Chemistry Worksheet on Chapter 2 Solutions -Set 2

Q-1: In the mixture obtained by mixing 25.0 mL of 1.2×10^{-3} M $MnCl_2$ and 35.0 mL of 6.0×10^{-4} M KCl solution, calculate the concentration(M) of Mn^{2+}, K^+, and Cl^- ions.

Q-2: The freezing point constant for water is 1.86 K(mol/kg)$^{-1}$. The freezing point when 0.01 mol of glucose is added to 1 kg of water is

a) 1.86 K
b) -1.86 K
c) 0.0186 K
d) -0.0186 K

Q-3: How liquid-liquid solutions are classified according to Rault's law?

Q-4: Identify the type of deviation shown by following solutions from Raoult's law?
   a) $CS_2 + CH_3COCH_3$
   b) Phenol + Aniline
   c) $CHCl_3 + CH_3COCH_3$

Q-5: Which of the following is correct for degree of dissociation,α for a electrolyte A_xB_y?

a) $$\alpha = \frac{i-1}{x+y-1}$$

b) $$\alpha = \frac{1-i}{1-x-y}$$

c) i= (1-α)+xα + yα
d) None of the above

Q-6: a) Define the term dissolution.
b) How does the solubility of solid in liquid vary with temperature if the dissolution process is endothermic?

Q-7: At the same temperature, a 0.004 M solution of Na_2SO_4 is isotonic with a 0.010 M solution of glucose. Na_2SO_4's apparent degree of dissociation is
a) 25%
b) 50%
c) 75%

d) 85%

Q-8: 35% by mass of HCl solution has density 1.46g/mL. Find the molarity.

Q-9: Two eggs' outer shells are removed. One egg is immersed in pure water, while the other is immersed in a saturated NaCl solution. What will be observed and why will it be observed?

Q-10: Find the osmotic pressure (in atm) of a mixture in which 2g of a protein having molar mass 6 Kg is present in 2 mL solution at 27°C.(Round off to the nearest integer)

Q-11: Why is the boiling point of a solution higher than that of a pure liquid?

Q-12: The molecular weight of benzoic acid in benzene as determined by depression in freezing point corresponds to
a) trimerization of benzoic acid
b) dimerization of benzoic acid
c) ionisation of benzoic acid
d) None of the above

Q-13: Which of the statements below is true?
a) The boiling point of a solution decreases as the amount of solute increases.
b) Adding more solvent lowers the freezing point of the solution.
c) Adding more solute raises the freezing point of the solution.
d) As the solute concentration increases, the freezing point of the solution decreases.

Q-14: Why is it recommended to mix ethylene glycol into the water in a car radiator in a hill station?

Q-15: The boiling point of a solution containing 1.8 g of glucose in 100 g of solvent rises by 0.1°C. Determine the liquid's molal elevation constant.

Q-16: In one litre of water, one mole of urea, glucose, and sodium chloride were dissolved. Solutions of which will generate equal osmotic pressure,
   a) Glucose and sodium chloride
   b) Urea and glucose
   c) Sodium chloride and Urea
   d) Water and Sodium chloride

Q-17: Which of the following represents a solid solution?
a) Camphor in nitrogen gas
b) Solution of hydrogen in palladium
c) Glucose dissolved in water

d) None of the above

Q-18: What is the mass of a nonvolatile solute (molar mass=45g/mol) that should be dissolved in 90g of water to reduce its vapour pressure by 75%?

Q-19: In medicine and pharmacy, which concentration unit is most commonly used?

Q-20: When scuba divers approach the surface, the pressure gradually decreases, causing the release of dissolved gases and the formation of bubbles of N_2 gas in the blood, which block the capillaries and cause bends. The air is diluted with helium to avoid bends and the toxic effects of high concentrations of N_2 gas.
Answer the following questions after reading the preceding passage:
(a) How does the use of helium alleviate the harmful condition of bends?
(b) Which of the laws is used to calculate the concentration of gases in solution?
(c) Which gas has less value of K_H , O_2 or He, and why ?
d) Mention the value associated with providing divers air diluted with helium.