



CHEMISTRY

BOOKS - OMEGA PUBLICATION

SOLUTIONS

Questions

1. The volume of O_2 at STP required for the complete combustion of CH_4 is

.....



[Watch Video Solution](#)

2. 0.9 g of Al reacts with dil HCl to give H₂. The volume of H₂ evolved at STP is



[Watch Video Solution](#)

3. What is the concentration of a solution ?



[Watch Video Solution](#)

4. Define the following terms :

Mass percentage (w/w)



Watch Video Solution

5. Define the following terms :

Volume percentage (v/v)



Watch Video Solution

6. The volume of CO_2 evolved on heating 50 g of CaCO_3



[Watch Video Solution](#)

7. A solution is prepared by adding 5g of a substance X to 18g of water. Calculate the mass percent of solute .



[Watch Video Solution](#)

8. A solution is prepared by adding 360g of glucose to 864 g of water. Calculate mole fraction of glucose. (molar mass of glucose = 180)



[Watch Video Solution](#)

9. Define the following terms

Molality



[Watch Video Solution](#)

10. Write two differences between molarity and molality



Watch Video Solution

11. Calculate mole fraction of ethanol and water in a sample of rectified spirit which contains 92% ethanol by mass.



Watch Video Solution

12. Calculate the mole fraction of ethylene glycol ($C_2H_6O_2$) in a aqueous solution containing 20% of $C_2H_6O_2$ by mass.



[Watch Video Solution](#)

13. Calculate mole fraction of ethanol and water in a sample of rectified spirit which contains 92% ethanol by mass.



[Watch Video Solution](#)

14. How many moles of of HCl are present in 250cm³ of 0.5 M HCl solution .



Watch Video Solution

15. A solution is prepared by dissolving 1.0 g of NaOH in water to get 250 ml of solution . Calculate its molarity .



Watch Video Solution

16. 1.26 g of hydrated oxalic acid was dissolved in water to prepare 250ml of solution. calculate molarity of the solution.



[Watch Video Solution](#)

17. The density of 10% by mass of KCl solution in water is 1.06 gmL^{-1} . Calculate molarity and molality of the solution



[Watch Video Solution](#)

18. A solution of glucose in water is labelled as 10 percent w/w . What would be the molality and mole fraction of each component in the solution? If the density of the solution is 1.2g mL^{-1} , then what shall be the molarity of the solution?



Watch Video Solution

19. An antifreeze solution is prepared from, 222.6g of ethylene glycol, $C_2H_4(OH)_2$ and 200g of water. Calculate the molality of the

solution . If the density of the solution is 1.072g mL^{-1} , then what shall be the molarity of the solution?



[Watch Video Solution](#)

20. What is the mole fraction of solute in 2.5m aqueous solution .



[Watch Video Solution](#)

21. A aqueous solution contains 10 moles of sucrose in 1 kg of solvent. calculate the molality of solution.



[Watch Video Solution](#)

22. Calculate the molality of a solution containing 5.3 g of anhydrous Na_2CO_3 in 400 g water .



[Watch Video Solution](#)

23. A solution is 25% water, 25% ethanol and 50% acetic acid by mass. Calculate the mole fraction of each component.



Watch Video Solution

24. Calculate the molality and mole fraction of the solute in aqueous solution containing 3.0 g urea per 250 g of water (molecular mass of urea = 60g).



Watch Video Solution

25. Calculate the number of moles of methanol in 5 L of its solution, if the density of solution is 0.981 kg L^{-1} (Molar mass of methanol = 32.0 g mol^{-1}).



Watch Video Solution

26. How many gram equivalents of H_2SO_4 are present in 200 ml of N/10 H_2SO_4 solution ?



Watch Video Solution

27. 100 ml decinormal HCl is mixed to 100ml seminormal H_2SO_4 solution . calculate the normality of resulting mixture.



[Watch Video Solution](#)

28. Find the molarity and molality of a 15% solution and H_2SO_4 whose density is 1.02 g cm^{-3} .



[Watch Video Solution](#)

29. Equal volumes of two solutions contain 50 g of sodium chloride and 50 g of potassium chloride respectively. Are their molarities equal ?



