

UNIT 4: Part A: SCH4C EXAM REVIEW

Modified True/False

Indicate whether the sentence or statement is true or false. If false, change the identified word or phrase to make the sentence or statement true.

- _____ 1. Water is called the universal solvent because it can dissolve all substances. _____
- _____ 2. Water has a very high heat capacity which means it can hold a lot of heat. _____
- _____ 3. In terms of dissolving, the saying to remember is "like dissolves like." _____
- _____ 4. When sodium chloride dissolves, it ionizes into sodium ions and chloride ions.

- _____ 5. When sodium ions dissolve, they are surrounded by the positive parts of water molecules.

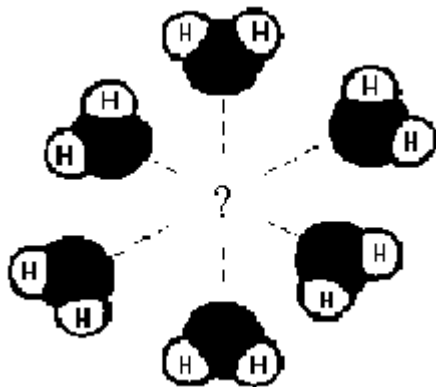
- _____ 6. Hard water is water that has a lot of iron ions dissolved in it. _____

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

- _____ 7. Water has a very high heat capacity, which means that
 - a. water can hold a lot of heat
 - b. water takes a long time to warm up
 - c. water takes a long time to cool down
 - d. all of the above
- _____ 8. Water is a(n)
 - a. polar molecule
 - b. nonpolar molecule
 - c. ionic compound
 - d. polyatomic ion
- _____ 9. Water is a polar molecule because
 - a. the hydrogen atoms are much smaller than the oxygen atom
 - b. the oxygen atom has a larger atomic radius than the hydrogen atoms
 - c. the oxygen atom has a higher electronegativity than the hydrogen atoms
 - d. the hydrogen atoms have a higher electron affinity than the oxygen atom
- _____ 10. Hydrogen bonding is
 - a. the bond between hydrogen atoms in a molecule
 - b. the bond between hydrogen and other atoms
 - c. an intermolecular force
 - d. an imaginary bond
- _____ 11. Water is able to dissolve polar molecules and ionic compounds because
 - a. "like dissolves like"
 - b. "unlike dissolves unlike"
 - c. water is the universal solvent
 - d. none of the above
- _____ 12. When ionic substances dissolve in water, they
 - a. ionize
 - b. dissociate
 - c. remain neutral
 - d. form molecules

____ 13.



If an ionic substance dissolved in water, the ion (?) in the diagram shown would be

- | | |
|-------------|------------------------|
| a. negative | c. neutral |
| b. positive | d. unable to determine |
- ____ 14. When an ionic substance dissolves in water, the solute is a(n)
- | | |
|---------|-------------------|
| a. acid | c. electrolyte |
| b. base | d. nonelectrolyte |
- ____ 15. When sugar dissolves in water, the solute is a(n)
- | | |
|---------|-------------------|
| a. acid | c. electrolyte |
| b. base | d. nonelectrolyte |
- ____ 16. If a high concentration of calcium or magnesium ions dissolve in water, the water
- | | |
|--------------------|--------------------------|
| a. will not freeze | c. will have a bad odour |
| b. will be "hard" | d. will have a bad taste |
- ____ 17. The concentration term parts per million (ppm) can also be expressed as
- | | |
|---------|----------|
| a. ppb | c. kg/mL |
| b. mg/L | d. g/L |

Problem

18. If a 50-mL sample of water has 0.004 mg of fluorine dissolved in it, is this quantity above the MAC for Canadian drinking water? The MAC for fluorine in Canadian drinking water is 1.5 ppm (mg/L).
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UNIT 4: Part A: SCH4C EXAM REVIEW ANSWERS

MODIFIED TRUE/FALSE

1. ANS: F
a large number of substances
many substances

REF: I OBJ: 4.1 LOC: CE1.06
2. ANS: T
LOC: CE1.06
REF: K/U OBJ: 4.1
3. ANS: T
LOC: CE1.06
REF: K/U OBJ: 4.1
4. ANS: F, dissociates

REF: C OBJ: 4.1 LOC: CE2.01
5. ANS: F, negative

REF: K/U OBJ: 4.1 LOC: CE1.06
6. ANS: F, calcium ions and magnesium ions

REF: K/U OBJ: 4.2 LOC: CE2.01

MULTIPLE CHOICE

7. ANS: D REF: K/U OBJ: 4.1 LOC: CE3.01
8. ANS: A REF: K/U OBJ: 4.1 LOC: CE1.06
9. ANS: C REF: I OBJ: 4.1 LOC: CE1.06
10. ANS: C REF: K/U OBJ: 4.1 LOC: CE1.06
11. ANS: A REF: K/U OBJ: 4.1 LOC: CE1.06
12. ANS: B REF: K/U OBJ: 4.1 LOC: CE1.06
13. ANS: B REF: I OBJ: 4.1 LOC: CE1.06
14. ANS: C REF: K/U OBJ: 4.1 LOC: CE1.06
15. ANS: D REF: K/U OBJ: 4.1 LOC: CE1.06
16. ANS: B REF: K/U OBJ: 4.2 LOC: CE1.06
17. ANS: B REF: K/U OBJ: 4.2 LOC: CE1.06

PROBLEM

18. ANS:
Concentration given: 0.004 mg/50 mL

Convert concentration to mg/L

$$\frac{0.004 \text{ mg}}{50 \text{ mL}} \times \frac{1000 \text{ mL}}{1 \text{ L}} = 0.08 \text{ mg/L}$$

The sample is below the MAC for Canadian drinking water.
