CHEMISTRY

BOOKS - USHA CHEMISTRY (ODIA ENGLISH)

SOLID STATE

Exercise

1. Number of particles per unit cell of BCC lattice is -

A. 1

B. 2

C. 4

D. 8

Answer:

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2. Co-ordination number of FCC crystal is -

A. 2

B. 12

C. 6

D. 8

Answer:

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3. Co-ordination number of HCP crystal is -

A. 4

B. 6

C. 8

D. 12

Answer:

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4. Empty space in BCC lattice is -

A. 0.32

B. 0.26

C. 0.48

D. 0.68

Answer:

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5. Calculate the packing efficiency of a metal crystal for a simple cubic lattice.

A. $\frac{\pi}{6}$

B. $\frac{\pi}{6}$

C. $\frac{\pi\sqrt{3}}{8}$

D. $\frac{\pi\sqrt{3}}{16}$

Answer:

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6. Packing efficiency in diamond is -

A. 34

B. 74

C. 48

D. 52

Answer:

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7. Packing efficiency in diamond is -

A. 0.34

B. 0.34

C. 0.68

D. 0.74

Answer:

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8. Interionic distance for CsCl crystal will be -

A. $\frac{4a}{\sqrt{3}}$

B. $\frac{2a}{\sqrt{3}}$

C. $\frac{\sqrt{3}}{2}a$

D. None

Answer:

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9. Number of tetrahedral sites in a close packed crystal is -

A. 8

B. 1

C. 3

D. 4

Answer:

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10. What is the structure of NaCl ?

A. bcc

B. bcc

C. fcc

D. None

Answer:

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11. Number of unit in 4g of an element, (atomic mass= 40) which crystalises bcc pattern is -

A. $\frac{N_0}{10}$

B. $\frac{N_0}{20}$

C. $2N_0$

D. N_0

Answer:

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12. Co-ordination number of rock salt type structure is -

A. 6

B. 1

C. 8

D. 2

Answer:

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13. Bragg's equation is -

A. $n\lambda = 2d \sin\theta$

B. $n\lambda = d \sin\theta$

C. $\lambda = 2d \sin\theta$

D. $n\lambda = \frac{d}{2} \sin\theta$

Answer:

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14. In a solid lattice the cation has left a lattice site and is located at an interstitial position. The lattice defect is known as -

A. frenkel defect

B. Interstitial defect

C. Schottky defect

D. Cation defect

Answer:

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15. Schottky defect defines imperfection in the lattice structure of -

A. liquid

B. solid

C. gas

D. all of these

Answer:

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16. All the solid crystals can be classified into -

A. 14 crystal systems

B. 7 crystal systems

C. 32 crystal systems

D. 9 crystal systems

Answer:

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17. Silica is an example of -

A. molecular crystal

B. covalent crystal

C. metallic crystal

D. all of these

Answer:

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18. Which of the following is an example of covalent solid ?

A. copper

B. rock salt

C. iodine

D. none of these

Answer:

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19. Crystals which are good conductor of heat and electricity are -

A. metallic

B. ionic

C. molecular

D. all of these

Answer:

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20. Ionic solids are characterised by:

A. low melting point

B. low melting point

C. good conductor of electricity in solid state

D. soluble in polar solvent

Answer:

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21. Which of the following is amorphous ?

A. glass

B. glass

C. bakelite

D. all

Answer:

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22. Explain, how much portion of an atom located at (i) corner and (ii) body centre of a cubic unit cell is part of its neighbouring unit cell?

A. 4 unit cells

B. 4 unit cells

C. 6 unit cells

D. 1 unit cell

Answer:

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23. Close packing is maximum in the crystal which is -

A. simple cubic

B. simple cubic

C. face centered cubic

D. can't be predicted

Answer:

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24. What do you mean by packing efficiency ? In which type of crystal arrangements packing efficiency is more ?

A. CsCl

B. CsCl

C. ZnS

D. KCl

Answer:

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25. What is co-ordination number ?

A. 6

B. 6

C. 10

D. 12

Answer:

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26. Schottky defect is generally appears in -

A. NaCl

B. CsCl

C. KCl

D. all of these

Answer:

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27. n-type semiconductor can be obtained by adding - ____ to pure germanium .

A. As

B. Ga

C. Si

D. B

Answer:

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28. n-type semiconductor can be obtained by adding - ____ to pure germanium .

A. Gr-13 element

B. Gr-13 element

C. Gr-15 element

D. None of these

Answer:

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29. In the cubic arrangement the radius ratio is found to be 0.884. The structure of the crystal will be ____ .

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30. Radius ratio of NaCl crystal is 0.532. The structure of the crystal is ____ .

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31. Number of particles present per unit cell of HCP crystal is ____ .

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32. Iodine is an example of ____ type of solid.

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33. The point defect which decreases the density of a solid is called as ____ .

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34. Give an example of hcp and bcc crystals.

