

Indian School Muscat

Chemistry Department

Senior Section

IIT – JEE

Solutions

- 1 What term is associated with the part of a solution that is present in the smallest amount?
(A) ionic compound
(B) solute
(C) covalent compound
(D) solvent
- 2 A solution is saturated at 25°C . It is then slowly cooled to 20°C with no change to the appearance of the liquid. What term would be associated with this solution?
(A) saturated
(B) supersaturated
(C) unsaturated
(D) oversaturated
- 3 Ice that contains a small amount of dissolved air is an example of what type of solution?
(A) a liquid dissolved in a liquid
(B) a solid dissolved in a gas
(C) a gas dissolved in a liquid
(D) a gas dissolved in a solid
- 4 A saturated solution is made by dissolving 36.8 g of a solid in 200 mL of water. A second solution is made by dissolving 19.1 g of the same solid in 100 mL of water. How would this solution be classified?
(A) unsaturated
(B) supersaturated
(C) saturated
(D) hypersaturated

- 5 Which of the following tests can be used to distinguish between an ionic solution and most molecular solutions?
- (A) pH measurement
 - (B) test for saturation
 - (C) solubility test
 - (D) conductivity test
- 6 Which type(s) of molecule(s) are polar solvents more likely to be able to dissolve?
- (A) ionic molecules
 - (B) polar and ionic molecules
 - (C) polar molecules
 - (D) ionic, polar and non-polar molecules
- 7 Which of the following is the least soluble in water?
- (A) lead(II) nitrate
 - (B) lithium phosphate
 - (C) magnesium sulfide
 - (D) silver acetate
- 8 Which forces affect solubility?
- (A) intramolecular forces
 - (B) hydrogen bonding
 - (C) intermolecular forces
 - (D) intramolecular and intermolecular forces
- 9 Which of the following solutions has the highest boiling point?
- (A) 5.85% solution of NaCl
 - (B) 18.0% solution of glucose
 - (C) 6.0% solution of urea
 - (D) all have same boiling point
- 10 Two solutions of NaCl and KCl are prepared separately by dissolving same amount of the solute in water. Which of the following statements is true for these solutions
- (A) KCl solution will have higher boiling point than NaCl solution
 - (B) both the solutions have same boiling point
 - (C) KCl and NaCl solutions possess same vapour pressure

- (D) None of the above
- 11 Molarity of pure water is
- (A) 1
 - (B) 18
 - (C) 55.5
 - (D) 6
- 12 18 gm glucose is dissolved in 90 gm of water. The relative lowering of vapour pressure is equal to
- (A) 0.02
 - (B) 5.1
 - (C) 0.2
 - (D) 6
- 13 The molar boiling point constant is the ratio of the elevation in boiling point to
- (A) molarity
 - (B) molality
 - (C) mole fraction of solvent
 - (D) less than that of water
- 14 An aqueous solution of methanol in water has vapour pressure
- (A) equal to that of water
 - (B) equation to that of methanol
 - (C) more than that of water
 - (D) less than that of water
- 15 An azeotropic mixture of two liquids boils at a lower temperature than either of them when
- (A) it is saturated
 - (B) it shows positive deviation from Raoult's law
 - (C) it shows negative deviation from Raoult's law
 - (D) it is metastable
- 16 In azeotropic mixture showing positive deviation from Raoult's law, the volume of mixture is
- (A) slightly more than the total volume of components

- (B) slightly less than the total volume of the component
(C) equal to the total volume of the components
(D) none of these
- 17 A solution of glucose is 10%. The volume in which 1 gm mole of it is dissolved will be
(A) 1 dm³
(B) 1.8 dm³
(C) 200 cm³
(D) 900 cm³
- 18 Colligative properties are the properties of
(A) dilute solutions which behave as nearly ideal solutions
(B) concentrated solutions which behave as nearly non-ideal solutions
(C) both (i) and (ii)
(D) neither (i) nor (ii)
- 19 The freezing mixture used in ice cream machine consists of ice and
(A) NaCl
(B) CaCl₂
(C) KNO₃
(D) both a & c
- 20 1 kg of sea water contains 4.96×10^{-3} gm of dissolved oxygen. The concentration of oxygen in sea water in ppm is
(A) 4.96×10^{-2}
(B) 0.496
(C) 4.96
(D) 49.6
- 21 A solution of sucrose is 34.2%. The volume of solution containing one mole of solute
(A) 500 cm³
(B) 1000 cm³
(C) 342 cm³
(D) 3420 cm³
- 22 Mole fraction of 10% urea is
(A) 0.042

- (B) 0.023
 - (C) 0.032
 - (D) 0.072
- 23 Which of the following mixtures of liquids show negative deviation
- (A) ethyl alcohol ether
 - (B) HCl and water
 - (C) phenol – water
 - (D) chlorobenzene – bromobenzene
- 24 The term cryoscopy is used
- (A) depression of freezing point
 - (B) elevation in boiling point
 - (C) lowering of vapour pressure
 - (D) osmotic pressure
- 25 The term ebullioscopy is used
- (E) depression of freezing point
 - (F) elevation in boiling point
 - (G) lowering of vapour pressure
 - (H) osmotic pressure
- 26 Azeotropic mixture
- (A) obey Henry's law
 - (B) obey Raoult's law
 - (C) do not obey Raoult's law
 - (D) obey Dalton's law
- 27 Which pair of mixture is called idea solution
- (A) nicotine–water
 - (B) chlorobenzene & bromobenzene
 - (C) water–ether
 - (D) water–alcohol
- 28 The vapour pressure of aqueous solution of sugar solution is
- (A) equal to vapour pressure of water
 - (B) more than vapour pressure of pure water

- (C) less than vapour pressure of pure water
(D) none of above
- 29 When NaCl is dissolved in water
(A) melting point decrease
(B) boiling point decrease
(C) both melting and boiling point decrease
(D) none of above
- 30 The solution which distils without change in composition is called
(A) unsaturated solution
(B) saturated solution
(C) zeotropic mixture
(D) azeotropic mixture
- 31 Solubility curve of $\text{Na}_2\text{SO}_4 \cdot 10 \text{H}_2\text{O}$ shows
(A) constant increase of solubility
(B) constant decrease of solubility
(C) discontinuous solubility with temp
(D) none of above
- 32 Use of glycol as antifreeze in the automobile is an important application of
(A) colligative property
(B) Raoult's law
(C) fractional crystallization
(D) hydrolysis
- 33 Use of NaCl in ice cream making is an important application of
(A) constitutive property
(B) additive property
(C) colligative property
(D) Raoult's law
- 34 Which one of the following solutions will have higher vapour pressure than that of water
(A) aqueous solution of CH_3OH
(B) aqueous solution of H_2SO_4
(C) aqueous solution of sugar

- (D) aqueous solution of urea
- 35 Ethylene glycol is mixed with water as anti freeze in radiator because
- (A) it has low vapour pressure
 - (B) it raises the boiling point of water
 - (C) it lowers the freezing point of water
 - (D) it changes osmotic pressure
- 36 Which one of following is not soluble in alcohol
- (A) KCl
 - (B) urea
 - (C) acetone
 - (D) ether
- 37 Which one of following is not a conjugate solution
- (A) ether + water
 - (B) phenol + water
 - (C) nicotine + water
 - (D) ethanol + water
- 38 Which one of the following has discontinuous solubility curve
- (A) NaCl
 - (B) KCl
 - (C) NaNO₃
 - (D) CaCl₂ · 6H₂O
- 39 Freezing point depression is measured by
- (A) Beckmann's apparatus
 - (B) Land's Berger's
 - (C) Antifreeze apparatus
 - (D) all the above
- 40 Elevation of boiling point is measured by
- (E) Beckmann's apparatus
 - (F) Land's Berger's
 - (G) Antifreeze apparatus
 - (H) all the above

- 41 Aqueous solution of glucose boils at 100.52°C . The solution contains
- (A) 180 gm glucose in 1 litre water
 - (B) 90 gm glucose in 1 litre water
 - (C) 18 gm glucose in 1 litre water
 - (D) 3.6 gm glucose in 1 litre water
- 42 Aqueous solution of methanol is zeotropic mixture because
- (A) it does not obey the Raoult's law
 - (B) mixture cannot be separated by sublimation
 - (C) mixture can be separated by distillation
 - (D) greater volume than the volume of component
- 43 When equal volumes of ether and water are shaken, then two layers are formed the ether layer contains water
- (A) 5.3%
 - (B) 6.3%
 - (C) 1.2%
 - (D) 2.1%