

**Honors Chem CH 15 Collab Assessment****Matching**

*Match each item with the correct statement below.*

- |                     |                |
|---------------------|----------------|
| a. solvation        | e. electrolyte |
| b. weak electrolyte | f. colloid     |
| c. aqueous solution | g. surfactant  |
| d. solvent          |                |

- \_\_\_\_\_ 1. interferes with hydrogen bonding between water molecules
- \_\_\_\_\_ 2. dissolving medium
- \_\_\_\_\_ 3. homogeneous mixture of water and dissolved substances
- \_\_\_\_\_ 4. Solute ions or molecules are surrounded by solvent molecules.
- \_\_\_\_\_ 5. compound that will conduct current in the liquid state or in aqueous solution
- \_\_\_\_\_ 6. compound that ionizes incompletely in aqueous solution
- \_\_\_\_\_ 7. mixture in which particle size averages between 1 nm and 1000 nm

*Match each item with the correct statement below.*

- |                      |                   |
|----------------------|-------------------|
| a. dispersed phase   | e. Tyndall effect |
| b. surface tension   | f. suspension     |
| c. Brownian motion   | g. solute         |
| d. dispersion medium | h. emulsion       |

- \_\_\_\_\_ 8. inward force tending to minimize surface area of a liquid
- \_\_\_\_\_ 9. dissolved particle
- \_\_\_\_\_ 10. mixture in which particle size averages greater than 1000 nm in diameter
- \_\_\_\_\_ 11. Colloidal particles spread throughout a suspension.
- \_\_\_\_\_ 12. phenomenon observed when beam of light passes through a colloid
- \_\_\_\_\_ 13. chaotic movement of colloidal particles
- \_\_\_\_\_ 14. colloid of a liquid in a liquid

**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

- \_\_\_\_\_ 15. How does the surface tension of water compare with the surface tensions of most other liquids?
  - a. It is lower.
  - b. It is about the same.
  - c. It is higher.
  - d. It is higher when a surfactant is added.

Name: \_\_\_\_\_

ID: A

- \_\_\_\_ 16. What causes water's low vapor pressure?
- a. dispersion forces
  - b. covalent bonding
  - c. hydrogen bonding
  - d. ionic attractions
- \_\_\_\_ 17. What is the shape of the water molecule?
- a. linear
  - b. tetrahedral
  - c. trigonal planar
  - d. bent
- \_\_\_\_ 18. Which of the following is primarily responsible for holding water molecules together in the liquid state?
- a. dispersion forces
  - b. hydrogen bonds
  - c. ionic bonds
  - d. polar covalent bonds
- \_\_\_\_ 19. Which atom in a water molecule has the greatest electronegativity?
- a. one of the hydrogen atoms
  - b. both hydrogen atoms
  - c. the oxygen atom
  - d. There is no difference in the electronegativities of the atoms in a water molecule.
- \_\_\_\_ 20. What is primarily responsible for the surface tension of water?
- a. dispersion forces
  - b. hydrogen bonding
  - c. ionic attractions
  - d. covalent bonding
- \_\_\_\_ 21. Which of the following is NOT a result of surface tension in water?
- a. Surface area is maximized.
  - b. Water has an unusually low vapor pressure.
  - c. Surface appears to have a "skin."
  - d. Drops tend to become spherical.
- \_\_\_\_ 22. Surface tension \_\_\_\_.
- a. is the inward force which tends to minimize the surface area of a liquid
  - b. may be increased by detergents
  - c. is decreased by hydrogen bonding
  - d. causes beads of water to spread out
- \_\_\_\_ 23. The fact that ice is less dense than water is related to the fact that \_\_\_\_.
- a. the molecular structure of ice is much less orderly than that of water
  - b. the molecules of ice are held to each other by covalent bonding
  - c. ice has a molecular structure in which water molecules are arranged randomly
  - d. ice has a molecular structure that is an open framework held together by hydrogen bonds
- \_\_\_\_ 24. Which is responsible for the high thermal energy required to melt ice?
- a. covalent bonding
  - b. dispersion forces
  - c. hydrogen bonding
  - d. ionic attractions
- \_\_\_\_ 25. What is the term for the dissolving medium in a solution?
- a. solvent
  - b. solute
  - c. solvator
  - d. emulsifier
- \_\_\_\_ 26. Which of the following substances is the most soluble in water?
- a. sodium chloride
  - b. methane
  - c. bromine
  - d. carbon