[Watch Video Solution](#)

30. Calculate the molarity of a solution containing 0.5 g of NaOH dissolved in 500 cm³ of the solution?



[Watch Video Solution](#)

31. If 100 ml of 1N H_2SO_4 is mixed with 200 ml of 1N HCl solution . calculate the normality of resulting solution .



Watch Video Solution

32. 27 g Al will react completely with oxygen equals to



Watch Video Solution

33. What is saturated solution ?



Watch Video Solution

34. State Henry's law and mention its some important applications.



Watch Video Solution

35. What is the effect of temperature on solubility of a gas in a liquid ?



[Watch Video Solution](#)

36. Why do gases always tend to be less soluble in liquids as the temperature is raised?



[Watch Video Solution](#)

37. Why solubility of alcohols in water decreases with increase in molecular mass ?



[Watch Video Solution](#)

38. Benzene and toluene form nearly ideal solution . At 313 K the vapour pressure of benzene and toluene are 160 mm and 60 mm of Hg respectively. Calculate the total pressure of the solution made by mixing their equal masses at 313 K.



Watch Video Solution

39. At 293 K, ethyl acetate has vapour pressure of 72.8 torr ethyl proprionatr has vapour pressure of 27 . 7 torr. Assuming their mixture

to obey Raoult's law determine the vapour pressure of the mixture containing 25 g ethyl acetate and 50 g of ethyl propionate



[Watch Video Solution](#)

40. The partial pressure of ethane over a solution containing 6.56×10^{-3} g of ethane is 1 bar. If the solution contains 5.00×10^{-2} g of ethane, then what shall be the partial pressure of the gas?



[Watch Video Solution](#)

41. Henry's law constant for the molality of methane in benzene at 298 K is 4.27×10^5 mm Hg. Calculate the solubility of methane in benzene at 298 K under 760 mm Hg.



Watch Video Solution

42. Why the vapour pressure of saline solutions is lower than that of pure water ?



Watch Video Solution

43. State Raoult's law. Using the law how would you distinguish between an ideal solution and non-ideal solution ?



Watch Video Solution

44. State and explain :

Raoult's law for volatile solute.



Watch Video Solution

45. The boiling point of a solvent containing non volatile solute :



Watch Video Solution

46. State and explain :

Raoult's law for non-volatile solute.



Watch Video Solution

47. Benzene and toluene form nearly ideal solution. At a certain temperature the vapour pressure of pure benzene and toluene are 150 and 50 torr. respectively. Calculate the vapour pressure of solution containing equal weights of benzene and toluene at this temperature .



Watch Video Solution

48. At some temperature the vapour pressure of pure benzene, C_6H_6 is 0 . 256 bar and

vapour pressure of toluene, $C_6H_5CH_3$ is 0.0925 bar, if the mole fraction of toluene in a solution is 0.60

(i) What is the total vapour pressure of the solution ?

(ii) Calculate the composition of the vapour phase in terms of mole fraction.



[Watch Video Solution](#)

49. At some temperature the vapour pressure of pure benzene, C_6H_6 is 0.256 bar and

vapour pressure of toluene, $C_6H_5CH_3$ is 0.0925 bar, if the mole fraction of toluene in a solution is 0.60

(i) What is the total vapour pressure of the solution ?

(ii) Calculate the composition of the vapour phase in terms of mole fraction.



[Watch Video Solution](#)

50. At 298 K the vapour pressure of pure benzene C_6H_6 is 0.256 bar and vapour

pressure of pure toluene, C_6H_8 is 0.925 bar. If the mole fraction of benzene in solution is 0.40, find the total vapour pressure of solution. Also find the mole fraction of toluene in vapour phase



[Watch Video Solution](#)

51. Vapour pressure of chloroform ($CHCl_3$) and dichloromethane (CH_2Cl_2) at 298 K are 200 mm Hg and 415 mm Hg respectively. Calculate the vapour pressure of the solution prepared

by mixing 25 g of $CHCl_3$ and 45 g of CH_2Cl_2 at 298 K. Also find the mole fraction of CHI_3 in the vapour phase .



[Watch Video Solution](#)

52. What is solution ?



[Watch Video Solution](#)

53. What is non ideal solution ?



[Watch Video Solution](#)

54. Write differences between ideal and non-ideal solutions.



Watch Video Solution

55. The non ideal solution showing positive deviation :



Watch Video Solution

56. What is meant by positive deviations from Raoult's law and how is sign of $\Delta_{\text{mix}}H$ related to positive deviation from Raoult's law ?



