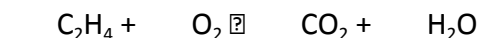
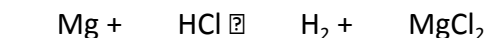
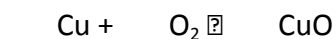


## Chapter 7 – Chemical Reactions

### Section 7.1 – Describing Reactions

- In a \_\_\_\_\_, the substances that \_\_\_\_\_ change are called \_\_\_\_\_.
- The \_\_\_\_\_ formed as a result of that change are called \_\_\_\_\_.
- A \_\_\_\_\_ is a representation of a chemical reaction in which the \_\_\_\_\_ are expressed in \_\_\_\_\_.
- The \_\_\_\_\_ states that mass is neither \_\_\_\_\_ in a chemical reaction.
- In order to show that \_\_\_\_\_ is \_\_\_\_\_ during a reaction, a \_\_\_\_\_ must be \_\_\_\_\_.
- You can \_\_\_\_\_ a chemical equation by changing the \_\_\_\_\_, the \_\_\_\_\_ that appear \_\_\_\_\_ the formulas.
- As you \_\_\_\_\_, you should never change the \_\_\_\_\_ in a formula.
- Balance the following equations.



- Balance \_\_\_\_\_ last.
- Keep \_\_\_\_\_ together if possible.
- If you have an \_\_\_\_\_ of atoms on one side, you can multiply by \_\_\_\_\_ to make it even.
- Because \_\_\_\_\_ often involve \_\_\_\_\_ of small particles, chemists use a counting unit called the \_\_\_\_\_ to measure \_\_\_\_\_ of substances.

1 mole =

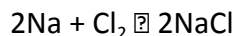
- This number is called \_\_\_\_\_.

### Section 7.1 Assessment

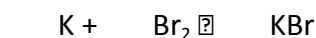
1. What is the law of conservation of mass?
2. Why does a chemical equation need to be balanced?

3. Why do chemists use the mole as a counting unit?

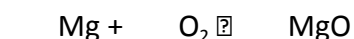
4. Is the following equation balanced?



5. Balance the following equation.



6. Balance the following equation.



## Section 7.2 – Types of Reactions

- Some general types of chemical reactions are \_\_\_\_\_

\_\_\_\_\_.

- A \_\_\_\_\_ reaction is a reaction in which \_\_\_\_\_ substances react to form a \_\_\_\_\_ substance.



- A \_\_\_\_\_ reaction is a reaction in which a \_\_\_\_\_ breaks down into \_\_\_\_\_ simpler substances.



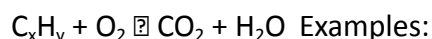
- A \_\_\_\_\_ reaction is a reaction in which \_\_\_\_\_ takes the place of another element in a \_\_\_\_\_.



- A \_\_\_\_\_ reaction is one in which two different \_\_\_\_\_ exchange \_\_\_\_\_ and form \_\_\_\_\_ new compounds.



- A \_\_\_\_\_ reaction is one in which a substance reacts rapidly with \_\_\_\_\_, often producing \_\_\_\_\_.



## Section 7.2 Assessment

1. What are five general types of reactions?
2. The synthesis of water is described by the following reaction  $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$ . How is the decomposition of water related to this reaction?
3. Explain the difference between a single-replacement reaction and a double-replacement reaction.
4. When propane ( $\text{C}_3\text{H}_8$ ) undergoes combustion, what products are formed?
5. Identify the following reactions.
  - a.  $\text{Pb}(\text{NO}_3)_2 + 2\text{HCl} \rightarrow \text{PbCl}_2 + 2\text{HNO}_3$
  - b.  $2\text{C}_2\text{H}_6 + 7\text{O}_2 \rightarrow 4\text{CO}_2 + 6\text{H}_2\text{O}$
  - c.  $\text{Ca} + 2\text{HCl} \rightarrow \text{CaCl}_2 + \text{H}_2$
  - d.  $2\text{SO}_2 + \text{O}_2 \rightarrow 2\text{SO}_3$

