

**ASSIGNMENT OF CHEMISTRY**  
**XII SCIENCE**  
**HHW- SUMMER BREAK (2024)**  
**Chapters - 1&2 of NCERT Book**

Q-1 A solution is prepared by dissolving 1.25 g of oil of winter green ( methyl salicylate) in 99 g of benzene has boiling point  $80.31^{\circ}\text{C}$  and  $K_b$  for benzene is  $2.53\text{ K kg mol}^{-1}$ . Find molar mass of the solute. Boiling point of benzene is  $80^{\circ}\text{C}$ .

Q-2 A 5% solution (by mass) of cane sugar in water has a freezing point of  $271\text{K}$ . Calculate the freezing point of 5% (by mass) glucose solution in water .

Q-3 Calculate the freezing point depression expected for  $0.0711\text{ m}$  aqueous solution of  $\text{Na}_2\text{SO}_4$  .If it actually freezes at  $0.320^{\circ}\text{C}$ , what would be the value of Van't Hoff factor ?

Q-4 What is the advantage of using osmotic pressure as compared to other colligative properties for the calculation of molar masses of solutes in solutions?

Q-5 Give reasons –

- (I) Measurement of osmotic pressure is preferred for determination of molar masses of Polymers and Biomolecules like proteins.
- (II) Aquatic animals are comfortable in cold water.
- (III) Boiling point of  $1\text{M KCl}$  solution is greater than that of  $1\text{ M Glucose}$  solution
- (IV) When dehydrated fruits and vegetables are placed in water, they slowly swell and return to original shape. Why? What is effect of temperature on this process? Explain.

Q-6 ( I) What is Van't Hoff factor?

(II) Why value of vant'hoff factor for ethanoic acid in benzene close to 0.5.

Q-7 Observe Electrochemical series given in NCERT –

i) Construct five electrochemical cells using different electrodes.

ii) Give cell representation and calculate standard EMF of cell at  $298\text{ K}$ .

iii) Arrange the cells in increasing order of their cell potential. Also compare which will be most expensive