Name: \_\_\_\_\_

ID: A

- \_\_\_\_ 27. What occurs in solvation?
- Solute ions separate from solvent molecules.
  - Solvent molecules surround solute ions.
  - Solvent molecules bind covalently to solute molecules.
  - Ionic compounds are formed.
- \_\_\_\_ 28. Which of the following substances dissolves most readily in gasoline?
- $\text{CH}_4$
  - $\text{HCl}$
  - $\text{NH}_3$
  - $\text{NaBr}$
- \_\_\_\_ 29. A solution is a mixture \_\_\_\_.
- from which the solute can be filtered
  - that has the same properties throughout
  - that is heterogeneous
  - in which a solid solute is always dissolved in a liquid solvent
- \_\_\_\_ 30. Predict which one of the following compounds would be insoluble in water.
- $\text{NaCl}$
  - $\text{HCl}$
  - $\text{CF}_4$
  - $\text{CuSO}_4$
- \_\_\_\_ 31. Which of these would you expect to be soluble in the nonpolar solvent carbon disulfide,  $\text{CS}_2$ ?
- $\text{H}_2\text{O}$
  - $\text{Cl}_4$
  - $\text{NaCl}$
  - $\text{SnS}_2$
- \_\_\_\_ 32. What type of compound is always an electrolyte?
- polar covalent
  - nonpolar covalent
  - ionic
  - network solid
- \_\_\_\_ 33. Which of the following compounds is a nonelectrolyte?
- sodium bromide
  - magnesium sulfate
  - copper chloride
  - carbon tetrachloride
- \_\_\_\_ 34. Which of the following compounds is an electrolyte?
- rubbing alcohol
  - sugar
  - carbon tetrachloride
  - sodium hydroxide
- \_\_\_\_ 35. Which of the following substances is NOT an electrolyte?
- $\text{KCl}$
  - $\text{CCl}_4$
  - $\text{LiCl}$
  - $\text{Na}_2\text{SO}_4$
- \_\_\_\_ 36. Which symbol is used to connect the formula of the compound with the number of water molecules in a hydrate?
- a parenthesis
  - an asterisk
  - a multiplication symbol
  - a dot

Name: \_\_\_\_\_

ID: A

- \_\_\_\_\_ 37. Which of these statements is correct?
- a. Particles can be filtered from a suspension.
  - b. A solution is heterogeneous.
  - c. A colloidal system does not exhibit the Tyndall effect.
  - d. The particles in a colloidal system are affected by gravity.
- \_\_\_\_\_ 38. The bonds between adjacent water molecules are called \_\_\_\_.
- a. hydrogen bonds
  - b. ionic bonds
  - c. nonpolar covalent bonds
  - d. polar covalent bonds
- \_\_\_\_\_ 39. The bonds between the hydrogen and oxygen atoms in a water molecule are \_\_\_\_.
- a. hydrogen bonds
  - b. ionic bonds
  - c. nonpolar covalent bonds
  - d. polar covalent bonds
- \_\_\_\_\_ 40. An electric current can be conducted by \_\_\_\_.
- a. methane gas
  - b. a sugar solution
  - c. a salt solution
  - d. rubbing alcohol

#### Short Answer

41. What is the angle between the bonds of a water molecule?
42. What is the percentage of water in the hydrate  $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$ ?

#### Essay

43. Define the terms *solute*, *solvent*, and *aqueous solution*. Provide an example of each.