

Solutions Practice Test

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) Which state of matter has a high density and an indefinite shape?
 - A) liquids
 - B) solids
 - C) gases
 - D) both solids and liquids
 - E) none of the above
- 2) Which of the following is an observed property of liquids?
 - A) Liquids have a fixed shape and variable volume.
 - B) Liquids that are insoluble mix homogeneously.
 - C) Liquids compress or expand significantly.
 - D) Liquids are less dense than gases.
 - E) none of the above
- 3) The opposite process of freezing is:
 - A) boiling.
 - B) condensation.
 - C) sublimation.
 - D) evaporation.
 - E) none of the above
- 4) The tendency of a liquid to minimize its surface area is called:
 - A) viscosity.
 - B) vaporization.
 - C) surface tension.
 - D) capillary action.
 - E) none of the above
- 5) The change of a substance from a liquid to a gaseous form is called:
 - A) volatile.
 - B) condensation.
 - C) dynamic equilibrium.
 - D) vaporization.
 - E) heat of fusion.
- 6) Evaporation is:
 - A) increased by increasing temperature.
 - B) the opposite process to condensation.
 - C) a cooling process for humans when they sweat.
 - D) an endothermic process.
 - E) all of the above
- 7) Liquids that have high vapor pressure and low boiling points are called:
 - A) viscous liquids.
 - B) volatile liquids.
 - C) abnormal liquids.
 - D) non-volatile liquids.
 - E) none of the above
- 8) What is the term for the pressure exerted by vapor molecules above a liquid in a closed container when the rates of vaporization and condensation are equal?
 - A) atmospheric pressure
 - B) partial pressure
 - C) vapor pressure
 - D) gas pressure
 - E) none of the above
- 9) When you make ice cubes:
 - A) it is an exothermic process.
 - B) the process is referred to scientifically as sublimation.
 - C) the heat of vaporization must be removed.
 - D) it is an endothermic process.
 - E) none of the above
- 10) Substance A is a molecular compound that dissolves in gasoline but not in water. The molecules of A are very likely:
 - A) metallic.
 - B) polar.
 - C) nonmetallic.
 - D) nonpolar.
 - E) none of the above

- 11) Which substance is most likely to be miscible with water?
- CS₂
 - Br₂
 - CHCl₃
 - CF₄
 - none of the above
- 12) What is the term for the heat required to convert a solid to a liquid at its melting point?
- heat of vaporization
 - specific heat
 - heat of fusion
 - heat of crystallization
 - none of the above
- 13) What is the term for the heat required to convert a liquid to a gas at its boiling point?
- heat of fusion
 - heat of vaporization
 - specific heat
 - heat of crystallization
 - none of the above
- 14) NaCl is which type of solid?
- nonbonding atomic solid
 - molecular solid
 - covalent atomic solid
 - metallic atomic solid
 - ionic solid
- 15) The reason for many of the unique properties of water is:
- moderate viscosity and expanding upon freezing.
 - high surface tension and low volatility.
 - the ability to form hydrogen bonds.
 - dispersion forces.
 - all of the above
- 16) The solubility of solids in water:
- increases with increasing temperature.
 - decreases with increasing temperature.
 - is independent of the temperature.
 - Solids are not soluble in water.
 - none of the above
- 17) When an ionic compound dissolves in water:
- the positive end of water dipoles attract the negative ions.
 - the solvent-solute attractive forces overcome the solute-solute attractions.
 - the negative end of water dipoles attract the positive ions.
 - each of the above (A, B, and C) occurs.
 - none of the above (A, B, or C) occurs.
- 18) The statement "like dissolves like" justifies why _____.
- water will not dissolve fats
 - water will dissolve ethyl alcohol
 - octane will dissolve methane
 - All of the above statements are correct.
- 19) The O-H bond in water is polar because
- hydrogen is much more electronegative than oxygen.
 - oxygen is much more electronegative than hydrogen.
 - oxygen occupies more space than hydrogen.
 - it is an ionic bond.
 - it is a hydrogen bond.
- 20) An impurity _____ the melting point of a compound.
- decreases
 - increases
 - has no effect on
 - One cannot say unless the physical properties of the compound are known.
- 21) An impurity _____ the boiling point of a compound.
- increases
 - decreases
 - has no effect on
 - One cannot say unless the physical properties of the compound are known.
- 22) How many grams of KCl are needed to make 50.0 mL of 2.45 M KCl?
- 1.52
 - 91.3
 - 0.123
 - 9.13
 - none of the above

