



CHEMISTRY

BOOKS - NCERT FINGERTIPS CHEMISTRY (HINGLISH)

SOLUTIONS

Types Of Solution

1. Homogeneous mixture of two or more than two components is called

- A. solute
- B. solvent
- C. both (a) and (b)
- D. solution

Answer: D



2. Which of the following is an example of gaseous solution ?

- A. Camphor in nitrogen gas
- B. Solution of hydrogen in palladium
- C. Chloroform mixed with nitrogen gas
- D. Both (a) and (c)

Answer: D



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3. In amalgam of mercury with sodium, solvent is

- A. mercury
- B. sodium
- C. amalgam

D. none of these

Answer: B

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Expressing Concentration Of Solutions

1. What is the mass percentage of carbon tetrachloride if 22 g of benzene is dissolved in 122 g of carbon tetrachloride ?

A. 84.72 %

B. 15.28 %

C. 50 %

D. 44 %

Answer: A

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2. What is the mole fraction of glucose in 10% W/W glucose solution ?

A. 0.01

B. 0.02

C. 0.03

D. 0.04

Answer: A



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3. Calculate the percentage composition of a solution obtained by mixing 300 g of a 20 % and 200 g of a 30 % solution by weight.

A. 50 %

B. 28 %

C. 64 %

D. 24 %

Answer: D



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4. When 1.04 g of $BaCl_2$ is present in 10^5 g of solution the concentration of solution is

A. 0.104 ppm

B. 10.4 ppm

C. 0.0104 ppm

D. 104 ppm

Answer: B



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5. What will be the mole fraction of ethanol in a sample of spirit containing 85% ethanol by mass ?

- A. 0.69
- B. 0.82
- C. 0.85
- D. 0.60

Answer: A

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6. What is the molarity of a solution containing 10 g of NaOH in 500 mL of solution ?

- A. 0.25 mol L^{-1}
- B. 0.75 mol L^{-1}
- C. 0.5 mol L^{-1}

D. 1.25 mol L^{-1}

Answer: C

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7. What will be the molarity of 30 mL of 0.5 M H_2SO_4 solution diluted to 500 mL ?

A. 0.3 M

B. 0.03 M

C. 3 M

D. 0.103 M

Answer: B

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8. How many Na^+ ions are present in 100 mL of 0.25 M of NaCl solution ?

A. 0.025×10^{23}

B. 1.505×10^{22}

C. 15×10^{22}

D. 2.5×10^{23}

Answer: B



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9. How many moles of sodium chloride present in 250 mL of a 0.50 M NaCl solution ?

A. 7.32 g

B. 3.8 g

C. 5 g

D. 0.5 g

Answer: C



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10. 250 ml of a sodium carbonate solution contains 2.65 grams of Na_2CO_3 . If 10 ml of this solution is diluted to one litre, what is the concentration of the resultant solution (mol. Wt. of $Na_2CO_3 = 106$)

- A. 0.01 M
- B. 0.001 M
- C. 0.05 M
- D. 0.002 M

Answer: D



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11. The density of a solution prepared by dissolving 120 g of urea (mol. Mass=60 u) in 1000 g of water is 1.15 g/mL. The molarity of this solution is

- A. 1.78 M
- B. 1.02 M
- C. 2.05 M
- D. 0.50 M

Answer: C



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12. What will be the value of molality for an aqueous solution of 10% w/W NaOH?

- A. 2.77 M
- B. 0.617 M
- C. 0.668 M

D. 1.623 M

Answer: A



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13. The molarity of 648 g of pure water is

A. 36 M

B. 55.5 M

C. 3.6 M

D. 5.55 M

Answer: B



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14. Calculate the mass of urea (NH_2CONH_2) required in making 2.5kg of 0.25molal aqueous solution.

- A. 37 g
- B. 25 g
- C. 125 g
- D. 27.5 g

Answer: A



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15. Concentration terms such as mass percentage, ppm, mole fraction and molality are independent of temperature, however molarity is a function of temperature. Explain.

A. volume depends on temperature and molarity involves volume

- B. molarity involves non-volatile solute while all other terms involve volatile solute
- C. number of moles of solute change with change in temperature
- D. molarity is used for polar solvents only .

Answer: A

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16. Express the terms representing the following formulae .

- (i) $\frac{\text{No. of moles of solute}}{\text{Volume of solution in litres}} = (W)$
- (ii) $\frac{\text{No. of moles of solute}}{\text{Mass of solvent in kg}} = (X)$
- (iii) $\frac{\text{No. of moles of component}}{\text{Moles in the solution}} = (Y)$
- (iv) $\frac{\text{Mass of component}}{\text{Mass of solution}} = (Z)$

A. W-Molality , X-Molarity , Y-Mass fraction, Z-Mole fraction

B. W-Molarity , X-Molality , Y-Mass fraction, Z-Mole fraction

C. W-Molarity , X-Molality , Y-Mole fraction, Z-Mass fraction

D. W-Molality , X-Molarity , Y-Mass fraction, Z-Mass fraction

Answer: C

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Solubility

1. Solubility of a substance is its maximum amount that can be dissolved in a specified amount of solvent. It depends upon

(i)nature of solute , (ii)nature of solvent , (iii)temperature , (iv)pressure

A. only (i),(ii) and (iii)

B. only (i), (iii) and (iv)

C. only (i) and (iv)

D. (i),(ii),(iii) and (iv)

Answer: D



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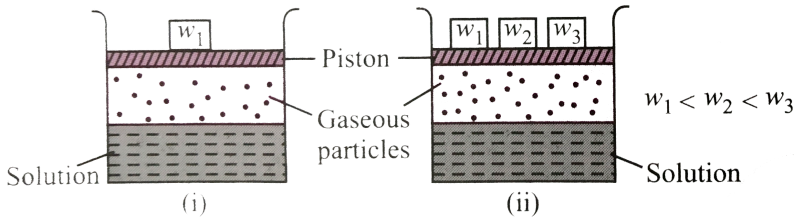
2. During dissolution when solute is added to the solvent, some solute particles separate out from the solution as a result of crystallisation . At the stage of equilibrium, the concentration of solute in the solution at given temperature and pressure

- A. increases
- B. decreases
- C. remains constant
- D. keeps changing

Answer: C



3. Consider the two figures given below :



Which of the following statements regarding the experiment is true ?

- A. The solubility of a gas in liquid in beaker (i) is greater than that is beaker (ii)
- B. The solubility of a gas in beaker (i) is less than that is beaker (ii)
- C. The solubility of a gas is equal in both beakers .
- D. The solubility of a gas remains unaffected by change in weights .

Answer: B



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4. The law which indicates the relationship between solubility of a gas in liquid and pressure is ____

- A. Raoult's law
- B. Henry's law
- C. Lowering of vapour pressure
- D. van't Hoff law

Answer: B



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5. According to Henry's law the partial pressure of the gas in vapour phase (p) is proportional to the mole fraction of the gas (x) in the solution . For different gases the correct statement about Henry's constant is

- A. higher the value of K_H at a given pressure , higher is the solubility of the gas
- B. higher the value of K_H at a given pressure , lower is the solubility of the gas
- C. K_H is not a function of nature of gas
- D. K_H value for all gases is same at a given pressure

Answer: B

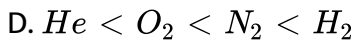
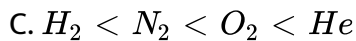
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6. The value of Henry's law constant for some gases at 293 K is given below. Arrange the gases in the increasing order of their solubility .

