

Testing for Gases Lab

Unit 7: Gases

Pre-lab Questions:

1. In the Gas Demo's that your instructor did last week you saw the production of oxygen gas, and carbon dioxide gas. How did you instructor test for the presence of each of these gases? Be specific and include observations from the gas demos.
 - a. How did the instructor test for the presence of oxygen gas?

 - b. How did the instructor test for the presence of carbon dioxide gas?

2. Why would it be important for someone to test for the presence of gases?

3. What is the kinetic molecular theory?

Purpose of the lab: To test for the presence of hydrogen, oxygen, and carbon dioxide following a chemical reaction.

Procedure:

Part 1: Testing for hydrogen.

1. Obtain hydrochloric acid and one piece of magnesium ribbon.
2. Carefully pour about 2 cm of hydrochloric acid into a small test tube.
3. Add magnesium ribbon to the hydrochloric acid.
4. Watch the solution for approximately one minute and record your observation in the table below.
5. Bring a burning wood splint to the opening of the test tube. A "pop" indicates the presence of hydrogen gas.
6. Record your observations in the table below.
7. Discard the contents of the test tube into the sink.

Name: _____ Per _____

Part 2: Testing for oxygen

1. Obtain hydrogen peroxide solution and manganese (IV) oxide.
2. Carefully pour about 2 cm of hydrogen peroxide into a small test tube.
3. Add a small amount of manganese (IV) oxide to the hydrogen peroxide.
4. Watch the solution for approximately one minute and record your observations in the table below.
5. Bring a glowing wood splint to the opening of the test tube. A glowing splint that bursts into flames indicates the presence of oxygen gas.
6. Record your observations in the table below.
7. Discard the contents of the test tube into the sink.

Part 3: Testing for Carbon Dioxide

1. Obtain acetic acid solution and solid sodium hydroxide carbonate.
2. Carefully pour about 2 cm of acetic acid into a small test tube.
3. Put a small scoopful of sodium hydrogen carbonate into the test tube.
4. Watch the solution for approximately one minute and record your observations in the table below.
5. Bring a burning wood splint to the opening of the test tube. A burning flame that is extinguished indicates the presence of carbon dioxide gas.
6. Record your observations in the table below.
7. Discard the contents of the test tube into the sink.

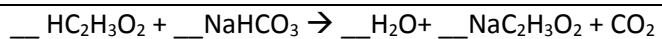
Make sure that your lab station is clean. You must get a clean-up stamp before working on the additional questions.

Results Table:

Gas	Balanced reaction:	How did you test for the presence of this gas?	Observations:
Hydrogen (H ₂)	___ Mg + ___ HCl → _____ + _____		
Oxygen (O ₂)	___ H ₂ O ₂ → ___ H ₂ O + ___ O ₂		

Name: _____

Per _____

Carbon
Dioxide
(CO₂)

Post-lab Questions:

1. Why is there a popping sound when you bring a burning wood splint to the opening of the test tube?
2. Why does a wooden splint burst into flames when in the presence of oxygen?
3. Why does a flame become extinguished when it is near carbon dioxide?
4. In part 1 of this lab the gas produced has a volume of 15 mL at 27 °C. Calculate the volume of the gas at 67°C. What gas law describes this relationship?
5. In part 2 of this lab the gas produced has a pressure of 1.18×10^4 Pa at 295 K. Calculate the pressure of the gas at 590 K. What gas law describes this relationship?
6. In part 3 of this lab the gas produced has a volume of 400 mL at 1.00 atm. Calculate the volume of gas at 2.00 atm. What gas law describes this relationship?

Name: _____ Per _____

Discussion:

Directions: Use the space below to write a conclusion about what you learned from this experiment. The overall goal of the discussion section is for you to demonstrate that you not only understood the concepts of the lab but you were able to relate you data to the concepts of the lab. Use the following outline below to help you write your discussion.

Paragraph 1: Introduce the experiment

- a. What was the purpose of the lab
- b. In 1-2 sentences describe the procedure of the lab.

Paragraph 2: Your results

- a. Talk about the results from each of your sections in the lab
- b. Talk about any sources of error.
- c. Talk about how you could improve your technique.

Paragraph 3: Conclude and Connect

- a. State your conclusion using the following sentence frame
I can conclude _____ because _____.

Claimdata/observations

- b. Talk about how this experiment could be used in the real world.
- c. State any other connections to previous chemistry learned this year.