

Concept Review

Section: Physical Properties of Solutions

Write the answer to the following questions in the space provided.

1. Separately, neither NaCl nor H₂O can conduct electricity, but if you put them together in the form of an aqueous solution, you have a conductor. Explain why.

2. Explain why you should not seek shelter under a tree during a thunderstorm.

In the space provided, write the letter of the term or phrase that best completes each statement or best answers each question.

- _____ 3. What term best describes a material's ability to conduct electricity?

- a. electrolysis
- b. electrolytic
- c. conductivity
- d. resistivity

- _____ 4. What term best describes the ability of pure water to conduct an electric current?

- a. nonconductor
- b. conductor
- c. electrolyte
- d. electrolysis

- _____ 5. What do we call a solute whose water solution conducts electricity?

- a. nonconductor
- b. electrolyte
- c. nonelectrolyte
- d. aqueous

Concept Review *continued*

- _____ 6. Which is a molecular substance whose water solution conducts electricity?
- liquid hydrogen
 - iron
 - sugar
 - hydrogen chloride
- _____ 7. What happens when acetic acid dissolves in water?
- Hydronium ions are one of the products.
 - The resulting solution will conduct electricity.
 - Most of the acid remains as un-ionized molecules in equilibrium with ions.
 - All of the above
- _____ 8. Which of the following types of water does not conduct electricity?
- chlorinated water
 - ground water
 - saltwater
 - distilled water

Complete each statement below by choosing a term from the following list. Use each term only once.

vapor pressure	total number	reduced
solute	less	colligative
decrease	increase	nature
freezing-point depression	particles	concentration
boiling-point elevation	properties	greater

9. The addition of a(n) _____ to a pure liquid solvent changes the _____ of the liquid. The vapor pressure, boiling point, and freezing point of a solution are _____ properties and depend upon the _____ of solute particles rather than on their _____.
10. The _____ of a liquid is related to the tendency of the molecules to escape from a solution. For example, the proportion and escaping tendency of water molecules is _____ when a solute is dissolved in pure water, and the vapor pressure of the solution is therefore _____ than that of pure water.

Concept Review *continued*

11. Decreasing the vapor pressure of a solvent by the addition of a solute causes a(n) _____ in the boiling point, a(n) _____.
12. The decrease in the vapor pressure of a solvent resulting from the addition of a solute causes a corresponding _____ in its freezing point, a _____.
13. The _____ of the solute affect(s) freezing- and boiling-point changes. The more _____, the _____ the freezing-point depression and boiling-point elevation.

Complete each statement below by underlining the correct word or phrase in brackets.

14. The droplets formed in an [suspension, emulsion] are colloid-size particles.
15. A [salt, soap] ion has a polar end and a nonpolar end.
16. Soap exhibits the characteristic property of a [suspension, surfactant] in that it forms a layer between two dissimilar phases.
17. [Hard, Soft] water enhances the surfactant abilities of soap.
18. [Detergents, Colloids] outperform soaps in hard water.

In the space provided, write the letter of the description that best matches the term or phrase.

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|-------------------------------|---|
| _____ 19. soap | a. a class of salts that concentrate at the boundary between two immiscible phases |
| _____ 20. surfactant | b. any mixture of two or more immiscible liquids in which one liquid is dispersed in the other |
| _____ 21. emulsion | c. a sodium or potassium salt of a fatty acid with a long hydrocarbon chain |
| _____ 22. synthetic detergent | d. can be used in hard water without forming precipitates |
| _____ 23. hard water | e. contains insoluble ions such as calcium or magnesium |