He:144.97 kbar, H_2 :69.16 kbar, N_2 :76.48 kbar, O_2 : 34.86 kbar

A. $He < N_2 < H_2 < O_2$

B. $O_2 < H_2 < N_2 < He$



Answer: A



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7. H_2S , a toxic gas with rotten egg like smell, is used for the qualitative analysis. If the solubility of H_2S in water at STP is $0.195m$, calculate Henry's law constant.

A. 0.0263 bar

B. 69.16 bar

C. 192 bar

D. 282 bar

Answer: D



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8. Henry's law constant for the molality of methane in benzene at $298K$ is $4.27 \times 10^5 \text{ mmHg}$. Calculate the solubility of methane in benzene at $298K$ under 760 mmHg .

A. 1.78×10^{-3}

B. 17.43

C. 0.114

D. 2.814

Answer: A



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9. When a gas is bubbled through water at 298 K , a very dilute solution of gas is obtained. Henry's law constant for the gas is 100 kbar . If gas exerts a pressure of 1 bar , the number of moles of gas dissolved in 1 litre of water is

A. 0.555

B. 55.55×10^{-5}

C. 55.55×10^{-3}

D. 5.55×10^{-5}

Answer: B



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10. Henry's law constant of oxygen is $1.4 \times 10^{-3} \text{ mol lit}^{-1} \text{ atm}^{-1}$ at 298

K. How much of oxygen is dissolved in 100 mL at 298 K when the partial pressure of oxygen is 0.5 atm?

A. 22.4 mg

B. 22.4 g

C. 2.24 g

D. 2.24 mg

Answer: D



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11. At high altitudes the partial pressure of oxygen is less than that at the ground level. This leads to

- A. low concentrations of oxygen in the blood and tissues
- B. high concentrations of oxygen in the blood and tissues
- C. release of dissolved gases and formation of bubbles of nitrogen in the blood
- D. thickening of blood and tissues

Answer: A



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1. Partial pressure of a solution component is directly proportional to its mole fraction. This statement is known as

- A. Henry's law
- B. Raoult's law
- C. Distribution law
- D. Ostwald's dilution law

Answer: B



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2. 3 moles of P and 2 moles of Q are mixed , what will be their total vapour pressure in the solution if their partial vapour pressures are 80 and 60 torr respectively ?

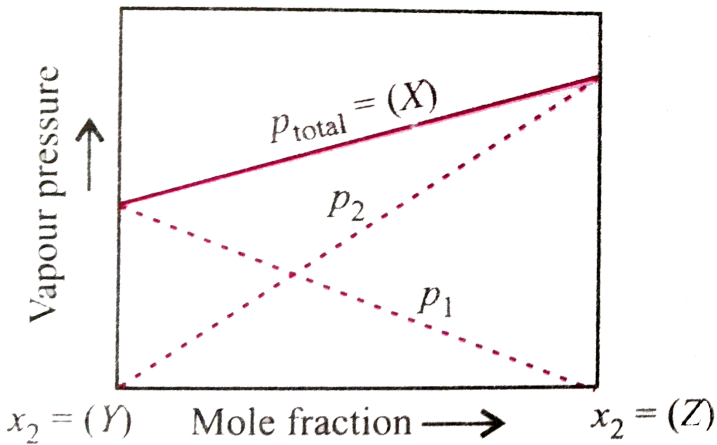
- A. 80 torr
- B. 140 torr

C. 72 torr

D. 70 torr

Answer: C

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X, Y and Z in the above graph are

A. $X = p_1 + p_2, Y=1, Z=0$

B. $X = p_1 + p_2, Y=0, Z=1$

C. $X = p_1 \times p_2, Y=0, Z=1$

$$D. X = p_1 - p_2, Y=1, Z=0$$

Answer: B

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4. Among the following substances, the lowest vapour pressure is exerted by

A. water

B. alcohol

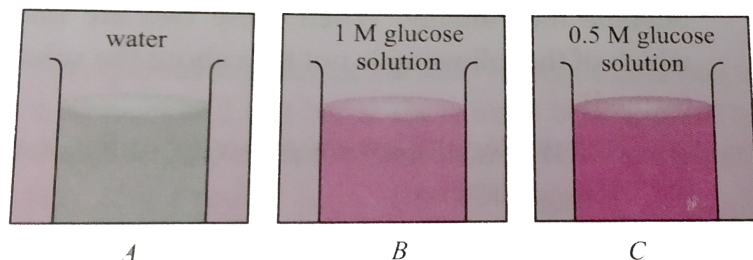
C. ether

D. mercury

Answer: D

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5. In three beakers labelled as (A),(B) and (C) , 100 mL of water, 100 mL of 1 M solution of glucose in water and 100 mL of 0.5 M solution of glucose in water are taken respectively and kept at same temperature .



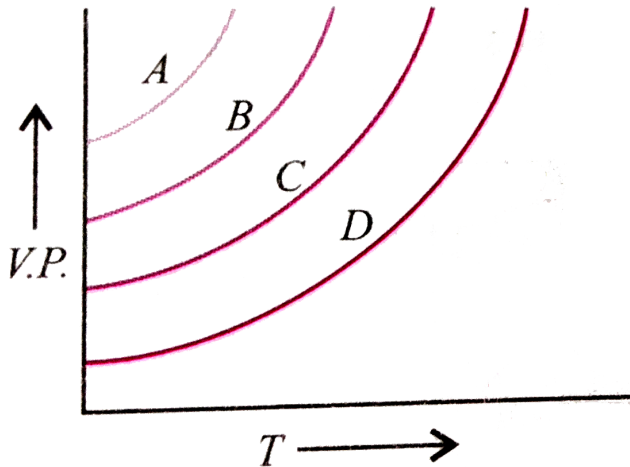
Which of the following statements is correct ?

- A. Vapour pressure in all the three beakers is same
- B. Vapour pressure of beaker B is highest
- C. Vapour pressure of beaker C is highest
- D. Vapour pressure of beaker B is lower than that of C and vapour pressure of beaker C is lower than that of A .

Answer: D

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1. The given graph shows the vapour pressure - temperature curves for some liquids



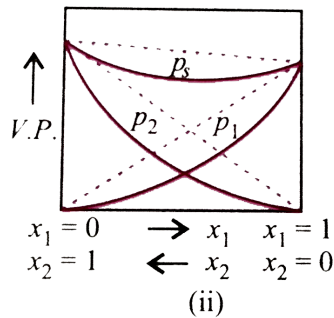
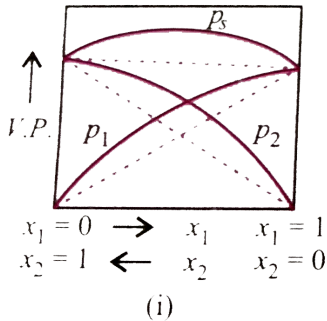
Liquids A,B, C and D respectively are

- A. diethyl ether, acetone , ethyl alcohol , water
- B. acetone , ethyl alcohol, diethyl ether , water
- C. water, ethyl alcohol , acetone , diethyl ether
- D. ethyl alcohol, acetone , diethyl ether, water

Answer: A

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2. Study the figures given below and mark the correct statement.



