CHEMISTRY

BOOKS - CHETANA PUBLICATION

SOLUTIONS

Example

1. Define the term solution and classify it depending upon the number of components.

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2. Define the term solution and its componenets: How many types of solution ar formed? Explain.

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3. Define: (i) Solute (ii) Solvent.

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4. Write the size of particles of colloids and those of true solution.

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5. Define the term true solution.

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6. Define the term concentration.

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7. Explain a solid solution.

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8. What are the different unit used to express the concentrations of solutions.

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9. What is Le-Chateliers principle?

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10. Answer the following question :

State the different types of solutions. Give one example.

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11. Identify the different types of solution.

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12. Identify solvent and solution from the given solution. Pumic stone, Brass, Iodine in air, Oxygen in water, Chloroform in Nitrogen.

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13. Explain different types of solutions depending on amount of solute present in a solution.

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14. What is solubility? What is the genergal unit used for expressing concentration?

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15. Explain the solubility of a solid in a liquid.

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16. Explain the different factors affecting solubility.

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17. Explain the effect of Temperatuer and pressure on solubility.

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18. What is the effect of temperatuer on solubility of soild in water? Give examples.

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19. What are the differenc types of forces between molecules.

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20. Why does Naphthalene dissolves in benzene but not in water.

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21. Anhydrous sodium sulphate dissolves in water with the evolution of heat. What is effect of temperature on its solubility?

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22. Explain the solubility of gas in a liquid.

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23. State and explain Henry's Law.

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24. Define Henry's law constant and state its unit.

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25. What are the exceptions to Henry's law, State the reason.

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26. State are Explain Raoult's law for volatile components.

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27. How can the composition of vapour phase be determined.

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28. How does Raoult's law behave in ideal solution?

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29. Explain the term ideal solution with the respect to Raoult's law.

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30. What is the meant by non ideal solution?

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31. Explain the term non ideal solution with the respect to Raoult's law.

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32. Define the term colligative property. Give examples.

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33. Vapour pressure of a solution is

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34. What is lowering of vapour pressure of a solution.

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35. How will you lower the vapour pressure of a solution?

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36. Why the vapour pressure of solution containing non-valatile solute is lower than that of pure solvent?

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37. What is vapour pressure of a liquid?

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38. State Raoult's law for the solution containing a non-volatile solute.

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39. Lowering of vapour pressure of solution

Watch Video Solution

40. State Raoult's law for the solution containing a non-volatile solute.

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41. What is relative lowering of vapour pressure?

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42. Derive the relationship between lowering of vapour pressure and molar mass of solute.

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43. Which of the following solution will have higher freezign point depression and why? (a) 0.1 NaCI (b) $0.05mAI_2$

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44. How vapour pressure lowering is related to a rise in boiling point of solution?

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45. What is Boiling point of liquid?

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46. What is elevation of boiling point?

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47. Explain elevation of boiling point in terms of vapour pressure lowerign with help of a graph or diagram.

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48. What is the effect on the boiling point of water if 1 mole of methyl alcohol is added to $1dm^3$ of water? Why?

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49. What is the relation between boiling point elevation and concentration of solution.

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50. Write the equation relating boiling point elevation of the concentration of solution.

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51. Give Reason: Concentration is expressed in molality and not molarity?

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52. Define ebullioscopic constant or molal elevation constanct or boiling point elevation constant. State the units of Kb.

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53. Derive a relation between elevation of boiling point and molar mass of the solute.

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54. Defien freezing point of liquid.

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55. What causes depression in freezing point?

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56. What causes depression in freezing point?

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57. Why freezing point of solvent is lowered by dissolving a non-volatile solute into it?

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58. Explain depression in freezing point on addtion of a solute with help of a graph.

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59. Define molal depression constant or Cryoscopic constant and give its unit.

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60. How will you find the molar mass of solutes using freezing point depression.

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61. While considering boiling point elevation and freezing point depression of a solution concentration is expressed in molality and not in molarity. Why?

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62. Define semipermeable membrane.

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63. Explain Osmosis

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64. A solvent and its solution containing a non-volatile solute are separated by semipermeable membrane. Does the flow of solvent occur in both directions: Comment giving reason.

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65. Define Osomsis.