Watch Video Solution

57. Discuss the behaviour of non-ideal solution having negative deviations from Raoult's law.



Watch Video Solution

58. What role does the molecular interaction play in a solution of alcohol and water?



Watch Video Solution

59. Write two points of differences between solutions of positive and negative deviations .



Watch Video Solution

60. The vapour pressure of ethanol and methanol are 44.5 and 88.7 mm of Hg at 298 K. An ideal solution is formed at the same temperature by mixing 60 g of ethanol and 40 g methanol. Calculate the total vapour pressure of the solution and the mole fraction of methanol in the vapour phase.



Watch Video Solution

61. What are Azeotropes ?





[Watch Video Solution](#)

62. Define Azeotropic mixture. Give one example.



[Watch Video Solution](#)

63. What are antifreeze solutions ?



[Watch Video Solution](#)

64. What are minimum boiling azeotropes ?

Give an example.



Watch Video Solution

65. Which will form maximum boiling azeotrope ?



Watch Video Solution

66. What are colligative properties ? Name four such properties.



Watch Video Solution

67. Show that relative lowering in vapour pressure is a colligative property



Watch Video Solution

68. Derive the relationship between the relative lowering of Vapour pressure and the mole fractions of the non volatile solute



Watch Video Solution

69. Derive the relationship between the relative lowering of Vapour pressure and the mole fractions of the non volatile solute



Watch Video Solution

70. Lowering of vapour pressure on dissolving a non-volatile solute in a liquid is a colligative property.



[Watch Video Solution](#)

71. How will you calculate the molecular mass of a solute with the help of relative lowering in vapour pressure of a solution of a non volatile solute?



[Watch Video Solution](#)

72. The vapour pressure of water is 12.3 kPa at 300 K. Calculate vapour pressure of 1 molal solution of a non-volatile solute in it.



Watch Video Solution

73. The vapour pressure of pure bronze at a certain temperature is 262atm. At the same temperature the V.P. of a solution containing 2.0g of non-volatile solid in 100g bronze is

256atm . What is the molecular mass of the solid?



[Watch Video Solution](#)

74. 1.0 gram of a non-volatile solute was dissolved in 100 gram of acetone (molecular mass = 58) at 298 K. The vapour pressure of solution was found to be 192.5 mm of Hg. Calculate the molecular mass of solute. The vapour pressure of pure acetone at 298 K is 195 mm of Hg.



Watch Video Solution

75. Based on solute-solvent interactions, arrange the following in order of increasing solubility in n-octane and explain. Cyclohexane, KCl, CH_3OH , CH_3CN .



Watch Video Solution

76. Calculate the mass of a non-volatile solute (molar mass 40g mol^{-1}) which should be

dissolved in 114g octane to reduce its vapour pressure to 80%.



[Watch Video Solution](#)

77. Define boiling point. What is elevation in boiling point ?



[Watch Video Solution](#)

78. Illustrate elevation in boiling point with the help of vapour pressure temperature curve of

a solution. Show that elevation in boiling point is a colligative property.



[Watch Video Solution](#)

79. Out of NaCl and $BaCl_2$ aqueous solutions which shows more elevation in boiling point and Why ?



[Watch Video Solution](#)

80. Explain, why does elevation in boiling point occur on the addition of non-volatile solute into it ?



Watch Video Solution

81. How will you calculate the molecular mass of a solute with the help of relative lowering in vapour pressure of a solution of a non volatile solute?



Watch Video Solution

82. 12 g Mg react with dilute mineral acid to produce maximum hydrogen equal to



Watch Video Solution

83. A solution of glycerol ($C_3H_8O_3$) in water as prepared by dissolving some glycerol in 500 g of water. This solution has a boiling point of $100 + 42^\circ$ C. What mass of glycerol was dissolved to make the solution ? K_b for $H_2O = 0.512$ K kg mol^{-1}



Watch Video Solution

84. A solution containing 12.5 g of a non-electrolyte substance in 175 g of water gave boiling point elevation of 0.70 K. Calculate the molar mass of the substance (K_b for water = 0.52 K kg mol⁻¹).



