

Measuring Rates of Fermentation [Joint lab report]

Background: [BRIAN]

Pyruvic acid + NADH → Alcohol + CO₂ + NAD⁺. Enzymes function in yeast in the temperature of 37°C to 42°C. Try to make a gas collector that simulates fermentation!

Materials: [BRIAN]

- Dry Yeast
- Sugar
- Lukewarm Water
- 25mL graduated cylinder
- Cylinder test tube
- Stopper
- Tubing
- Thermometer
- Beakers
- Hot Plate

Methods: [KATE]

*PRE STEP: Pick a variable in this experiment (since our group was the experimental group)

1. Build your gas collector.
2. Add 400 mL of water to the hot plate (37°)
3. Fill up the tube halfway, stir sugar and yeast in. (Amount varies)
4. Fill up tube about 40 percent more.
5. Shake up the tube and record gas produced using table.

Results: [BOTH]

See both lab sheet(s) attached.

Discussion: Part 1

See both lab sheet(s) attached (KATE)

Discussion: Part 2 [BRIAN]

What new tools or techniques did you learn in this lab? Write a description of these tools and techniques and how they were used. What errors may have occurred during this lab? Describe them if any, and if they were from a flaw in the design or lab due to your performance with the tools & techniques.

Throughout the lab, I was thoroughly confused on how to write down the data, and didn't understand how to flip the tube over to get the water flowing, etc... so I have a general idea of what went wrong. I think that we should've picked some other variable to manipulate, because, as we all saw, our lab went pretty slow; about 22 mL of gas captured over the course of about 30 minutes. This tells me that the more you increase the sugar, or the more errors you make, the less accurate/ speedy the results are.

Find a relationship of this lab to the current classroom subject matter. Look at the textbook to current, previous, or future sections to see which text topics relate to the lab topics. You should cite the chapter and page number from the textbook. After you list the book info, describe how it is related to this lab.

On page 122 in the textbook (4.6) it directly explains and defines fermentation. Fermentation had everything to do with this lab because that's what we were experimenting with! One group, Annie and Sophia, were doing control "stuff" so that Kate and I had something to work off of and compare to; and they got COMPLETELY different results from us (probably because I messed ours up!). In reality, fermentation was really one of the last steps in cellular respiration, if the conditions of "no oxygen" were present (anaerobic).

Summarize what you learned from this lab. This section should include definitions, explanations, and descriptions. This is the most important essay question!

In this lab, we learned that as you increase the sugar content in a mixture of water and yeast, the time that CO₂ takes to "leave" the mixture is **DRASTICALLY reduced**. This means that it almost slows fermentation, the process in which heat or lactic acid are released as byproducts of an anaerobic state in a cell. When we added sugar, that meant (hopefully) that more glucose was added to break down in glycolysis, causing the excruciatingly long "processing period" per-se. Either it was just me and my foolishness, or the sugar really did affect the speed of the breakdown (fermentation in this case).