

SOLUTIONS

1. Give an example of liquid in solid solution. 1
2. Give an example of solid in gas solution 1
3. Which method of expressing concentration is used to express:-
(a) concentration of pollutants in air or water 1
(b) concentration of medicines in pharmacy. 1
4. Out of M and m, which is a better method of expressing concentration and why? 1
5. Out of 1M and 1m, which solution is more concentrated and why? 1
6. Presence of glucose in water decreases the vapour pressure of glucose solution. Why? 1
7. Draw a plot of vapour pressure Vs mole fraction for a solvent in solution containing nonvolatile solution. 1.
8. Raoult's Law is a special case of Henry's Law, Justify. 1
9. What type of equilibrium exists in a solution of solid solute in liquid solvent at saturation point? 1
10. What is the effect of increase in temperature on solubility of NaCl in water given $\Delta_{\text{sol}}H = +ve$? 1
11. What is the sign of enthalpy change for dissolution of a gas in liquid? 1
12. What type of deviation from Raoult's Law is expected in a binary solution containing:-
(a) H₂O and HCl (b) Acetone and CS₂
Explain on the basis of interactions 2
13. On what factor does the value of K_b and K_f depend? How can the values of K_b and K_f be calculated using thermodynamic quantities? 3
14. A 0.004 M solution of Na₂SO₄ is isotonic with 0.01 M solution of glucose at same temperature. Calculate degree of dissociation of Na₂SO₄. 2
15. A solution of urea in water boils at 100.18⁰c at atmospheric pressure. If K_f and K_b for water are 1.86 and 0.52 Kkgmol⁻¹, what will be the freezing point of this solution? 2
16. Solution A contains 6 g of urea in 100 ml solution at 27⁰C while solution B contains 6 g of acetic acid in 100 ml at the same temp. Are the two solutions equimolar as well as isotonic? Justify. 2
17. What are the characteristics of an azeotropic mixture? What type of azeotropic mixture will be formed by:- (a) Alcohol and water (b) Acetone and aniline 3
18. Give reasons for the following: - 1
x 6
(a) Fishes do not grow well in warm water.
(b) Calcium chloride is used to clear snow in cold countries.
(c) RBC burst when placed in contact with 0.1% NaCl solution.
(d) Out of all colligative properties, osmotic pressure is used to determine M_B of macromolecules.
(e) Climbers usually develop symptoms of "ANOXIA"
(f) People eating lot of salty food suffer from "EDEMA"
19. Complete the following: - 1x 5
(a) Depression in freezing point for 1M urea, 1M glucose and 1M NaCl are in ratio _____
(b) In a dilute solution i for K₄ [Fe (CN)₆] is _____
(c) Vant Hoff factor for Ba (NO₃)₂ solution is 2.74, its degree of dissociation is _____
(d) Value of i for 0.1 m of NaCl is _____ than that for 0.001 m NaCl solution.
(e) K_H for He > K_H for Ar ∴ solubility of _____ is higher