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66. Explain the osmosis phenomenon in day to day life.

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67. Define Osmotic pressure

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68. Define the following terms: Isotonic solutions

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69. Define the following terms: Hypertonic solutions

Watch Video Solution

70. Define the followign terms: Hypotonic solutions.

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71. How is molar mass of a solute determined by osmotic pressure measurement?

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72. Give Reason: Concentration is expressed in molality and not molarity?

Watch Video Solution

73. How is molar mass of a solute determined by osmotic pressure measurement?

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74. Define the term Reverse osmosis.

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75. Explain the process of Reverse Osmosis with an example.

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76. What are non-electroytes?

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77. How does the colligative properties of electrolyte solutions differ from those for non-electrolyte solution.

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78. Define van't Haff factor OR what is van't Hoff factor.

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79. Write van't Hoff factor in terms of different colligative properties.

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80. Define van't Haff factor OR what is van't Hoff factor.

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81. What will be the colligative properties of the following electrolytes compared to that of non-electroytes KNO_3, NaCl, Na_2SO_4, CaCl_2`.

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82. Which of the four colligative properties is most often used for molecular mass determination? Why?

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83. Write the modified expressions of colligative properties of non-electrolytes made applicable for electrolyte solutions.

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84. Derive the equation, $\alpha = \frac{i-1}{n-1}$.

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85. How is van't-Hoff- factor related to degree of ionisation?

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86. Derive the relationship between degree of dissociation and dissociation constant in weak electrolytes. (any one)

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87. The solubilling of N_2 gas in water at $25^\circ C$ and 1 bar is 6.85×10^{-4} mol L^{-1}. Calculate henry's law constant Molarity of N_2

gas dissolved in water under atmospheric conditions when partial pressure of N_2 in atmosphere is 0.75 bar.

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88. The Henry's law constant of methly bromide (CH_3Br) is $0.159mol\ L^{-1}$ bar.^{1} at $25^\circ C$. What is the solubility of methly bromide in water at $25^\circ C$ and at pressure of 130 mmHg?

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89. Fish generally needs O_2 concentration in water atleast $3.8m\frac{g}{L}$ for survival. What partial pressur of O_2 above the water is needed for the survival of fish? Give te solubility of O_2 in water at 0° and 1 atm partial pressure is 2.2×10^{-3}mol/L

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90. Henry's law constant for the solubility of Methane in banzene is 4.27×10^{-5} (mm Hg) mol dm^{-3} at constant temperature. Calculate the solubility of methane at 760 mm Hg pressure at the same temperature.

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91. For a gas the Henry's law constant is $1.25 \times 10^{-3} moldm^{-3}$ bar $.^{-1}$ at $50^{\circ}C$. Calculate the solubility of the given gas at 5 bar and $50^{\circ}C$,.

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92. The vapour pressure of pure liquids A and B are 450 mm Hg and 700 mm Hg, resprectively at 350 K. Find the composition of liquid and vapour if total vapour pressure is 600 mm. Hg.

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93. A mixture of benzene and toluene contains 30% by mass of toluene. At $30^{\circ} C$, vapour pressure of pure toluene is 36.7mm Hg and that of pure benzene is 118.2 mm Hg. Assuming that the two liquids form ideal silutions, calculate that total pressure and partial pressur eof each constituent above the solution at $30^{\circ} C$.

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94. A solutions is prepared by dissolving 394 g of a nonvolatile solute in 622 g of water. The vapour pressure of solution is found to be 30.74 mm Hg at $30^{\circ} C$. If vapour pressure of water at $30^{\circ} C$ is 31.8mm Hg, what is the molar mass of solute?

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95. The vapour pressure of pure benzene (molar mass 78 g/mol) at a certain temperature is 640 mm Hg, A nonvolatile solute of mass 2.315g is added to 49 g of benzene. The vapour pressure of the solution is 600 mm Hg. What is the molar mass of solute?

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96. The vapour pressure of water at $20^{\circ}C$ is 17 mm Hg. What is the vapour pressure of solution containing 2.8 g urea in 50 g of water?

