**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Period\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**LAB: Decomposition of Baking Soda**

**PURPOSE:** To decompose baking soda

**BACKGROUND INFORMATION:**

Due to the widespread use of baking soda (sodium bicarbonate) in many food products (cakes, muffins, cookies, pancakes), the thermal decomposition reaction has been studied extensively by food chemists. Baking soda is used to prepare cakes in order to insure that cakes “rise” as they bake.



As the temperature of the cake batter reaches approximately 50°C, the baking soda decomposes and carbon dioxide gas is released. The use of baking soda is popular in making waffles and pancakes since the high cooking temperatures (350°-450°F; 175°-230°C) cause the carbon dioxide gas to be liberated before the dough has time to set and gives you a fluffy product!

**MATERIALS:**

Baking soda

Hot plate

Small beaker (150 mL or less)

Balance

Spatula

**PROCEDURE:**

1. Turn on your hot plate to medium heat (setting 5 or 6)
2. Measure the mass of the dry beaker and record in the table below.
3. Add approximately 5 grams of baking into your beaker, record the mass of the beaker + baking soda in the table below.
4. Take your beaker off the balance, and find the mass of the baking soda, and record in the table below.
5. Place the beaker on the hot plate. Leave on the heat for approximately 15 minutes.
6. Turn off hot plate and allow your beaker to cool.
7. Once your beaker is cool, find the mass of your beaker and record in the table below.
8. Find the mass of the product by subtracting out the mass of the beaker.
9. Dispose of left over product in the trash, clean up lab bench.

**DATA TABLES**

Before Reaction

|  |  |
| --- | --- |
| 1. Mass of Beaker
 |  |
| 1. Mass of Beaker + Baking Soda
 |  |
| 1. Mass of Baking Soda (B-A)
 |  |

After Reaction Reaction

|  |  |
| --- | --- |
| 1. Mass of Beaker + Product
 |  |
| 1. Mass of Product (D-A)
 |  |

**QUESTIONS:**

1. The chemical formula for baking soda is Na(HCO3). If it decomposes into Sodium Hydroxide, NaOH and Carbon Dioxide, CO2. Write the unbalanced reaction below.
2. Balance the reaction.
3. What was the solid product in your beaker?
4. How much mass was “lost” in the experiment?
5. Where did the “lost” mass go, or what product left the beaker as a gas?
6. Was this reaction endothermic or exothermic? Explain?