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35. The total number of atoms per unit cell of a face centred cubic crystal is

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36. Which non-stoichiometric point defect is responsible for colour in alkali metal halides?

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37. Explain the following with suitable examples:

n-type semiconductor

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38. When Indium is added to Germanium which type of semiconductor is formed ?

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39. Bragg's equation is -

A. Bauxite

B. Dolomite

C. Haematite

D. Chalcopyrite

Answer:

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40. Write two characteristics of ionic solid.

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41. In molecular solid the constituent particles are held together by ____ .

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42. Carborundum is a ____ type of solid while dry ice is a ____ type of solid.

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43. Which type of crystalline solids are good conductor of electricity ?

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44. In a simple cubic crystal packing efficiency is ____ .

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45. Which of the following lattices has the highest packing efficiency?

(i) Simple cubic

(ii) Body-centred cubic

(iii) Hexagonal close-packed lattice

A. Wurtz reaction

B. Wurtz-Fittig reaction

C. Sandmeyer reaction

D. Friedel-Craft reaction

Answer:

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46. Which stoichiometric defect decreases the density of the crystal?

A. KI

B. SO_2

C. $SnCI_2$

D. PbS

Answer:

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47. If there are 'N' tetrahedral voids, then number of octahedral voids is ____ .

A. 2N

B. N

C. N/2

D. 3N

Answer:

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48. Octahedral void is created by ____ lattice points.

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49. Number of atoms in FCC crystal is ____ .

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50. Which type of crystal defect increases the density of a solid ?

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51. How do metallic solid and ionic solid differ in conducting property ?

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52. Why does Frenkel defect not change the density of AgCl crystal?

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53. What is F-centres ?

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54. Name the type of structure possessed by unit cell of CsCl.

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55. What type of stoichiometric defect is shown by ZnS?

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56. What type of stoichiometric defect is shown by AgBr?

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57. How many Chloride ions are there around sodium ion in sodium chloride crystal ?

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58. How will you distinguish between tetrahedral void and octahedral void ?

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59. What is co-ordination number ?

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60. Write the equation by which you can find atomic mass of a metal from its density and dimensions of unit cell.

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61. An ionic compound has a unit cell consisting of A ions at the corners of a cube and B ions on the centres of the faces of the

cube. What is the empirical formula of the compound ?

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62. What is a semiconductor? What aren-type and p-type semiconductors?

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63. Gold (atomic radius = 0.144 nm) crystallises in a face centred unit cell. What is the length

of the side of the cell?

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64. What type of forces operate in molecular solids?

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65. Write two characteristic properties of molecular solid.

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66. Write two characteristic properties of ionic solid.

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67. What types of solids are electric conductors, malleable and ductile?

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68. What type of solids are very hard and electrical insulator in solid state as well as in molten state?

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69. What do you mean by packing efficiency ? In which type of crystal arrangements packing efficiency is more ?

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70. What type of stoichiometric defect is shown by ZnS?

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71. What type of stoichiometric defect is shown by AgBr?

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72. What is meant by point defect in crystals ?

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73. If 'a' is the edge length of the unit cell of a fcc crystal, then what is the distance of closest approach between the two atoms in the crystal ?

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74. In a bcc crystal what is the relationship between atomic radius (r) and edge length (a) ?

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75. What is the packing efficiency in a bcc arrangement of crystals ?

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76. Classify the following solids based on intermolecular forces. sodium chloride , urea, glucose, zincsulphide, ice, Diamond, Gold, Potassium sulphate , silicon carbide.

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77. Classify the solids on the basis of intermolecular force of attraction.

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78. Give two difference between crystalline and amorphous solids.

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79. Ionic solids conduct electricity in molten state but not in solid state. Explain.

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80. A solid has a cubic structure in which X atoms are located at corners of the cube, Y atoms are at the centres and 'O' atoms are at the edge centres. Find the formula of the compound.

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81. Lithium crystalises in bcc lattice. Find the number of unit cells in 14g of lithium.

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82. Distinguish between cubic and orthorhombic unit cells.

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83. Find the packing efficiency in fcc arrangement.

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84. How does Schottky defect arise ? In which type of ionic compounds does this defect arise ?

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85. How does Frankel defect arise? Give example.

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86. What is difference between p-type and n-type semiconductor?

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87. How are point defects and line defects different?

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88. Describe two types of point defects.

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89. Write two features by which you can distinguish metallic solid from ionic solid.

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90. The radius of Na^+ is 95 pm and Cl^- ion 181 pm. Find co-ordination number of Na^+ ion.

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91. Silver crystallises in fcc unit cell. The edge length of unit cell is 409 pm. Find the radius of silver atom.

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92. What is co-ordination number in solids?

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93. Write co-ordination number in hcp, ccp and bcc crystal structure.

