

Antacid Summary and Proposal 2

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*All work must be **very neat and organized**. If you need to collect your thoughts, please use a separate sheet of paper. Proposals are a **group effort**. Please submit the completed document as a PDF to the **Antacid Proposal 2** D2L DropBox before the scheduled end of lab.*

1. In your own words, the **goal for this second session** of the *Antacid Project* is...

Implement Proposal 1 and use that data to contribute to the class data set for NaHCO_3 . Using the class data set, analyze and build a plot for NaHCO_3 . Then from the plots and the techniques used to implement Proposal 1, create Proposal 2 that will analyze an unknown OTC antacid (Rugby).

2. **Observations and Results from Implementing Proposal 1.** Using the numbered steps from your **Proposal 1** (submitted last session), report your results/observations for each procedural step in the left column. In the right column, explain what these results/observations indicate.

Observation	Explanation or Indication
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<ol style="list-style-type: none"> 1) Gather appropriate materials for the experiment (50 ml filter flask, 1" magnetic stir bar, bored no.m 1 rubber stopper, 100ml Grad cylinder body, Jtube w/ flexible tubing) 2) Fill your 250 ml beaker and 100 ml graduated cylinder with water 3) Invert the graduated cylinder into the beaker looking to have a small amount of air in your cylinder (<10ml) 4) Take note of how much air was in your graduated cylinder before the running of the reaction 5) Place Jtube into your beaker and graduated cylinder system careful not to alter the air already in the system 6) Carefully measure out your sodium bicarbonate into your filter flask (careful not to have a mass more than 0.5g and no less than 0.025 g.) 7) Place your magnetic stir bar into the vial and seal it with the rubber stopper 8) Attach the filter flask to the j tube mentioned in step 5 9) Fill a 10ml syringe with HCL (hydrochloric acid) ensuring there are no air bubbles 10) Make sure the filter flask and jtube system are securely placed near the hot plate and properly attached to the hot plate 11) Insert your HCL syringe into the filter flask and empty the contents 12) Slowly turn up the stir dial on the hot plate slowly increasing the speed of the stir bar 13) Monitor the reaction for about 10 min. or until your graduated cylinder system is no longer seeing an increase in CO₂ 14) Record your ending volume of the graduated cylinder 15) Repeat for a different mass of sodium bicarbonate and compare the data with the first trial. 	<ol style="list-style-type: none"> 1) Part of the logistics of my experiment 2) Part of the logistics of my experiment 3) A continuation of creating a system capable of quantifying the data we are monitoring (CO₂ using Water) 4) In my first trial I had a volume of 3 ml of Co₂ left before running the experiment and for my second trial I had a Co₂ volume of 7 ml. 5) Part of the logistics of my experiment 6) I recorded a mass of 0.049g for my first trial and 0.05g 7) Part of the logistics of my experiment 8) Part of the logistics of my experiment 9) Part of the logistics of my experiment 10) Part of the logistics of my experiment 11) The emptying of the Hydrochloric acid into the vial causes the solid to start to bubble signifying the start of the reaction 12) Part of the logistics of my experiment 13) The reaction ran for about 3-5 minutes with 5 minutes ensuring that the reaction is finished before gathering data. Once there were no more air bubbles being produced I stopped my experiment. 14) After my first trial my recorded ending volume of Co₂ was 24 ml and for the second trial, my ending volume of Co₂ was 28 ml. 15) I got the same volume of Co₂ produced in both my trials for the set mass of 0.05g
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3. **Proposal 2.** Using the techniques developed in the exploration and implementation of the **knowns (Proposal 1)** develop a proposal to analyze an **unknown** OTC antacid (either Equate or Rugby). As with the knowns, this requires each group member to run **one or more reactions** for a given **unknown** (either Equate or Rugby) that are tightly coordinated with other groups so a V_{CO_2} vs. $m_{antacid}$ plot results for *each* unknown. (Remember, half the groups of your lab section should work on Equate, while the other half focuses on Rugby.) Your plan must be complete for just the trials (**multiple reactions**) your group will run and justify the steps. **Please NUMBER your procedural steps.**

