

Group # _____

Name _____

Period ____ Date ____/____/____

Lab Ch 7 • Combination, Decomposition, and Combustion Reactions

Lab Partners: _____

READ Prelab #1-5 – Must be done before you enter lab

Objectives:

- Execute and observe different types of chemical reactions
- Qualitatively identify products of these chemical reactions
- Write balanced chemical equations for these chemical reactions

Safety:



- Use caution with burner.
- In this investigation you will be working with open flames, heating chemicals, handling acids, and producing gaseous products.
- Remember never to smell a chemical directly.
- Wear safety goggles and aprons at all times when working in the lab.
- Be very careful with solutions, especially acids and silver nitrate.

Pre-Lab: Classification of Chemical Reactions (Must be done before lab)

1. Write the general formula for a combination reaction. (Use letters like A, B, C, etc)

2. Write the general formula for a decomposition reaction.

3. Write the general formula for a combustion reaction.

4. What is a precipitate reaction?

5. What is a gas evolution reaction?

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Laboratory Procedure:

Part A: Combination Reaction:

1. Get a piece of copper wire (~5 cm). Note the appearance of the wire.
 - a. Using crucible tongs, hold the wire in the hottest part of a burner flame (reaction with O₂) for 1 to 2 minutes.
 - b. Examine the wire and note any change in its appearance caused by heating.
 - c. Record all observations in Data Table.
 - d. Dispose metal into the trash once it has **COOLED**.

	Observations <u>Observations should include color changes, odor, produced precipitate, produced gas, etc... Be descriptive!!!</u>
Reaction	
Balanced Equation: Don't forget to balance charges first!! Include States of Matter!!	$\text{Cu (s)} + \text{O}_2 \text{ (g)} \rightarrow$

2. (We did this experiment before, but I want to see the "equation"). Get a piece of magnesium from your teacher and grab an evaporation dish. Examine a piece of magnesium ribbon.
 - a. Using crucible tongs, hold the sample in the burner flame until the magnesium starts to burn. **Make sure none of the Mg goes into the Bunsen burner. DO NOT LOOK DIRECTLY AT THE FLAME. HOLD THE BURNING MAGNESIUM AWAY FROM YOU AND DIRECTLY OVER THE EVAPORATING DISH in case some of it falls.**
 - b. When the ribbon stops burning, put the remains in the evaporating dish. Examine this product carefully.
 - c. Record all observations in Data Table.
 - d. Dispose metal into the trash once it has cooled. **Clean lab equipment.**

	Observations <u>Observations should include color changes, odor, produced precipitate, produced gas, etc... Be descriptive!!!</u>
Reaction	

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Balanced Equation: Don't forget to balance charges first!! Include States of Matter!!	$\text{Mg}_{(s)} + \text{O}_{2(g)} \rightarrow$
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Part B: Decomposition Reactions:

3. Hydrogen Peroxide

- a. Put about 3 mL of 30% hydrogen peroxide (H_2O_2) solution in a small test tube.
- b. Add a very tiny amount (pea size) of MnO_2 catalyst. (A catalyst makes a reaction occur faster.)
- c. Prepare a **glowing (not burning)** splint test. Check for the presence of gas.
- d. Insert the **glowing** wood splint (half way into tube – don't touch liquid) so that it hits the bubbles produced. **If the splint flames up, you have O_2 being produced.**
- e. Record all observations in Data Table.
- f. Dispose liquid in sink (lots of water). **Clean lab equipment.**

	<u>Observations</u> <u>Observations should include color changes, odor, produced precipitate, produced gas, etc... Be descriptive!!!</u>
Reaction	
Balanced Equation: Don't forget to balance charges first!! Include States of Matter!!	$\text{H}_2\text{O}_2_{(aq)} \rightarrow \quad +$

4. Copper(II) Carbonate

- a. Set up a ring stand and Bunsen burner.
- b. Put a very small amount (small scoop) of solid copper (II) carbonate into a test tube.
- c. Using a test tube holder, warm **gently** for 1-2 minutes. Make sure you point test tube away from people.
- d. Move the test tube around while under the flame so it does not crack.
- e. Light a wooden splint.

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- Turn gas off. Using the **burning** splint test, check for the presence of gas. Place the **burning** splint above the opening of crucible. **If the fire goes out, you have CO₂ being produced.**
- Record all observations in Data Table.
- Allow five minutes for test tube to cool on rack.
- Dispose solid into the trash and clean lab equipment.**

	<u>Observations</u> <u>Observations should include color changes, odor, produced precipitate, produced gas, etc... Be descriptive!!!</u>
Reaction	
Balanced Equation: Don't forget to balance charges first!! Include States of Matter!!	$\text{CuCO}_3 (\text{aq}) \rightarrow \quad +$ <p>Hint: Should produce 2 compounds!!</p>

Part C: Combustion Reactions

5. When you light a Bunsen burner, you are igniting methane, CH₄, the primary component of "natural gas". Methane reacts with oxygen to produce 2 compounds.

Balanced Equation: Don't forget to balance charges first!! Include States of Matter!!	$\text{CH}_4 (\text{g}) + \text{O}_2 (\text{g}) \rightarrow \quad +$ <p>Hint: Should produce 2 compounds!!</p>
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Cleaning and Disposal:

- Solids go in the trash
- Clean ALL equipment with LAB Equipment soap & brushes
- Dry dishes for next lab group and place test tubes upside down on test tube rack.
- Clean Lab BENCH with small soap bottle and sponge.
- Wash hands with hand soap.
- Let me know when you are ready. Do not get unprotected until dismissed.