Watch Video Solution

85. A solution containing 0.45 g of a urea in 22.5 g of water gave a boiling point elevation of 0.17 K. Calculate the molal elevation constant of water. Molar mass of urea is 60 g mol^{-1} .



Watch Video Solution

86. Calculate the molal elevation constant of water, it is being given that 0.2 molal solution

of a non-electrolyte increases boiling point of water by 0.104 K.



[Watch Video Solution](#)

87. Boiling point of benzene is 353.23 K . When 1 . 80 g of non-volatile solute was dissolved in 90 g of benzene the boiling point is raised to 354. 11 K? Calculate molar mass of solute .

(K_b for benzene is 2 . 53 K kg mol^{-1})



[Watch Video Solution](#)

88. 18g of glucose , $C_6H_{12}O_6$ (Molar mass= $180g\ mol^{-1}$) is dissolved in 1000g (1kg) of water in a sauce pan . At what temperature will water boil at 1.013 bar? K_b for water is $0.52K\ kg\ mol^{-1}$. Water boils at 373.15K at 1.013bar pressure.



[Watch Video Solution](#)

89. Define freezing point.



[Watch Video Solution](#)

90. Freezing point of a solvent containing a non volatile solute



Watch Video Solution

91. Define molar depression constant



Watch Video Solution

92. Calculate the depression in the freezing point of water when 10 g of

$CH_3CH_2CHClCOOH$ is added to 250 g of water.

$$K_a = 1.4 \times 10^{-3},$$

$$K_f = 1.86 \text{ K kg mol}^{-1}.$$



[Watch Video Solution](#)

93. How will you show that depression in freezing point is a colligative property?



[Watch Video Solution](#)

94. Sodium chloride solution freezes at lower temperature than water but boils at higher temperature than water . Explain.



Watch Video Solution

95. On dissolving 0.25 g of a non-volatile substance in 30 mL of benzene (density 0.8 g mol^{-1}) its freezing point decreases by 0.40°C . Calculate the molecular mass of the non-

volatile substance. (K_f for benzene is 5.12 k m^{-1})



[Watch Video Solution](#)

96. Calculate the amount of CaCl_2 (molar mass = 111 g mol^{-1}) which must be added to 500 g of water of lower its freezing point by 2K, assuming CaCl_2 is completely dissociated. (K_f for water = $1.86 \text{ k kg mol}^{-1}$).



[Watch Video Solution](#)

97. A 5% solution (by mass) of cane sugar in water has freezing point of 271K Calculate the freezing point of 5% glucose in water if freezing point of pure water is 273.15 K.



Watch Video Solution

98. Calculate the amount of KCl which must be added to 1 kg of water so that its freezing point is depressed by 2 K.



Watch Video Solution

99. in a cold climate water gets frozen causing damage to the radiator of a car . Ethylene glycol is used as an antifreezing agent . Calculate the amount of ethylene glycol to be added to 4kg of water to prevent it from freezing at -6°C . (K_f for water 1.85K m^{-1}).



Watch Video Solution

100. How many grams of ethylene glycol (molar mass = 62) should be added to 10 kg of

water, so that the resulting solution freezes at -10°C (K_f for water = 1.86 K mol^{-1}).



[Watch Video Solution](#)

101. Addition of 0.643g of a compound to 43.95g of benzene lowers the freezing point from 5.51°C to 5.03°C . If K_f for benzene is 5.12K kg mol^{-1} , calculate the molar mass of the compound.



[Watch Video Solution](#)

102. In winter, the normal temperature in Dharmshala is -8°C Is a 30% by mass of an aqueous solution of ethylene glycol (molar mass = 62) suitable for car radiator . K_f for water is 1.86 K/m



[Watch Video Solution](#)

103. 0.1 mole of NaCl has more osmotic pressure than 0.1 mole of sugar dissolved in one litre of water. Why ?



[Watch Video Solution](#)

104. Define osmosis. What is the difference between osmosis and diffusion ?



Watch Video Solution

105. Calculate the molality of a solution containing 3g glucose dissolved in 30g of water. (molar mass of glucose = 180)



Watch Video Solution

106. What is reverse osmosis ?



Watch Video Solution

107. When dehydrated fruits and vegetables are placed in water they slowly swell and return to original form why ? What is the effects of temperature on the process ?



