

Unit B Quiz

Part A: Modified True/False

Indicate whether each statement is true or false. If the statement is false, change the statement to make it true.

- ____ 1. A physical property can be observed only by changing the chemical composition of a substance.

- ____ 2. A compound is a pure substance made up of atoms of two or more elements combined in varying ratios.

- ____ 3. Organic compounds have carbon as their basis.

- ____ 4. The chemical equation $C + O_2 \rightarrow CO$ is the balanced chemical equation for the reaction of carbon (C) and oxygen (O_2) to form carbon monoxide (CO).

Part B: Completion

Complete the following sentences.

5. Scientists classify matter into two main groups: _____ and _____.
6. Atoms can form bonds by _____ or _____ electrons.
7. Acids have pH values _____ than 7, and bases have pH values _____ than 7.
8. In a chemical equation, the _____ are on the left side of the arrow, and the _____ are on the right side.

Part C: Matching

Match each chemical formula with its chemical name.

- | | |
|-------------------------|------------------------|
| ____ 9. Fe_2O_3 | (a) iron(II) chloride |
| ____ 10. $FeCl_2$ | (b) iron(II) hydroxide |
| ____ 11. $Fe_2(SO_4)_3$ | (c) iron(III) oxide |
| ____ 12. $Fe(OH)_2$ | (d) iron(III) sulfate |

Unit B Quiz (continued)

20. A solution of baking soda in water has a pH of approximately 9. Which of these statements about the solution is true?
- It would turn litmus paper red.
 - It would turn litmus paper blue.
 - It has more H^+ ions than a solution with a pH of 4.
 - It has more OH^- ions than a solution with a pH of 12.
21. Which of these chemical formulas represents an organic compound?
- H_2O
 - CoCl_2
 - Na_2CO_3
 - CH_3COOH
22. A student is drawing the Lewis dot structure for dinitrogen tetroxide (N_2O_4). How many dots should be in the Lewis dot structure for this compound?
- 11
 - 24
 - 34
 - 46
23. During photosynthesis, carbon dioxide (CO_2) and water (H_2O) react to produce glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) and oxygen (O_2). Which of these shows the correct, balanced equation for this reaction?
- $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2$
 - $\text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
 - $6 \text{CO}_2 + 6 \text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6 \text{O}_2$
 - $\text{C}_6\text{H}_{12}\text{O}_6 + 6 \text{O}_2 \rightarrow 6 \text{CO}_2 + 6 \text{H}_2\text{O}$
24. Which of these chemical equations represents a combustion reaction that could also be classified as a synthesis reaction?
- $2 \text{H}_2\text{O} \rightarrow 2 \text{H}_2 + \text{O}_2$
 - $\text{Mg} + \text{Cl}_2 \rightarrow \text{MgCl}_2$
 - $4 \text{Na} + \text{O}_2 \rightarrow 2 \text{Na}_2\text{O}$
 - $\text{C}_2\text{H}_4 + 3 \text{O}_2 \rightarrow 2 \text{CO}_2 + 2 \text{H}_2\text{O}$
25. A chemist combines a solution of hydrochloric acid (HCl) and a solution of sodium hydroxide (NaOH). The two compounds react to form sodium chloride (NaCl) and water. What could the scientist do make this reaction happen more quickly?
- Put the reaction vessel in the freezer.
 - Mix the two solutions one drop at a time.
 - Increase the concentration of each solution.
 - Decrease the concentration of each solution.
26. Calcium metal (Ca) reacts with hydrochloric acid (HCl). Predict the products of this reaction.
- CaHCl
 - $\text{CaCl}_2 + \text{H}_2$
 - $\text{CaH}_2 + \text{Cl}_2$
 - $\text{Ca} + \text{Cl}_2 + \text{H}_2$

Unit B Quiz (continued)

Part E: Short Answer

27. Describe the relationship between protons and atomic number.

28. Write the chemical symbol for an ion with 17 protons and 18 electrons. Explain how you got your answer.

29. A student has a solution of an unknown inorganic compound. The compound is either an acid, a base, or a salt. Describe a test the student could perform to determine whether the compound is an acid, a base, or a salt.

30. A scientist wants to get substance A to react with substance B. Substance A is a large crystal. Substance B is a liquid. Describe two things the scientist could do to increase the reaction rate between substance A and substance B. Explain why each strategy would increase the reaction rate.

31. A student dissolves an inorganic compound in water and observes that the solution conducts electricity well. Based only on this observation, the student concludes that the compound is a salt. Explain what is wrong with the student's reasoning.
