Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER



Class–9

SCIENCE

Chapter – 2

IS MATTER AROUND US PURE

Part – 6

Exercise

Deeksha Pahilajani

Under CSR Support by ipca | Foundation

EXERCISE



1 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.

Under CSR Support by ipca | Foundation

EXERCISE

missiongyan LET'S LEARN TOGETHER



Answer :

(a) Sodium chloride from its solution in water.

→ Evaporation

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

Sublimable substance

→ Sublimation

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

→ Filtration

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

→ Chromatography

(e) Butter from curd.

→ Centrifugation

Under CSR Support by ipca | Foundation

EXERCISE



(f) Oil from water.

→ Separating funnel

(g) Tea leaves from tea.

→ Filtration

(h) Iron pins from sand.

→ Magnetic separation

(i) Wheat grains from husk.

→ Winnowing

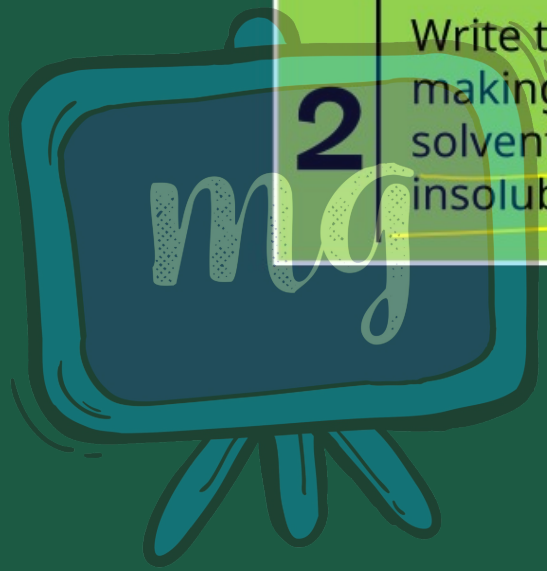
(j) Fine mud particles suspended in water.

→ Decantation and filtration

Under CSR Support by ipca | Foundation

EXERCISE





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

Under CSR Support by ipca | Foundation

EXERCISE



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

Answer :

1. Take a cup of water in a container as solvent and heat it.
2. Add sugar in it which is solute. Heat it till all sugar dissolves.
3. You get a solution of water and sugar.

Under CSR Support by ipca | Foundation

EXERCISE



4. Sugar is soluble in water completely.
5. Add half a tea-spoon of tea-leaves, it is insoluble in water.
6. Boil the contents, add milk which is also soluble in water, boil again.
7. Filter the tea with the help of strainer, the tea collected in cup is filtrate and the tea leaves collected on the strainer is residue.

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

EXERCISE



3 Pragya 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
	Solubility				
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

Under CSR Support by ipca | Foundation

EXERCISE



62 g → 100 g H_2O

50 g

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?

Substance Dissolved	Temperature in K				
	283	293	313	333	353
	Solubility				
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

Under CSR Support by ipca | Foundation

EXERCISE



Answer :

Mass of KNO_3, to produce a saturated solution of KNO_3 in water at 313 K = 62 g

∴ Mass of KNO_3 in 50 grams of water at 313 K

$$= \frac{62.0 \times 50}{100} = 31.0 \text{ g}$$

Under CSR Support by ipca | Foundation

EXERCISE



b Pragya makes a saturated solution of potassium chloride in water at 353 K and leaves the solution to coo! at room temperature. What would she observe us the solution cools? Explain.

Substance Dissolved	Temperature in K				
	283	293	313	333	353
	Solubility				
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

Under CSR Support by ipca | Foundation

EXERCISE



Answer :

Crystals of potassium chloride will be obtained on cooling solution.

Under CSR Support by ipca | Foundation

EXERCISE



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

Substance Dissolved	Temperature in K				
	283	293	313	333	353
	Solubility				
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

Under CSR Support by ipca | Foundation

EXERCISE



Answer : Solubility of each salt at 293 K is

(i) Potassium nitrate → 32 g

(ii) Sodium chloride → 36 g

(iii) Potassium chloride → 35 g

(iv) Ammonium chloride → 37 g

missiongyan LET'S LEARN TOGETHER

Under CSR Support by ipca | Foundation

EXERCISE



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

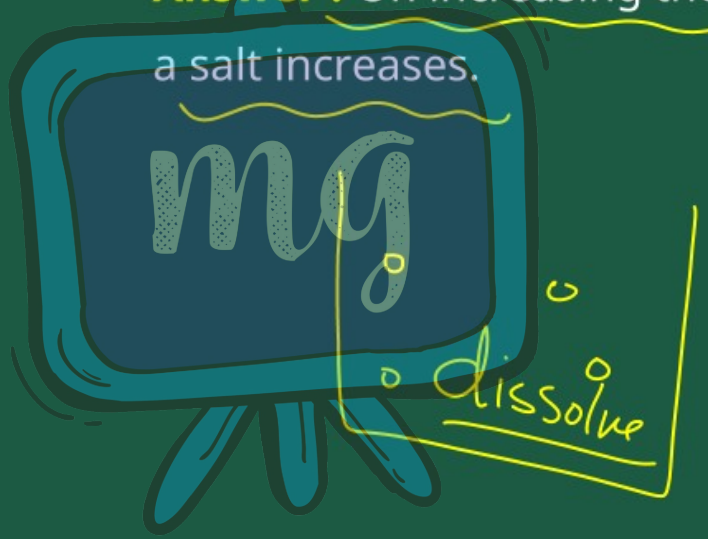
Substance Dissolved	Temperature in K				
	283	293	313	333	353
	Solubility				
Potassium nitrate	21	32	62	106	167
Sodium chloride	36	36	36	37	37
Potassium chloride	35	35	40	46	54
Ammonium chloride	24	37	41	55	66

Under CSR Support by ipca | Foundation

EXERCISE



Answer : On increasing the temperature, solubility of a salt increases.