Watch Video Solution

108. Show that osmotic pressure is a colligative property?



Watch Video Solution

109. Isotonic solutions have



Watch Video Solution

110. Calculate the number of electrons , protons and neutrons in phosphorous atom.



[Watch Video Solution](#)

111. Define osmosis. What is the difference between osmosis and diffusion ?



[Watch Video Solution](#)

112. What are isotonic, hypertonic and hypotonic solutions.



[Watch Video Solution](#)

113. A solution prepared by dissolving 8.95 mg of a gene fragment in 35.0 mL of water has an osmotic pressure of 0.335 torr at 25°C . Assuming that the gene fragment is a non-electrolyte, calculate its molar mass.



Watch Video Solution

114. 3.0 g of non-volatile solute when dissolve in 1 litre water, shows an osmotic pressure of 2 atmosphere at 300 K. Calculate the molar

mass of the solute. ($R = 0.0821$ litre atm $K^{-1}mol^{-1}$).



[Watch Video Solution](#)

115. 200 cm^3 of an aqueous solution of a protein contains 1.26g of the protein . The osmotic pressure of such a solution at 300K is found to be 2.7×10^{-3} bar. Calculate the molar mass of the protein ($R=0.083$ L bar $mol^{-1}K^{-1}$)



[Watch Video Solution](#)

116. Determine the osmotic pressure of a solution prepared by dissolving 25 mg of K_2SO_4 in 2 litre of water at $25^\circ C$, assuming that it is completely dissociated.



[Watch Video Solution](#)

117. If 1.71 g of sugar (molar mass = 342) are dissolved in 500cm^3 of solution at 300 K, what will be its osmotic pressure ?



[Watch Video Solution](#)

118. Calculate the osmotic pressure in pascals exerted by a solution prepared by dissolving 1.0 g of polymer of molar mass 1,85,000 in 450 ml of water at 37°C



Watch Video Solution

119. Calculate the molar concentration of urea solution if it exerts an osmotic pressure of

2.45 atmosphere at 300K . ($R=0.0821\text{L atm mol}^{-1}\text{K}^{-1}$)



[Watch Video Solution](#)

120. At 300 K, 36 g of glucose present in a litre of its solution has an osmotic pressure of 4.98 bar. If the osmotic pressure of the solution is 1.52 bars at the same temperature, what would be its concentration?



[Watch Video Solution](#)

121. What do you mean by abnormal molecular mass ? Why do we get abnormal molecular masses from colligative properties



Watch Video Solution

122. Calculate the number of electrons , protons and neutrons in sulphur.



Watch Video Solution

123. Find number of electrons , protons and neutrons if mass number is 56 and atomic number is 26.



Watch Video Solution

124. Why do you get sometimes abnormal molecular mass of substances by using colligative properties of the solution? State the factors with examples which produces abnormality in the result.





[Watch Video Solution](#)

125. What is Van't Hoff factor ?



[Watch Video Solution](#)

126. Under what conditions Van't Hoff factor , i
less than one



[Watch Video Solution](#)

127. Calculate the no of proton , electron and neutron in Cl^- if atomic no is 17 and mass no is 35.



Watch Video Solution

128. Under what conditions Van't Hoff factor , i is equal to unity



Watch Video Solution

129. What is degree of dissociation of association ?



Watch Video Solution

130. Calculate the frequency of photon with energy $3.98 (10^{-15})$



Watch Video Solution

131. 2g of benzoic acid (C_6H_5COOH) is dissolved in 25g of benzene show depression in freezing point equal to 1.62K. Molar depression constant for benzene, $K_f=4.9K\text{ kgmol}^{-1}$. What is percentage association of acid if it forms a dimer in solution?



Watch Video Solution

132. 1 . 5 of Ba (NO_3)₂ dissolved in 100 g of water shows a depression in freezing point

equal to $0.28^{\circ}C$. What is the percentage dissociation of the salt ? (K_f for water = 1.86 K/m and molar mass of $Ba(NO_3)_2 = 261$.)