- A. (i) Nitric acid + water, (ii) Acetone + Ethyl alcohol
- B. (i) Water + Ethyl alcohol, (ii) Acetone + Benzene
- C. (i) Acetone + Ethyl alcohol, (ii) Acetone + Chloroform
- D. (i) Benzene + Chloroform, (ii) Acetone + Chloroform

Answer: C

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Ideal And Non Ideal Solutions

1. For an ideal solution with $P_A > P_B$, which of the following is true ?

A. $(x_A)_{\text{liquid}} = (X_A)_{\text{vapour}}$

B. $(x_A)_{\text{liquid}} > (X_A)_{\text{vapour}}$

C. $(x_A)_{\text{liquid}} < (X_A)_{\text{vapour}}$

D. $(x_A)_{\text{liquid}}$ and $(X_A)_{\text{vapour}}$ do not bear any relationship with each other

Answer: C



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2. What are the conditions for an ideal solution which obeys Raoult's law over the entire range of concentration ?

A. $\Delta_{\text{mix}}H = 0$, $\Delta_{\text{mix}}V = 0$, $P_{\text{Total}} = p_A^\circ x_A + p_B^\circ x_B$

B. $\Delta_{\text{mix}}H = +ve$, $\Delta_{\text{mix}}V = 0$, $P_{\text{Total}} = p_A^\circ x_A + p_B^\circ x_B$

C. $\Delta_{\text{mix}}H = 0$, $\Delta_{\text{mix}}V = +ve$, $P_{\text{Total}} = p_A^\circ x_A + p_B^\circ x_B$

D. $\Delta_{\text{mix}}H = 0$, $\Delta_{\text{mix}}V = 0$, $P_{\text{Total}} = p_B^\circ x_B$

Answer: A

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3. Intermolecular forces between n-hexane and n-heptane are nearly same as between hexane and heptane individually. When these two are mixed, which of the following is not true about the solution formed ?

A. it obey Raoult's law , i.e. $p_A = x_A p_A^\circ$ and $p_B = x_B p_B^\circ$

B. ΔH_{mixing} is zero

C. ΔV_{mixing} is zero

D. It forms minimum boiling azeotrope

Answer: D

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4. Which of the following solutions shows positive deviation from Raoult's law ?

- A. Acetone + Aniline
- B. Acetone + Ethanol
- C. Water+ Nitric acid
- D. Chloroform + Benzene

Answer: B

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5. Which of the following solutions is an example of negative deviation from Raoult's law ?

A. Acetone + Ethanol

B. Carbon tetrachloride + Chloroform

C. Acetone + Chloroform

D. Water + Ethanol

Answer: C

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6. When acetone and chloroform are mixed together, hydrogen bonds are formed between them. Which of the following statements is correct about the solution made by mixing acetone and chloroform?

A. On mixing acetone and chloroform will form an ideal solution

B. On mixing acetone and chloroform positive deviation is shown since the vapour pressure increases

C. On mixing acetone and chloroform negative deviation is shown

since there is decrease in vapour pressure

D. At a specific composition acetone and chloroform will form

minimum boiling azeotrope

Answer: C

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7. Given below are few mixtures formed by mixing two components .

Which of the following binary mixtures will have same composition in liquid and vapour phase ?

(i) Ethanol + Chloroform

(ii) Nitric acid + Water

(iii) Benzene + Toluene

(iv) Ethyl chloride + Ethyl bromide

A. (i) and (iii)

B. (i) and (ii)

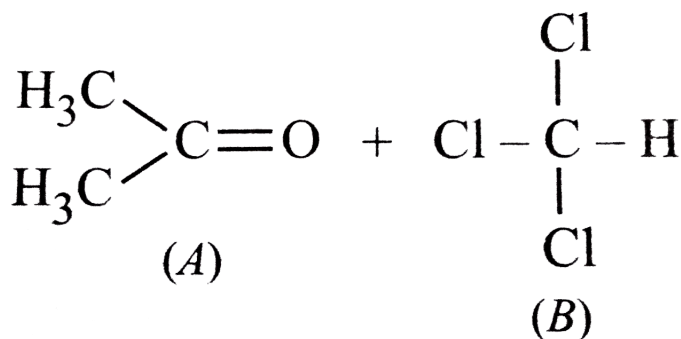
C. (i), (ii) and (iii)

D. (iii) and (iv)

Answer: B

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8. When acetone and chloroform are mixed together, which of the following observations is correct ?



A. A-A and B-B interactions are stronger than A-B interactions .

B. A - A and B-B interactions are weaker than A-B interactions

C. A-A,B-B and A-B interactions are equal

D. The liquids form separate layers and are immiscible

Answer: B

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9. Match the column I with column II and mark the appropriate choice.

Column I		Column II	
(A)	$\Delta H_{\text{mix}} = 0, \Delta V_{\text{mix}} = 0$	(i)	Non-ideal solution
(B)	$\Delta H_{\text{mix}} \neq 0, \Delta V_{\text{mix}} \neq 0$	(ii)	Positive deviation
(C)	$\Delta H_{\text{mix}} < 0, \Delta V_{\text{mix}} < 0$	(iii)	Ideal solution
(D)	$\Delta H_{\text{mix}} > 0, \Delta V_{\text{mix}} > 0$	(iv)	Negative deviation

A. A-(i),B-(iii),C-(ii),D-(iv)

B. A-(iii),B-(i),C-(iv),D-(ii)

C. A-(ii),B-(iii),C-(iv),D-(i)

D. A-(iii),B-(i),C-(i) ,D-(iv)

Answer: B



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10. Fill in the blanks with appropriate words.

Azeotropic mixtures boil without change in their ____. Azeotropic mixtures exist in solutions showing ___ or ___ deviations. ___ solutions do not form azeotropes. Van't Hoff factor for an electrolyte is ___ than 1.

- A. colour, positive, negative , non-ideal, smaller
- B. properties , positive , negative , ideal , smaller
- C. boiling point, positive , negative , non-ideal , lesser
- D. composition , positive , negative , ideal , greater

Answer: D



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11. The system that forms maximum boiling azeotrope is

- A. acetone-chloroform
- B. ethanol-acetone
- C. n-hexane-n-heptane
- D. carbon disulphide - acetone

Answer: A



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12. Two liquids HNO_3 (A) and water (B) form a maximum boiling azeotrope when mixed in the ratio of 68% and 32% respectively . It means

- A. A-B interactions are stronger than A -A and B-B interactions
- B. A-B interactions are weaker than A -A and B-B interactions
- C. vapour pressure of solution is more than the pure components

D. vapour pressure of solution is less since only one component vaporises .

Answer: A



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13. Which of the following azeotropes is not correctly matched ?

A. HNO_3 (68%) + H_2O (32%) ,Maximum boiling azeotrope , boiling point =393.5 K

B. H_2O (43%) + HI(57%) : Minimum boiling azeotrope , boiling point =290 K

C. C_2H_5OH (95.5%) + H_2O (4.5%) : Minimum boiling azeotrope , boiling point = 351.15 K

D. Chloroform (93.2%) + C_2H_5OH (6.8%) : Minimum boiling azeotrope, boiling point =332.3 K

Answer: B



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Colligative Properties And Determination Of Molar Mass

1. The relative lowering in vapour pressure is proportional to the ratio of number of

- A. solute molecules to solvent molecules
- B. solvent molecules of solute molecules
- C. solute molecules to the total number of molecules in solution
- D. solvent molecules to the total number of molecules in solution

Answer: C



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2. Vapour pressure of a pure liquid X is 2 atm at 300 K. It is lowered to 1 atm on dissolving 1 g of Y in 20 g of liquid X. If molar mass of X is 200, what is the molar mass of Y?

