

GENERAL CHEMISTRY

STANDARD 8.1

DEFINITIONS

- **Products:** The chemicals on the right side of the equation
- **Reactants:** The chemicals on the left side of the equation
- **Yield Sign:** The arrow pointing to the right that represents the reactants chemically converting into the products
- **Word Equation:** A chemical reaction expressed in words instead of chemical formulas
- **Chemical Equation:** A symbolic representation of a chemical reaction in the form of symbols and formulas
- **Aqueous State:** An ionic compound that has been dissolved in water to create a solution
- **Solubility Table:** A table of ionic solubility in water

HINTS

- To determine the location of the yield sign, look for the following:
 - Yield
 - React to form
 - Combine to produce
 - Create
- The chemicals before the yield sign represent reactants
- The chemicals after the yield sign represent the products
- Always include the state of matter in parenthesis after a compound
 - Consider the reaction to occur at room temperature unless noted otherwise
 - Options include:
 - Solid (s)
 - Liquid (l) – This is a pure liquid (molten form)
 - Gas (g)
 - Aqueous (aq) – ionic solid dissolved in solution
 - Use a solubility table to determine if an ionic solid is (s) or (aq)

EXAMPLES

- Copper reacts with oxygen gas to produce copper (II) oxide
 - $\text{Cu (s)} + \text{O}_2 \text{ (g)} \rightarrow \text{CuO (s)}$
- Zinc and lead (II) nitrate produce zinc nitrate and lead metal
 - $\text{Zn (s)} + \text{Pb(NO}_3)_2 \text{ (aq)} \rightarrow \text{Zn(NO}_3)_2 \text{ (aq)} + \text{Pb (s)}$
- Magnesium and oxygen combine to yield solid magnesium oxide
 - $\text{Mg (s)} + \text{O}_2 \text{ (g)} \rightarrow \text{MgO}$
- Carbon monoxide and solid iron (III) oxide combine to yield iron and carbon dioxide
 - $\text{CO (g)} + \text{Fe}_2\text{O}_3 \text{ (s)} \rightarrow \text{Fe (s)} + \text{CO}_2 \text{ (g)}$

MORE EXAMPLES

- Hydrochloric acid and magnesium react to form soluble magnesium chloride and hydrogen gas
- Aqueous sodium hydroxide and aqueous iron (II) chloride yield aqueous sodium chloride and solid iron (II) hydroxide
- Ammonium nitrate (solid) decomposes explosively to form nitrogen, oxygen, and water vapor

MORE EXAMPLES SOLUTIONS

- Hydrochloric acid and magnesium react to form soluble magnesium chloride and hydrogen gas



- Aqueous sodium hydroxide and aqueous iron (II) chloride yield aqueous sodium chloride and solid iron (II) hydroxide



- Ammonium nitrate (solid) decomposes explosively to form nitrogen, oxygen, and water vapor