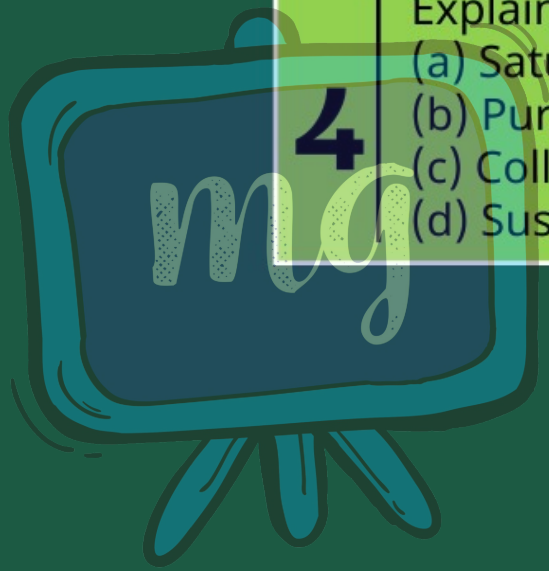


Under CSR Support by ipca | Foundation

EXERCISE

missiongyan LET'S LEARN TOGETHER





4 Explain the following giving examples:
(a) Saturated solution
(b) Pure substance
(c) Colloid
(d) Suspension

Under CSR Support by ipca | Foundation

EXERCISE

missiongyan LET'S LEARN TOGETHER



4 Explain the following giving examples:
(a) Saturated solution
(b) Pure substance
(c) Colloid
(d) Suspension

Answer :

(a) Saturated solution : In a given solution when no more solute can dissolve further at a given temperature is called saturated solution.

(b) Pure substance : A pure substance consists of a single type of particles. E.g., gold, silver.

Under CSR Support by ipca | Foundation

EXERCISE



(c) Colloid : A colloid is a solution in which the size of solute particles are bigger than that of true solution. These particles cannot be seen with our naked eyes, they are stable, e.g., milk, blood.

(d) Suspension : It is a heterogeneous mixture in which the solute particles are big enough to settle down, e.g., chalk-water, sand-water, etc.

Under CSR Support by ipca | Foundation

EXERCISE





5 Classify each of the following as a homogeneous or heterogeneous mixture:
soda water, wood, air. soil, vinegar, filtered tea.

Under CSR Support by ipca | Foundation

EXERCISE



5 Classify each of the following as a homogeneous or heterogeneous mixture:
soda water, wood, air, soil, vinegar, filtered tea.

Answer :

Homogeneous : Soda water, vinegar, filtered tea, air.

Heterogeneous : Wood, soil.

Under CSR Support by ipca | Foundation

EXERCISE

missiongyan LET'S LEARN TOGETHER





6 How would, you confirm that a colourless liquid given to you is pure water?

Under CSR Support by ipca | Foundation

EXERCISE



6 How would, you confirm that a colourless liquid given to you is pure water?

Answer :

By finding the boiling point of a given colourless liquid. If the liquid boils at 100°C at atmospheric pressure, then it is pure water. This is because pure substances have fixed melting and boiling point.

Under CSR Support by ipca | Foundation

EXERCISE



7 Which of the following materials fall in the category of a "pure substance"?

(a) Ice → Pure (H_2O)
(b) Milk → Mixture
(c) Iron → Pure
(d) Hydrochloric acid (HCl – Pure)
(e) Calcium oxide → Pure (CaO)
(f) Mercury → Pure
(g) Brick
(h) Wood
(i) Air

Under CSR Support by ipca | Foundation

EXERCISE

missiongyan LET'S LEARN TOGETHER



8 Identify the solutions among the following mixtures.

(a) Soil → Heterogeneous

(b) Sea water → Salt + H_2O → Solution

(c) Air

(d) Coal → Heterogeneous

(e) Soda water

Under CSR Support by ipca | Foundation

EXERCISE



9 Which of the following will show "Tyndall effect"?

(a) Salt solution

(b) Milk

(c) Copper sulphate solution

(d) Starch solution

Under CSR Support by ipca | Foundation

EXERCISE



10 Classify the following into elements, compounds and mixtures.

(a) Sodium → Element
(b) Soil → M
(c) Sugar solution → M
(d) Silver → E
(e) Calcium carbonate → C ($CaCO_3$)
(f) Tin → E
(g) Silicon → E
(h) Coal → M
(i) Air → M
(j) Soap → M
(k) Methane → C (CH_4)
(l) Carbon dioxide → C (CO_2)
(m) Blood → M