EXPERIMENT 10

Name:_____

Date:_____

Partner:_____

I. COMBINATION REACTIONS

1. The combination of **aluminum** with **iodine** (The answers are provided so you will know how to answer the remaining questions. The answers are *highlighted* below.)

   a. Evidence of reaction:

   A flash of light and blue smoke was produced.

   _____

   b. Write a word equation for this reaction and briefly describe both the reactants and the products:

   _*aluminum*_____ + _*iodine*_____ → _*aluminum iodide*_____

   _*silver powder*_____ _*dark purple crystals*_____ _*purple smoke*_____

   _

   c. Write a balanced chemical equation for the combination of aluminum and iodine *(show the state designations):*

   $$2Al_{(s)} + 3I_{2(s)} \rightarrow 2AlI_{3(s)}$$

2. The combination of **zinc** with **sulfur**

   a. Evidence of reaction:

   _____

   _____

   b. Write a word equation for this reaction and briefly describe both the reactants and the products:

   _____ + _____ → _____

   _____ _____ _____

   c. Write a balanced chemical equation for the combination of zinc with sulfur *(show state designations):*

3. The reaction of red **phosphorus** with **oxygen**

   a. Evidence of reaction:

   _____

   _____

   b. Write a word equation for this reaction and briefly describe both the reactants and the products:

   _____ + _____ → _____

   _____ _____ _____

   c. Write a balanced chemical equation for the combination of red phosphorus with oxygen *(show state designations):*

4. The reaction of **copper** with **oxygen**

   a. Evidence of reaction:

   _____

   _____

   b. Write a word equation for this reaction and briefly describe both the reactants and the products:

   _____ + _____ → _____

   _____ _____ _____

   c. Write a balanced chemical equation for the combination of copper with oxygen *(show state designations):*

5. The reaction of **magnesium** with **air**

   a. Evidence of reaction:

   b. Write a balanced chemical equation for the combination of magnesium with **oxygen:**
   (show state designations)

   c. Write a balanced chemical equation for the combination of magnesium with **nitrogen:**
   (show state designations)

II. DECOMPOSITION REACTIONS

1. Electrolysis of **water**

   a. Write a balanced chemical equation which represents the reaction for the decomposition of water:
   (show state designations)

   b. Describe the test used to identify the presence of oxygen:

   b. Describe the test used to identify the presence of hydrogen:

2. Decomposition of **mercury (II) oxide** (2 steps). Step one, the decomposition of mercury (II) oxide to form mercury (I) oxide:

   Step 1:decomposition of **mercury (II) oxide**:

   a. Evidence of reaction:

   _____

   b. Write a word equation for this reaction and briefly describe both the reactants and the products:

   _____ → _____ + _____

   _____ _____ _____

   c. Write a balanced chemical equation for the decomposition of mercury (II) oxide *(show state designations)*:

   Step 2: decomposition of **mercury (I) oxide**:

   d. Evidence of reaction:

   _____

   e. Write a word equation for this reaction and briefly describe both the reactants and the products:

   _____ → _____ + _____

   _____ _____ _____

   f. Write a balanced chemical equation for the decomposition of mercury (I) oxide *(show state designations)*:

3. Decomposition of **sugar**

   a. Evidence of reaction:

   _____

   b. Write a word equation for this reaction and briefly describe both the reactants and the products:

   _____ → _____ + _____

   _____ _____ _____

   c. Write a balanced chemical equation for the decomposition of sugar:
   (show state designations):

4. Dehydration of **bluestone algicide** (copper (II) sulfate pentahydrate)

   a. Evidence of reaction:

   _____

   _____

   b. Write a word equation for this reaction and briefly describe both the reactants and the products:

   _____ → _____ + _____

   _____ _____ _____

   c. Write a balanced chemical equation for the decomposition of copper (II) sulfate pentahydrate: *(show state designations)*:

5. Decomposition **malachite** (basic copper (II) carbonate or $CuCO_3 \cdot Cu(OH)_2$)

   a. Evidence of reaction:

   _____

   _____

   b. What happened to the burning splint when it was inserted into the test tube?

   _____

   _____

   c. What does this suggest about the gaseous product formed?

   _____

   d. Write a word equation for this reaction and briefly describe both the reactants and the products:

   _____ → _____ + _____ + _____

   _____ _____ _____ _____

   _____ _____ _____ _____

   e. Write a balanced chemical equation for the decomposition of $CuCO_3 \cdot Cu(OH)_2$ *(show state designations)*:

6. Decomposition of **hydrated (III) iron (III) nitrate (**$Fe(NO_3)_3 \cdot 9H_2O$)

   a. Evidence of reaction:

   _____

   _____

   b. Write a word equation for this reaction and briefly describe both the reactants and the products:

   _____ → _____ + _____ + _____ + _____

   _____ _____ _____ _____ _____

   _____ _____ _____ _____ _____

   c. Write a balanced chemical equation for the decomposition of $Fe(NO_3)_3 \cdot 9H_2O$ *(show the state designations)*:

7. Decomposition of **ammonium dichromate (**$(NH_4)_2Cr_2O_7$)

   a. Evidence of reaction:

   _____

   _____

   b. Write a word equation for this reaction and briefly describe both the reactants and the products:

   _____ → _____ + _____ + _____

   _____ _____ _____ _____

   _____ _____ _____ _____

   c. Write a balanced chemical equation for the decomposition of $(NH_4)_2Cr_2O_7$ *(show the state designations)*: