

Chapter 7 Chemical Reactions

Guided Notes

Section 7.1: The Nature of Chemical Reactions

Chemical Reactions

- It is a change in matter that produces one or more _____ with different _____
- A chemical reaction is another name for a _____.
- _____ are formed
- _____ atoms are made, but atoms are _____
- _____ can be made
- Old bonds are _____ and _____ are formed
- Always involves changes in _____
- What forms of evidence show that a chemical reaction took place?

_____ Change.

New phase is made

_____ formation.

Changes in _____

Changes in Properties.

_____ change

- Parts of a Chemical Reaction

Reactants	Products
starting materials of a chemical reaction	substances formed at the end
Example:	

Energy and Reactions

- Chemical reaction _____ when chemical bonds _____ and _____ form.
- Always takes a _____
- Chemical reactions usually _____ or liberate (_____) heat.
- Different forms of energy can be used:

- Every Reaction Involves Energy

1. During a _____... bonds absorb _____ and _____



2. New bonds form...energy _____

- Forming bonds releases _____
- Energy is _____

_____ is energy _____ in the bonds of the chemicals

Ex:

- Reactions have an energy change

Exothermic Reactions	Endothermic Reactions
<ul style="list-style-type: none"> If breaking bonds takes _____ than making them- it releases energy (exothermic) Exo- _____ therm- _____ Exothermic reactions release energy Get _____ Give off _____ Or release _____ 	<ul style="list-style-type: none"> A chemical reaction in which energy is taken in. Endo-into Therm-heat " _____ " heat Feels _____ Require heat or energy or _____
<p style="text-align: center;">Example:</p> <p>Energy is in the products in an Exothermic Reaction</p>	<p style="text-align: center;">Example</p> <p>Energy is in the reactants in an Endothermic Reaction</p>
<p style="text-align: center;">Diagram</p> 	<p style="text-align: center;">Diagram</p> 

- What is the law of the conservation of mass?

During a chemical reaction, matter is neither _____
_____ = _____

Section 7.2: Balancing Chemical Equations

Chemical Equation

- A _____ of a chemical reaction
- Putting chemical changes into _____
- The plus sign mean "_____"
- The arrow means "_____ " or "make"

Element Symbols

- All _____ are represented by a 1 or 2 letter symbol
C = Carbon Ne = Neon O = Oxygen
- The symbols are shown on the _____

Chemical Formulas

- Shows the elements & _____ of each element in a molecule
- Subscript

H ₂ SO ₄	Hydrogen: Sulfur: Oxygen:
	_____atoms total

Coefficients

- A formula may begin with a _____.
 - This number is called the _____.
 - Represents the _____ of that compound or atom needed in the _____
 - For example:
 - 2H₂SO₄ - _____
- Never put a coefficient in the _____ (2 NaCl is okay, _____ is not)
- If there is no number, then "1" is _____ to be in _____ of the formula.

2H ₂ SO ₄	2 molecules of Sulfuric Acid A coefficient is distributed to ALL elements in a compound 2 - H ₂ (for a total of _____) 2 - S (for a total of _____) 2 - O ₄ (for a total of _____)

Reading Chemical Equations

- The _____ of the equation are separated by an _____.
 - _____: The combination of chemicals before the reaction are on the left side of the arrow
 - _____: The right side indicates the combination of chemicals after the reaction.



Balanced Chemical Equations

- A balanced chemical equation follows the _____.
- It can tell you the _____ you will need, and the amount of _____ - from the reaction.
- For example,
 - Methane + oxygen \rightarrow _____ + _____
 - $\text{CH}_4 + \text{O}_2 \rightarrow$
 - Does not tell you how much of each compound you will need.
 - $\text{CH}_4 + 2 \text{O}_2 \rightarrow$
 - This balanced equation does.
- Balance equations by _____
- ... never by changing _____
- Remember the _____: Matter cannot be created or destroyed. That means we need to have the _____ on each side of the _____.

Rules for Balancing Equations

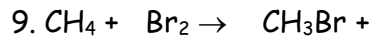
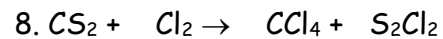
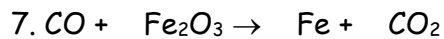
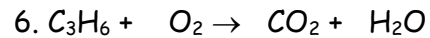
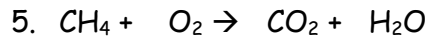
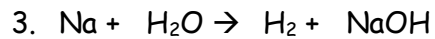
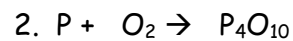
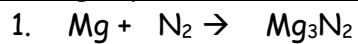
1.	Make a
2.	Write the _____ for all the _____ and _____
2.	Count the number of _____ of each type appearing on _____
3.	_____ the elements one at a time by adding _____ (the numbers in front)
4.	Check to make sure it is _____

- Begin balancing chemical equations by putting numbers (coefficients) in front of them.
 - Example _____ on one side could become _____
 - Remember that each side needs to have same number of _____
 - Note - Don't change the _____
 - Example:

Photosynthesis Reaction

- Carbon dioxide + water \rightarrow Glucose (sugar) + oxygen
Formula: _____
- Count the atoms on each side of the equation

Balancing Equations Practice



More Balancing Equations Practice

A. Magnesium + Oxygen (g) \rightarrow Magnesium Oxide

B. Hydrogen plus oxygen yield water.

C. Aluminum bromide plus chlorine yield aluminum chloride and bromine.

D. Nitrogen gas plus oxygen gas react and form dinitrogen pentoxide.

E. Potassium iodide reacts with bromine forming potassium bromide plus iodine.

Five Types of Reactions

	Formula	Example
Synthesis		
Decomposition		
Single Displacement		
Double Displacement		
Combustion Reaction		

Synthesis Reaction

- Two or more substances (reactants)
- _____ to form only _____ substance (product)

Decomposition Reaction

- One substance (reactant) combine forms _____ substances (products)

Single-Displacement Reaction

- One _____ and one _____ (in reactants)
- Produces one element and one compound (in Products)

Double-Displacement Reaction

- 2 compounds (in reactants) produce
- _____ (in products)

Combustion Reaction

- A reaction in which a compound and _____.
- _____ is a common product

Reaction Type Practice Problems