[Watch Video Solution](#)

133. Name the element with electronic configuration $1s^2 2s^2 2p^6 3s^2 3p^1$



[Watch Video Solution](#)

134. Name the element with electronic configuration $1s^2 2s^2 2p^6$



[Watch Video Solution](#)

Multiple Choice Questions

1. Calculate the number of electron, proton and neutron in phosphate ion .



[Watch Video Solution](#)

2. Calculate the number of electron, proton and neutron in sulphate ion .



Watch Video Solution

3. Calculate the number of electron, proton and neutron in carbonate ion .



Watch Video Solution

4. Units of molarity of

A. g/L

B. mol / L

C. kg/L

D. none of these

Answer: B



Watch Video Solution

5. For a molar solution of NaCl in water at $25^{\circ}C$ and $1atm$ pressure shows that:

A. molality = normality

B. molarity = normality

C. molarity = mole fraction

D. normality = mole fraction

Answer: B



Watch Video Solution

6. 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



Watch Video Solution

7. In a mixture, A and B compounds show negative deviation as

A. $\Delta V_{\text{mix}} > 0$

B. $\Delta H_{\text{mix}} < 0$

C. A-B interaction is weaker than A-A and B-B interaction

D. None of the above reason is correct

Answer: B



Watch Video Solution

8. Which of the following liquid pair shows positive deviation from Raoult's law:

A. benzene - chloroform

B. benzene - acetone

C. benzene - ethanol

D. benzene - carbon tetrachloride

Answer: A



Watch Video Solution

9. If liquid A and B form an ideal solution

A. the entropy of mixing is zero

B. the free energy of mixing is zero

C. the free energy as well as the entropy of mixing are zero

D. the enthalpy of mixing is zero

Answer: D



Watch Video Solution

10. Which of the following is not correct for ideal solution?

A. $\Delta S_{\text{mixing}} = 0$

B. $\Delta V_{\text{mixing}} = 0$

C. $\Delta H_{\text{mixing}} = 0$

D. it obey's Raoult's law

Answer: A



Watch Video Solution

11. Very dilute solutions which show deviations (positive or negative) from Raoult's law are called

- A. ideal solutions
- B. true solutions
- C. non-ideal solutions
- D. colloidal solutions

Answer: C



Watch Video Solution

12. Colligative properties of solutions are those which depend upon

- A. the nature of the solvent
- B. the nature of the solute
- C. the number of solvent molecules
- D. the number of solute particles

Answer: D



Watch Video Solution

13. Which of the following is a colligative property?

- A. Melting point
- B. Osmotic pressure
- C. Freezing point
- D. Sublimation temperature

Answer: B



Watch Video Solution

14. Which of the following is not a colligative property?

- A. Osmotic pressure
- B. elevation in boiling point
- C. Depression in freezing point
- D. Increase in freezing point

Answer: D



Watch Video Solution

15. The temperature at which the vapour pressure of a liquid becomes equal to external pressure is

- A. Melting point
- B. sublimation point
- C. inversion point
- D. boiling point

Answer: D



Watch Video Solution

16. The molecular mass of a solute cannot be calculated by one of the following relations

$$\text{A. } M_B = \frac{K_b \times 1000 \times w_B}{\Delta T_b \times w_A}$$

$$\text{B. } M_B = \frac{w_B \times RT}{\pi V}$$

$$\text{C. } M_B = \frac{p_0 \times w_B \times M_A}{(p_0 - p) \times w_A}$$

$$\text{D. } M_B = \frac{\Delta T_b \times 1000 \times w_B}{K_b \times w_A}$$

Answer: D



Watch Video Solution

17. Which of the following is correctly matched ?

A. Acetone 0.51

B. Benzene 2.53

C. Water 1.86

D. Chloroform 1.22

Answer: A



Watch Video Solution

18. If the elevation in boiling point of a solution of 10 gm of solute (mol. Wt. = 100) in 100 gm of water is ΔT_b , the ebullioscopic constant of water is

