**CBSE Class 12 physics**
**Important Questions**
**Chapter 2**
**Solutions**

**1 Marks Questions**

**1. Define the term –solubility?**

**Ans.** The maximum amount of a substance that can be dissolved in a specified amount of solvent is called its solubility.

**2. What is the effect of pressure on solubility of a gas?**

**Ans.** The solubility of a gas increases with increases of pressure.

**3. State Henry's Law.**

**Ans.** Henry's Law states that at a constant temperature the solubility of a gas in a liquid is directly proportional to the pressure of the gas.

**4. State Raoult's Law.**

**Ans.** Raoult's Law states that for a solution of volatile liquids, the partial vapour pressure of each component in the solution is directly proportional to its mole fraction.

**5. What are the factors on which vapour pressure depends?**

**Ans.** The factors on which vapour pressure depends are –

1) Temperature of the liquid.      2) Nature of the liquid.

**6. The vapour pressure of solvent gets lowered, when a non- volatile solute is**

**added to it. Why?**

**Ans.** When a non-volatile solute is added to a solvent, the surface area for escape of solvent molecules decreases and vapour pressure gets lowered.

**7. Name two ways by which vapour pressure of a liquid can be lowered.**

**Ans.** The two ways by which vapour pressure can be lowered are –

1) By decreasing the temperature.

2) By adding a non- volatile solute.

**8. Define 'solution'?**

**Ans.** Solutions are homogeneous mixtures of two or more than two components.

**9. Define the following terms : (a) Molality (b) Molarity**

**Ans.** (a) Molality is defined as the number of moles of the solute per kilogram of solvent.

$$\text{Molality } (m) = \frac{Moles \text{ of solutes}}{Mass \text{ of solvent in Kg}}$$

(b) Molarity (M) = Number of moles of solute dissolved in one litre of solution.

$$\text{Molarity } (M) = \frac{No. \text{ of Moles of solute}}{Volume \text{ of solution in litre}} \text{ Molarity (M)}$$

**10. How does change in temperature changes the molarity and molality values?**

**Ans**. As the temperature increases, volume increases and molarity decreases whereas molality does not change with any change in temperature.

**11. Define the term colligative properties?**

**Ans.** The properties which depends upon amount of solute and not upon the nature of solute are called colligative properties.

**12. What are the possible deviations from ideal behaviors?**

**Ans.** There are two types of deviation from ideal behaviour – positive and negative deviations.

**13. Give one example of each deviation?**

**Ans**. Positive deviation – ethanol and acetone.

Negative deviation – chloroform and acetone.

**14. At** $400^0 C$ **, the vapour pressure of water is 55.3 mm Hg .Calculate the vapour pressure at the same temperature over 10% aqueous solution of urea** $\left[ CO\left( NH_2 \right)_2 \right]$**?**

**Ans.** 53.48 mm Hg.

**15. How much urea (molar mass 60 g/mol) should be dissolved in 50g of water so that its vapour pressure at room temperature is reduced by 25%?**

**Ans.** 41.7 g .

**16. Why is the boiling point elevated when a non – volatile solute is dissolved in a liquid?**

**Ans.** When a non – volatile solute is added the vapour pressure decreases and the solution is heated to a higher temperature, increasing the boiling point.

**17. How is boiling point changed when mass of solvent is doubled?**

**Ans.** $\Delta T_b = K_b \dfrac{Wsolute}{Wsolvent} \times \dfrac{1000}{Msolute}$

= when the amount of solvent is doubled, ΔTb is halved.

**18. What happens when red blood cells are placed in 0.1% NaCl solution?**

**Ans.** Water from NaCl solution passes into cells &they swell. Finally they will burst.

**19. How is osmotic pressure of a solution related to its concentration?**

**Ans**. Osmotic pressure, π = CRT

C = concentration ,R = gas constant.

T= temperature

**20. Calculate the osmotic pressure of 0.25 M solution of urea at** $37^0 C$**. R = 0.083 L**

**bar/mol/k.**

**Ans.** T = $37^0C$ = 310k

$$T_1 = CRT = \frac{n}{v} \, RT$$

$= 0.25 \times 0.083 \times 310$ = 6.43 bar.

**21. An aqueous solution of glucose, $C_6H_{12}O_6$ has osmotic pressure of 2.72 atm at 298k. How many moles of glucose were dissolved per litre of solution?**

**Ans.** 0.111 mol.

**22. When does the measurement of colligative property leads to abnormal molecular mass?**

**Ans**. When the solute undergoes either association or disassociation abnormal molar mass is obtained.

**23. When is the value of i less then unity?**

**Ans**. When the solute under goes association in solution, I is less then unity.

**24. The molecular mass of a solute is 120 g/mol and van't Hoff factor is 4. What is its abnormal molecular mass?**

**Ans.** Abnormal molecular mass = $\dfrac{\text{Normal moleculer mass}}{i}$

$= \dfrac{120}{4} = 30$ g/mol .