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94. A non-stoichiometric oxide of iron has the formula $Fe_{0.93}O_{1.00}$ what % of iron is present in the form of Fe (III)?

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95. The edge length of unit cell of a body centred metal crystal is 352 pm. Calculate the radius of an atom of the metal.

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96. Write the equation by which you can find atomic mass of a metal from its density and dimensions of unit cell.

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97. Give a comparison between metallic solid and ionic solid.

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98. What do you mean by F – centres and interstitials?

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99. What makes a glass different from a solid such as quartz? Under what conditions could quartz be converted into glass?

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100. Define a unit cell of a crystal.

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101. Explain interstitial voids.

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102. Write the three types of cubic crystal arrangement, Describe the total number of

atoms, distance between nearest neighbours, radius and packing efficiency in each case.

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103. Classify the solids on the basis of intermolecular force of attraction.

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104. A face centred cubic crystal has an edge length of $4A^{\circ}$, If atomic mass of the element

is 60, find its density.

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105. Give comparison between Schottky defect and Frenkel defect.

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106. For a crystal of CsCl, the radius ratio is 0.884. What information is obtained from it?

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107. What are the different types of cubic crystal systems.

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108. On the basis of band theory explain the conducting power of conductors, semiconductor and insulator.

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109. Explain interstitial voids.

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110. If the radius of the octahedral void is r and radius of the atoms in close packing is R, derive a relation between r and R.

Draw a diagram showing octahedral void and derive the relation between r and R.

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111. Give a relationship between radius of atom (r), edge (a) of unit cell for fcc and bcc crystal.

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112. Illustrte metal excess defect and metal deficiency defect.

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113. Two solution of equal Osmotic pressure are known as

A. Ideal solution

B. Nonideal solution

C. Isotonic solution

D. Hypotonic solution

Answer:

114. In which of the following process semipermeable membrane is required.

A. Osmosis

B. Diffusion

C. Decantation

D. Filtration

Answer:

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115. Vapour pressure is measured in –

A. Forward Reaction

B. Equilibrium

C. Backward Reaction

D. None

Answer:

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116. Vapour pressure is measured in –

A. Open container

B. Colsed container

C. Both the case

D. None

Answer:

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117. When vapour pressure of liquid becomes equal to atmospheric pressure then the temperature is known as –

A. Boiling point

B. Melting point

C. Sublimation Temperature

D. None

Answer:

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118. When vapour pressure of liquid becomes equal to atmospheric pressure

A. All the liquid is transformed into gas

B. All the Gas is transformed into liquid

C. Liquid and Gas remain in equilibrium

D. Can't be said

Answer:

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119. When temperature increases vapour pressure of liquid –

A. Increases

B. Decreases

C. Remain same

D. Can't be said

Answer:

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120. The solution which obeys Raoult's law is –

A. Isotonic

B. Ideal

C. Non ideal

D. Critical solution

Answer:

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121. Henry's law is related to –

A. Solid

B. Liquid

C. Gas

D. Solution

Answer:

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122. In ideal solution –

A. No Enthalpy and volume change occurs

B. Volume is changed but enthalpy does not change

C. Enthalphy in changed but volume does not change

D. Both Enthalpy and volume is changed.

Answer:

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123. Constant boiling mixtures are known as –

A. Azeotropes

B. Eutectics

C. True solution

D. Foam

Answer:

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124. Constant Freezing mixtures are known as –

A. Azeotropes

B. Eutectits

C. True solution

D. Foam

Answer:

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125. Which of the following mixture is an example of Ideal solution

A. Benzene+chloroform

B. Acetone+Benzene

C. Benzene+Toluene

D. None of these

Answer:

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126. Which of the following is not an ideal mixture

A. n-Hexane+n-Heptane

B. Chlorobenzene+Bromobenzene

C. Ethyl Bromide+Ethyl Iodide

D. Water+methanol

Answer:

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127. Which of the following is an example of minimum boiling Azeotropes

A. Acetone+Ethanol

B. Ethylbromide+Ethyl Iodide

C. Chloroform+Diethylether

D. None of these

Answer:

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128. Which of the following is not an example of non ideal solution showing positive deviation

A. Acetone+Aniline

B. Acetone+Carbondisulfide

C. Ethanol+cyclohexane

D. Carbontetrachloride+Toluene

Answer:

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129. Which of the following is not an example of non ideal solution showing negative deviation.

A. Chloroform+Nitric Acid

B. Chloroform+Acetone

C. Chloroform+Carbontetrachloride

D. Nitric Acid+Water

Answer:

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130. Which of the following is an example of maximum boiling Azeatropes.

A. Chlorobenzene+Bromo benzene

B. Chloroform+Nitric Acid

C. Carbontera chloride+Chloroform

D. None of these

Answer:

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131. Non ideal solution showing positive deviation is known as:

A. Minimum boiling Azeotropes

B. Maximum boiling Azeotropes

C. Medium boiling Azeotropes

D. Eutecties

Answer:

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132. Non Ideal solution showing negative deviation is known as:

A. Minimum boiling Azeotropes

B. Maximum boiling Azeotropes

C. Medium boiling Azeotropes

D. None of these

Answer:

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133. For non ideal solution positive deviation volume change is:

A. Zero

B. Positive

C. Negative

D. None of these

Answer:

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134. For non ideal solution showing negative deviation Enthalpy change is:

A. Negative

B. Positive

C. Zero

D. None of these

Answer:

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135. For minimum boiling Azeatropes the total vapour pressure will be

A. Less than expected value

B. More than expected value

C. Same as expected value

D. Can't be said

Answer:

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136. For maximum boiling Azeatropes the total vapour pressure will be

A. Less than expected value

B. More than expected value

C. Same as expected value

D. Can't be said

Answer:

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137. For solution showing positive deviation which is false.

A. $\triangle H_{mix} > 0$

B. $\triangle V_{mix} > 0$

C. $P_T > P_A + P_B$

D. $P_A = P_A^0 X_A$

Answer:

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138. For solution showing negative deviation which is false.

A. $P_T < P_A + P_B$

B. $\triangle H_{mix} = -ve$

C. $P_B = P_B^0 X_B$

D. $\triangle V_{mix} = -ve$

Answer:

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139. Which of the following is not true for ideal solution

A. $\triangle V_{\max} = 0$

B. $\triangle H_{mix} = 0$

C. $P_T \neq P_A + P_B$

D. $P_A = P_A^0 X_A$

Answer:

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140. With increase in surface area vapour pressure of solution –

A. Decreases

B. Increases

C. Remain same

D. Can't be said

Answer:

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141. Vapour pressure of solution decreases with ___ in temperature.

A. Decrease

B. Increase

C. Independent

D. None of these

Answer:

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142. Vapour pressure of solvent is ___ than solution.

A. Less

B. More

C. Equal to

D. Independent

Answer:

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143. Boiling point of solution is ____ than pure solvent.

A. More

B. Less

C. Equal to

D. Can't be said

Answer:

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144. Freezing point of pure solvent is ____ than solution

A. Less

B. More

C. Equal

D. Can't be said

Answer:

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145. For Raoults law containing volatile solute the expression is –

A. $P_A = P_A^0 \cdot X_A$

B. $\frac{\triangle P}{P_0} = X_{solute}$

C. $\frac{\triangle P}{P_s} = X_{solute}$

D. None of these

Answer:

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146. The expression for Raoult's Law containing non volatile solute is –

A. $P_s = P^0 X_{solute}$

B. $P_s = P^0 \cdot X_{solvent}$

C. $\frac{\triangle P}{P_0} = X_{solute}$

D. $\frac{\triangle P}{P_s} = X_{solvent}$

Answer:

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147. Colligative property depends upon –

A. Number of particles of solute

B. Number of particle of solvent

C. Total number of Particles in solution

D. All of these

Answer:

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148. The expression for Henry law is –

A. $X_A = K_H P_A$

B. $P_A = K_H X_A$

C. $P_A = P_A^0 X_A$

D. All of these

Answer:

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149. Which of the following is not a colligative property.

A. Relative lowering in vapour pressure

B. Osmotic pressure

C. Diffusion

D. Elevation in Boiling point

Answer:

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150. Which of the following is not a colligative property.

A. Depression in freezing point

B. Freezing point

C. Boiling point

D. All of these

Answer:

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151. According to Henry's law amount of gas dissolved in a liquid is ____ with pressure

A. Inversely proportional

B. Directly proportional

C. Equal

D. None of these

Answer:

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152. The phenomenon by which plants derive water from their roots against the law of gravitation is called _____

A. Osmosis

B. Reverse Osmosis

C. Diffusion

D. Surface tension

Answer:

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153. Which of the following colligative property can provide molar mass of proteins with great precision?

A. Relative lowering in vapour pressure

B. Osmotic Pressure

C. Elevation in Boiling Point

D. Depression in freezing point

Answer:

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154. Melting point is highest for:

A. $Ca(NO_3)_2$

B. $La(NO_3)_3$

C. $C_6H_5NH_3Cl$

D. $C_6H_{12}O_6$

Answer:

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155. Which of the following solution will have greater depression in freezing point

A. IM Glucose

B. urea

C. IM NaCl

D. $IMMgCl_2$

Answer:

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156. Which of the following is true for ideal solution?

A. $\triangle V_{mix} = 0$

B. $\triangle H_{mix} = 0$

C. $P_T = P_A + P_B$

D. All of these

Answer:

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157. During depression of freezing point in a solution which are in equilibrium

A. Liquid solvent and solid solvent

B. Liquid solvent and solid solute

C. Liquid solute and solid solute

D. Liquid solute and solid solvent

Answer:

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158. After adding a solute freezing point of aqueous solution decreases to $-0.186^{\circ}C$. Calculate $\triangle T_b$ if $k_f = 1.86$ and $k_b = 0.521$

A. 0.0521

B. 0.521

C. 11.21

D. 1.521

Answer:

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159. 18g glucose is added to 178.2g water. The vapour pressure of water for this aqueous solution at $100^{\circ} C$ is –

A. 759 torr

B. 752.4 torr

C. 7.6 torr

D. 760 torr

Answer:

160. A 0.004 M solution of Na_2SO_4 is isotonic with 0.010M solution of Glucose at the same

temperature. The approximate percentage of Dissociation is –

A. 0.25

B. 0.5

C. 0.75

D. 1

Answer:

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161. calculate the molal depression constant of a solvent having freezing point $16.6^{\circ}c$ and $L_f = 180.75J/g$ is:

A. 2.68

B. 3.86

C. 4.68

D. 2.86

Answer:

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162. The mole fraction of solute in molal aqueous solution is

A. 0.027

B. 0.036

C. 0.018

D. 0.009

Answer:

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163. If α is the degree of dissociation of Na_2SO_4. 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:

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164. The van't Hoff factor for $BaCl_2$ at 0.01 M concentration is 1.98. The % dissociation of $BaCl_2$ at this concentration is –

A. 49

B. 69

C. 98

D. 89

Answer:

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165. Which of the following does not vary with temperature ?

A. normality

B. Molarity

C. Molality

D. None of these

Answer:

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166. Highest boiling point is found in –

A. 0.1 MNaCl

B. 0.1M $BaCl_2$

C. 0.1 M sucrose

D. 0.1M KCL

Answer:

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167. Vapour pressure of pure solvent is 0.8 mm of Hg at a particular temperature. On addition of non volatile solute 'A' the vapour pressure of solution become 0.6 mm of Hg. The mole fraction of component 'A' is –

A. 0.25

B. 0.75

C. 0.5

D. 0.35

Answer:

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168. The solubility of a gas in a liquid is directly proportional to the pressure of the gas. This statement is

A. Raoult's law

B. Van't Hoff's law

C. Henry's law

D. None of these

Answer:

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169. An azeotropic mixture of two liquids boils at a lower temperature than either of them when

A. It is saturated

B. It does not deviate from Raoult's law

C. It shows negative deviation from Raoult's law

D. It shows positive deviation from Raoult's law

Answer:

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170. The solubility of a substance is defined as the amount of solute in gram

A. Present per litre of solution

B. Present per 100 g solution

C. Present per 100g solvent

D. Present per 100 ml of solution

Answer:

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171. Solubility of a gas in liquid increaes on :

A. Increase in pressure

B. Decrease in temperature

C. Increase in amount of liquid

D. Both (a) and (b)

Answer:

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172. Normal boiling point of a liquid is that temperature at which vapour pressure of the liquid is equal to –

A. Zero

B. 760mm

C. 100mm

D. 273mm

Answer:

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173. Water boils at lower temperature on higher altitudes because

A. Atmospheric pressure is high there

B. Hydrogen bond is weaker there

C. Atmospheric pressure is low there

D. None of these

Answer:

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174. Which of the following is not a property of liquid?

A. Viscosity

B. Surface tension

C. Anisotropy

D. Evaporation

Answer:

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175. Which of the following decreases with increase in molecular mass for a liquid?

A. Viscosity

B. Vapour pressure

C. Boiling point

D. Surface tension

Answer:

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176. Semipermeable membrane is that which permits the passage of

A. Solute molecules only

B. Solvent molecules only

C. Both solute and solvent molecules

D. neither solute nor solvent molecule

Answer:

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177. The osmotic pressure of a 5% solution of glucose (mol.mass=180) $15^{\circ} C$ is

A. 6.56 atm

B. 5 atm

C. 6.65 atm

D. 3.46 atm

Answer:

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178. Which of the following has highest osmotic pressure?

A. $0.1M Al_2(SO_4)_3$

B. 0.1M $BaCl_2$

C. 0.1M NaCl

D. 0.1 M glucose

Answer:

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179. A 1.05% (w/v) solution of a substance was found to be isotonic with 3% glucose solution. The molecular mass of the substance is

A. 6.3

B. 63

C. 36

D. 10.5

Answer:

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180. Which of the following pairs of solutions are isotonic?

A. 0.1M urea and 0.1M NaCl

B. 0.1 M NaCl and 0.1M Na_2SO_4

C. 0.1M$Ca(NO_3)_2$ and 0.1M K_2SO_4

D. 0.1M glucose and 0.2M $MgCl_2$

Answer:

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181. Cryoscopy is related with

A. Osmotic pressure of solution

B. Elevation in boiling point of solution

C. Depression in freezing point of solution

D. None of these

Answer:

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182. The plant cells will shrink when placed in

A. Water

B. Hypotonic solution

C. Hypertonic solution

D. Isotonic solution

Answer:

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183. The study of colligative property is useful for the calculation of

A. Atomic weight of solute

B. Molecular weight of solute

C. Equivalent weight of solute

D. All of these

Answer:

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184. The relative lowering of vapour pressure is equal to mole fraction of the solute. This is known as

A. Raoult's law

B. Van't Hoffs law

C. Ostwald's law

D. Henry's law

Answer:

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185. Which of the following 0.1 M aqueous solutions will have the lowest freezing point :

A. $0.1MNa_3PO_4$

B. 0.1M $BaCl_2$

C. 0.1M NaCl

D. 0.1M urea

Answer:

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186. 18g glucose is dissolved in 90g water. The relative lowering of vapour pressure is equal to

A. $\frac{1}{6}$

B. $\frac{1}{5}$

C. $\frac{50}{51}$

D. $\frac{1}{51}$

Answer:

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187. The vapour pressure of toluene is 20.9mm and benzene is 74.2mm at same temperature. The total vapour pressure of an equimolar solution of two liquids is

A. 57.4 atm

B. 37.2mm

C. 47.5mm

D. 10.4 mm

Answer:

188. Which of the following from an ideal solution ?

A. H_2O & HBr

B. C_6H_6 & CCl_4

C. C_2H_5OH & CCl_4

D. All of these

Answer:

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189. When a solute is dissolved in a solvent the vapour pressure of the solution is decreased. It causes –

A. A decrease in B.P. of solution

B. An increase in BP of solution

C. A decrease in osmotic pressure

D. None of these

Answer:

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190. The osmotic pressure ofa solution containing 50 g of a solute in one litre of

solution at 300K is 20.5 atmosphere. Calculate the molecular mass of the solute.

A. Degree of dissociation of solute

B. Melting point of solute

C. Temperature of solution

D. Mole fraction of solute

Answer:

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191. Which of the following precipitate can act as a semipermeable membrane?

A. Copper ferrocyanide

B. Barium oxalate

C. Calcium sulphate

D. Nickel sulphate

Answer:

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192. The osmotic pressure of glucose at $27^\circ C$ is 2.5 atm, the concentration of glucose solution is

A. $0.1g/L$

B. $9g/L$

C. $18g/L$

D. $10\frac{g}{L}$

Answer:

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193. Which of the following expression gives the osmotic pressure of a solution

A. $\pi = \frac{RT}{C}$

B. $\pi = CRT$

C. $\pi = VRT$

D. $\pi = \frac{RC}{T}$

Answer:

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194. Which pairs of equimolar solutions will have equal osmotic pressure

A. Glucose and urea

B. NaCl and urea

C. NaCl and glucose

D. None of these

Answer:

Watch Video Solution

195. Boiling point of a solution is independent of

A. Amount of solute

B. Amount of solution

C. Nature of solvent

D. Pressure

Answer:

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196. The elevation in boiling point for one mole of a solute in 1000g solvent is called

A. Cryoscopic constant

B. Boiling point constant

C. Ebullioscopic constant

D. Freezing point constant

Answer:

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197. Which of the following methods can not be used to determine the molecular weight of non-volatile solute?

A. Cryoscopic method

B. Osmotic pressure

C. Ebullioscopic method

D. Victor-meyer's method

Answer:

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198. Define Hennry's law about solubility of a gas in a liquid.

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199. 20ml of a liquid A and 20ml of a liquid B mixed together. The volume of the resulting solution was found to be 39.8ml what do you conclude?

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200. Why does sea water boil at higher temperature than normal water?

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201. Vapour pressure of a liquid 'A' is lighter than vapour pressure of liquid 'B' at 25°C. Which will have higher boiling point?

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202. What happens to vapour pressure of water if some common salt is added to it?

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203. Between 1M sugar solution & urea solution which has higher boiling point?

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204. Fill in the blanks: $\triangle T_b = K_b \times$ _____

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205. Can we separate the components of azeotropic mixture by distillation?

Watch Video Solution

206. How does vapour pressure vary with temperature?

Watch Video Solution

207. Define Raoult's law.

Watch Video Solution

208. What do you mean isotonic solution?

Watch Video Solution

209. Give reason, when 30ml of ethyl alcohol is mixed with 30ml water, the volume of the resulting mixture is more than 60ml.

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210. Define Osmotic pressure.

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211. What is condition of reverse osmosis?

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212. Define molality ?

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213. Two liquid A and B boils at 155°c and 175°C respectively. Which of them has lighter vapour pressure at 100°C.

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214. What are azeotropes? Give an example.

Watch Video Solution

215. According to Henry's law $P_{gas} = K_H \times$ _____.

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216. What is the value of Van't Hoff factor (i) for KCl if it is 80% dissociated in aqueous solution?

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217. Define molefraction of solute.