A. 10

B. $10\Delta T_b$

C. ΔT_b

D. $\Delta T_b / 10$

Answer: C



Watch Video Solution

19. Molal depression constant is calculated from the enthalpy of fusion (ΔH_f) and b.pt. of solvent using the relation.

$$\text{A. } K_f = \frac{M_1 R T_0^2}{1000 \Delta H_f}$$

$$\text{B. } K_f = \frac{1000 R T_0^2}{M_1 \Delta H_f}$$

$$\text{C. } K_f = \frac{1000 M_1 T_0^2}{R \Delta H_f}$$

$$\text{D. } K_f = \frac{\Delta H_f}{1000 M_1 T_0^2}$$

Answer: A



Watch Video Solution

20. The depression in freezing point is directly proportional to

A. mole fraction of the solution

B. molarity of the solution

C. molality of the solution

D. molarity of the solvent

Answer: C



Watch Video Solution

21. A 0.5 molal solution of ethylene glycol water is used as coolant in a car. If the freezing point constant of water be $1.86^{\circ}C$ per mole, the mixture shall freeze at

A. $0.93^{\circ}C$

B. $-0.93^{\circ}C$

C. $1.86^{\circ}C$

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

Answer: B



Watch Video Solution

22. An aqueous solution freezes at $1.186^{\circ}C$ ($K_f = 1.86$, $K_b = 0.512$). What is the elevation in boiling point?

A. 0.186

B. 0.512

C. 0.86

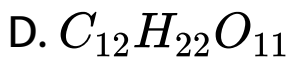
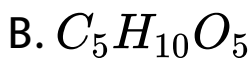
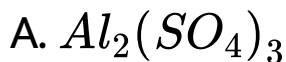
D. 0.0512

Answer: D



Watch Video Solution

23. Which of the following 0.10 m aqueous solution will have the lowest freezing point?



Answer: A



24. Which of the following aqueous solution will have highest depression in freezing point?

A. 0.1 M urea

B. 0.1 M sucrose

C. 0.1 M $AlCl_3$

D. 0.1 M $K_4[Fe(CN)_6]$

Answer: D



25. A solution contains non volatile solute of molecular mass M_2 . Which of the following can be used to calculate the molecular mass of solute in terms of osmotic pressure ?

A. $M_2 = \left[\frac{m_2}{\pi} \right] VRT$

B. $M_2 = \left[\frac{w_2}{V} \right] \frac{RT}{\pi}$

C. $M_2 = \left[\frac{m_2}{V} \right] nRT$

D. $M_2 = \left[\frac{w_2}{V} \right] \frac{\pi}{RT}$

Answer: B



Watch Video Solution

26. The relationship between osmotic pressure at 273K when 10 g glucose (P_1), 10 g urea (P_2) and 10 g sucrose (P_3) are dissolved in 250 ml of water is

A. $P_1 > P_2 > P_3$

B. $P_3 > P_1 > P_2$

C. $P_2 > P_1 > P_3$

D. $P_2 > P_3 > P_1$

Answer: C



Watch Video Solution

27. Isotonic solutions have

- A. same boiling point
- B. same vapour pressure
- C. same melting point
- D. same osmotic pressure

Answer: D



Watch Video Solution

28. What happens when isotonic solution of A (mol wt. 342) and B (mol. Wt. 60) are put into communication through semipermeable membrane

A. transference of solvent from solution A to that of B takes place

B. transference of solvent from solution B to that of A takes place

C. no transference of solvent from solution

A to that of B takes place

D. change in temperature of solutions take place.

Answer: C



Watch Video Solution

29. Which of the following experimental methods is adopted to determine osmotic pressure?

A. Ostwald method

B. Berkely-Hartley method

C. Solvay's method

D. Haber's method

Answer: B



Watch Video Solution

30. Isotonic solutions have

A. molar concentration

B. molarity

C. normality

D. molality

Answer: A



Watch Video Solution

31. $CuSO_4 \cdot 5H_2O$ is a

A. solution of solid in a liquid

B. solution of liquid in a solid

C. salt of $CuSO_4$ and water

D. co-ordination compound of copper sulphate with water molecules

Answer: D



Watch Video Solution

32. 'The solubility of a gas is directly proportional to the pressure of the gas'. The above statement is based upon.

