

Name \_\_\_\_\_

## Honors Chemistry

\_\_\_/\_\_\_/\_\_\_

### Chemical Reactions Lab

**Apparatus:** test tubes, spot plates, bunsen burner, clamp, forceps, medicine dropper, matches, wooden splints

**Materials:** magnesium ribbon, red & blue litmus paper, sodium carbonate, copper(II) sulfate pentahydrate, 6 M hydrochloric acid, copper(II) sulfate, silver nitrate, sodium chloride, zinc strips, iron strips, ammonium hydroxide, lead(II) nitrate, potassium iodide, aluminum foil, copper(II) chloride

#### Procedure:

##### 1. Combustion Reaction

Light a match and ignite the natural gas in your Bunsen burner. Natural gas is mostly methane( $\text{CH}_4$ ). Write the equation for the reaction of methane with air.

##### 2. Synthesis/Combustion/Redox Reaction

Using your forceps, ignite a strip of magnesium ribbon in your Bunsen burner flame. Do not drop the product on the table. **DO NOT LOOK DIRECTLY AT THE LIGHT!!!** Describe the product below.

Write the equation for this reaction. (Hint: The magnesium ribbon is reacting with air).

##### 3. Synthesis/Anhydride Reaction

Add some water to a spot plate well. Drop your burned magnesium product in to the well. Stir well using a toothpick. Test the solution with a small piece of red & blue litmus paper. Acids turn blue litmus paper red and bases turn red litmus paper blue. What happens to the color of the litmus paper?

Write the equation for this reaction.

##### 4. Decomposition of Carbonate Reaction

Heat a scoop of sodium carbonate in a test tube held in a diagonal position. Light a wooden splint and dip it into the test tube. What happens to the flame?

Write the equation for this reaction. (If the flame went out, carbon dioxide is being produced; if the flame continues to burn, oxygen is being produced; and if the gas explodes hydrogen gas is produced.)

##### 5. Decomposition of Hydrate Reaction

Heat a crystal of copper(II) sulfate pentahydrate in a test tube held in a position with the mouth of the test tube lower than the closed end. What appears in the colder part of the tube? Note any changes in the color of the solid.

Write the equation for this reaction.

### 6. Single-Replacement/Redox Reaction

Add 5 ml of hydrochloric acid (HCl) to a piece of zinc in a test tube. Turn your test tube horizontal but be careful to not spill the acid. A lab partner should light a wooden splint using a match in the mean time. After approximately 45 seconds, bring the burning splint to the mouth of the test tube. Remember to point the mouth of the test tube AWAY from your lab partner. What happens? Decant the liquid in to the waste beaker, leaving the solid zinc in the test tube.

Write the **net ionic** equation for this reaction.

### 7. Single-Replacement/Redox Reaction

Drop a strip of steel wool into a spot plate well. Add a few drops of copper(II) sulfate solution to the well. After 3 minutes, note the substance on the steel wool and any change in the color of the solution. Rinse out the spot plate when you are finished.

Write the **net ionic** equation for this reaction. (Hint: Steel wool is mostly iron and can be represented by the symbol Fe.)

### 8. Single-Replacement/Redox Reaction

Add a strip of aluminum to 5 ml of copper(II) chloride solution in a spot plate well. After 3 minutes, note the substance on the aluminum and any change in the color of the solution. Rinse out the spot plate when you are finished.

Write the **net ionic** equation for this reaction.

### 9. Double-Replacement Precipitate Reaction

Add a few drops of iron(III) chloride solution to a few drops of sodium hydroxide solution in a spot plate. Record your observations. Rinse out the spot plate when you are finished. Write your observations and the net ionic equations for this reaction.

Observations:

Net Ionic:

### 10. Double-Replacement Precipitate Reaction

Add a few drops of ammonium hydroxide solution to a few drops of lead(II) nitrate solution in a spot plate. Note your observations. Rinse out the spot plate when you are finished. Write your observations and the net ionic equations for this reaction.

Observations:

Net Ionic:

### 11. Double-Replacement Precipitate Reaction

Add a few drops of lead(II) nitrate solution to a few drops of sodium iodide solution in a spot plate. Record your observations. Rinse out the spot plate when you are finished. Write your observations and the double displacement, complete ionic and net ionic equations for this reaction.

Observations:

Net Ionic: