

Biology Chapter 6 Test: Chemistry in Biology**True/False**

Indicate whether the statement is true or false.

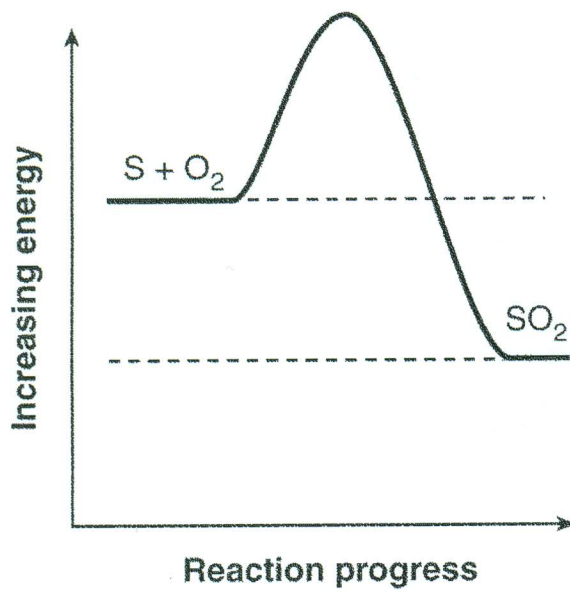
- ____ 1. An element is a pure substance that cannot be broken down into other substances by physical or chemical means.
- ____ 2. If a neutral atom contains 18 protons, it also contains 18 electrons.
- ____ 3. An ionic bond is formed when two atoms share electrons.
- ____ 4. Van der Waals forces are attractive forces between molecules.
- ____ 5. A chemical reaction is the process by which atoms or groups of atoms in substances are reorganized into different substances.
- ____ 6. When an endothermic chemical reaction takes place, heat is released into the environment.
- ____ 7. A catalyst increases the rate of a reaction by increasing the net energy change of the reaction.
- ____ 8. A substrate binds to an enzyme's active site.

Multiple Choice

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

- ____ 9. ____ represents a formula for a chemical compound.
 - a. H
 - b. C
 - c. P
 - d. H₂O
- ____ 10. The total number of atoms in a molecule of sucrose, C₁₂H₂₂O₁₁, is ____.
 - a. 11
 - b. 12
 - c. 22
 - d. 45
- ____ 11. Which is the negatively charged particle located outside the nucleus of an atom?
 - a. electron
 - b. neutron
 - c. silicon
 - d. proton
- ____ 12. Which particle in the nucleus of an atom has a neutral charge?
 - a. carbon
 - b. electron
 - c. neutron
 - d. proton
- ____ 13. One isotope of carbon differs from another in which way?
 - a. atomic number
 - b. number of electrons
 - c. number of neutrons
 - d. number of protons
- ____ 14. A molecule of water (H₂O) has which bonds?
 - a. 1 covalent bond
 - b. 1 ionic bond
 - c. 2 covalent bonds
 - d. 2 ionic bonds
- ____ 15. A single covalent bond forms when two atoms do which of these?
 - a. when they share one electron
 - b. when they share two electrons
 - c. when one gives an electron to the other
 - d. when one gives two electrons to the other

- _____ 16. Which is an example of a chemical reaction?
- a. ice melting
 - b. iron rusting
 - c. sugar dissolving in water
 - d. water evaporating
- _____ 17. Two substances are combined and heat is produced. Does this provide evidence that a chemical reaction took place?
- a. No, because heat is not a chemical.
 - b. No, because this would be a physical change.
 - c. Yes, because energy is absorbed.
 - d. Yes, because energy is released.

**Figure 6-3**

- _____ 18. Consider the energy diagram for a chemical reaction in Figure 6-3. Overall, is energy released or absorbed?
- a. absorbed, because the energy level increases during the reaction
 - b. absorbed, because the energy level of the products is greater than that of the reactants
 - c. released, because the reaction is initiated by the addition of heat
 - d. released because the energy level of the reactants is greater than that of the products
- _____ 19. Which is the best description of activation energy?
- a. Heat added to initiate a reaction.
 - b. Heat released as the reaction proceeds
 - c. Heat stored within the reactant molecules.
 - d. Heat stored within the product molecules.
- _____ 20. How does an enzyme influence a biological reaction?
- a. It increases the net energy difference between reactants and products.
 - b. It decreases the activation energy necessary to initiate the chemical change.
 - c. It increases the kinetic energy of reactants, thereby increasing their tendency to collide.
 - d. It decreases the kinetic energy of reactants, enabling them to undergo chemical change more easily.

- _____ 21. Which property is responsible for the fact that water and oil do not mix?
- a. density
 - b. mass
 - c. phase
 - d. polarity
- _____ 22. When added to water, how does an acid affect the pH and H^+ concentration?
- a. Both pH and H^+ decrease.
 - b. Both pH and H^+ increase.
 - c. The pH decreases while the H^+ increases.
 - d. The pH increases while the H^+ decreases.
- _____ 23. Which element is found in proteins but *not* carbohydrates or lipids?
- a. C
 - b. H
 - c. N
 - d. O
- _____ 24. In humans and other multicellular organisms, which substance plays a central role as an energy source?
- a. carbohydrate
 - b. fat
 - c. protein
 - d. water
- _____ 25. Amino acids are the building blocks of which macromolecule?
- a. carbohydrate
 - b. DNA
 - c. lipid
 - d. protein