Watch Video Solution

218. How does vapour pressure of a solvent affected by adding a non-volatile solute to it?

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219. What is the effect of temperature on molarity and molality?

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220. What is difference between molality and molarity?

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221. Define Ebullioscopic constant.

Watch Video Solution

222. Define cryoscopic constant.

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223. Arrange the following in increasing order of their vapour pressure at room temperature. (Water, salt solution in water, alcohol – water solution)

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224. Between sea water and drinking water which will freeze at lower temperature?

Watch Video Solution

225. A liquid with low vapour pressure at room temperature will have _____ boiling point.

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226. What do you mean by colligative properties?

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227. For a non-electrolyte van't Hoff factor is _____.

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228. What is unit of molal depression constant?

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229. What do you mean by ideal solution?

Watch Video Solution

230. What are the characteristics of ideal solution?

Watch Video Solution

231. Which type of deviation from Raoult's law is shown by benzene – methanol solution?

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232. Give an example each of ideal solution and non-ideal solution.

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233. Write the characteristics of non-ideal solution.

Watch Video Solution

234. What type of solution is methanol water liquid system?

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235. Give the expression for the relative lowering in vapour pressure.

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236. What type of deviation from Raoult's law is shown by acetone – chloroform liquid pair?

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237. Which of the following has higher vapour pressure? (mercury, water)

Watch Video Solution

238. Which type of solution show abnormal colligative properties?

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239. In which type of solution observed molecular mass of solute is greater than normal molecular mass of solute?

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240. When will be the value of vant Hoff factor greater than one?

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241. Find the mole fraction of 10% NaOH solution.

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242. Find the volume of water required to prepare a decimolar solution of urea from 10ml of its 2M solution.

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243. Molality of pure water is _____.

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244. How much urea must be dissolved in 250ml water to prepare a decimolar solution?

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245. If the solute solvent interaction is stronger than solvent-solvent interaction, then solution will exhibit _____ deviation.

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246. For solution showing negative deviation which is false.

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247. How the ebullioscopic constant, is related to enthalpy of vapourisation?

Watch Video Solution

248. Between one molar urea and 1 molar common salt solution which will freeze at lower temperature?

Watch Video Solution

249. Between equimolar solution of KCl and K_2SO_4 which will boil at higher temperature?

Watch Video Solution

250. What is semipermeable membrane?

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251. A solution with lower osmotic pressure than other is termed as _____.

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252. A solution with higher osmotic pressure than solution is termed as_____.

Watch Video Solution

253. Sea water can be made useful by using the process of _____.

Watch Video Solution

254. Shrinking of the cell due to out flow of water in a hypertonic solution is called _____.

Watch Video Solution

255. What is solid solution? Give an example.

Watch Video Solution

256. The plant cells will shrink when placed in

Watch Video Solution

257. The transportation of water from roots to the leaves through xylem is due to _____.

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258. Write the difference between ideal and non-ideal solutions.

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259. Explain, why non-ideal solution deviate from Raoult's law.

Watch Video Solution

260. Explain why CCl_4 and water are immisible where as ethanol and water are missible in all proportions.

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261. 3g urea is dissolved in 100ml water. Find the freezing point of solution $\left(K_f = 1.86 kkgmol_{-1}\right)$

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262. Calculate the molality of KCl solution in water if its freezing point is 271k $\left(K_f = 1.86 kkgmol_{-1}\right)$

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263. Explain why freezing point of a solvent is lowered by adding a non-volatile solute into it.

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264. Give an application of depression in freezing point.

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265. The solution of a non-volatile solute boils at a higher temperature than pure solvent. Explain this with a suitable diagram.

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266. Give one example each of solutions showing positive and negative deviation from Raoult,s law, with reason.

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267. The solution of a non-volatile solute freezes at lower temperature than pure solvent. Explain this with a suitable diagram.

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268. Calculate the amount of H_2SO_4 present in 2lit of 0.5M solution.

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269. Explain why normality and molarity vary with temperature while molality is: temperature independent.

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270. Define molality. 29.25 gms of NaCl are present in 529.25 gms of solution . Find out the molality .

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271. When dehydrated fruits and vegetables are placed in water, they slowly, swell and return to original from. Why?

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272. Explain, why freezing point depression of 0.1M NaCl is nearly twice that of 0.1M glucose solution.

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273. What is osmotic pressure? How can you explain it is a colligative property?

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274. Equal weights of glucose and urea are dissolved separately in 100g water each. Which solution will show higher boiling point and why?

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275. What weight of the non volatile urea (NH_2CONH_2) must be dissolved in 100g water in order to decrease its vapour pressure by 25%?

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276. What is van't Hoff factor? What are its values If the solute undergoes (i) dissociation (i) association.

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277. Explain the depression in Freezing point order of equimolar solution of glucose, common salt, acetic acid.

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278. Determine the amount of $CaCl_2$ (i=2.5) should be dissolved in 2.5 lit of water, so that its osmotic pressure is 0.75 atm at 27° C.

