



CHEMISTRY

CH: 1 SOLUTIONS

Name: _____

Date: _____

Class: XII Sec: _____

Choose the correct answer

1. Low concentration of oxygen in the blood and tissues of people living at high altitude is due to : (2023)
(a) high atmospheric pressure
(b) low temperature
(c) low atmospheric pressure
(d) both low temperature and high atmospheric pressure
2. For an electrolyte undergoing association in a solvent, the Van't Hoff factor : (2023)
(a) is always greater than one
(b) has negative value
(c) has zero value
(d) is always less than one
3. In case of association the abnormal molar mass of the solute will (2024)
a) Increase b) Decrease c) No change d) First increases then becomes constant.
4. An unripe mango placed in a concentrated solution of salt will
a) will shrivel due to reverse osmosis b) will shrivel due to osmosis
c) will swell due to reverse osmosis d) will swell due to osmosis .
5. Van't Hoff factor for K_2SO_4 assuming it is completely dissociated (2024)
a) 5 b) 2 c) 3 d) 4

Answer the following

1. Aquatic species are more comfortable in cold water than warm water. Why?
2. At higher altitudes people suffer from anoxia resulting in inability to think. Why?
3. A and B liquids on mixing produced a cold solution. Which type of deviation is there and why?
4. What type of azeotropic mixture will be formed by a solution of acetone and chloroform? Justify on the basis of intermolecular interactions that develop in the solution.
5. Predict the state of solute in the solution in the following situations.
a) when i is found to be 0.4.
b) when i is found to be 4.
c) experimentally determined molar mass is more than true value
6. What is the advantage of using osmotic pressure as compared to other colligative properties for the determination of molar masses?
7. On mixing liquid X and liquid Y, volume of the resulting solution decreases. What type of



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deviation from Raoult's law is shown by the resulting solution? What change in temperature would you observe after mixing liquids X and Y ?

8. Will the elevation in boiling point be same for a 1M potassium chloride or 1 M glucose solution? Explain.
9. Henry's law constant K_H for the solution of CH_4 in benzene at 298 K is $4.27 \times 10^5 \text{ mm Hg}$. Calculate the solubility of methane in benzene at 298 K & 760 mm Hg.
10. Vapour pressure of water at 20°C is 17.5 mm Hg. Calculate the vapour pressure of water at 20°C when 15 g of glucose (Molar mass = 180 g mol^{-1}) is dissolved in 150 g of water.
11. A 1.00 molal aqueous solution of trichloroacetic acid is heated to its boiling point. The solution has a boiling point of 100.18°C . Determine the van't Hoff factor for trichloroacetic acid. K_b for water = $0.512 \text{ K kg mol}^{-1}$
12. An antifreeze solution is prepared by dissolving 31 g of ethylene glycol (Molar mass = 62 g mol^{-1}) in 600g of water. Calculate the freezing point of solution. (K_f for water = $1.86 \text{ K kg mol}^{-1}$).
13. A solution is prepared by dissolving 10 g of non-volatile solute in 200 g of water. It has a vapour pressure of 3184 mm Hg at 308 K. Calculate the molar mass of the solute. (Vapour pressure of pure water at 308 K = 32 mm Hg) (2024)
14.
 - (i) Ishan's automobile radiator is filled with 1.0 kg of water. How many grams of ethylene glycol (Molar mass = 62 g mol^{-1}) must Ishan add to get the freezing point of the solution lowered to -2.8°C . K_f for water is $1.86 \text{ K kg} \cdot \text{mol}^{-1}$.
 - (ii) What type of deviation from Raoult's law is shown by ethanol and acetone mixture ? Give reason.

(2024)

15.i) Boiling point of water at 750mm of Hg pressure is 99.68°C . How much sucrose (Molar mass 342 g/mol) is to be added to 500g of water such that it boils at 100°C .(K_f of water = 0.52 K kg/mol)

ii) State Henry's law and give one application . (2024)

Reasoning Assertion Questions

- (a) **Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.**



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(b) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.

(c) Assertion is correct, but reason is wrong statement.

(d) Assertion is wrong, but reason is correct statement.

1. Assertion: Molality is a better method to express concentration than molarity
Reason: Molality is defined in terms of mass of solvent and not mass of solution.
2. Assertion: Helium is mixed with nitrogen and oxygen in diving cylinders
Reason: Helium has comparatively low K_H value.
3. Assertion: Vapour pressure of a solution is more than that of the pure solvent.
Reason: The solute particles occupy certain area of the surface of the solution which reduces the amount of vapour.
4. Assertion: Lowering of vapour pressure is directly proportional to osmotic pressure of the solution.
Reason: Osmotic pressure is a colligative property.
5. Assertion: Ice containing dissolved sugar will melt at a higher temperature than pure ice.
Reason: Dissolving sugar in water leads to a depression in freezing point.
6. Assertion (A) : When NaCl is added to water a depression in freezing point is observed.
(2024)
Reason (R) : NaCl undergoes dissociation in water



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