- 23) What is the mass percent of a solution prepared by dissolving 18.9 grams of solid into 39.5 grams of water?
- A) 58.4%
 - B) 47.8%
 - C) 32.4%
 - D) The identity of the compound must be known.
 - E) none of the above
- 24) How many grams of LiF would be present in 575 mL of 0.750 M LiF solution?
- A) 0.0338
 - B) 1.12×10^4
 - C) 11.2
 - D) 19.9
 - E) 33.8
- 25) What is the final concentration of a solution prepared by diluting 35.0 mL of 12.0 M HCl to a final volume of 1.20 L?
- A) 3.50 M
 - B) 0.420 M
 - C) 0.504 M
 - D) 0.350 M
 - E) none of the above
- 26) What volume of 12.0 M HCl is required to make 75.0 mL of 3.50 M HCl?
- A) 21.9 mL
 - B) 0.560 mL
 - C) 560. mL
 - D) 257 mL
 - E) none of the above
- 27) What volume of 9.00 M nitric acid is needed to make 6.50 L of 1.25 M solution?
- A) 1.10 L
 - B) 748 mL
 - C) 1.73 L
 - D) 903 mL
 - E) none of the above
- 28) If you add 4.00 mL of pure water to 6.00 mL of 0.750 M NaCl solution, what is the concentration of sodium chloride in the diluted solution?
- A) 0.450 M
 - B) 0.250 M
 - C) 0.500 M
 - D) 1.13 M
 - E) none of the above
- 29) Solutions are considered to be which general type of matter?
- A) heterogeneous mixtures
 - B) homogeneous mixtures
 - C) pure elements
 - D) pure substances
- 30) Which of the following accounts for the unusually high melting point of ice?
- A) the crystalline structure of ice
 - B) the molar mass of ice
 - C) the density of ice
 - D) the specific heat of ice
 - E) the hydrogen bonds in ice
- 31) Which of the following accounts for the unusually high boiling point of water?
- A) the surface tension in water
 - B) the density of water
 - C) the hydrogen bonds in water
 - D) the molar mass of water
 - E) the specific heat of water
- 32) Which of the following accounts for the unusually high heat of fusion for ice?
- A) the molar mass of ice
 - B) the hydrogen bonds in ice
 - C) the density of ice
 - D) the specific heat of ice
 - E) the crystalline structure of ice
- 33) Which of the following accounts for the high heat of vaporization for water?
- A) the molar mass of water
 - B) the hydrogen bonds in water
 - C) the surface tension in water
 - D) the specific heat of water
 - E) the density of water

- 34) What is the term that refers to liquids that do not dissolve in one another and separate into two layers?
A) insoluble
B) soluble
C) immiscible
D) miscible
E) none of the above
- 35) What is the term for the general principle that solubility is greatest when the polarity of the solute and solvent are similar?
A) polarity rule
B) solute rule
C) solvent rule
D) *like dissolves like* rule
E) none of the above
- 36) What is the term for the concentration expression that relates the moles of solute dissolved in each liter of solution?
A) molality (*m*)
B) parts per million (ppm)
C) mass/mass percent (m/m %)
D) molarity (*M*)
E) none of the above
- 37) What is the term for a solution that contains the maximum solute that can dissolve at a given temperature?
A) supersaturated
B) saturated
C) unsaturated
D) concentrated
E) none of the above
- 38) What is the term that refers to the maximum amount of a given solute that dissolves in a solvent at a specified temperature?
A) miscibility
B) probability
C) solubility
D) polarizability
E) none of the above
- 39) What is the term for the component of a solution that is the lesser quantity?
A) secondary component
B) solute
C) solvent
D) primary component
E) none of the above
- 40) What is the general term for a solute dissolved in a solvent?
A) suspension
B) mixture
C) solution
D) colloid
E) none of the above
- 41) What is the term for the component of a solution that is the greater quantity?
A) secondary component
B) solvent
C) solute
D) primary component
E) none of the above
- 42) Which of the following illustrates the *like dissolves like* rule for a solid solute in a liquid solvent?
A) A polar compound is soluble in a polar solvent.
B) An ionic compound is soluble in a polar solvent.
C) A nonpolar compound is soluble in a nonpolar solvent.
D) all of the above
E) none of the above
- 43) Which of the following decreases the rate of dissolving for a solid solute in a solvent?
A) grinding the solute
B) stirring the solution
C) heating the solution
D) all of the above
E) none of the above
- 44) What is the solubility of KCl at 55 °C? (Refer to text Figure 13.5.)
A) 46 g/100 g water
B) 38 g/100 g water
C) 139 g/100 g water
D) 55 g/100 g water
E) 101 g/100 g water

- 45) What is the solubility of LiCl at 55 °C? (Refer to text Figure 13.5.)
- A) 46 g/100 g water
 - B) 55 g/100 g water
 - C) 38 g/100 g water
 - D) 139 g/100 g water
 - E) 101 g/100 g water
- 46) How concentrated is a solution containing 15 g of NaCl in 100 g water at 15 °C? (Refer to text Figure 13.5.)
- A) superunsaturated
 - B) unsaturated
 - C) saturated
 - D) supersaturated
 - E) none of the above
- 47) Which of the following best explains why peanut butter can remove grease from soiled clothing?
- A) Peanut butter and grease are both polar.
 - B) Peanut butter and grease are both nonpolar.
 - C) Peanut butter and grease are both organic.
 - D) Peanut butter is polar and grease is nonpolar.
 - E) Peanut butter is nonpolar and grease is polar.

Answer Key

Testname: SOLUTIONS PRACTICE TEST

- 1) A
- 2) E
- 3) E
- 4) C
- 5) D
- 6) E
- 7) B
- 8) C
- 9) A
- 10) D
- 11) C
- 12) C
- 13) B
- 14) E
- 15) C
- 16) A
- 17) D
- 18) D
- 19) B
- 20) A
- 21) A
- 22) D
- 23) C
- 24) C
- 25) D
- 26) A
- 27) D
- 28) A
- 29) B
- 30) E
- 31) C
- 32) B
- 33) B
- 34) C
- 35) D
- 36) D
- 37) B
- 38) C
- 39) B
- 40) C
- 41) B
- 42) D
- 43) E
- 44) A
- 45) E
- 46) B
- 47) B