- A. 20
- B. 50
- C. 100
- D. 200

Answer: A



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3. An aqueous solution of 2 per cent (*wt. / wt*) non-volatile solute exerts a pressure of 1.004 bar at the boiling point of the solvent. What is the molecular mass of the solute?

- A. 23.4 g mol^{-1}

B. 41.35 g mol^{-1}

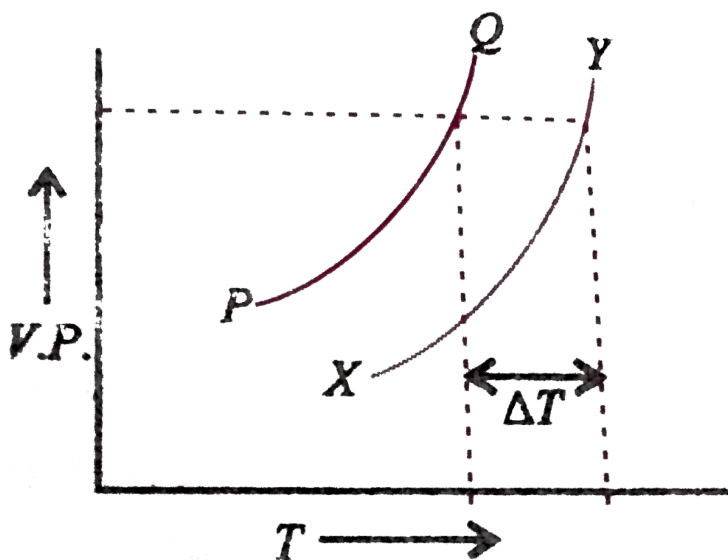
C. 10 g mol^{-1}

D. 20.8 g mol^{-1}

Answer: B

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4. In the graph plotted between vapour pressure (V.P.) and temperature (T),



A. PQ is the curve for solvent , XY is the curve of solution and ΔT is depression in freezing point

B. PQ is the curve for solution. XY is the curve for solvent and ΔT is elevation is boiling point

C. PQ is the curve for solvent, XY is the curve for solution and ΔT is molal elevation in boiling point

D. PQ is the curve for solvent, XY is the curve for solution and ΔT is elevation in boiling point

Answer: D

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5. A solution containing 12.5 g of non-electrolyte substance in 185 g of water shows boiling point elevation of 0.80 K. Calculate the molar mass of the substance. ($K_b = 0.52 \text{Kkgmol}^{-1}$)

A. 53.06 g mol^{-1}

B. 25.3 g mol^{-1}

C. 16.08 g mol^{-1}

D. 43.92 g mol^{-1}

Answer: D



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6. If 1 g of solute (molar mass = 50 g mol^{-1}) is dissolved in 50 g of solvent and the elevation in boiling point is 1 K. The molar boiling constant of the solvent is

A. 2

B. 3

C. 2.5

D. 5

Answer: C

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7.2 g of sugar is added to one litre of water to give sugar solution. What is the effect of addition of sugar on the boiling point and freezing point of water ?

- A. Both boiling point and freezing point increase
- B. Both boiling point and freezing point decrease
- C. Boiling point increases and freezing point decreases
- D. Boiling point decreases and freezing point increases.

Answer: C

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8. How does sprinkling of salt help in clearing the snow covered roads in hilly areas? Explain the phenomenon involved in the process.

- A. lowering in vapour pressure of snow
- B. depression in freezing point of snow
- C. increase in freezing point of snow
- D. melting of ice due to increase in temperature by putting salt

Answer: B

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9. Equimolar solutions in the same solvent have-

- A. same elevation in boiling point and same depression in freezing point

B. different elevation in boiling point and different depression in freezing point

C. same elevation in boiling point but different depression in freezing point

D. same depression in freezing point but different elevation in boiling point

Answer: A

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10. A 5% solution (w/W) of cane sugar (molar mass = 342 g mol^{-1}) has freezing point 271 K. What will be the freezing point of 5% glucose (molar mass = 18 g mol^{-1}) in water if freezing point of pure water is 273.15 K ?

A. 273.07 K

B. 269.07 K

C. 273.15 K

D. 260.09 K

Answer: B

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11. What weight of glycerol should be added to 600 g of water in order to lower its freezing point by $10^{\circ}C$?

$$(K_f = 1.86^{\circ}Cm^{-1})$$

A. 496 g

B. 297 g

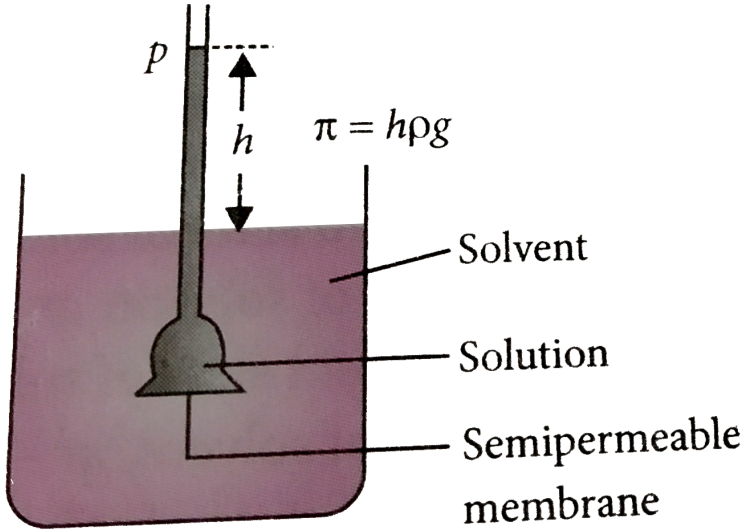
C. 310 g

D. 426 g

Answer: B

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12. If semipermeable membrane is placed between the solvent and solution as shown in the given figure then



- A. the solvent molecules will flow through the membrane from solution to pure solvent
- B. the solvent molecules will flow continuously till the equilibrium is attained

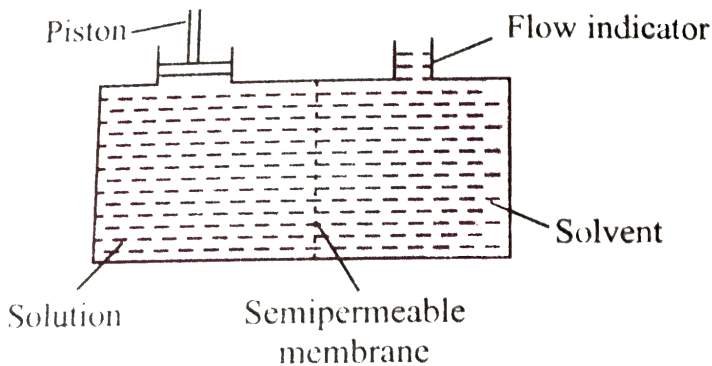
C. the flow of the solvent from its side to solution side across a semipermeable membrane can be stopped if some extra pressure (called osmotic pressure) is applied on the solution

D. both (b) and (c)

Answer: D

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13. Study the following figure showing osmosis and mark the correct statement .



- A. The external pressure applied on the solution to stop osmosis is called osmotic pressure
- B. The external pressure applied on the solvent to stop osmosis is called osmotic pressure
- C. The hydrostatic pressure built up on solvent which just stops osmosis is osmotic pressure
- D. Pressure developed by solvent while solution flows through semipermeable membrane.

