

## 11

**CHEMICAL REACTIONS****Practice Problems**

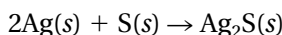
*In your notebook, solve the following problems. Use the 3-step problem-solving approach you learned in Chapter 1.*

**SECTION 11.1 DESCRIBING CHEMICAL REACTIONS**

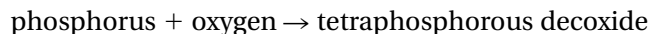
1. Write the skeleton equation for the reaction between hydrogen and oxygen that produces water.
2. Write the skeleton equation for the reaction that produces iron(II) sulfide from iron and sulfur.
3. Write the skeleton equation representing the heating of magnesium carbonate to produce solid magnesium oxide and carbon dioxide gas.
4. Write a balanced equation for the production of HCl gas from its elements.
5. Write a sentence that completely describes the chemical reaction represented by this balanced equation.



6. Write the word equation for the following equation. Write a sentence fully describing the reaction. Is the equation correctly balanced? Explain.



7. Write a balanced equation representing the formation of aqueous sulfuric acid from water and sulfur trioxide gas.
8. Write a balanced equation from this word equation.  
aqueous silver nitrate + copper metal  $\rightarrow$  silver metal + aqueous copper nitrate
9. Write a balanced equation for the following word equation.

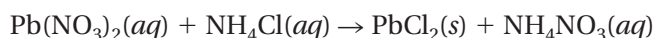
**SECTION 11.2 TYPES OF CHEMICAL REACTIONS**

1. Write a balanced equation representing the reaction of magnesium with oxygen gas to produce magnesium oxide.
2. Write the balanced equation for the reaction that occurs between aluminum and fluorine.
3. Write the balanced equation for the production of oxygen gas and potassium chloride from the decomposition of potassium chlorate.
4. Write the balanced equation for the reaction between hydrochloric acid and calcium metal. The products are hydrogen gas and calcium chloride.
5. Write the balanced equation for the combustion of propane ( $\text{C}_3\text{H}_8$ ) to produce carbon dioxide and water vapor.
6. Write the balanced equation for the reaction between iron(III) chloride and sodium hydroxide. The products are iron(III) hydroxide and sodium chloride.

7. Classify each of the reactions in problems 1–6 as to type.
8. Use the activity series of metals (Table 11.2) and your knowledge of the relative reactivity of the halogens to predict whether the following reactions will occur. Write balanced equations for those reactions that do occur.
  - a.  $\text{Br}_2(l) + \text{NaCl}(aq) \rightarrow$
  - b.  $\text{Ca}(s) + \text{Mg}(\text{NO}_3)_2(aq) \rightarrow$
  - c.  $\text{K}(s) + \text{H}_2\text{SO}_4(aq) \rightarrow$
  - d.  $\text{Zn}(s) + \text{NaOH}(aq) \rightarrow$

## SECTION 11.3 REACTIONS IN AQUEOUS SOLUTION

1. Write the net ionic equation for the reaction between aqueous barium nitrate,  $\text{Ba}(\text{NO}_3)_2$ , and sodium sulfate,  $\text{Na}_2\text{SO}_4$ .
2. Magnesium reacts with HCl to form hydrogen and magnesium chloride. Write the balanced net ionic equation for this reaction.
3. The double-replacement reaction below results in the formation of the precipitate lead chloride. Balance the equation and write the net ionic equation.



4. Identify the precipitate formed when solutions of the following ionic compounds are mixed. If no precipitate is formed, write *no precipitate*.
  - a.  $\text{Zn}(\text{NO}_3)_2 + \text{SnCl}_2 \rightarrow$
  - b.  $\text{KCl} + \text{AgNO}_3 \rightarrow$
  - c.  $\text{Cu}(\text{NO}_3)_2 + \text{Na}_2\text{S} \rightarrow$
  - d.  $\text{Al}_2(\text{SO}_4)_3 + 3\text{Mg}(\text{OH})_2 \rightarrow$