

**Introduction**

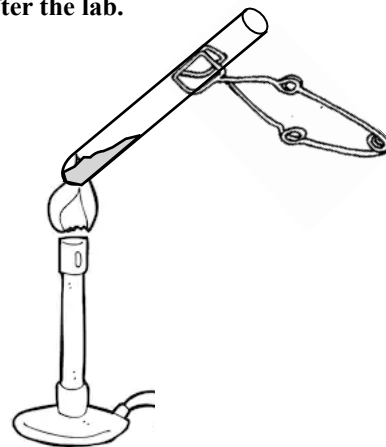
Many compounds will decompose upon heating. Some compounds will decompose into elements, some will decompose into other compounds, some will decompose into both elements and compounds. In this lab we will observe and quantitatively study the decomposition of sodium bicarbonate.

**PreLab**

1. Set up a new tab in your Google Lab sheet labeled H4. Make a data table with a line item for each measurement and each process the data

**Procedure**      **Goggles will be worn at all times at the lab stations. Wash your hands after the lab.**

- A. Be sure your test tube is clean and dry. Check the label for either pyrex® or kimax®. If you do not have one of those labels, the test tube is not safe to heat. Please check with the teacher to get a new one. Record the weight of the test tube.
- B. Tare the test tube, and add between 2.5 – 3.5 grams of sodium bicarbonate to the tube. Record the weight of the sodium bicarbonate.
- C. Be sure that your test tube clamp has a good grip, and that you grab your tube ~1/4 from the top.
- D. Set up the burner with a good hot flame, and being careful to not point the tube in anyone's direction, heat the contents of the tube for approximately 5 minutes occasionally rotating the solid in the tube as demonstrated in class. Before shutting off the flame, be sure all of the condensation at the top of the tube has been evaporated.
- E. Set the tube in the wooden test tube rack to cool.
- F. When cool enough, weigh the tube with the solid product, sodium carbonate.
- G. EXTRA. We can do another reaction with the sodium carbonate product by reacting your product with ~20 ml of 1 M HCl.
  - (i) Dump your product into the 150 ml beaker, prepare ~20 ml of the 1 M acid.
  - (ii) Have a partner light a wooden stick ready to put the stick down in to the beaker after adding the acid to detect the product gas that forms.
  - (iii) What happens to the flame? What gas does this indicate?
- H. Leave your test tube in the rack for the next class. Clean up by rinsing out the beaker, and put all burned sticks into the trash.

**Process the Data**

- Write the formula for sodium bicarbonate \_\_\_\_\_ and molar mass \_\_\_\_\_
  - Write the formula for sodium carbonate \_\_\_\_\_ and molar mass \_\_\_\_\_
1. Calculate the mass of sodium carbonate product.
  2. Calculate the moles of sodium bicarbonate reactant.
  3. Calculate the moles of sodium carbonate product.
  4. Calculate the mole ratio of sodium bicarbonate reactant to sodium carbonate product.
    - Submit the data requested to the google form.

## LAD H4 (pg 2 of 2) Decomposition of Baking Soda

### Post Lab Questions

1. There are two gaseous products from this decomposition. Did you detect one of them during the decomposition? Where, and why did that gas show up there? What chemical?
2. After the lab, a demonstration was done to detect the other gas being given off by the decomposition. What was the gas? What lab test was used to detect this gas, and what was the confirmatory result?
3. After looking at the class data, we will write the balanced equation for this reaction in the space below.
4. Is this reaction an oxidation reduction reaction? Apply oxidation numbers to confirm.
5. Write an equation to represent the reaction of the product sodium carbonate with hydrochloric acid.