Answer: A

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14. Relative lowering of vapour pressure, osmotic pressure of a solution and elevation in boiling points are (p) properties. Osmosis is the passage of (q) through a semipermeable membrane from a solution of (r) towards a solution of (s). Osmotic pressure is equivalent to

mechanical pressure which must be applied on $\pi(t)$ to prevent osmosis.

In the above paragraph p,q,r,s and t respectively are

A. colligative, solution, higher concentration , lower concentration ,
solution

B. colligative, solvent, higher concentration , lower concentration ,
solution

C. colligative , solution , lower concentration, higher concentration ,
solvent

D. colligative , solvent , lower concentration, higher concentration ,
solution.

Answer: D



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15. The osmotic pressure of a solution can be increased by

- A. increasing the volume
- B. increasing the number of solute molecules
- C. decreasing the temperature
- D. removing semipermeable membrane

Answer: B

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16. People taking lot of salt experience puffiness or swelling of the body due to

- A. water retention in tissue cells and intercellular spaces because of osmosis
- B. water loss from the cells through skin tissues
- C. capillary action of water through skin pores
- D. excessive thirst and drinking more water .

Answer: A



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17. The preservation of meat by salting and of fruits by adding sugar protects them from bacterial action because

- A. bacteria die of eating sugar or salt
- B. due to osmosis bacteria lose water on salted meat or candid fruit and die
- C. due to osmosis bacteria gain water on salted meat or candid fruit and die
- D. bacteria get stuck to the salt and sugar layers and die

Answer: B



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18. Sea water is desalinated to get fresh water by which of the following methods ?

- A. When pressure more than osmotic pressure is applied pure water is squeezed out of sea water by reverse osmosis
- B. When excess pressure is applied on sea water pure water moves in by osmosis
- C. Water moves out from sea water due to osmosis
- D. Salt is precipitated from sea water when kept undisturbed for sometime

Answer: A



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19. A 5 % solution of cane sugar (molecular weight=342) is isotonic with 1 % solution of substance X . The molecular weight of X is

A. 171.2

B. 68.4

C. 34.2

D. 136.2

Answer: B



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20. Which of the following statements is correct about diffusion and osmosis ?

(i) In Osmosis, a semipermeable membrane is used while diffusion is without membrane .

(ii) In osmosis, movement of molecules occurs in one direction while in diffusion, movement occurs in all directions

(iii) In osmosis only the solvent moves while in diffusion both solute and solvent move

- A. Only (i) and (ii)
- B. Only (i)
- C. Only (ii) and (iii)
- D. (i) ,(ii) and (iii)

Answer: D

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21. 10% solution of urea is isotonic with 6% solution of a non-volatile solute X. What is the molecular mass of solute X ?

- A. 6 g mol^{-1}
- B. 60 g mol^{-1}
- C. 36 g mol^{-1}
- D. 32 g mol^{-1}

Answer: C



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22. A solution containing 10.2 g of glycerine per litre is found to be isotonic with 2% solution of glucose (molar mass = 180g mol^{-1}).

Calculate the molar mass of glycerine.

A. 91.8 g

B. 1198 g

C. 83.9 g

D. 890.3 g

Answer: A



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23. What will be the osmotic pressure in pascals exerted by a solution prepared by dissolving 1.0 g of polymer of molar mass 150,000 in 500 mL of water at 37°C ?

A. 30.96 Pa

B. 34.36 Pa

C. 68.72 Pa

D. 48.25 Pa

Answer: B

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24. Osmotic pressure of a solution containing 2 g dissolved protein per 300 cm^3 of solution is 20 mm of Hg at 27°C . The molecular mass of protein is

A. $6239.6 \text{ g mol}^{-1}$

B. $12315.5 \text{ g mol}^{-1}$

C. $3692.1 \text{ g mol}^{-1}$

D. $7368.4 \text{ g mol}^{-1}$

Answer: A



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25. Twenty grams of a substance were dissolved in 500ml. Of water and the osmotic pressure of the solution was found to be 600mm of mercury at 15°C . Determine the molecular weight of the substance.

A. 1198

B. 500

C. 1200

D. 1000

Answer: A



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26. Which of the following statements is not correct ?

A. 5% aqueous solutions of NaCl and KCl are said to be isomolar

B. 1 M sucrose solution and 1 M glucose solution are isotonic

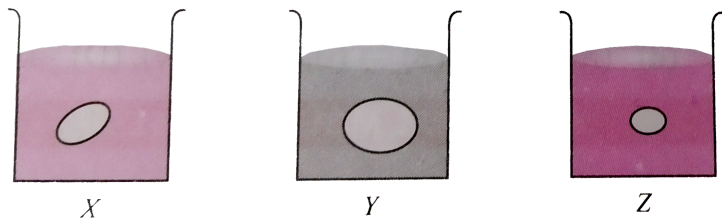
C. Molecular mass of acetic acid and benzoic acid is higher than normal mass in cryoscopic methods.

D. For the same solution, $\frac{\Delta T_b}{\Delta T_f} = \frac{K_b}{K_f}$

Answer: A

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27. Grapes placed in three beakers X, Y and Z containing different type of solutions are shown in figures.



If beaker X contains water, Y and Z contain

A. Y-hypotonic solution, Z-hypertonic solution

B. Y-hypertonic solution, Z-hypotonic solution

C. Y and Z -isotonic solutions

D. Y and Z - hypotonic solutions

Answer: A



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28. A plant cell shrinks when it is kept in

A. hypotonic solution

B. hypertonic solution

C. isotonic solution

D. pure water

Answer: B



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29. Which of the following statements is correct ?

- A. A saturated solution will remain saturated at all temperatures.
- B. A plant cell swells when placed in hypertonic solution
- C. The depression in freezing point is directly proportional to molality of the solution
- D. Lowering in vapour pressure is a colligative property .

Answer: C



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30. For carrying reverse osmosis for desalination of water the material used for making semipermeable membrane is

- A. potassium nitrate
- B. parchment membrane
- C. cellulose acetate

D. cell membrane

Answer: C



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31. Which of the following is not an industrial or biological importance of osmosis ?

- A. Movement of water from soil into plant roots and upper portion of plant .
- B. Salting of meat to prevent bacterial action
- C. Reverse osmosis for desalination of sea water
- D. Filling of ink in a fountain pen

Answer: D



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32. Match the column I with column II and mark the appropriate choice.

Column I		Column II	
(A)	K_b	(i)	$\frac{K_b \times W_2 \times 1000}{\Delta T_b \times W_1}$
(B)	M_2	(ii)	$\frac{W_2 \times 1000}{M_2 \times W_1}$
(C)	π	(iii)	$\frac{RT_b^2}{1000 \times L_V}$
(D)	m	(iv)	$\frac{\Delta T_b \times dRT}{1000 \times K_b}$

A. A-(i),B-(iii), C-(ii),D-(iv)

B. A-(iv),B-(ii),C-(i),D-(iii)

C. A-(ii),B-(iv),C-(iii),D-(i)

D. A-(iii),B-(i),C-(iv),D-(ii)

Answer: D



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1. Why is the molecular mass determined by measuring colligative property in case of some solutes is abnormal ?

- A. Due to association or dissociation of solute molecules
- B. Due to insolubility of solute molecules
- C. Due to decomposition of solute molecules
- D. Due to large size of solute molecules.

Answer: A



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2. Which of the following representations of i (van't Hoff factor) is not correct ?

