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

**Law of Conservation of Mass Lab**

**Purpose:** To attempt to verify & observe the Law of Conservation of Mass. In any chemical reaction, the total

mass of the reactants is always equal to the mass of the products.

**Materials:**

* 100 mL Beaker
* Small test tube
* 125 mL Erlenmeyer flask with rubber stopper
* 5 mL graduated cylinders
* Scoopula
* Balance
* 0.1 M HCl & sodium bicarbonate

**Introduction:** In this lab, you will be using hydrochloric acid and sodium bicarbonare as your reactants. Putting these two compounds together will allow us to create a chemical reaction which you will need to observe.

**Procedure Part 1:**

1. Safety: put on safety goggles or glasses. These must be worn for the entirety of the lab. Remove any hats (or turn backwards). Tie up any long hair. Wear glasses rather than contact lenses. You may also use gloves.
2. You will need the beaker and graduated cylinder.
3. Using the graduated cylinder, measure 2 mL of hydrochloric acid.
4. Using the scoopula, take 1 scoops of sodium bicarbonate and place it in the beaker.
5. Place both the beaker with sodium bicarbonate and graduated cylinder with hydrochloric acid on the balance scale. (these should not be mixed simply put them on the scale).
6. Weigh all materials and record this in your data table (this is your total mass of object before the reaction for part 1).
7. Remove everything off the balance scale.
8. Pour all hydrochloric acid from the graduated cylinder into the beaker combining your reactants.
9. Record below what you observed, and explain how you know a chemical reaction is occurring.
10. Leave your reactants and let it sit until it has settled. **(This is a good time to start on part 2).**

**Procedure Part 2:**

1. You will need a flask with a rubber stopper, the graduated cylinder and a small test tube.
2. Using the scoopula, take 1 scoops of sodium bicarbonate and place it into your flask.
3. Using the graduated cylinder, measure 2 mL of hydrochloric acid. Pour this into the test tube.
4. Place your small test tube into the flask without mixing the reactants **(tilt the flask to gently place the test tube in).**
5. Put the rubber stopper tightly on the top (**this is important if you don’t place it on properly you will get an explosion of your reactants).**
6. Place the flask with the rubber stopper and the test tube with your reactants on the balance scale and record your data on the table (this is your total mass of object before the reaction for part 2, put on both lines).
7. Remove everything off the balance scale.
8. Turn your flask upside down to mix reactants (might have to do this a couple of times).
9. Go back to part 1.

**Procedure Part 1 Continued:**

1. At this point your beaker with the products should be settled
2. Place the beaker with the products and the graduated cylinder back on the scale. **You must remember to put the graduated cylinder on as well.**
3. Record your data (this will be total mass of object after the reaction for part 1).
4. Continue part 2.

**Procedure Part 2 Continued:**

1. At this point your flask with the products should be settled
2. Place the flask with the products and the test tube back on the scale.
3. Record your data (this will be total mass of object after the reaction for part 2).
4. Remove the rubber stopper and write down what you hear below.
5. Place the flask with products back on the scale with the rubber stopper gently on top and record your data below.

**Clean Up:**

1. Pour everything down the sink.
2. Rinse all equipment including dropper by putting water inside the dropper a couple of times.
3. Place everything upside down back in the tray.
4. Put balance scale back on tray.

**Data Collection:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Total mass of object with reactants (g)** | **Total mass of object with products (g)** | **Total mass of reactants – Total mass of products (g)** |
| **Part 1** |  |  |  |
| **Part 2: with the rubber stopper** |  |  |  |
| **Part 2: rubber stopper removed** |  |  |  |

**Analysis Questions:**

1. When you mixed the reactants to make the product what happened?

1. Draw a diagram of what you observed.

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| --- |
|  |

1. When you removed the rubber stopper from part 2 what did you hear? Why do you think this happened?

1. What evidence was there to indicate that a chemical reaction occurred?

1. How did the final (products) mass of the system compare with the initial (reactants) mass of the system for each trial? How did your result support or violated the Law of Conservation of Mass?

1. Was this experiment an open or closed system? Explain your answer.