

## CHAPTER 2.4: Water

1. Sketch a few molecules of water, indicate their polarity, and where H bonds form.

2. Why is H bonding so important to water's properties?

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3. Distinguish between hydrophobic and hydrophilic molecules.

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4. List the "special" properties of water and give an example of why the property may be important to living things.

a. \_\_\_\_\_

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b. \_\_\_\_\_

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c. \_\_\_\_\_

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d. \_\_\_\_\_

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5. Explain the pH scale.

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6. What is a buffer? How do they work? Why are they necessary in biological systems? Give an example.

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## END OF CHAPTER 2 MULTIPLE CHOICE

1. The atomic number of an element
  - A) equals the number of neutrons in an atom.
  - B) equals the number of protons in an atom.
  - C) equals the number of protons minus the number of neutrons.
  - D) equals the number of neutrons plus the number of protons.
  - E) depends on the isotope.
  
2. The atomic weight (atomic mass) of an element
  - A) equals the number of neutrons in an atom.
  - B) equals the number of protons in an atom.
  - C) equals the number of electrons in an atom.
  - D) equals the number of neutrons plus the number of protons.
  - E) depends on the relative abundances of its electrons and neutrons.

3. Which of the following statements about the isotopes of an element is not true?
- A) They all have the same atomic number.
  - B) They all have the same number of protons.
  - C) They all have the same number of neutrons.
  - D) They all have the same number of electrons.
  - E) They all have identical chemical properties.
4. Which of the following statements about covalent bonds is not true?
- A) A covalent bond is stronger than a hydrogen bond.
  - B) A covalent bond can form between atoms of the same element.
  - C) Only a single covalent bond can form between two atoms.
  - D) A covalent bond results from the sharing of electrons by two atoms.
  - E) A covalent bond can form between atoms of different elements.
5. Hydrophobic interactions
- A) are stronger than hydrogen bonds.
  - B) are stronger than covalent bonds.
  - C) can hold two ions together.
  - D) can hold two nonpolar molecules together.
  - E) are responsible for the surface tension of water.
6. Which of the following statements about water is not true?
- A) It releases a large amount of heat when changing from liquid into vapor.
  - B) Its solid form is less dense than its liquid form.
  - C) It is the most effective solvent of polar molecules.
  - D) It is typically the most abundant substance in a living organism.
  - E) It takes part in some important chemical reactions.
7. The reaction  $\text{HCl} \rightarrow \text{H}^+ + \text{Cl}^-$  in the human stomach is an example of the
- A) cleavage of a hydrophobic bond.
  - B) formation of a hydrogen bond.
  - C) elevation of the pH of the stomach.
  - D) formation of ions by dissolving an acid.
  - E) formation of polar covalent bonds.
8. The hydrogen bond between two water molecules arises because water is
- A) polar.
  - B) nonpolar.
  - C) a liquid.
  - D) small.
  - E) hydrophobic.

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

Note Set 03

9. When table salt (NaCl) is added to water,
- A) a covalent bond is broken.
  - B) an acidic solution is formed.
  - C)  $\text{Na}^+$  and  $\text{Cl}^-$  ions are separated.
  - D)  $\text{Na}^+$  is attracted to the hydrogen atoms of water.
  - E) water molecules surround Na (but not Cl) atoms.
10. The three most abundant elements in a human skin cell are
- A) calcium, carbon, and oxygen.
  - B) carbon, hydrogen, and oxygen.
  - C) carbon, hydrogen, and sodium.
  - D) carbon, nitrogen, and potassium.
  - E) nitrogen, hydrogen, and argon.