

TO: WSA APS Labs

SUBJECT: Carbon Dioxide testing and measurement

Greenway Company is located here in Augusta, GA. We are a company that does research and development of new green products. For a specific new product that we have developed we need carbon dioxide as a reactant in the chemical reaction involved. We do not seek large volumes of carbon dioxide but rather very precise small volumes. We need to be able to insert a very specific amount of carbon dioxide into the reaction vessel to get our desired product.

We need you to gather data for us and determine which variables can be adjusted so that we can choose the exact amount of carbon dioxide desired. The amount of carbon dioxide we will need will always be between 0-200mL, but the exact amount changes based on the product ordered by our customers. In essence, we are looking for you to collect all the data we need, consolidate it into graphical form, and present it directly to our CEO, Mr. D. Redick. You will need to prepare a formal slide show presentation summarizing your experimental work and data.

Constraints:

- Report acetic acid in % vinegar
- Report all sodium hydrogen carbonate in grams
- Keep solution total at 100mL – no less or no more
- Please test at least 2 variables for how it affects CO₂ production – 3 if you have time – getting as much data from these two adjustments as possible
- Our quality control requires 3 trials (then take an average) for each data point
- Graphical presentation would be optimal (e.g., spreadsheet)
- Limit gas collection to 0-200mL
- Limit temperature constraints to 0-60° C

Control:

- 50% vinegar (50mL water, 50mL vinegar)
- .50g sodium hydrogen carbonate
- 23° C (room temperature)

I know the CEO personally and am fully aware of what he is looking for in this project. I am here to answer questions and obtain all supplies needed. Please feel free to request assistance as needed.

Suggestions:

1. Decide as a class what three variables you will adjust. Choose the most critical two and have the groups work out the details for how the adjustments will be made. You have equipment for four groups to be obtaining data at once.
2. Divide into groups right away and give each group specific jobs.
3. Begin working on the final presentation and written product right away – do not delay! Assign a group to this task – or even two. You will need to eventually choose a presenter who will do the speaking, or you may have several speakers on separate topics.
4. Mr. D. Redick will be missing lunch to view your presentation. You should honor the time he is investing with an excellent presentation. Think about what will make it a pleasant experience for him.
5. Remember, leaders are to coordinate and keep the focus on the bigger picture – not do the work! Keep asking – is the class getting closer to having the final project done? Any extensions will need to be asked for but will not be looked upon favorably.

Wishing you all the best as you take on this challenge.