A. $i = \frac{\text{Observed colligative property}}{\text{Expected colligative property}}$

$$B. i = \frac{\text{Normal molecular mass}}{\text{Observed molecular mass}}$$

$$C. i = \frac{\text{Number of molecules actually present}}{\text{Number of molecules expected to be present}}$$

D.

$$i = \frac{\text{Total number of particles taken before association/dissociation}}{\text{Number of particles after association/dissociation}}$$

Answer: D

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3. Which of the following relations is not correctly matched with the formula ?

A. In case of association, $\alpha = \frac{i - 1}{\frac{1}{n} - 1}$

B. In case of dissociation, $\alpha = \frac{i - 1}{n + 1}$

C. Relative lowering of vapour pressure $= \frac{p_A^\circ - p_A}{p_A^\circ} = i \frac{n_B}{n_A + n_B}$

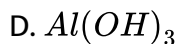
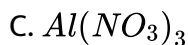
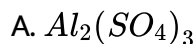
D. Elevation in boiling point, $\Delta T_b = K_b \times \frac{W_B \times 1000}{M_B \times W_A}$

Answer: B



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4. Which of the following will have same value of van't Hoff factor as that of $K_4[Fe(CN)_6]$?



Answer: A



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5. Arrange the following aqueous solutions in the order of their increasing boiling points

(i) 10^{-4} M NaCl , (ii) 10^{-4} M Urea , (iii) 10^{-3} M $MgCl_2$, (iv) 10^{-2} M NaCl

A. (i) lt (ii) lt (iv) lt (iii)

B. (ii) lt (i) = (iii) lt (iv)

C. (ii) lt (i) lt (iii) lt (iv)

D. (iv) lt (iii) lt (i) = (ii)

Answer: C

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6. Which of the following has the highest freezing point ?

A. 1 m NaCl solution

B. 1 m KCl solution

C. 1 m $AlCl_3$ solution

D. 1 m $C_6H_{12}O_6$ solution

Answer: D

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7. If α is the degree of dissociation of Na_2SO_4 the van't Hoff's factor (i) used for calculating the molecular mass is

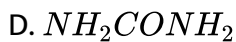
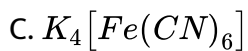
- A. $1 + \alpha$
- B. $1 - \alpha$
- C. $1 + 2\alpha$
- D. $1 - 2\alpha$

Answer: C

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8. For which of the following solutes the van't Hoff factor is not greater than one ?

- A. $NaNO_3$
- B. $BaCl_2$



Answer: D

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9. What will be the degree of dissociation of 0.1 M $Mg(NO_3)_2$ solution if van't Hoff factor is 2.74 ?

A. 75 %

B. 87 %

C. 100 %

D. 92 %

Answer: B

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10. Which of the following will have the highest freezing point at one atmosphere ?

A. 0.1 M NaCl solution

B. 0.1 M sugar solution

C. 0.1 M $BaCl_2$ solution

D. 0.1 M $FeCl_3$ solution

Answer: B



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11. A solute forms a pentamer when dissolved in a solvent. The van't Hoff factors 'i' for the solute will be :

A. 0.5

B. 5

C. 0.2

D. 0.1

Answer: C

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12. What will be the freezing point of a 0.5 m KCl solution ? The molal freezing point constant of water is $1.86^{\circ} C m^{-1}$.

A. $-1.86^{\circ} C$

B. $-0.372^{\circ} C$

C. $-3.2^{\circ} C$

D. $0^{\circ} C$

Answer: A

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13. What amount of $CaCl_2$ ($i=2.47$) is dissolved in 2 litres of water so that its osmotic pressure is 0.5 atm at $27^\circ C$?

- A. 3.42 g
- B. 9.24 g
- C. 2.834 g
- D. 1.820 g

Answer: D

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14. The van't Hoff factor of a 0.005 M aqueous solution of KCl is 1.95. The degree of ionisation of KCl is :

- A. 0.95
- B. 0.97
- C. 0.94

D. 0.96

Answer: A

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15. The elevation in boiling point of a solution of 9.43 g of $MgCl_2$ in 1 kg of water is ($K_b = 0.52 \text{ K kg mol}^{-1}$, Molar mass of $MgCl_2 = 94.3 \text{ gmol}^{-1}$)

A. 0.156

B. 0.52

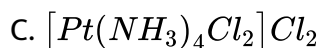
C. 0.17

D. 0.94

Answer: A

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16. A 0.001 molal solution of $[Pt(NH_3)_4Cl_4]$ in water had a freezing point depression of $0.0054^\circ C$. If K_f for water is 1.80, the correct formulation for the above molecule is



Answer: C



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Higher Order Thinking Skills

1. The Henry's law constant for the solubility of N_2 gas in water at $298K$ is $1.0 \times 10^5 atm$. The mole fraction of N_2 in air is 0.8. The number of

moles of N_2 from air dissolved in 10 moles of water at $298K$ and $5atm$.

Pressure is:

A. 4.0×10^{-4}

B. 4.0×10^{-5}

C. 5.0×10^{-4}

D. 4.0×10^{-6}

Answer: A



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2. Two liquids A and B form ideal solution. At $300K$, the vapour pressure of a solution containing 1 mole of A and 3 moles of B is $550mm$ of Hg. At the same temperature, if one more mole of B is added to this solution, the vapour pressure of the solution increases by $10mm$ of Hg. Determine the vapour pressure of a and B in their pure states.

A. $p_A^\circ = 600$ mm Hg and $p_B^\circ = 400$ mm Hg

B. $p_A^\circ=550$ mm Hg and $p_B^\circ=560$ mm Hg

C. $p_A^\circ=450$ mm Hg and $p_B^\circ=650$ mm Hg

D. $p_A^\circ=400$ mm Hg and $p_B^\circ=600$ mm Hg

Answer: D

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3. The vapour pressures of ethanol and methanol are 44.5 and 88.7 mmHg, respectively. An ideal solution is formed at the same temperature by mixing 60g of ethanol with 40g of *methanol*. Calculate the total vapour pressure of the solution and mole fraction of methanol in the vapour.

A. 43.46 mm and 0.51

B. 66.15 mm and 0.657

C. 66.15 mm and 0.791

D. 70.59 mm and 0.657

Answer: B

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4. Benzene and naphthalent form an ideal solution at room temperature.

For this process, the true statement(s) is (are

- A. (ii) and (iv) only
- B. (i) and (iii) only
- C. (ii),(iii) and (iv) only
- D. all of these

Answer: C

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5. Vapour pressure of pure water at $298K$ is $23.8mmHg$. $50g$ of urea (NH_2CONH_2) is dissolved in $850g$ of water. Calculate the vapour

pressure of water for this solution and its relative lowering.

- A. 23.8 mm Hg and 0.16
- B. 25.4 mm Hg and 0.02
- C. 30.2 mm Hg and 0.020
- D. 23.4 mm Hg and 0.017

Answer: D



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6. Which of the aqueous equimolar solution will have its vapour pressure near to solvent ?

- A. Urea
- B. $Ba(NO_3)_2$
- C. $NaNO_3$
- D. $Al(NO_3)_3$

Answer: A



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7. 75.2g of C_6H_5OH (phenol) is dissolved in a solvent of $K_f = 14$. If the depression in freezing point is $7K$, then find the percentage of phenol that dimerises.

- A. 75 %
- B. 80 %
- C. 70 %
- D. 100 %

Answer: A



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8. Sea water is 3.5 % by mass of a salt and has a density 1.04gcm^{-3} at 293K . Assuming the salt to be sodium chloride, calculate the osmotic pressure of sea water. Assume complete ionisation of the salt-

A. 25.45 atm

B. 11.56 atm

C. 29.98 atm

D. 30.20 atm

Answer: C

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9. Arrange the following solutions in increasing order of their osmotic pressures .

