

General Chemistry
Unit #4: Chemical Reactions, The Mole, & Stoichiometry
Part I: Chemical Reactions Practice Problems

Georgia Performance Standard

SC2. Students will relate how the Law of Conservation of Matter is used to determine chemical composition in compounds and chemical reactions.

Practice problems are designed to help students reinforce concepts taught in class. Problems will be assigned on a nightly basis. Practice problems will not be collected, however, they will appear on open notes quizzes.

Required Skills

In order to be successful in this unit, you must have the following skills:

- writing chemical formulas for ionic and covalent compounds
- naming ionic and covalent compounds

*if you are still having trouble with these topics, you need to come to tutorial.

Chapter 10: Section 10.1 Reactions and Equations

1. List three types of evidence that indicate a chemical reaction has occurred.

Write the skeleton equations for the following word equations:

2. hydrogen(g) + bromine(g) → hydrogen bromide(g)
3. carbon monoxide(g) + oxygen(g) → carbon dioxide(g)
4. potassium chlorate(s) → potassium chloride(s) + oxygen(g)

5. Compare and contrast the skeleton equation and the chemical equation.
6. Why is it important that a chemical equation be balanced?
7. When balancing a chemical equation, can you adjust the number subscripted to a substance's formula? Explain your answer.

Write chemical equations for each of the following chemical reactions:

8. In water, iron(III) chloride reacts with sodium hydroxide, producing solid iron(III) hydroxide and sodium chloride.
9. Liquid carbon disulfide reacts with oxygen gas, producing carbon dioxide gas and sulfur dioxide gas.
10. Solid zinc and aqueous hydrogen sulfate react to produce hydrogen gas and aqueous zinc sulfate.

Chapter 10: Section 10.2 Classifying Chemical Reactions

11. What are the five classes of chemical reactions?
12. Identify two characteristics of combustion reactions.
13. Compare and contrast single-replacement and double-replacement reactions.
14. Describe the result of a double-replacement reaction.

Write chemical equations for the following reaction. Classify each reaction as synthesis, combustion or both.

15. The solids aluminum and sulfur react to produce aluminum sulfide.
16. Water and dinitrogen pentoxide gas react to produce aqueous hydrgrogen nitrate.
17. The gases nitrogen dioxide and oxygen react to produce dinitrogen pentoxide gas.
18. Ethane gas (C₂H₆) burns in air, producing carbon dioxide gas and water vapor.

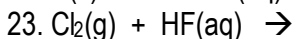
Write chemical equations for the following decomposition reactions.

19. Aluminum oxide(s) decomposes when electricity is passed through it.

20. Nickel(II) hydroxide(s) decomposes to produce nickel(II) oxide(s) and water.

21. Heating sodium hydrogen carbonate(s) produces sodium carbonate(aq), carbon dioxide(g) and water.

Predict if the following single-replacement reactions will occur. If a reaction occurs, write a balanced chemical equation for the reaction.



Write the balanced equation for the following double-replacement reactions.

25. Aqueous lithium iodide and aqueous silver nitrate react to produce solid silver iodide and aqueous lithium nitrate.

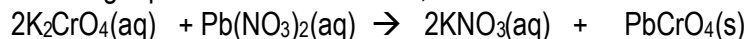
26. Aqueous barium chloride and aqueous potassium carbonate react to produce solid barium carbonate and aqueous potassium chloride.

27. Aqueous sodium oxalate and aqueous lead(II) nitrate react to produce solid lead(II) oxalate and aqueous sodium nitrate.

Essay Questions. On your unit test, you will choose three of five questions to answer. All answers must be at least four sentences and you must use correct punctuation.

1. Explain how an equation can be balanced even if the number of reactant particles differs from the number of product particles.

2. Is the following equation balanced? If not, correct the coefficients and explain your answer.



3. Does the following reaction occur? Explain your answer.



4. What type of reaction is most likely to occur when barium reacts with fluorine? Write the chemical equation for the reaction and explain your answer.

5. Explain why the chemical formulas for substances involved in a chemical reaction must be correct.