

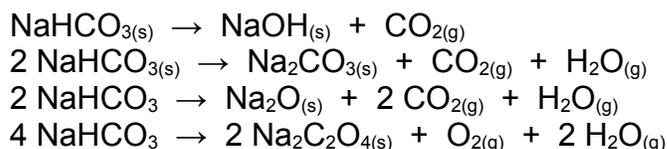
## Decomposition of Sodium Bicarbonate

### Purpose

To observe a chemical reaction and to use qualitative and quantitative evidence to identify this reaction from four possibilities.

### Introduction

In this experiment you will heat a common household chemical, baking soda (sodium bicarbonate –  $\text{NaHCO}_3$ ). The reaction which occurs is one of the following:



You will choose the correct equation for this reaction based on qualitative observations (observations that are not based on measurements) and quantitative measurements (observations that are based on measurements).

### Procedure, Observations/Data and Calculations

1. Add about 0.5 g of  $\text{NaHCO}_3$  to a test tube. The exact amount does not matter. Obtain a test tube half-filled with limewater. Set up the apparatus as directed by your teacher. Heat the  $\text{NaHCO}_3$  gently for about 2 minutes while holding the limewater near the opening of the first test tube. After 2 minutes, shake the limewater test tube.

Observations	Conclusions and Reactions Eliminated

2. Discard the residue left over from procedure step 1.
3. Determine the mass of a clean, dry crucible and cover. You may need to heat the crucible before using it if it has been washed recently.
4. Add about 1.5 g of  $\text{NaHCO}_3$  to the crucible and find the mass of the crucible and its contents.
5. Heat the crucible gently for about 1 minute and then strongly for another 6 minutes, keeping the lid slightly ajar. Once cool, determine the mass of the crucible and residue.

Objects Being Massed	Masses (g)

6. Determine which of the remaining reactions is the correct one for the decomposition of  $\text{NaHCO}_3$ . In order to do this, you will have to make stoichiometric calculations (U – calculations) using the remaining reactions and compare the calculated (theoretical) mass of the residue to the actual mass you obtained.

### Conclusion

### Sources of Error

Errors	How to Fix
1.	
2.	