Name: _____ Chem 10, Section: _____

Lab Partner: _____ Experiment Date: _____

The Properties of Oxygen Gas

Part A: Generating and Collecting Oxygen Gas

1) Write the equation for the reaction used to generate oxygen gas.

   Word Equation: _____

   Formula Equation: _____

2) What is the *name* and *formula* of the catalyst used in this reaction?

   _____

   What is the purpose of this catalyst?

3) In addition to oxygen, what other substance is produced by this reaction? Where is this substance collected?

4) Two notable physical properties of oxygen are its low solubility in water and a density greater than air.

a. Which one of these properties allows the oxygen gas collected to be stored in the bottles *mouth up*? Explain.

b. Which one of these properties allows the oxygen gas to be collected via the *displacement of water*? Explain.

Part B: The Properties of Oxygen Gas

Test 1	Observations
Glowing splint in Bottle #1	
Glowing splint in air bottle	

Test 2	Observations
Burning candle in Bottle #2	Candle burned for _____ seconds.
Burning candle in air bottle	Candle burned for _____ seconds.
Test 3	Observations
Burning sulfur in Bottle #3	
Burning sulfur in air bottle	
Test 4	Observations
Glowing steel in Bottle #4	
Glowing steel in air bottle	
Test 5	Observations
Burning hydrogen in air	
Test 6	Observations
Burning magnesium in air	

Analysis of Combustion Results

1) Consider your results for the first four tests you performed. In which bottles, air-filled or oxygen-filled, did the combustion reactions occur more vigorously? Why?

2) Are the combustion reactions of oxygen exothermic or endothermic? Support your answer with one or more <u>specific</u> observations from the tests you performed.

3) Consider your Test 2 results. Although the candle burns for a longer period of time in one bottle, it eventually goes out in both the empty bottle and Bottle #2. Why does it go out?

4) When an element burns in oxygen gas, the product is called an oxide.

a. The wood in the splint consists mostly of carbon. The combustion of carbon produces carbon dioxide, CO_2. Write the equation for the combustion of wood (carbon).

Word Equation: _____

Balanced Formula Equation: _____

b. The combustion of sulfur produces sulfur dioxide, SO_2. Write the equation for the combustion of sulfur.

Word Equation: _____

Balanced Formula Equation: _____

c. Steel wool consists mostly of iron. The combustion of iron produces iron(III) oxide, Fe_2O_3. Write the equation for the combustion of steel wool (iron).

Word Equation: _____

Balanced Formula Equation: _____

d. The combustion of hydrogen produces water, H_2O. Write the equation for the combustion of hydrogen.

Word Equation: _____

Balanced Formula Equation: _____

e. The combustion of magnesium produces magnesium oxide, MgO. Write the equation for the combustion of magnesium.

Word Equation: _____

Balanced Formula Equation: _____

5) Do you expect the product formed during the combustion of magnesium in Test 6 (the ashy magnesium oxide) to weigh more than, less than, or the same as the original piece of magnesium? Explain.