ASSIGNMENT- 2

SOLUTIONS

(Q1 – Q10) Given below are four options against each question. Choose the option which you consider the most appropriate as your answer.

Q1.   Which of the solutions is an example of non- ideal solution?
   (a) n- hexane + n – heptanes   (b) benzene and toluene
   (c) bromoethane + chloroethane   (d) none of these

Q2. Which of the following is a colligative property?
   (a) surface tension   (b) viscosity
   (c) osmotic pressure   (d) boiling point

Q3. The number of moles of NaCl in 5 litres of of 2 M solution is:
   (a) 1   (b) 3
   (c) 10   (d) 27

Q4. Pressure cooker reduces cooking time because
    (a) The heat is more evenly distributed
    (b) The higher pressure tenderizes the food
    (c) The boiling point of water inside is elevated
    (d) A larger flame is used

Q5. Osmotic pressure is measured quickly and accurately by
    (a) Berkeley and Hartley method
    (b) Morse's method
    (c) Pfeffer's method
    (d) De varies method

Q6. Which has the highest freezing point?
    (a) 1 M glucose   (b) 1 M NaCl
    (c) 1 M $CaCl_2$ (d) 1 M AlF_3

Q7. A10 % solution of urea is isotonic with 20% solution of 'X' at same temperature. Molecular weight of 'X' will be;
   (a)120 g mol^{-1} (b) 60 g mol^{-1}
   (c) 80 g mol^{-1} (d) none of these.

Q8. Measurement of which colligative property is preferred for determination of molar mass?
   (a) relative lowering of vapour pressure   (b) osmotic pressure
   (c) elevation of boiling point   (d) depression of freezing point

Q9. Colligative properties depend upon :
    (a) no. of particles   (b) nature of particle
    (c) both of these   (d) none of these

Q10. Solutions which distil without change in composition are called
    (a) amorphous   (b) azeotropic mixture
    (c) ideal   (d) supersaturated

Q11. What do you mean by ideal solution? Give any two examples.

Q12. How is vapour pressure of solvent affected when a non- volatile solute is added to it?

Q13. Find the boiling point of a solution containing 0.50 g of glucose ($C_6H_{12}O_6$) dissolved in 80.2 g of water. [Given K_b for water is 0.52K kg mol^{-1}].

Q14. 100 g of a non- electrolyte solution dissolved in 50 g of benzene lowered the freezing point of benzene by 0.40 K. The freezing point depression constant of benzene is 5.12 K kg mol^{-1}. Find the molar mass of the solute.

Q15. Explain abnormal molar mass giving example of potassium chloride and acetic acid.

Q16. (a) Explain why a solution of chloroform and acetone shows negative deviation from Raoult's law.
      (b) Phenol associates in benzene to certain extent to form a dimer. A solution containing 20 g of phenol in 1.0 kg of benzene has its freezing point lowered by 0.69 K. Calculate the fraction of phenol that has dimerised. [Given K_f for benzene is 5.1 Km^{-1}].

Q17. (i) Define the following terms:
    (a) Azeotropes   (b) Osmotic pressure
    (ii) Calculate the molarity of 9.8% (w/w) solution of H_2SO_4, if the density of the solution is 1.02 g m L^{-1}. (Molar mass of sulphuric acid is 98 g mol^{-1}).

Q18. 2g of benzoic acid (C_6H_5COOH) dissolved in 25 g of benzene shows a depression in freezing point equal to 1.62 K. Molal depression constant of benzene is 4.9 K kg mol^{-1}. What is the percentage association of acid, if it forms dimer in solution?

Q19. With the help of a neat diagram describe reverse osmosis. How can water be purified by this process? Explain its importance in the context of gulf countries.

Q20 Explain the positive and negative deviation from ideal behaviour with the help of a neat diagram.

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