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## SCH 4C Decomposition of Either Na<sub>2</sub>CO<sub>3</sub> or NaHCO<sub>3</sub>

Purpose: Given either  $Na_2CO_3$  or  $NaHCO_3$  (mystery carbonate) use a double displacement decomposition reaction and stoichiometry to correctly identify which carbonate you were given.

Experimental Data:

mass empty crucible (and lid)	g
mass crucible plus carbonate	g
mass curcible plus NaCl after heating	g

Concluding Questions:

 Using the standard three line calculation (see Mg lab for details) determine the mass of carbonate that you actually reacted (probably 1.000 g).

2. Write a balanced chemical equation for the reaction of  $\rm Na_2\rm CO_3$  with HCl.

- 4. Write a balanced chemical equation for the reaction of NaHCO $_3$  with HCl.
- 5. Use your answer from #1 as a starting point and the balanced chemical equation from #4, convert (use three conversion factors) from mass  $NaHCO_3$  to mass NaCl.

6. Using a standard three line calculation determine the mass of NaCl that you obtained after heating.

7. Compare your answers for #3 and #5 with #6. What was the identity of the carbonate that you were given?

- 8. Using the formula given below, determine your percent error for your experiment.
  - the experimental mass is the mass of NaCl that you obtained and measure in the experiment (#6 above)
  - the theoretical mass is the mass of NaCl that you would expect to form based on stoichiometric theory (either #3 or #5 from above)
  - the numerator has "absolute value" bars, which means ignore the negative if the theoretical value happens to be larger than the experimental value

% error =  $\frac{|\text{experimental mass} - \text{theoretical mass}|}{\text{theoretical mass}} \times 100 \%$