- A. Raoult's law
- B. Henry's law
- C. Kohlrausch law
- D. None of these

Answer: B



Watch Video Solution

33. Out of molarity (M), molality (m) formality (f) and mole fraction (x) which one are independent of temperature?

A. M, m

B. F, x

C. m, x

D. M, x

Answer: C



Watch Video Solution

34. The density of 10% by mass of KCl solution in water is 1.06 gmL^{-1} . Calculate molarity and molality of the solution

A. The number of gram moles of the solute dissolved per ml of the solution

B. The number of moles of solute dissolved per kilogram of solvent

C. The number of moles of solute dissolved per litre of the solution

D. Number of grams of solute dissolved per kilogram of solvent

Answer: B



Watch Video Solution

35. Which halogen is used for the formation of chloroform?

A. The solution formed is ideal

B. A non-ideal solution with positive deviation

C. A non ideal solution with negative deviation

D. Unpredictable

Answer: C



Watch Video Solution

36. A liquid mixture which boils without change in the composition is called a/an

A. binary liquid mixture

B. azeotropic mixture

C. isotropic mixture

D. no specific name

Answer: B



Watch Video Solution

37. Which of the following compounds is not an antacid ?

A. $\Delta H_{\text{mixing}} = 0$

B. $\Delta V_{\text{mixing}} = 0$

C. Raoult's law is obeyed

D. Formation of an azeotropic mixture

Answer: D



Watch Video Solution

38. A binary solution of ethanol and n-heptane is an example of

- A. Ideal solution
- B. Non ideal solution with +ve deviation
- C. Non ideal solution with -ve deviation
- D. Unpredictable behaviour

Answer: B



Watch Video Solution

39. Solubility of gas in liquid depends upon

- A. Nature of the gas
- B. Temperature
- C. Pressure of the gas
- D. All of the above

Answer: D



Watch Video Solution

40. The number of moles in 180 g of water is.....

A. 1

B. 10

C. 18

D. 100

Answer: B



41. When the solute is present in trace quantities, the following expression is used

- A. gram per milion
- B. miligram percent
- C. microgram percent
- D. parts per million

Answer: D



42. which of the following mode of expressing the concentration is independent of temperature?

A. normality

B. mass - volume percent

C. molality

D. molarity

Answer: C



Watch Video Solution

43. Units of molarity of

A. g/1t

B. mol / 1t

C. kg/1t

D. None of these

Answer: B



Watch Video Solution

44. 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



Watch Video Solution

45. In a mixture, A and B compounds show negative deviation as

A. $\Delta V_{\text{mix}} > 0$

B. $\Delta H_{\text{mix}} < 0$

C. A-B interaction is weaker than A-A and B-B interaction

D. None of the above reason is correct

Answer: B



Watch Video Solution

46. Which of the following is not correct?

A. $\Delta S_{\text{mixing}} = 0$

B. $\Delta V_{\text{mixing}} = 0$

C. $\Delta H_{\text{mixing}} = 0$

D. it obey's Raoult's law

Answer: A



Watch Video Solution

47. Colligative properties of solutions are those which depend upon

- A. the nature of the solvent
- B. the nature of the solute
- C. the number of solvent molecules
- D. the number of solute particles

Answer: D



Watch Video Solution

48. Which of the following is not a colligative property?

A. Depression in freezing point

B. elevation in boiling point

C. Optical activity

D. Relative lowering in vapour pressure

Answer: C



Watch Video Solution

49. Which of the following is a colligative property?

A. Molar mass

B. Osmotic pressure

C. Viscosity

D. Optical activity

Answer: B



Watch Video Solution

50. Which is not a colligative property?

A. ΔT_b

B. ΔT_f

C. K_b

D. π

Answer: C



Watch Video Solution

51. Blood cells do not shrink in blood because blood is :

A. hypotonic

B. isotonic

C. equimolar

D. hypertonic

Answer: B



Watch Video Solution

52. A pressure cooker reduces cooking time because :

A. heat is more evenly distributed

B. the high pressure tenderises the food

C. the boiling point of water inside the cooker is elevated

D. the boiling point of water inside the cooker is depressed

Answer: C



Watch Video Solution

53. which of the following mode of expressing the concentration is independent of temperature?

A. Molarity

B. Molality

C. Formality

D. Normality

Answer: B



54. The boiling point of a solvent containing non volatile solute :

- A. is depressed
- B. is elevated
- C. does not change
- D. None of the above

Answer: B



55. Freezing point of a solvent containing a non volatile solute

A. is depressed

B. is elevated

C. does not change

D. None of the above

Answer: A



Watch Video Solution

56. The molarity of pure water (density of water = 1 gml^{-1})

A. 18

B. 5.56

C. 55.6

D. 100

Answer: C



Watch Video Solution