

Date: \_\_\_\_\_

Name: \_\_\_\_\_

Due Date: \_\_\_\_\_

Period: \_\_\_\_\_

## Lab: Identifying Mystery Gases

### Purpose

To use chemical properties of various gases to identify the product gas of each chemical reaction.

### Materials

- Pipettes/dropper bottles
- Test tube
- Candle
- Wooden splint
- Scoopula
- Rubber stopper

### Tests

Test 1: hydrogen peroxide ( $\text{H}_2\text{O}_2$ ) + dry active yeast

Test 2: acetic acid (vinegar,  $\text{CH}_3\text{CO}_2\text{H}$ ) + sodium bicarbonate (baking soda,  $\text{NaHCO}_3$ )

Test 3: hydrochloric acid ( $\text{HCl}$ ) + magnesium ( $\text{Mg}$ )

### Procedure

1. Before mixing the substances for each test, describe their physical properties.
2. Use a pipette to add a small amount (less than 1 cm) of the liquid reactant to a test tube.
3. Use a scoopula to add a small amount of the solid reactant to the same test tube.
  - a. For yeast, add 3-4 grains.
  - b. For baking soda, add a small scoop.
  - c. For magnesium, add one 2-cm strip.
4. Hold a stopper in the test tube and shake the reactants together.
  - a. For test 1, shake for at least one minute, then add a glowing splint.
  - b. For test 2, shake for 5-10 seconds, then add a flaming splint.
  - c. For test 3, shake for at least one minute, then add a flaming splint.
5. Write down observations.
6. If the gas test is negative, repeat for the same substances until you have a positive test.
7. Dump out all products into your waste beaker and rinse the test tube with distilled water.  
Do not dump anything down the drain at your station!

### Safety

Hydrochloric acid is corrosive and will irritate skin. Wash skin immediately if it comes in contact with hydrochloric acid.

Tie back long hair. Roll up long sleeves.

Wear safety goggles at all times during the lab.

**Observations (16 marks)**

Test	Reactant Substances		Observations After Mixing	Type of Gas
	Name	Physical Properties (4)		
1	Hydrogen peroxide			
	Yeast			
2	Acetic acid			
	Sodium bicarbonate			
3	Hydrochloric acid			
	Magnesium			

**Discussion**

1. How do you know that these reactions are chemical reactions? (2 marks)

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2. Which gas seems to be the most hazardous out of oxygen, hydrogen or carbon dioxide?  
Why? (2 marks)

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3. State one chemical property of each gas produced in this experiment. (3 marks)

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**Conclusion** (2 marks)

Explain what you discovered in this experiment. Be really specific.

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