**Lab: Does the Mass Add Up? Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

During a chemical reaction, chemicals react to produce new substances. Is any mass lost in this process?

**Purpose:** to determine if mass is gained or lost during chemical reactions

**Hypothesis:** **If** two compounds react together to produce new products, **then** the mass of the products will be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the mass of the reactants, **because** mass can be neither created nor destroyed.

**Materials and Apparatus:**

Erlenmeyer flask with rubber stopper small test tube 2 small glass beakers

electronic balance scoopula paper towels

2 graduated cylinders (10 mL) plastic dropper vinegar

baking soda (sodium hydrogen carbonate) sodium hydroxide (NaOH) iron (III) nitrate (Fe(NO3)3)

**Method - Part A:**

1. Using the scoopula, place a small amount (~ 2 scoops) of baking soda in one of the small beakers.

2. Measure 5 ml vinegar into the other small beaker, using a clean graduated cylinder.

3. Place a paper towel on the electronic balance, and place the 2 glass beakers on the paper towel.

4. Record the mass of the reactants in table 1.

5. Carefully pour the vinegar into the baking soda.

6. Wait 30 seconds and record the mass of the 2 plastic beakers in the table 1.

7. Clean everything up: pour materials down the sink, and wash all apparatus thoroughly.

**Method - Part B:**

1. Measure 5 ml of sodium hydroxide (NaOH) into the Erlenmeyer flask, using a clean graduated cylinder.

2. Measure a dropper full of iron (III) nitrate (Fe(NO3)3) into the small test tube using the second graduated cylinder.

3. Carefully **slide** the test tube **into** the Erlenmeyer flask. Do not allow the test tube contents to spill.

4. Place a stopper on the flask.

5. Measure and record the total mass of the flask and its contents in the table 1.

6. Slowly tip the flask back and forth to allow the two solutions to mix.

7. Measure and record the total mass of the flask and its contents once more.

8. Pour the contents of the flask into the waste container provided, being careful not to dispose of the small test tube.

9. Wash the flask, test tube, and stopper thoroughly. **Be careful of the small test tube due to fragility!**

**Observations:**

Table 1: Reactant and Product Masses before and after Chemical Reactions

|  |  |  |
| --- | --- | --- |
|  | **Part A**  **baking soda + vinegar** | **Part B**  **NaOH + Fe(NO3)3** |
| Predicted change in mass  **(increase, decrease, no change)** |  |  |
| Mass of reactants (g) |  |  |
| Mass of products (g) |  |  |
| Calculated difference in mass, **+ / -** , (g)  **(mass of reactants - mass of products)** |  |  |

**Analyze and Evaluate:**

1. Provide evidence that a chemical change occurred in the following parts of the lab?

Part A: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Part B: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Were the predictions correct? **(Yes or No)**

Part A: \_\_\_\_\_\_\_\_\_\_\_\_\_ Part B: \_\_\_\_\_\_\_\_\_\_\_\_\_

3. Mass can be neither created nor destroyed. Why did the mass change is Part A? **(Full Sentences)**

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| 4. The products of the reaction in **Part B** are sodium nitrate and iron(III) hydroxide.  A) Write a ***word equation*** to describe this reaction.  B) Write a ***chemical equation*** to describe this reaction.  Word:  Chemical: |