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97. The vapour pressure of 2.1% solution of a non-electrolyte in water at $100^{\circ}C$ is 755 mm Hg. Calculate the molar mass of the solute. $\left(58.69gmol^{-1}\right.$

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98. In an experiment, 18.04 g of mannitol were dissolved in 100 g of water. The vapour pressure of water was lowered by 0.309 mm Hg from 17.535 mm Hg. Calculate the molar mass of mannitol.

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99. The normal boiling point of ethyl acetate is $77.06^\circ C$. A solution of 50 g of a nonvolatile solute in 150 g of ethyl acetate boils at $84.27^\circ C$. Evaluate the molar mass of solute if K_b for ethyl acetate is $2.77^\circ CKgMol^{-1}$

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100. 3.795 g of sulphur is dissolved in 100 g of carbon disulfide. This solution boils at 319.81K. What is the molecular formula of sulphure in solution? The boiling point of the solvent is 319.45K.

(Given that Kb for CS2 = 2.42 K kg mol(-1) and atomic mass of S = 32)

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101. A solution of citric acid $C_6H_6O_7$ in 50 g of acetic and has boiling point elevation of 1.76 K. if K_b for acetic acid is 3.07 K kg mol^{-1}, What is the molality of solution?

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102. The boiling point of benzene is 353.23 K. When 1.809 of a non-volatile solute was dissolved in 90 g of benzene, the boiling point is raised to 354.11K. Calculate the molarmass of the solute. K_b for benzene is $2.53Kkgmol^{-1}$.

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103. A solution containing 0.62g of an unknown solute in 50g $\mathbb{C}I_4$ gavea boiling point elevation of 0.65K. If the molal elevation constant

of $\mathbb{C}I_4$ is $5.02Kkgmol^{-1}$ Calculate molecular weight of solute:

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104. 1.02 g of urea when dissolved in 98.5 g of certain solvent decreases its freezing point by 0.211K. 1.609 g of unknown compound when dissolved in 86 g of the same solvent depresses the freezing point by 0.34 K. Calculate the molar mass of the unknown compound. (molar mass of urea = 60 g/mol)

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105. A 5% aqueous solution (by mass) of cane sugar (molar mass 342 g/mol) has freezing point of 271K. Calculate the freezing point of 5% aqueous glucdse solution if freezing point of water is 273.15K.

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106. 1.00 g of a non-electrolyte solute dissolved in 50 g of benzene lowered the freezing point of benzene of 0.40K. The freezing point depression constant of benzene is $5.12Kkgmol^{-1}$. Find the molar mass of the solute .

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107. 1.250 g of naphthalene was dissolved in 60 cm3 of benzene and freezing point of the solution was found to be 277.515 K while that of benzene 278.495 K. Density of benzene is $0.880gcm^{-3}Kf = 5.1Kmol^{-1}$ kg. Calculate the molecular weight of naphthalene.

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108. A solution containing 34.2 g of cane sugar $(C_{12}H_{22}O_{11})$ dissolved in 500 cm3 of water froze at - 0.374°C. Calculate the

freezing point depression constant of water.

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109. What is the molar mass of a solute if a solution prepared by dissolving 0.822g of it in 300 mdm3 of water has an osmotic pressure of 149 mm Hg at 298 K?

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110. If 1.71g of sugar (molarmass = 342) are dissolved in 500 cm3 of a solution at 300K, what will be its osmotic pressure? (R = 0.082 L bar $K^{-1}mol^{-1}$).

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111. At300 K,thesolutionof ureahasitsmolarity 0.1.Calculate the osmotic pressure of urea solution. Given that R = 0.082 Lbar $K-1mol^{-1}$.

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112. The osmotic pressure of CaCl2 and urea solutions of the same concentration at the same temperature are respectively 0.605 atmand 0.245 aim. Calculate van't Hoff factor for $CaCl_2$.

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113. 0.2m aqueous solution of KCI freezes at $-0.680^\circ C$. Calcuate van't Hoff factor and osmotic pressure of solution at $0^\circ C$. $\left(K_f = 1.86Kkgmol^{-1}\right.$.

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114. 0.01m aqueous formic acid solution freezes at $-0.021^{\circ}C$. Calculate its degree of dissodation. $K_f = 1.86 K kgmol^{-1}$.