(i) 34.2 g/litre sucrose

(ii) 60 g/litre of urea

(iii) 90 g/litre of glucose

(iv) 58.5 g/litre of sodium chloride

A. (i) < (iii) < (ii) < (iv)

B. (iii) < (i) < (iv) < (ii)

C. (i) < (iii) < (iv) < (ii)

D. (ii) < (iv) < (i) < (iii)

Answer: A



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10. 1.4275 g sample of $[Cr(NH_3)_6]SO_4Cl$ (mol. Wt. = 285.5) is dissolved to prepare 250 mL solution showing an osmotic pressure of 1.478 atm at $27^\circ C$. Which of the following statements are correct about this solution ?

(i) Each molecule furnishes three ions in solution

(ii) The van't Hoff factor is 3.

(iii) Equilibrium molarity of $[Cr(NH_3)_6]SO_4Cl=0$

(iv) Equilibrium molarity of $[Cr(NH_3)_6]^{3+} = 0.02 \text{ M}$

A. I and III only

B. II and IV only

C. I, II and IV only

D. all of these

Answer: D



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Ncert Exemplar

1. Which of the following units is useful in relating concentration of solution with its vapour pressure?

A. Mole fraction

B. Parts per million

C. Mass percentage

D. Molality

Answer: A

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2. On dissolving sugar in water at room temperature solution feels cool to touch. Under which of the following cases dissolution of sugar will be most rapid?

A. Sugar crystals in cold water

B. Sugar crystals in hot water

C. Powdered sugar in cold water

D. Powdered sugar in hot water

Answer: D

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3. At equilibrium the rate of dissolution of a solid solute in a volatile liquid solvent is

- A. less than the rate of crystallisation
- B. greater than the rate of crystallisation
- C. equal to the rate of crystallisation
- D. zero

Answer: C



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4. A beaker contains a solution of substance 'A'. Precipitation of substance 'A' takes place when a small amount of 'A' is added to the solution. The solution is.....

- A. saturated

B. supersaturated

C. unsaturated

D. concentrated

Answer: B



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5. Maximum amount of a solid solute that can be dissolved in a specified amount of a given liquid solvent does not depend upon

A. temperature

B. nature of solute

C. pressure

D. nature of solvent

Answer: C



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6. Low concentration of oxygen in the blood and tissues of people living at high altitude is due to.....

- A. low temperature
- B. low atmospheric pressure
- C. high atmospheric pressure
- D. both low temperature and high atmospheric pressure

Answer: B



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7. Considering the formation, breaking and strength of hydrogen bond, predict which of the following mixture will show a positive deviation from Raoult's law?

- A. Methanol and acetone

B. Chloroform and acetone

C. Nitric acid and water

D. Phenol and aniline

Answer: A

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8. Colligative properties depend on ___

A. the nature of the solute particles dissolved in solution

B. The number of solute particles in solution

C. the physical properties of the solute particles dissolved in solution

D. the nature of solvent particles

Answer: B

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9. Which of the following aqueous solution should have the highest boiling point ?

A. 1.0 M NaOH

B. 1.0 M Na_2SO_4

C. 1.0 M NH_4NO_3

D. 1.0 M KNO_3

Answer: B



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10. The unit of ebullioscopic constant is

A. $K \text{ kg mol}^{-1}$ or $K (\text{molality})^{-1}$

B. $\text{mol kg } K^{-1}$ or $K^{-1} (\text{molality})$

C. $\text{kg mol}^{-1} K^{-1}$ or $K^{-1} (\text{molality})^{-1}$

D. $K \text{ mol kg}^{-1}$ or $K (\text{molality})$

Answer: A



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11. In comparison to a 0.01 M solution of glucose, the depression in freezing point of a 0.01 M $MgCl_2$ solution is.....

- A. the same
- B. about twice
- C. about three times
- D. about six times

Answer: C



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12. An unripened mango placed in a concentrated salt solution to prepare pickle shrivels because.....

- A. it gains water due to osmosis
- B. it loses water due to reverse osmosis
- C. it gain water due to reverse osmosis
- D. it loses water due to osmosis

Answer: D

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13. At a given temperature, osmotic pressure of a concentrated solution of a substance __

- A. is higher than that at a dilute solution
- B. is lower than that of a dilute solution
- C. is same as that of a dilute solution
- D. cannot be compared with osmotic pressure of dilute solution

Answer: A



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14. Which of the following statements is false ?

- A. Two different solutions of sucrose of same molality prepared in different solvents will have the same depression in freezing point .
- B. The osmotic pressure of a solution is given by the equation $\pi = CRT$ (where C is the molarity of the solution)
- C. Decreasing order of osmotic pressure for 0.01 M aqueous solutions of barium chloride , potassium chloride , acetic acid and sucrose is $BaCl_2 > KCl > CH_3COOH > \text{ sucrose}$.
- D. According to Raoult's law , the vapour pressure exerted by a volatile component of a solution is directly proportional to its mole fraction in the solution.

Answer: A



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15. The values of van't Hoff factors for KCl, NaCl and K_2SO_4 , respectively, are ___

- A. 2,2 and 2
- B. 2,2 and 3
- C. 1,1 and 2
- D. 1,1 and 1

Answer: B



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16. Which of the following statements is false ?

- A. Units of atmospheric pressure and osmotic pressure are the same

- B. In reverse osmosis , solvent molecules move through a semipermeable membrane from a region of lower concentration of solute to a region of higher concentration
- C. The value of molal depression constant depends on nature of solvent
- D. Relative lowering of vapour pressure , is a dimensionless quantity .

Answer: B

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17. Value of Henry's constant K_H ...

- A. increases with increase in temperature
- B. decreases with increase in temperature
- C. remains constant
- D. first increases then decreases

Answer: A



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18. Value of Henry's constant K_H ...

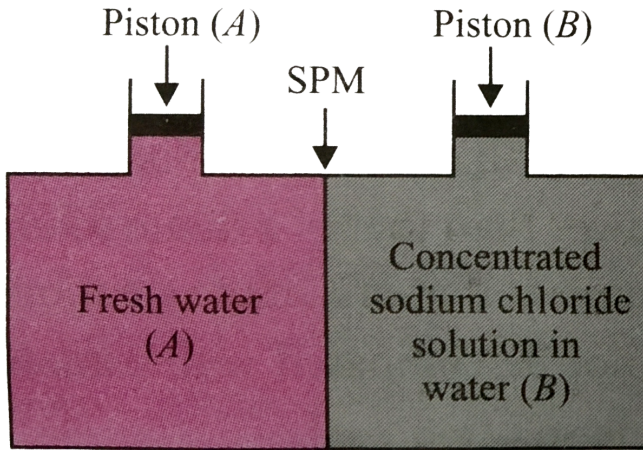
- A. greater for gases with higher solubility
- B. greater for gases with lower solubility
- C. constant for all gases
- D. not related to the solubility of gases

Answer: B



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19. Consider the figure and mark the correct option.



