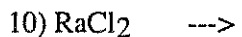
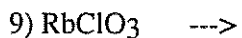
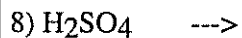
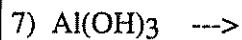
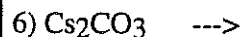
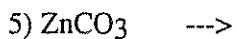
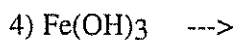
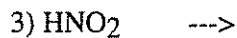
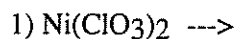


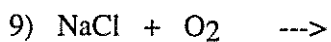
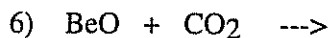
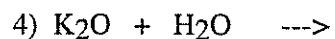
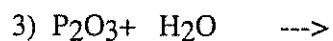
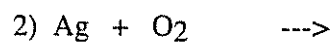
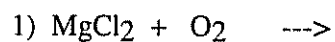
| REACTION CATEGORY | DECOMPOSITION |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| REACTION DESCRIPTION | During decomposition, one compound splits apart into two or more substances. These substances can be elements or simpler compounds. |
| REACTION FORMAT | $AB \rightarrow A + B$ |
| REACTION GUIDELINES | <ol style="list-style-type: none"> 1. Binary compounds breakdown into their elements. 2. Carbonates break down into an oxide and carbon dioxide. 3. Chlorates break down to a binary salt and oxygen. 4. Bases break down to the oxide of the metal and water. 5. Acids break down to the oxide of the nonmetal plus water. |
| REACTION GUIDELINE EXAMPLES | <ol style="list-style-type: none"> 1. $2 \text{NaCl} \rightarrow 2 \text{Na} + \text{Cl}_2$ 2. $\text{Na}_2\text{CO}_3 \rightarrow \text{Na}_2\text{O} + \text{CO}_2$ 3. $\text{Ba}(\text{ClO}_3)_2 \rightarrow \text{BaCl}_2 + \text{O}_2$ 4. $\text{Ca}(\text{OH})_2 \rightarrow \text{CaO} + \text{H}_2\text{O}$ 5. $2 \text{H}_3\text{PO}_4 \rightarrow \text{P}_2\text{O}_5 + 3 \text{H}_2\text{O}$ |

Decomposition Reaction Practice



| REACTION CATEGORY | SYNTHESIS OR DIRECT COMBINATION |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| REACTION DESCRIPTION | In these reactions, two different molecules or atoms unite to usually form a single substance. |
| REACTION FORMAT | $A + B \rightarrow AB$ |
| REACTION GUIDELINES | <ol style="list-style-type: none"> 1. Direct union of two elements will produce a binary compound. 2. Metallic oxides and carbon dioxide react to produce carbonates. 3. Binary salts and oxygen react to produce a chlorate. 4. Metallic oxides and water react to produce a base. 5. Nonmetallic oxides and water react to produce an acid. |
| REACTION GUIDELINE EXAMPLES | <ol style="list-style-type: none"> 1. $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$ 2. $\text{Na}_2\text{O} + \text{CO}_2 \rightarrow \text{Na}_2\text{CO}_3$ 3. $2\text{KCl} + 3\text{O}_2 \rightarrow 2\text{KClO}_3$ 4. $\text{Na}_2\text{O} + \text{H}_2\text{O} \rightarrow 2\text{NaOH}$ 5. $\text{N}_2\text{O}_5 + \text{H}_2\text{O} \rightarrow 2\text{HNO}_3$ |

Synthesis Reaction Practice



| REACTION CATEGORY | COMPLETE COMBUSTION |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| REACTION DESCRIPTION | For our purposes combustion will mean the reaction of oxygen with a compound containing carbon and hydrogen. A common synonym for combustion is burn. |
| REACTION FORMAT | $C_xH_y + O_2 \rightarrow CO_2 + H_2O$ |
| REACTION GUIDELINES | <ol style="list-style-type: none"> 1. Identify the reaction as being a combustion reaction. (A hydrocarbon reacting with oxygen) 2. Remember the products are always CO_2 and H_2O. 3. Compounds that contain carbon and hydrogen sometimes contain oxygen; the products are still the same-- CO_2 and H_2O. 4. Compounds that contain carbon and hydrogen sometimes contain nitrogen; in this case another product, NO_2 is formed along with CO_2 and H_2O. 5. Compounds that contain carbon and hydrogen sometimes contain sulfur; in this case another product, SO_2 is formed along with CO_2 and H_2O. |
| REACTION GUIDELINE EXAMPLES | <ol style="list-style-type: none"> 1. $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ 2. $2H_2C_2O_4 + O_2 \rightarrow 4CO_2 + 2H_2O$ 3. $C_{21}H_{24}N_2O_4 + 27O_2 \rightarrow 21CO_2 + 12H_2O + 2NO_2$ |

Practice Problems

