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

**Partners: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Factors that affect the Rate of Reaction between an Acid and a Metal**

**Purpose:**

* to determine how the nature of a reactant affects the rate of a reaction
* to determine how the concentration of a reactant affects the rate of a reaction

 

**Experiment 1 First Column Lab Partners**

* piece of magnesium metal and approx. 10 mL of 3.0 mol/L HCl(aq)

**Experiment 2 Second Column Lab Partners**

* piece of magnesium metal and approx. 10 mL of 6.0 mol/L HCl(aq)

**Experiment 3 Third Column Lab Partners**

* piece of magnesium metal and approx. 10 mL of 6.0 mol/L CH3COOH(aq)

**Observations:**

* create a data table for volume vs. time
* first column (time)
* second column ( volume of hydrogen gas)
* you will collect only one set of data
* you will obtain the other 2 sets of data from your "row mates" by taking photos

**BCEs:**

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2\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Analyses of Data:**

1) By **computer** generate **ONE** **GRAPH** using the 3 sets of data. Use a **legend.**

2) Determine the **average rate** of formation of hydrogen gas over time for each set of data.

|  |
| --- |
| **Average Rate of Formation of Hydrogen Gas = Total Volume of Hydrogen** **Total Time** |

**Experiment 1** Calculated **Average Rate for 3 M HCl:**

**Experiment 2** Calculated **Average Rate for 6 M HCl:**

**Experiment 3** Calculated **Average Rate for 6 M CH3COOH:**

How does the type of acid affect the rate of reaction **and why using COLLISION THEORY**?

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How does the concentration of acid affect the rate of reaction **and why using COLLISION THEORY**?

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Two different variables were tested in the lab.

What were the 2 independent variables?

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What was the dependent variable in each case? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

List everything that was held constant (use bullets)--at least 5.

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Why could we use a **copper** cage to hold the magnesium metal?

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