Chapter 8
SOLUTIONS

INTRODUCTION

1. German silver is mixture of - (3)
2. Bronze is a mixture of - (2)
3. ____ ppm of fluoride ions prevents tooth decay.
4. ____ ppm of fluoride ions mottling of tooth.
5. In chloroform mixed with nitrogen gas, what is the physical state of solute and solvent ?
6. ____% (v/v) solution of _____ is used as antifreeze in cars for cooling the engine. (NEET)
7. Unit commonly used in medicine and pharmacy is -
8. Define Volume percentage (V/V).
9. Define Mass by volume percentage (w/V).
10. Define ppm.
11. Define Molarity.
12. Molality(m) = Moles of solute/Mass of solution in kg T/F
13. Molality is dependent on temperature. T/F (NEET)
14. Molarity is independent of temperature. T/F (NEET)

SOLUBILITY & VAPOUR PRESSURE

15. A polar solvent dissolves a nonpolar solute very easily. T/F
16. Some solute particles in solution collide with the solid solute particles and get separated out of solution. This process is known as -
17. With rise in temperature, solubility can decrease. T/F
18. Higher the value of KH, higher is the solubility at a given pressure. T/F
19. Why are aquatic species more comfortable in cold waters rather than in warm waters ?
20. When dissolved in a solution, the gas molecules are converted to liquid phase. T/F
21. Write Henry Law.
22. Write Raoult's law.
23. Henry law is a special case of Raoult's law. T/F

IDEAL & NON-IDEAL SOLUTIONS

24. The 2 important properties of ideal solutions are - (NEET)
25. Ex. of ideal solutions are - (3) (NEET)

26. Vapour pressure of non-ideal solution can be higher than predicted. T/F
27. The solutions which show negative deviation have stronger solute-solute and solvent-solvent interaction than solute-solvent interaction. T/F (NEET)
28. Ethanol and acetone mixture show positive/negative deviation. (NEET)
29. NCERT ex. of positive deviation are - (2) (NEET)
30. NCERT ex.. of negative deviation are - (2) (NEET)
31. Phenol-aniline & CHCl3-acetone show negative deviation because -
32. What are azeotropes ?
33. Solutions which show large negative deviations from Raoult's law form maximum boiling azeotrope/minimum boiling azeotrope. (NEET)
34. Azeotrope of HNO3-water has ___% HNO3 and ___% water with a boiling point of ____ K.

COLLIGATIVE PROPERTIES

35. What are colligative properties ?
36. Freezing point and boiling point are colligative properties. T/F
37. Equation of relative lowering of vapour pressure -
38. Equation of elevation of boiling point -
39. Eq. of depression of freezing point -
40. Eq. of osmotic pressure -
41. Cryoscopic constant is -
42. Ebullioscopic constant is -
43. Unit of Kf is -
44. Kf (in terms of M, Tf, $\Delta_{fus}H$) =
45. Kb (in terms of M, Tf, $\Delta_{vap}H$) =
46. Process of flow of the solvent is called -
47. Technique of osmotic pressure for determination of molar mass is particularly useful for molecules like - (2)
48. Membranes used in reverse osmosis are made up of -
49. Van't Hoff factor, i = Abnormal molar mass/Normal molar mass. T/F
50. Pure water can be obtained from sea water by - (NEET)
51. If the molality of the dilute solution is doubled, the value of Kf becomes half. T/F (NEET)

ANSWERS

• INTRODUCTION

1. Cu, Zn, Ni
2. Cu, Sn
3. 1 ppm
4. 1.5 ppm
5. Solute - Liquid, Solvent - Solid
6. 35%, ethylene glycol
7. w/V
8. Volume % = (Volume of the component/Total volume of solution) x 100
9. mass of solute dissolved in 100 mL of the solution
10. Number of parts of the component x 10^6/ Total number of parts of all components of the solution
11. Molarity = Moles of solute/Volume of solution in litre
12. F
13. F
14. F

• SOLUBILITY, VAPOUR PRESSURE

15. F
16. Crystallisation
17. T
18. F
19. Because solubility of O2 is more in cold water than warm water
20. T
21. $P = K_H X$
22. $p_1 = p^\circ_1 x_1$. Hence by using Dalton's law of partial pressure, we arrive at equation $P_t = p^\circ_1 \times 1 + p^\circ_2 \times 2$
23. F

• IDEAL & NON-IDEAL SOLUTIONS

24. $\Delta mixH = 0$, $\Delta mixV = 0$
25. n-hexane and n-heptane, bromoethane and chloroethane, benzene and toluene
26. T
27. F
28. Positive
29. Ethanol-acetone, CS2-acetone
30. Phenol-aniline, CHCl3-acetone
31. They form hydrogen bonds with each other
32. binary mixtures having the same composition in liquid and vapour phase and boil at a constant temperature
33. Maximum boiling azeotrope
34. 68%, 32%, 393.5 K

• COLLIGATIVE PROPERTIES

35. Properties which depend on the number of solute particles irrespective of their nature.
36. False, depression in freezing and elevation in boiling point are colligative properties, i.e. that change (ΔTb or ΔTf) is colligative property, not the temp (Tb or Tf) itself. Same is true for vapour pressure.
37. $\Delta p_1/p_1 = i\, n_2/n_1$
38. $\Delta Tb = i\, Kb\, m$
39. $\Delta Tf = i\, Kf\, m$
40. $\pi(P) = CRT$
41. Kf
42. Kb
43. K kg/mol
44. R x Molar mass of solvent x Tf2/(1000 x $\Delta fusH$)
45. R x Molar mass of solvent x Tb2/(1000 x $\Delta vapH$)
46. Osmosis

47. Biomolecules - proteins, polymers etc
48. Cellulose acetate
49. F
50. Reverse osmosis
51. F, it remains unchanged