ACHIEVERS FOUNDATION

Class – XII (CBSE)

Subject – CHEMISTRY

SOLUTIONS Worksheet - 1

1. The term cryoscopy is used
   (a) depression of freezing point (b) elevation in boiling point
   (c) lowering of vapour pressure (d) osmotic pressure
2. The term ebullioscopy is used
   (a) depression of freezing point (b) elevation in boiling point
   (c) lower of vapour pressure (d) none of above
3. Azeotropic mixture
   (a) obey Henry's law (b) obey Raoult's law
   (c) do not obey Raoult's law (d) obey Dalton's law
4. Which of the following mixtures of liquids show negative deviation
   (a) ethyl alcohol- ether (b) HCl and water
   (c) CCl_4 – water (d) chlorobenzene – bromobenzene
5. Mole fraction of 10% urea is
   (a) 0.042 (b) 0.023 (c) 0.032 (d) 0.072
6. Which of the following solutions has the highest boiling point?
   (a) 5.85% solution of NaCl (b) 18.0% solution of glucose
   (c) 6.0% solution of urea (d) all have same boiling point
7. Molarity of pure water is
   (a) 1 (b) 18 (c) 55.5 (d) 6
8. The molar boiling point constant is the ratio of the elevation in boiling point to
   (a) molarity (b) molality (c) mole fraction of solvent (d) less than that of water
9. An aqueous solution of methanol in water has vapour pressure
   (a) equal to that of water (b) equation to that of methanol
   (c) more than that of water (d) less than that of water
10. An azeotropic mixture of two liquids boils at a lower temperature than either of them when
    (a) it is saturated (b) it shows positive deviation from Raoult's law
    (d) it is stable (c) it shows negative deviation from Raoult's law
11. The sum of mole fractions (X) of components of a solution is equal to
    (a) 100 (b) 200 (c) one (d) zero
12. Which pair of mixture is called idea solution
    (a) carbon tetrachloride–toluene (b) benzene - toluene
    (c) water–ether (d) water–alcohol
13. 12g of Urea is dissolved in 1L of water and 68.4g sucrose is dissolved in 1L of water. Relative lowering of vapour pressure of Urea solution is:

(a) Greater than sucrose solution

(b) Less than sucrose solution

(c) Double that of sucrose solution

(d) Equal to that of sucrose solution

Solve the following Numerical:

1. How much urea (mol. mass 60 g mol–1) must be dissolved in 50 g of water so that the vapour pressure at the room temperature is reduced by 25%? Also calculate the molality of the solution obtained.

   [Ans. : 55.55 g and 18.5 m]

2. Calculate the amount of ice that will separate out on cooling solution containing 50 g of ethylene glycol in 200 g H2O to –9.3°C. (Kf for water = 1.86 K kg mol–1)

   [Ans. : 38.71g]

Account for the following :–

(a) $CaCl_2$ is used to clear snow from roads in hill stations.

(b) Ethylene glycol is used as antifreeze solution in radiators of vehicles in cold countries.

(c) The freezing point depression of 0.01 m NaCl is nearly twice that of 0.01 m glucose solution.

Give reasons for the following :–

(a) RBC swell up and finally burst when placed in 0.1% NaCl solution.

(b) When fruits and vegetables that have been dried are placed in water, they slowly swell and return to original form.

(c) A person suffering from high blood pressure is advised to take less amount of table salt.