WORKSHEET 2

CHAPTER 3 – WATER

A. Tick (✓) the correct option.

1. If 30 g of the common salt is present in 150 mL of the solution, the concentration of solution is
   a. 30%. b. 25%. c. 20%. d. 15%.
2. Green vitriol is
   a. $ZnSO_4 \cdot 7H_2O$. b. $MgSO_4 \cdot 7H_2O$. c. $FeSO_4 \cdot 7H_2O$. d. $Fe_2(SO_4)_3 \cdot 7H_2O$.
3. Which of the following salts show minimal increase in solubility with increase in temperature?
   a. Slaked lime b. Sodium chloride c. Sodium sulphate d. Lead nitrate
4. The rate of dissolution of a solid in a given solvent can be increased by
   a. decreasing the temperature. b. increasing the quantity of the solute in the solution.
   c. agitating the solution. d. decreasing the surface area of the solute particles.
5. The percentage of dissolved nitrogen in water is
   a. 65%. b. 34%. c. 1%. d. 75%.

B. Fill in the blanks from the choices given within the brackets.

1. A solution which cannot dissolve more of the solute is called a/an _____ (saturated/unsaturated) solution.
2. A solution is a _____ (homogeneous/heterogeneous) mixture.
3. Bromine dissolved in carbon tetrachloride is an example of _____ (aqueous solution/non-aqueous solution)
4. _____ (Sodium chloride/Sodium sulphate) salt shows anamolous solubility.
5. _____ (Quick lime/Calcium hydroxide) acts as both hygroscopic as well as drying agent.

C. Give reasons for the following.

1. Blue vitriol when exposed to air loses its crystalline shape.
2. Oxygen is present in higher amounts than nitrogen in boiled off air.
3. Hard water is used in brewing industries.
4. Concentrated sulphuric acid is used as a dehydrating agent.
5. Permanent hardness cannot be removed by boiling the hard water.

D. Match the following.

1. Solute	Can dissolve more of the solute
2. Solvent	Universal solvent
3. Stirring and heating	Recovered from a solution by evaporation
4. Unsaturated solution	Recovered from a solution by distillation
5. Water	Help to dissolve a solute

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Class: IX Date: .....

E. Answer the following questions.

1. List the factors that affect the solubility of a solid in a solvent.
2. The solubility of NaCl at 40 °C is 36.59. What is meant by this statement?
3. Distinguish between efflorescence and deliquescence.
4. Why does anhydrous $CaCl_2$ used in a desiccator?
5. How does washing soda remove permanent hardness of water?

ANSWERS

WORKSHEET 2

A. Tick (✓) the correct option.

1. c
2. c
3. b
4. c
5. a

B. Fill in the blanks from the choices given within the brackets.

1. saturated
2. homogeneous
3. non-aqueous solution
4. Sodium sulphate
5. Quick lime

C. Give reasons for the following.

1. Blue vitriol contains five molecules of water of crystallisation which is responsible for its crystalline shape. But when it is exposed to air, it loses its water of crystallisation due to which it loses its crystalline shape.
2. The percentage of oxygen is higher than nitrogen in boiled off air because the solubility of oxygen in water is greater than that of nitrogen.
3. Hard water is used in brewing industries because dissolved salts in hard water give taste to the beer.
4. Concentrated sulphuric acid is used as a dehydrating agent because it can remove chemically combined water molecules from the compounds.
5. Permanent hardness cannot be removed by boiling the hard water because hard water contains soluble chlorides and sulphates of calcium and magnesium which cannot be decomposed or removed by simply boiling.

D. Match the following.

1. Solute	Recovered from a solution by evaporation
2. Solvent	Recovered from a solution by distillation
3. Stirring and heating	Help to dissolve a solute
4. Unsaturated solution	Can dissolve more of the solute
5. Water	Universal solvent

E. Answer the following questions.

1. The factors that affect the solubility of a solid in a solvent are
   i. The nature of the solute and the solvent.
   ii. Temperature.
   iii. Pressure.
2. The given statement suggests that 36.5 g of NaCl is dissolved in 100 g of water at 40 °C.
3.

Efflorescence	Deliquescence
Efflorescence is the phenomenon in which a substance on exposure to air, loses a part or whole of their water of crystallisation.	Deliquescence is the phenomenon in which a water soluble substance when exposed to air absorbs sufficient moisture from the air to completely dissolve in it and forms a saturated solution.
This occurs when vapour pressure in the hydrated substance is more than the atmospheric pressure.	This occurs when the vapour pressure of the substance is lower than the atmospheric pressure.

4. Anhydrous $CaCl_2$ is a drying agent which can readily absorb moisture from other substances without reacting chemically with them.

5. Washing soda reacts with soluble calcium and magnesium chlorides and sulphates in hard water to form insoluble carbonates which get precipitated.

$$CaCl_2 + Na_2CO_3 \longrightarrow CaCO_3 \downarrow + 2NaCl$$
$$MgCl_2 + Na_2CO_3 \longrightarrow MgCO_3 + 2NaCl$$
$$CaSO_4 + Na_2CO_3 \longrightarrow CaCO_3 \downarrow + Na_2SO_4$$
$$MgSO_4 + Na_2CO_3 \longrightarrow MgCO_3 \downarrow + Na_2SO_4$$