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115. 3.4 g of $CaCl_2$ is dissolved in 2.5 L of water at 300 K. What is the osmotic pressure of the solution? van't Hoff factor for $CaCl_2$ is 2.47. (Ca = 40, Cl =35.5)

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116. A 0.1m solution of K_2SO_4 in water has freezing point of $-4.3^{\circ}C$. What is the value of van't Hoff factor if Kf for water is $1.86 K kgmol^{-1}$.

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117. Assuming complete dissociation, calculate the molality of an aqueous solution of KBr whose freezing point is $-2.95^{\circ}C$. K, for water is $1.86Kkgmol^{-1}$.

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118. An aqueous solution of a certain organic compound hasa density of $1.063gL^{-1}$ an osmotic pressure of 12.16 atm at $25^{\circ}C$ and a freezing point of $-1.03^{\circ}C$. What is the molar mass of the compound? $\left(Givenkg = 1.86kgmol^{-1}\right.$.

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119. At $25^{\circ}C$ a 0.1 molar solution of CH_3COOH is 1.35% dissodated in an aqueous solution. Calculate'freezing point and osmotic pressure of the solution assuming molality and molarity to be identical. $K_f = 1.86,$

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120. The solubility of nitrogen gas at1bar pressure at $25^{\circ}C$ is $6.8 \times 10^{-4}\ moldnr^{-3}$. Calculate the solubility of N_2 gasfrom atmosphere at $25^{\circ}C$ if atmospheric pressure is 1 bar and partial pressure of N_2 gas at this temperature and pressure is 0.78 bar.

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121. The vapour pressurefor purebenzene at a certain`temperature is 0.850 bar. A non-volatile, nonelectrolyte solid weighing 0.5 g when added to 39.0 g of benzene (molar mass 78 g mol-1) Vapour pressure of solution, then, is 0.845 bar. What is the molar mass of the solid substance.

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122. Calculate the mass in grams of an impurity ofmolar mass $100gmol^{-1}$ which would be required to raise the boiling point of 50 g of chloroform by 0.30 K (Kb for chloroform $3.63Kkgmol^{-1}$).

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123. 1.00 g of a non-electrolyte solute dissolved in 50 g of benzene lowered the freezing point of benzene of 0.40K. The freezing point depression constant of benzene is $5.12Kkgmol^{-1}$. Find the molar mass of the solute .

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124. 200 cm3 of an aqueous solution of a protein contain1.26g of the prote in.The osmotic pressure of such a solution at 300 K is found to be 2.57×10^{-3} bar. Calculate the molarimass of-the protein.

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125. 2 g of benzoic add (C_6H_5COOH) dissolved in 25 g of benzene shows a depression in freezing point equal to 1.62 K. Molal depression constant for benzene is $4.98Kkgmol^{-1}$. What is the percentage assodation of the acid if it forms dimer in solution.

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126. The solubility of dissolved oxygen to $27^{\circ}Cis2.6 \times 10^{-3}mo\frac{l}{d}m^3at2aim.\ F \in ditsso$ lub $ilityat8.4atm$ and 27^@C`.

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127. Calculate the freezing point of solution prepared by dissolving 4.5 g of glucose $\left(molarmass = 180gmol^{-1}\right)$ in 250 g of bromoform.

Given, freezing point of bromoform $= 7.8^{\circ}C$ and K_f for bromoform $= 14.4 K kg mol^{-1}$.

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128. The solubility of Nitrogen at $30^{\circ}C$ is $2.5 \times 10^{-3} g dm^{-3}$ at 760 mm pressure. What will be its solubility in mol dm^{-3} at 20,000 mm and same temperature?

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129. Vapour pressure of chloroform $(CHCI_3)$ and dichloromethane (CH_2CI_2) at 298 K are 200 mm Hg and 415 mm Hg respectively, (i) Calculate the vapour pressure of the solution prepared by mixing 25.5 g of $CHCI_3$ and 40 g of CH_2CI_2 at 298 K and (ii) mole fractions of each component in vapour phase.

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130. What is the mass of sucrose in its 1L solution $\left(molarmass = 342gmol^{-1}\right)$ which is isotonic with `6.6 xx 10^(-3) kg L1of urea (NH, CONH,)? (H = 1, C = 12, N = 14, 0 =16)

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131. An organicsubstance $\left(M = 169gmol^{-1}\right)$ isdissolved in 2000 cm3 of water. Its osmotic pressure at $12^{\circ}C$ was found to be 0.54 aim. If R = 0.0821 L atm $K^{-1}mol^{-1}$, calculate the mass of the solute.