- A. Water will move from side (A) to side (B) if a pressure lower than osmotic pressure is applied on piston (B)
- B. Water will move from side (B) to side (A) if a pressure greater than osmotic pressure is applied on piston (B)
- C. Water will move from side (B) to side (A) if a pressure equal to osmotic pressure is applied on piston (B)
- D. Water will move from side (A) to side (B) if a pressure equal to osmotic pressure is applied on piston (B)

Answer: B

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20. We have three aqueous solutions of NaCl labelled as A, B and C with concentration $0.1M$, 0.01 and $0.001 M$, respectively. The value of van't Hoff factor for these solutions will be in the order :

A. $i_A < i_B < i_C$

B. $i_A > i_B > i_C$

C. $i_A = i_B = i_C$

D. $i_A > i_B < i_C$

Answer: C

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21. On the basis of information given below mark the Correct option

.Information:

(P) In bromoethane and chloroethane mixture intermolecular interactions of A.A and B.B type are nearly same as A .B type interactions.

(Q) In ethanol and acetone mixture A.A or B.B type intermolecular interaction are stronger than A.B type interactions.

(R) In chloroform and acetone mixture A.A or B.B type intermolecular interactions are weaker than A. B type interactions.

A. Solution (II) and (III) will follow Raoult's law

B. Solution (I) will follow Raoult's law

C. Solution (II) will show negative deviation from Raoult's law .

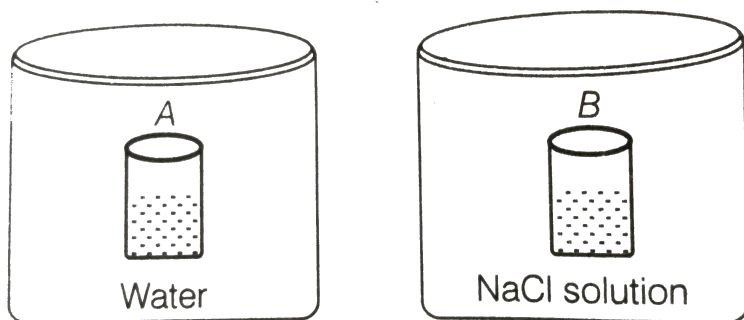
D. Solution (III) will show positive deviation from Raoult's law .

Answer: B



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22. Two beakers of capacity 500 mL were taken. One of these beakers, labelled as "A" was filled with 400 mL water whereas the beaker labelled "B" was filled with 400 mL of 2M solution of NaCl. At the same temperature both the beakers were placed in containers of same material and same capacity as shown in figure.



- A. Vapour pressure in container (A) is more than that in container (B)
- B. Vapour pressure in container (A) is less than that in container (B)
- C. Vapour pressure is equal in both the containers .
- D. Vapour pressure in container (B) is twice the vapour pressure in container (A)

Answer: A



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23. If two liquids A and B form minimum boiling azeotrope at some specific composition then

- A. A-B interactions are stronger than those between A-A or B-B
- B. vapour pressure of solution increases because more number of molecules of liquids A and B can escape from the solution
- C. vapour pressure of solution decreases because less number of molecules of only one of the liquids escape from the solution.
- D. A-B interactions are weaker than those between A-A and B-B

Answer: D



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24. 4 L of 0.02 M aqueous solution of NaCl was diluted by adding 1 L of water. The molality of the resultant solution is.....

A. 0.004

B. 0.008

C. 0.012

D. 0.016

Answer: D



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25. On the basis of information given below mark the correct option.

Information : On adding acetone to methanol some of the hydrogen bonds between methanol molecules breaks.

A. At specific composition methanol-acetone mixture will form minimum boiling azeotrope and will show positive deviation from Raoult's law

- B. At specific composition methanol-acetone mixture will form maximum boiling azeotrope and will show positive deviation from Raoult's law
- C. At specific composition methanol-acetone mixture will form minimum boiling azeotrope and will show negative deviation from Raoult's law
- D. At specific composition methanol-acetone mixture will form maximum boiling azeotrope and will show negative deviation from Raoult's law

Answer: A

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26. K_H value for Ar(g) , CO(g) , HCHO(g) and $\text{CH}_4(\text{g})$ are 40.39 , 1.67 , 1.83×10^{-5} and 0.413 respectively. Arrange these gases in the order of their increastively solubility.

A. HCHO lt CH_4 lt CO_2 lt Ar

B. HCHO lt $\text{CO}_2 < \text{CH}_4 < \text{Ar}$

C. $\text{Ar} < \text{CO}_2 < \text{CH}_4 < \text{HCHO}$

D. $\text{Ar} < \text{CH}_4 < \text{CO}_2 < \text{HCHO}$

Answer: C

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Assertion And Reason

1. Assertion: Amalgam of mercury with sodium is an example of solid solutions .

Reason: Mercury is solvent and sodium is solute in the solution

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false

D. If both assertion and reason are false

Answer: C

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2. Assertion: The concentration of pollutants in water or atmosphere is often expressed in terms of ppm

Reason :Concentration in parts per million can be expressed as mass to mass, volume of volume and mass to volume .

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false

D. If both assertion and reason are false

Answer: B



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3. Assertion: One molar aqueous solution is more concentrated than that of 1 molal aqueous solution .

Reason : Molarity is a function of temperature as volume depends on temperature.

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false

D. If both assertion and reason are false

Answer: B



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4. Assertion: Pressure does not have any effect on solubility of solids in liquids.

Reason : Solids and liquids are highly incompressible

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: A



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5. Assertion: Aquatic species are more comfortable in warm waters than cold waters .

Reason: K_H values for both N_2 and O_2 decrease with increase of temperature

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: D



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6. Assertion: At equilibrium, vapour phase will be always rich in component which is more volatile

Reason: The composition of vapour phase in equilibrium with the solution is determined by the partial pressures of the components

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: A



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7. Assertion: Decrease in the vapour pressure of water by adding 1 mol of sucrose to one kg of water is higher to that produced by adding 1 mol of urea to the same quantity of water at the same temperature .

Reason : Molecular mass of sugar is less than that of urea .

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: D



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8. Assertion: In an ideal solution, $\Delta_{\text{mix}}H$ is zero

Reason : In an ideal solution, A-B interactions are lower than A-A and B-B interactions.

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: C

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9. Assertion: A solution of phenol and aniline will show negative deviations from Raoult's law

Reason : In case of negative deviations from Raoult's law , A-B forces are stronger than A-A and B-B forces .

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: A

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10. Assertion: The solutions which show large positive deviations from Raoult's law form maximum boiling azeotropes.

Reason : 95% aqueous solution of ethanol is maximum boiling azeotrope

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: D



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11. Assertion:The vapour pressure of an aqueous solution of sucrose is less than 1.013 bar at 373.15 K

Reason : Vapour pressure of water is 1.013 bar at 373.15 K.

- A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false

D. If both assertion and reason are false

Answer: B

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12. Assertion: Lowering of vapour pressure is not dependent on the number of species present in the solution.

Reason : Lowering of vapour pressure and relative lowering of vapour pressure are colligative properties

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false

D. If both assertion and reason are false

Answer: D



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13. Assertion: Osmosis does not take place in two isotonic solutions separated by semipermeable membrane.

Reason : Isotonic solutions have same osmotic pressure

A. If both assertion and reason are true and reason is the correct explanation of assertion

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false

D. If both assertion and reason are false

Answer: A



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14. Assertion: 1 M solution of KCl has greater osmotic pressure than 1 M solution of glucose at the same temperature

Reason :In solution KCl dissociates to produce more number of particles .

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: A



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15. Assertion: Molecular mass of KCl calculated on the basis of colligative properties will be lower than the normal molecular mass.

Reason : Experimentally determined molar mass of always lower than the true value .

- A. If both assertion and reason are true and reason is the correct explanation of assertion
- B. If both assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Answer: C



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