

An Experiment To Investigate The Amount Of O₂ Given Off By Elodea With Varying Concentrations Of NaHCO₃

Aim-

To investigate the amount of O₂ given off by the Elodea with varying amounts of concentrations of NaHCO₃. The rate of photosynthesis is measured by counting the number of bubbles of O₂ being produced during that process.

Introduction-

Photosynthesis is the process in which plants take in energy from the sunlight. It is then converted into food energy. It is responsible for all carbon compounds in living organisms. When a plant cell absorbs the sun's light, H₂O and CO₂ it gives out oxygen and glucose.

Graphs to show photosynthesis-

This graph shows that the light intensity speeds up photosynthesis, but only to a certain point, and beyond that the increase of light intensity has a small effect.

This graph shows if the temperature of the plant is raised it may cause the photosynthesis to speed up, but only to the point where the light intensity limits further increase.

Planning-

The experiment is meant to be a fair test. To ensure a fair test the hydrogen carbonate should be the same volume every time, make sure the beaker with the Elodea in is the same distance from the lamp. The weed should be cut at the stem before being put in the beaker. The variables that will be kept constant in the experiment are: water, chlorophyll, light and temperature. The CO varies due to the changes in the NaHCO solution concentrations.

Variables, Affecting Photosynthesis:

- CO
- H O
- Chlorophyll
- Light
- Temperature

Prediction-

The greater the sodium hydrogen carbonate solution concentration, the greater the rate of photosynthesis. The sodium hydrogen carbonate solution concentrations doubles so also the rate of photosynthesis will. When there is less concentration of carbon solution then the bubbles will be quicker and there will be more of them. So photosynthesis is quicker and more oxygen is produced.

Equipment:

- Pond weed (Elodea)
- Beaker
- Sodium hydrogen carbonate solution (NaHCO)
various amounts- 0.000M, 0.025M, 0.050M,
0.100M, 0.200M, 0.400M.
- Light (lamp)

- Stop Clock
- Paper clip
- Measuring cylinder

Diagram-

Method-

- Must follow safety precautions-wear a lab coat.
- Have a measuring cylinder filled at 100cm with NaHCO_3 .
- Get some pondweed and attach a paperclip to it.
- Set up the equipment as in the diagram.
- Go through the different concentrations with the Elodea in.
- Put a thermometer in the beaker to make sure the temperature will be the same.

- Use a lamp near it, which will increase the rate of O bubbles.
- When the Elodea is put in the beaker start the stopwatch and count the bubbles every minute.
- 3 times for each concentration.

Results-

Concentration Of NaHCO (m)	Number of bubbles per min			
	1st	2nd	3rd	Average
0	2	2	2	2
0.025	28	24	20	24
0.05	44	28	26	32.6
0.1	36	30	26	30.6
0.2	30	25	32	29
0.4	28	32	26	28.6

Conclusion-

My results support my prediction. My results get faster as there was more sodium hydrogen carbonate used. A few of my results don't follow the others, so they don't support my prediction because they are not as close to the line of best fit; this might be because the concentration of sodium hydrogen carbonate was measured wrong.

Improvements/sources of errors-

The graph curves to the left like it supposed to because the higher the concentration the more amount of bubbles dispersed. The few odd results which aren't near the line of best fit are wrong due to human error either using the wrong amount of concentration or the bubbles might have been counted wrong or the elodea was

damaged so didn't produce the right amount of oxygen.

John George 4PJG