THEORY OF DILUTE SOLUTIONS & COLLOIDS

Q. 1 **Which of the following colligative property can provide molar mass of proteins (or polymers of colloids) with great precision?**

1. Elevation in Boiling point
2. Relative lowering of Vapour pressure
3. Depression in freezing point
4. Osmotic pressure

Q. 2 **Which of the following is not colligative property for the cane suger solution which results in**

1. Increase in the b. p. of water

2. Decrease in the f. p. of water

3. Decrease in angle of rotation on adding dil. HCl

4. Decrease in v. p. of water

Q. 3 **Two solutions A and B are separated by a semi-permeable membrane. The vapour pressure of A is lower than that of B. Then**

1. **No flow will occur**

2. **Rate of flow of A and B are same**

3. **More solvent will flow from B to A**

4. **More solvent will flow from A to B**

Q. 4 **Which of the following liquids shows a positive deviation from Raoult's law?**

1. Water – Hydrochloric acid

2. Benzene – Methanol

3. Water – Nitric acid

4. Acetone – Chloroform

Q. 5 34.2 g of cane sugar is dissolved in 180 g of water. The relative lowering of vapour pressure will be

1. 0.0099
2. 1.1597
3. 0.840
4. 0.9901

Q. 6 Which of the following has highest boiling point?

1. 1M NaCl
2. 1M MgCl$_2$
3. 1M Urea
4. 1M Glucose.

Q.7 **The b. p of a solution of 0.11 g of a substance in 15 g of ether was found to be 0.1^0 C higher than that of pure ether. The molecular mass of the substance is (K_b = 2.16)**

    1. 148

    2. 158

    3. 168

    4. 178

Q. 8 Which of the following aqueous solution has the highest freezing point?

1. 0.1M HCl
2. 0.05M Sucrose
3. 0.1M Glucose
4. 0.1M NaCl

An aqueous solution of a non-electrolyte solute boils at 100.52^{0}C. The freezing point of the solution will be

1. 0^{0}C

2. −1.86^{0}C

3. 1.86^{0}C

4. 0.52^{0}C

Q. 10 **The molal elevation constant is the ratio of the elevation in B.P to**

1. **Molarity**
2. **Molality**
3. **Mole fraction of solute**
4. **Mole fraction of solvent.**

Q. 11 Benzene (p^o = 160 mm) and toluene (p^o = 68 mm) form ideal solution at certain temperature with mole fraction of benzene as 0.2. The vapour pressure of solution will be

1. 220 mm
2. 86.4 mm
3. 160 mm
4. 100mm

Q. 12 A plant cell is likely to shrink when kept in

1. Hypotonic solution

2. Hypertonic solution

3. Isotonic solution

4. Water

Q. 13 **Osmotic pressure of the solution can be increased by**

1. Increasing temperature

2. Decreasing temperature

3. Increasing the volume of the vessel

4. Diluting the solution.

Q. 14 **If liquid A and B form a ideal solution,**

1. The entropy of mixing is zero

2. Free energy of mixing is zero

3. Free energy as well as entropy of mixing is zero

4. Enthalpy of mixing is zero

Q. 15 Select the pair that will not form an ideal solution

1. $C_6H_6 + CCl_4$
2. $C_2H_5Br + C_2H_5I$
3. $C_6H_6 + C_6H_5CH_3$
4. $(CH_3)_2CO + CCl_4$

Q.16 **The osmotic pressure of 0.1M sodium chloride solution at 27^{0}C is**

1. 4.0 atm
2. 2.46 atm
3. 4.92 atm
4. 1.23 atm

Q. 17 The v.p of water at 20^0C is 17.5mm of Hg. If 18 g of glucose is added to 178.2g of water at 20^0 C, the v.p. of the resulting solution will be

1. 17.325 mm Hg

2. 17.675 mm Hg

3. 15.750

4. 16.500 mm Hg

Q. 18 12 g of urea is dissolved in 1 litre of water and 68.4 g of sucrose is dissolved in 1litre of water. The lowering of vapour pressure of first case is

1. Equal to second

2. Greater than second

3. Less than second

4. double that of second

Q. 19 **Which of the following aqueous solution will exhibit highest boiling point?**

1. 0.015M Urea
2. 0.01M KNO_3
3. 0.01 Na_2SO_4
4. 0.015M glucose

Q. 20 **The azeotropic mixtures of water and HCl boils at 108.5º C. When this is distilled, it is possible obtain**

1. Pure HCl

2. Pure water

3. Pure water as well as pure HCl

4. Neither HCl nor water in their pure state

Q. 21 **The osmotic pressure of 5% solution of cane suger at 150ºC is**

1. 3.47
2. 5.07
3. 2.09
4. 4.03

Which of the following is not colligative property?