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132. Find the osmotic pressure of 5 per cent solution of glucose $(C_6H_{12}O_6)$ at $27^{\circ}C$. (R = 0.082 litre atmosphere per degree per mole).

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Exercise

1. The vapour pressure of a solution contain2 moles of a solute in 2 moles of water (vapour pressure of pure water = 24 mm Hg) is

A. 24 mm Hg

B. 32 mm Hg

C. 48 mm Hg

D. 12mm Hg

Answer:

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2. The colligative property of a solutionis

A. vapour pressure

B. boiling point

C. osmotic pressure

D. freezing point

Answer:

Watch Video Solution

3. While considering boiling point elevation and freezing point depression of a solution concentration is expressed in molality and not in molarity. Why?

A. molarity

B. molality

C. mole fraction

D. mass precent

Answer:

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4. Ebullioscopic constant is the boiling point elevation when the concentration of solution is

A. 1m

B. 1 M

C. 1 mass %

D. 1 mole fraction of solute

Answer:

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5. Cryoscopic constant depend on

A. mature of solvent

B. nature of solute

C. nature of solution

D. number of solvent molecules

Answer:

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6. Identify the correct statement

A. vapour pressure of solution is higher than that of pure solvent

B. boiling point of solvent is lower than that of solution

C. osmotic pressure of solution is lower than that of solvent

D. osmosis is a colligative property

Answer:

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7. A living cell contains a solution which is isotonic with0.3Msugar solution. What osmotic pressure develops when the cell is placed in 0.1 M KCl solution at body temperature.

A. 5.08 atm

B. 2.54 atm

C. 4.92 atm

D. 2.46 atm

Answer:

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8. The osmotic pressure of blood is 7.65 atm at 310 K. An aqueous solution of glucose isotonic with blood has the percentage (by

volume)

A. 5.41

B. 3.54

C. 4.54

D. 53.4

Answer:

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9. Vapour pressure of a solution is _____.

A. directly propertional to the mole fraction of the solute

B. inversely propertional to the mole fraction of the solute

C. Inversely proportional to the moel fraction of the solvent

D. directly propertional to the mole fraction of the solvent

Answer:

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10. Pressure cooker reduces cooking time for food because

A. boiling point of water involved in cooking is increased.

B. heat is more evenly distributed in the cooking space.

C. the higher pressure inside the cooker smashes the food material.

D. cooking involves chemical changes helped by a rise in temperature.

Answer:

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11. Henry's law constant for a gas CH_3Br is 0.15 g $moldm^{-3}atm^{-1}at25^{\circ}C$. What is the solubility of CH_3Br in water at $25^{\circ}C$ and a partial pressure of 0.164 atm?

A. $0.0159mol^{-1}$

B. $0.164mol^{-1}$

C. 0.026 M

D. 0.042 M

Answer:

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12. Which of the following statement is NOT correct for 0.1 M urea solution and 0.05 M sucrose solution?

A. osmotic pressure exhibited by urea solution is higher than that exhibited by sucrose solution.

B. urea solution is hypertonic to sucrose solution.

C. They are isotonic solutions

D. sucrose solution is hypotonic to urea solution.

Answer:

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13. Which of the following is independent of temperature?

A. Normality

B. molarity

C. molality

D. formality

Answer:

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14. When NaCI added to a water.

A. freezing point is raised

B. boiling point is depressed

C. freezing point does not change

D. boiling point is raised

Answer:

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15. Which of following 0.1M equeous solution will exert highest osmotic pressure.

