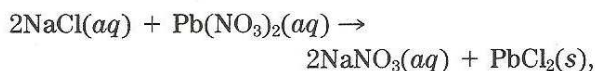


## CHAPTER 9

Text Reference: Section 9-13

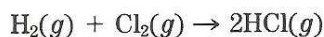
## Practice Problems

1. Given the balanced chemical equation

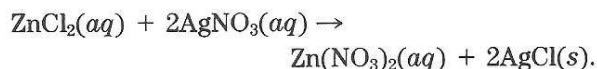


write a word equation for the reaction and then write a complete sentence, without symbols, that corresponds to the word equation.

2. Write a word equation and a complete sentence description for the reaction that occurs according to the following balanced chemical equation:

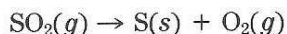


3. The balanced chemical equation for the double replacement reaction between  $\text{ZnCl}_2$  and  $\text{AgNO}_3$  is



Write a word equation and a complete sentence that describes this reaction.

4. Given the balanced chemical equation



write a word equation and a corresponding complete sentence for this reaction.

5. Solid sodium reacts with oxygen gas to produce solid sodium oxide. Write a word equation for this reaction. Then write a balanced chemical equation, using the correct chemical formulas and phase symbols.

6. Give the word equation and the balanced chemical equation for the decomposition of solid calcium carbonate into solid calcium oxide and carbon dioxide gas.

7. Solid zinc metal reacts with aqueous hydrogen ion to produce zinc ion in solution, with evolution of hydrogen gas. Write the word equation and the balanced chemical equation for this reaction.

8. Solid potassium chlorate is synthesized by combination of solid potassium, chlorine gas, and oxygen gas. Write the word equation and the balanced chemical equation for this synthesis.

9. Magnesium metal replaces mercury in an aqueous solution of the compound mercury(II)

nitrate. Give the word equation and the balanced chemical equation for this single replacement reaction.

10. Write the word equation and the balanced chemical equation for the chemical reaction between liquid water and calcium metal, given that the reaction produces aqueous calcium hydroxide and hydrogen gas.

11. Give the word equation and the balanced chemical equation for the chemical reaction that produces solid copper(I) oxide from its elements.

12. Liquid bromine combines with gaseous nitrogen to produce gaseous nitrogen tribromide. Write the word equation and the balanced chemical equation for this synthesis reaction.

13. Lead(II) sulfate is precipitated from a mixture of water solutions of potassium sulfate and lead(II) nitrate. Write the word equation and the balanced chemical equation for this double replacement reaction.

14. Write the word equation and the balanced chemical equation for the chemical reaction that occurs when solid aluminum oxide is decomposed into aluminum and oxygen.

15. Solid diphosphorus pentoxide can be produced from the chemical elements oxygen and phosphorus. Write the word equation and the balanced chemical equation for this synthesis reaction. (Hint: Elemental phosphorus contains four atoms per molecule.)

16. Carbon monoxide gas reacts with sulfur trioxide gas to produce carbon dioxide gas and sulfur dioxide gas. Write the word equation and the balanced chemical equation for this reaction.

17. Write the word equation and the balanced chemical equation for the synthesis reaction that occurs when ammonia vapor and hydrogen sulfide gas react to produce solid ammonium sulfide. (Hint: The chemical formula for ammonia is  $\text{NH}_3$ .)

18. Ethane gas,  $\text{C}_2\text{H}_6$ , combines chemically with atmospheric oxygen in a combustion reaction to produce carbon dioxide gas and water vapor. Write the word equation and the balanced chemical equation for this reaction.

Complete the following equations. Note that precipitates are insoluble and are followed by (s). Species in solution are followed by (aq). Note the list of insoluble salts. These are precipitates. Note the list of polyatomic ions. These atoms always stay together as a unit.

**Precipitation Reactions:**

Which of the following substances would you expect to be insoluble in water?

Barium hydroxide

Hydrochloric acid

Lithium sulfate

Ammonium nitrate

Silver chloride

Lithium carbonate

Calcium carbonate

Barium sulfate

Ammonium acetate

Lead acetate

Strontium hydroxide

Ammonium nitrate

Silver nitrate

Cadmium acetate

Solutions of lead (II) nitrate and potassium iodide are mixed.

- Does a precipitation reaction occur?
- Write balanced molecular, total ionic, and net ionic equations.