1. ΔT_f

2. π

3. ΔT_b

4. K_b

On adding a solute a solvent having vapour pressure 0.80 atm, vapour pressure reduces to 0.60 atm. Mole fraction of solute is

1. **0.25**

2. **0.75**

3. **0.50**

4. **0.33**

Q. 24 **A 5% solution of suger is isotonic with 1% solution of substance X. The molecular mass of X is**

1. 34.2

2. 171.2

3. 68.4

4. 136.8

Q. 25 According to Raoult's law, The relative lowering of vapour pressure for solution is equal to

1. Moles of solute

2. Moles of solvent

3. Mole fraction of solute

4. Mole fraction of solvent

Q. 26 The process of passing precipitate in to colloidal solution on adding an electrolyte is called

1. Dialysis
2. Peptisation
3. Adsorption
4. Absorption

Q. 27 **Which one of the following is not a colloid?**

1. Ruby glass

2. Chlorophyll

3. Hemoglobin

4. Smoke

Q.28 **Purification of blood in the body is based upon the phenomenon is**

1. Electrophoresis
2. Electro osmosis
3. Dialysis
4. Coagulation

Q. 29 Which of the following is homogeneous system?

1. Blood
2. Muddy water
3. Solution of suger in water
4. Milk

Q. 30 **The coagulating power electrolytes for arseneous oxide decreases in the order**

1. Na^+, Al^{3+}, Ba^{2+}
2. Na^+, Ba^{2+}, Al^{3+}
3. Al^{3+}, Ba^{2+}, Na^+
4. Ba^{2+}, Na^+, Al^{3+}

Q. 31 **Alum purifies muddy water by**

1. Coagulation
2. Dialysis
3. Peptisation
4. Emulsification

Q. 32 Cottrell precipitator works on the principle of

1. Distribution law
2. Neutralization of charge on colloids
3. Lechatelier's principle
4. Addition of electrolytes

Q. 33 Cellulose dispersed in ethanol is called

1. Emulsion
2. micelle
3. collodion
4. hydrophilic sol

Q. 34 **Which of the following is an example of associated colloid?**

1. Protein + water
2. Soap + water
3. Rubber + benzene
4. As_2O_3 + $Fe(OH)_3$

Q. 35 Metal alloys belong to which type of colloid?

1. Sol
2. Gel
3. Foam
4. Emulsion

Q. 36 **Among the electrolytes Na_2SO_4, $CaCl_2$, $Al_2(SO_4)_3$ and NH_4Cl, the most effective coagulating agent for Sb_2S_3 sol is**

1. Na_2SO_4
2. $CaCl_2$
3. $Al_2(SO_4)_3$
4. NH_4Cl

Q. 37 **Which of the following represents a multimolecular colloidal particles?**

1. Sol of sulphur
2. Starch
3. Soaps
4. Proteins

Q. 38 When a small amount of $FeCl_3$ is added to freshly precipitated $Fe(OH)_3$, a reddish brown colloidal solution is obtained. This phenomenon is called

1. Dialysis
2. Peptisation
3. Protection
4. Dissolution

Q. 39 Lyophilic sols are most stable than lyophobic sols because:

1. Colloidal particles have +ve charge

2. Colloidal particles have -ve charge

3. The colloidal particles are solvated

4. There are strong electrostatic repulsions

Q. 40 Water loving colloids are called as:

1. **Hydrophilic**
2. **Hydrophobic**
3. **Lyophobic**
4. **Lyophillic**

Q. 41 All colloids are

1. Are suspensions of one phase in another
2. Are two phase system
3. Contains only water soluble particles
4. Are true solutions

Q. 42 Gold number gives an indication of

1. Protective nature of colloids
2. Purity of gold in suspension
3. Charge on colloidal solution of gold
4. Number of moles of gold per liter.

Q. 43 **A dispersion of silver chloride in water is**

1. **Hydrophilic colloid**
2. **An emulsion**
3. **Alcosol**
4. **Hydrophobic colloid**

Q. 44 The ability of ion to bring about coagulation of given colloid depends on

1. Its charge

2. Sign of the charge alone

3. Magnitude of the charge

4. Both magnitude and sign of the charge

Q. 45 **Brownian moment is observed in**

1. Suspension
2. Colloidal solution
3. Saturated solution
4. Unsaturated solution.

Q. 46 Which of following is used for ending charge on colloidal solution?

1. Electrons

2. Electrolytes

3. Positively charged ions

4. Compounds

Q. 47 A colloidal dispersion of one liquid in another is called

1. Gel

2. Emulsion

3. Demulsification

4. Aerosol

Q. 48 **Cloud is an example of**

1. **Solid dispersed in gas**
2. **Liquid dispersed in gas**
3. **Liquid dispersed in solid**
4. **Solid dispersed in liquid**

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Q. 49 **Soap forms colloidal solution in water and removes the greasy matter by**
  1. Adsorption
  2. Absorption
  3. Coagulation
  4. Emulsification

Q. 50 **Protective action of different colloids is expressed in terms of**

1. **Oxidation Number**

2. **Atomic number**

3. **Gold number**

4. **Avogadro number**