Procedural Step	Justification
Our second proposal has the following steps:	We are modifying this step of the procedure because:
<ol style="list-style-type: none"> 1) Gather appropriate materials for the experiment (50 ml filter flask, 1" magnetic stir bar, bored no.m 1 rubber stopper, 100 ml Grad cylinder body, Jtube w/ flexible tubing) 2) Fill your 250 ml beaker and 100 ml graduated cylinder with water 3) Invert the graduated cylinder into the beaker looking to have a small amount of air in your cylinder (<10ml) 4) Take note of how much air was in your graduated cylinder before the running of the reaction 5) Place Jtube into your beaker and graduated cylinder system careful not to alter the air already in the system. 6) As the antacid will come in the form of a tablet, over the counter type of drug, we will need to break it up using a pestle and mortar. 7) Carefully measure out the unknown antacid (Rugby), broken up in step 6, into your filter flask, 0.025 grams and 0.05 grams for two different trials. 8) Place your magnetic stir bar into the vial and seal it with the rubber stopper. 9) Attach the filter flask to the J-tube mentioned in step 5. 10) Fill a 10ml syringe with HCL (hydrochloric acid) ensuring there are no air bubbles 11) Make sure the filter flask and J-tube system are securely placed near the hot plate and adequately attached to the hot plate 12) Insert your HCL syringe into the filter flask and empty the contents 13) Slowly turn up the stir dial on the hot plate slowly increasing the speed of the stir bar 	<ol style="list-style-type: none"> 1) Part of the logistics of my experiment 2) Making a system able to measure CO2 easily using the given materials 3) A continuation of creating a system capable of quantifying the data we are monitoring (CO2 using Water) 4) You are recording the staring volume of air so that you are able to determine the increase in CO2 at the end of the experiment having less than 10 ml of air in the graduated cylinder monitors anything that can ruin the credibility of my experiment 5) A continuation of creating a system capable of quantifying the data we are monitoring (CO2 using Water) 6) The pestle and mortar will break the drug from tablet form into powder form and this will allow us to accurately measure out the correct mass we will be using in step 7. 7) Making sure to have proper results and no outliers in the class data set two masses for two different trials: 0.025 grams and 0.05 grams. 8) The part of the experiment ensuring that the reaction is happening appropriately by being mixed properly 9) Creating a seal between the water system made to measure CO2 and the reaction itself in the vial 10) Part of the logistics of my experiment (monitoring anything that can ruin the credibility of my experiment) 11) Ensuring one's safety and the running of the experiment without error 12) Part of the logistics of my experiment 13) Ensuring that the mix of the reaction is happening at a rate you're able to monitor

<p>14) Monitor the reaction for about 10 min. or until your graduated cylinder system is no longer seeing an increase in CO₂</p> <p>15) Record your ending volume of the graduated cylinder</p> <p>16) Repeat for the second mass of the unknown (Rugby) and compare the data with the first trial.</p>	<p>14) The reaction should be done after about 10 minutes. Also if there are no longer any air bubbles (CO₂) entering your water system for a steady amount of time the reaction is more or less over</p> <p>15) Monitoring the amount of CO₂ produced from the reaction of HCL and Rugby</p> <p>16) Gathering a second set of data so that you have data to compare and draw conclusions and analysis from</p>
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Technical Skill Evaluation

What **known** (CaCO_3 or NaHCO_3) did you work with? What **masses** of your **known** (CaCO_3 or NaHCO_3) did you collect data on?

NaHCO ₃ used	CO ₂ produced
Mass (grams)	Volume (mL)
0.025	15
0.05	21
0.075	22
0.1	37
0.125	41
0.175	53
0.25	67
0.3	68
0.35	68
0.4	68
0.45	68
0.5	68

NaHCO ₃ used	CO ₂ produced
Mass (grams)	Volume (mL)
0.025	8
0.075	25
0.125	36
0.175	36
0.225	36
0.275	36
0.325	36
0.375	36
0.425	36
0.475	36
0.5	36

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Gather and analyze the *entire* class results and build V_{CO_2} vs. m_{base} plots for each of the **knowns** ($CaCO_3$ and $NaHCO_3$).