A. NaCl

B. $BaCI_2$

C. $mgSO_4$

D. $AI_2(SO_4)_3$

Answer:

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16. According to the Raoult's law, 'the relative lowering of vapour pressure is equal to the

A. mole fraction of solvent

B. mole fraction of solute

C. independent of mole fraction of solute

D. molality of solution

Answer:

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17. Partial pressure of solvent in solution of non-volatile solute is given by equation,

A. $p = x_2 p^\circ$

B. $p = x p^\circ$

C. $p = x_2 P^\circ$

D. $p = x_1 p^\circ$

Answer:

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18. When partial pressure of solvent in solution of non-volatile solute is plotted against its mole fraction, nature of graph is

A. a straight line passing through origin.

B. a straight line parallel to mole fraction of solvent.

C. a straight line parallel to vapour pressure of solvent

D. a stright line intersecting vapour pressure axis

Answer:

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19. Lowering of vapour pressure of solution

A. is a property of solute

B. is a property of solute as well as solution.

C. is a property of solution.

D. is a colligative property.

Answer:

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20. Molal elevation constant is elevation in boiling poind produced by

A. 1 g of solute in 100 g of solvent.

B. 100 g of solute in 1000 g of solvent.

C. 1 mole of solute in one litre of solvent.

D. 1 mole of solute in one kg of solvent.

Answer:

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21. Why the vapour pressure of solution containing non-valatile solute is lower than that of pure solvent?

A. equal to the vapour pressure of pore solvent.

B. higher than vapour pressure of pure solvent

C. lower than vapour pressure of pure solvent.

D. constant.

Answer:

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22. Explain Osmosis

A. solvent molecules pass from high concentration of solute to low concentration.

B. solvent molecules pass from a solution of low concentration of solute to a solution of high concentration of solute.

C. solutemoleculespassfromlowconcentration to high concentration.

D. solute molecules pass from high concentration to low concentration.

Answer:

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23. The two solutions with same osmotic pressure are called

A. isotonic

B. isomeric

C. hypotonic

D. hypertonic

Answer:

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24. The two solutions with same osmotic pressure are called

A. isotonic

B. isomeric

C. hypotonic

D. hypersonic

Answer:

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25. molarity of solution depend on

A. temperature

B. nature of solute dissolved

C. mass of solvent

D. pressure

Answer:

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26. Which of the following aqueous solution will have minimum elevation in boiling point?

A. 0.1 m KCl

B. 0.05 m NaCl

C. $1mAlPO_4$

D. 0.1 m MgSO

Answer:

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27. Which of the following will have maximum depression in freezing point?

A. $0.5mLi_2SO_4$

B. 1 m KCl

C. $0.5mAI_2(SO_4)_3$

D. $0.5mBaCI_2$

Answer:

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28. Relative lowering of vapour pressure depend only on

A. mole fraction of solute

B. Nature of solvent

C. Nature of solute

D. Nature of solute and solvent

Answer:

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29. If mass is expressed in gram then Kb is given by

A. $\frac{M_2 \Delta T_b \times W_1}{1000 x W_2}$

B. $\frac{W_2}{\Delta T_b \times W_1 \times M_1}$xx1000

C. $\frac{M_2 \Delta T_b \times W_2}{1000 \times W_1}$

D. $\frac{W_2}{\Delta T_b \times W_1 \times M_2}$xx1000

Answer:

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30. A homegeneous mixture of two more pure substance is called .....

A. compound

B. solute

C. Solvent

D. Solution

Answer:

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31. The properties of a solution depends upon the nature of

A. solute

B. Solvent

C. solute and solvent

D. Solution

Answer:

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32. CO_2 dissolved in water is _____

A. liquid solution

B. liquid in gas solution

C. liquid in liquid solution

D. gaseous solution

Answer:

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33. sodium amalgam and silver amalgam are the following types of solution:

A. solid in liquid

B. liquid in solid

C. solid in solid

D. solid in Mercury

Answer:

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34. Solubility is expressed in .....

A. $moldm^{-3}$

B. $moldm^3$

C. mol kg

D. mol/kg

Answer:

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35. Which gas is less soluble in water?

A. O_2

B. NH_3

C. HCl

D. CO_2

Answer:

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36. Solubility of gas in liquid.....

A. increases with increase in temperature .

B. decreases with increase in temperature.

C. remains constant.

D. increases with decrease in temperature.

Answer:

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37. For pure liquid, the vapour pressure will be directly proportional to

A. boiling point

B. freezing point

C. mole fraction

D. temperature

Answer:

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38. Homogeneous system among the following is

A. starch solution

B. sand in water

C. urea in water

D. benzene in water

Answer:

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39. A homogeneous solution constitute..... number of phases

A. A. one

B. B. two

C. C. three

D. D. four

Answer:

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40. Occlusion of Hydrogen on Palladium is an example of..... Type solution.

