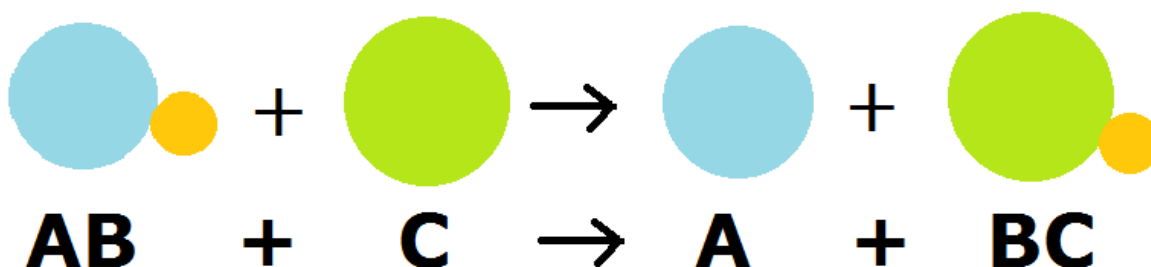


Unit 3: Stoichiometry
Types of Chemical Reactions

This worksheet will discuss the various types of chemical reactions that are commonly seen in general chemistry. Specifically, this worksheet will focus on problems on identifying different types of reactions, like combustion, displacement, and decomposition/synthesis reactions. This worksheet also covers reactions that involve the transfer of electrons, referred to as redox reactions.



Cite: <http://collinalexgerryroryhyfr.weebly.com/single-replacement-reaction.html>

1. Above is an example of a single displacement reaction. Provide an example of a single displacement reaction.

2. The following questions are in regards to identifying types of reactions.
 - a. Which type of reaction involves the combination of two or more substances to form a single compound?
 - b. Which type of reaction involves the reactants breaking up into simpler parts?
 - c. Which type of reaction occurs when a compound replaces an element?

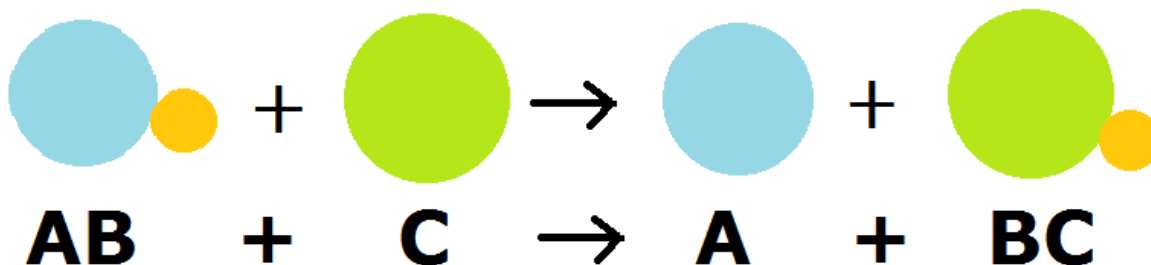
3. Explain how the activity series can be used to determine whether a single displacement reaction will occur.

4. What term is commonly used to describe redox reactions?

5. Define oxidation and reduction in the context of redox reactions.

6. Which gas is typically involved in combustion reactions?

7. Provide an example of a decomposition reaction.

ANSWER KEY

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1. Above is an example of a single displacement reaction. Provide an example of a single displacement reaction.

The reaction of zinc (Zn) with hydrochloric acid (HCl) to produce zinc chloride (ZnCl₂) and hydrogen gas (H₂).



2. The following questions are in regards to identifying types of reactions.
 - a. Which type of reaction involves the combination of two or more substances to form a single compound?
 - b. Which type of reaction involves the reactants breaking up into simpler parts?
 - c. Which type of reaction occurs when a compound replaces an element?

- a. Synthesis reaction. In a synthesis reaction, two or more substances combine to form a single compound. This is the opposite of a decomposition reaction where a compound breaks down into simpler substances.
- b. The type of reaction that involves the reactants breaking up into simpler parts is called a decomposition reaction.
- c. The type of reaction that occurs when a compound replaces an element is called a replacement reaction, specifically a single displacement reaction

3. Explain how the activity series can be used to determine whether a single displacement reaction will occur.

The activity series lists metals in order of their reactivity. If a metal in a reaction is higher in the activity series than the metal it is trying to displace from a compound, the reaction will occur. If it's lower, the reaction won't proceed. For example, if you have a piece of zinc (Zn) and a solution of copper sulfate (CuSO_4), you can use the activity series to predict that zinc will displace copper from the compound because zinc is higher in the series than copper.

4. What term is commonly used to describe redox reactions?

Oxidation-reduction reactions. Redox reactions involve the transfer of electrons between reactants, which leads to changes in the oxidation states of the elements involved.

5. Define oxidation and reduction in the context of redox reactions.

Oxidation is the process of losing electrons, while reduction is the process of gaining electrons. In redox reactions, one substance is oxidized (loses electrons) while another is reduced (gains electrons).

6. Which gas is typically involved in combustion reactions?

Oxygen (O_2). Combustion reactions involve the rapid combination of a substance with oxygen, often resulting in the release of energy in the form of heat and light.

7. Provide an example of a decomposition reaction.

The decomposition of hydrogen peroxide (H_2O_2) into water (H_2O) and oxygen (O_2).
 $2 \text{H}_2\text{O}_2 \rightarrow 2 \text{H}_2\text{O} + \text{O}_2$. Decomposition reactions can be identified if there are more products than reactants.