

Name _____ Date _____ Class _____

CHAPTER 12 STUDY GUIDE FOR CONTENT MASTERY

Stoichiometry

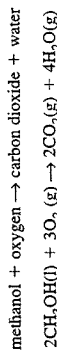
Section 12.1 What is stoichiometry?

In your textbook, read about stoichiometry and the balanced equation.

For each statement below, write *true* or *false*.

- true** The study of the quantitative relationships between the amounts of reactants used and the amounts of products formed by a chemical reaction is called stoichiometry.
- true** Stoichiometry is based on the law of conservation of mass.
- false** In any chemical reaction, the mass of the products is less than the mass of the reactants.
- true** The coefficients in a chemical equation represent not only the number of individual particles but also the number of moles of particles.
- true** The mass of each reactant and product is related to its coefficient in the balanced chemical equation for the reaction by its molar mass.

Complete the table below, using information represented in the chemical equation for the combustion of methanol, an alcohol.



Substance	Molar Mass (g/mol)	Number of Molecules	Number of Moles (mol)	Mass (g)
6. Methanol	32.05	2	2	64.10
7. Oxygen gas	32.00	3	3	96.00
8. Carbon dioxide	44.01	2	2	88.02
9. Water	18.02	4	4	72.08

- What are the reactants? methanol and oxygen gas
- What are the products? carbon dioxide and water
- What is the total mass of the reactants? 160.10 g
- What is the total mass of the products? 160.10 g
- How do the total masses of the reactants and products compare? They are equal.

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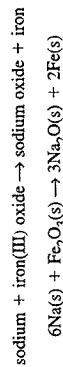
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Section 12.1 continued

In your textbook, read about mole ratios.

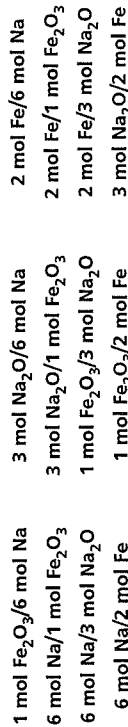
Answer the questions about the following chemical reaction.



- What is a mole ratio?
A mole ratio is a ratio between the numbers of moles of any two substances in a balanced chemical equation.
- How is a mole ratio written?
A mole ratio is written for two substances in a balanced chemical equation as a fraction by placing the number of moles of one substance in the numerator and the number of moles of another substance in the denominator.

17. Predict the number of mole ratios for this reaction. 12

18. What are the mole ratios for this reaction?



19. What is the mole ratio relating sodium to iron? 6 mol Na/2 mol Fe

20. What is the mole ratio relating iron to sodium? 2 mol Fe/6 mol Na

21. Which mole ratio has the largest value? 6 mol Na/1 mol Fe₂O₃

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