 35 grams.

(iv) Solubility of Ammonium chloride at 293 K is 37 grams.

The solubility of Ammonium chloride is highest at this temperature.

(d) The solubility of salt increases with increase in temperature