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279. The osmotic pressure of a solution is 2.4 atm at 27° C. if its strength is 18 $g/litre$, find molecular mass of the solute.

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280. A peeled egg when dipped in water swells, while in saturated salt solution it shrinks. Explain.

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281. Write the difference between osmosis and diffusion.

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282. How many grams of glucose must be dissolved in 0.5 lit water for its osmotic pressure to be same us that of a solution of 12g urea in 250ml water.

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283. If mole fraction of a solvent is 0.25 and its vapour pressure in pure state is 150mlmm, find the vapour pressure of the solution.

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284. 10g of a non-volatile solute was dissolved in 100g water at 20°C. the vapour pressure was lowered from 17.35 to 17.23 mm. calculate molecular mass of the solute.

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285. An aqueous solution of glucose containing 12g in 100g water was found to boil at 100.34°C. calculate K_b for water.

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286. Calculate the weight of non volatile solute (mw=90) which should be dissolved in 180g water to reduce its vapour pressure to 80%.

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287. 0.48g of a non volatile solute was dissolved in 10.6g benzene. The freezing point of the solution was lowered by 1.8°C. calculate molecular mass of the salute (K_f for benzene is $5kgmol^{-1}$)

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288. Calculate the osmotic pressure of a decimolar solution of glucose at $30_{\circ}$ C

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289. An aqueous solution containing urea was found to boil at more than373K, while the same solution freezes below 273K, which are the normal values for pure water. Explain.

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290. What is meant by abnormal molecular mass of solute?

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291. Discuss the factors which bring this abnormality during study of colligative properties.

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292. How is osmotic pressure related to molecular weight of solute?

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293. What are the advantages of osmotic pressure method for determining molecular masses?

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294. Explain, with a suitable diagram how non ideal solution show positive deviation from ideal behaviour

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295. A solution of urea in water has a boiling point of 100.128° C. calculate its freezing point $(K_b = 0.512$ and $K_f = 1.86 K kgmol_{-1})$

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296. Between sea water and drinking water which will freeze at lower temperature?

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297. A solution of sucrose (mol.mass=342) was prepared by dissolving 34.2g of it in 1000g water. Find its freezing point. $\left(K_f \text{ for water } = 1.86 k k g m o l^{-1}\right)$

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298. How much urea is to be added to 500g water so that it will boil at 374K? (k_b for water = 0.52K kg mol^{-1})

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299. Dissolution of 10g solute in 100g benzene increases its boiling point by 1°C. calculate molecular mass of solute. ($k_b = 2.35KKgmol^{-1}$)

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300. 0.1 mol sugar was dissolved in 1 Kg water, and depression in freezing point was found to be 0.186K. $\left(K_f \text{ for water} = 1.86 \text{ K Kg } mol^{-1}\right)$ .predict whether sugar is dissociated or associated?

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301. A 5% aqueous solution of sucrose is isotonic with 3% aqueous solution of another substance 'A'. find molecular mass of A. (sucrose mol. mass=342)

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302. A 5% aqueous solution of mass of cane sugar (mw=342) has freezing point 271K. calculate the freezing point of 5% glucose solution in water, if freezing point of pure water is 273.15K.

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303. The depression in freezing point of a 0.1 molal solution of benzoic acid in benzene is 0.256K. $\left(K_f \text{ for benzene } = 5.12\text{K kg } mol^{-1}\right)$. Calculate the value of van't Hoff factor and predict whether benzoic acid is associated or dissociated.

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304. The expression in freezing point of a 0.1 molal solution of a substance is 0.372° C. what

can you say about the solute? $\left(K_f \text{ for water is } 1.86 K kgmol^{-1}\right)$

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305. What do you mean by elevation in boiling point ?

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306. Derive the relationship between elevation in boiling point and molar mass.

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307. Addition of 1.5g of a non-volatile solute in 90g benzene increases its boiling point by $0.88^{\circ}C$. calculate molecular mass of solute. (k_b for benzene=2.53 k kg mol^{-1}.

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308. What do you mean by depression in freezing point? Show that depression in

freezing point is a colligative property.

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309. What do you mean by depression in freezing point? Show that depression in freezing point is a colligative property.

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310. 1g of a non-electrolyte when dissolved in 50g benzene, the freezing point of solvent is

lowered by 0.40K. Find molecular mass of solute. (K_f for benzene is 5.12 K kg mol^{-1})

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311. Which of the following methods can not be used to determine the molecular weight of non-volatile solute?

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312. What are azeotropes? Give an example.

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313. What are non-ideal solutions ? Describe graphically the non-ideal solution showing positive deviation and negative deviation from Raoult's law.

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314. 1.8% Nacl solution is isotonic with 10.8% solution of glucose (mol. mass =180). Calculate

the van't Hoff factor and degree of dissociation for Nacl

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