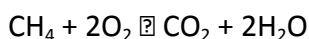
## Section 7.3 – Energy Changes in Reactions

- \_\_\_\_\_ is the energy stored in the \_\_\_\_\_ of a substance.
- Chemical reactions involve the \_\_\_\_\_ in the reactants and the \_\_\_\_\_ in the products.
- \_\_\_\_\_ chemical bonds \_\_\_\_\_ energy.
- The \_\_\_\_\_ of chemical bonds \_\_\_\_\_ energy.
- In a \_\_\_\_\_, energy is either \_\_\_\_\_.
- A chemical reaction that \_\_\_\_\_ to its surroundings is called an \_\_\_\_\_.
- In \_\_\_\_\_, the energy \_\_\_\_\_ as the products form is greater than the energy \_\_\_\_\_ to break the bonds in the reactants.
- A chemical reaction that \_\_\_\_\_ energy from its surroundings is called an \_\_\_\_\_.

- In an \_\_\_\_\_, more energy is \_\_\_\_\_ to break the bonds in the reactants than is \_\_\_\_\_ by the formation of the products.
- The \_\_\_\_\_ states that energy is neither \_\_\_\_\_  
\_\_\_\_\_ in a chemical or physical process.

### Section 7.3 Assessment

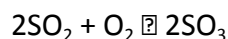
1. What happens to chemical bonds as a chemical reaction occurs?
2. How do chemical reactions involve energy?
3. Is the combustion of propane endothermic or exothermic?
4. Is energy created during an exothermic reaction? Explain.
5. What bonds are broken when one molecule of methane reacts with two molecules of oxygen in the following reaction:



### Section 7.4 – Reaction Rates

- A \_\_\_\_\_ is the rate at which reactants \_\_\_\_\_ into products over time.
- \_\_\_\_\_ tell how \_\_\_\_\_ a reaction is going.
- Factors that affect reaction rates include \_\_\_\_\_  
\_\_\_\_\_.
- Chemical reactions are based on the \_\_\_\_\_ of particles.
- Generally, an increase in \_\_\_\_\_ will increase the \_\_\_\_\_, while a decrease in temperature will \_\_\_\_\_ the reaction rate.
- Increasing the \_\_\_\_\_ of a substance causes its \_\_\_\_\_ to move faster which causes more \_\_\_\_\_.
- An increase in \_\_\_\_\_ increases the \_\_\_\_\_ of reactants to one another.
- The greater this \_\_\_\_\_, the more \_\_\_\_\_ there are that involve reacting \_\_\_\_\_.

- \_\_\_\_\_ the reactants will generally \_\_\_\_\_ the reaction rate.
- \_\_\_\_\_ causes the reactants to \_\_\_\_\_ quickly, which causes more \_\_\_\_\_.
- \_\_\_\_\_ refers to the \_\_\_\_\_ in a given volume.
- Generally, \_\_\_\_\_ increases as \_\_\_\_\_ increases.
- The \_\_\_\_\_ that are present in a given volume, the more opportunities there are for \_\_\_\_\_ involving those particles.
- A \_\_\_\_\_ is a substance that affects the \_\_\_\_\_ without being used up in the reaction.
- Since a \_\_\_\_\_ is neither a \_\_\_\_\_, it is written over the \_\_\_\_\_.



#### Section 7.4 Assessment

1. What does a reaction rate tell you?
2. What five factors affect reaction rate?
3. Explain why reactions take place faster at higher temperatures.
4. How does a catalyst make a reaction go faster?
5. Explain why hamburger meat lasts longer in the freezer than in refrigerator.
6. The reaction between magnesium and hydrochloric acid produces hydrogen. If you increase the concentration of HCl, the reaction takes place faster. Could HCl be considered a catalyst for this reaction? Explain.