A. gas in solid

B. solid in gas

C. gas in liquid

D. liquid in ga

Answer:

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41. The concentration unit which does not change with the temperature is

A. both molality and mole fraction

B. molality only

C. mole fraction only

D. molarity only

Answer:

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42. The units of molarity are

A. $\equiv a \leq ntlit^{-3}$

B. $mollit^{-1}$

C. $mo \leq skg^{-1}$

D. $\equiv a \leq ntkg^{-1}$

Answer:

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43. The temperature at which the vapour pressure of the liquid becomes equal to the atmospheric pressure is known as Its ____.

A. melting point

B. boiling oint

C. 273K

D. 373K

Answer:

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44. The vapour pressure is least for

A. pure water

B. 0.1 M aueous urea

C. 0.2 M aqueous urea

D. 0.3 M aqueous urea

Answer:

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45. What is osmotic pressure?

A. 1 M NaCl

B. $1MMgCI_2$

C. $1M(NH_4)_3PO_4$

D. $1MNa_2SO_4$

Answer:

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46. When mango n placed in dilute aqueous solution of hydrochloric acid it,

A. Shrinks

B. swells

C. bursts

D. nothing happen

Answer:

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47. The boiling point of 0.1 molal $K_4\left[Fe(CN)_6\right]$ solution will be (given K_b for water = 0.52 k kg mol^(-1))`

A. $100.52^\circ C$

B. $100.104^\circ C$

C. $100.26^\circ C$

D. $102.6^\circ C$

Answer:

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48. The freezing point of equimolal aqueous solution will be higher for

A. $C_6H_5NH_3^+CI^-$

B. $Ca(NO_3)_2$

C. $La(NO_3)_2$

D. $C_6H_{12}O_6$

Answer:

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49. The depression in freezing point 1 m urea, 1 m glucose and 1 m NaCI are in the ratio of

A. A. 1:2:3

B. B. 1:2:2

C. C.3:2:2

D. D. 1:1:2

Answer:

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50. A homogeneous solution constitute..... number of phases

A. one

B. two

C. three

D. four

Answer:

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51. Relative lowering of vapour pressure depend only on

A. mole fraction of solute

B. Nature of solvent

C. Nature of solvent

D. Nature of solute and solvent

Answer:

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52. When NaCI added to a water.

A. freezing point is raised

B. boiling point is depressed

C. freezing point does not change

D. boiling point is raised

Answer:

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53. van't Hoff factor of $Ca(NO_3)$ is

A. one

B. two

C. three

D. four

Answer:

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54. Define the term Reverse osmosis.

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55. 0.15 molal solution of a substance boils at 373.23 K. Calculate molal elevation constant of water, (Given boiling point of water=373.15K)

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56. At 298 K, $1000cm^3$ of a solution containing 4.34g of solute shows osmotic pressure of 2.55 atm., What is the molar mass of the solute.

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57. The vapour pressure of a solution containing 13×10^{-3} kg of solute in 0.1 kg of water at 298 K is 27.371 mm Hg. Calculate the molar mass of the solute. given that the vapour pressure of water at 298k is 28.065 mm hg

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58. What is the concentration of dissolved oxygen at $25^{\circ}C$ at 1 bar if partial pressure of oxygen is 0.22 bar? The Henry's law constant for oxygen is 1.3×10^{-3} mol dm 3 bar1.

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59. The observed depression in the freezing print of water for a particular solution is 0.087 K. Calculate the molality of the solution if molal depression constant for water is $1.86Kkg.\ mol^{-1}$.

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60. Assuming complete dissociation, calculate the molality of an aqueous solution of KBr whose freezing point is $-2.95^{\circ}C$. K, for water is $1.86Kkgmol^{-1}$.

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61. Battery acid is 4.22 M aqueous H_2SO_4 solution, and has density of $1.21gcm^{-3}$. What is the molality of H_2SO_4? H =1, S = 32, O = 16`.

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62. Boiling point of water at 750 mm of Hg is $99.63^\circ C$. How much sucrose must be added to 500 g of water so that it boils at $100^\circ C$

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63. What is solubility. Explain the different factors affecting solubility.

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