An experiment to measure the amount of oxygen bubbles given off in different strengths of sodium hydrogen carbonate

Equipment list

- Lamp

- Beaker

- Boiling tube

- Pond weed

- Ruler

- scissors

- Water

- Measuring cylinder

- Different strengths of $NaHCO_3$

- Paper clip

- Stop clock

Plan

In the experiment I will get a piece of pond weed and cut it to 5cm I will then make sure that the hole is clear and the leaves from that end have been removed so that oxygen bubbles will be able to escape and not get trapped. Once I have done this I will attach a paper clip to the other end to keep the piece of weed in water or the solution. I will then get a beaker and put 200ml of water and into it. After this I would place the boiling tube with 40ml of water and the pond weed into it and turn on the lamp that will be put 20cm away from the beaker and leave for 3minutes so that the weed can get used to the water. Once these 3 minutes are over I will be taking readings on how many bubbles come out of the weed every 30 seconds and I will be taking ten readings. After I have took all these reading I will do the same again. But instead of the piece of pond weed

being in water in will now be in 0.25% NaHCO$_3$ and I will do the same leave it for 3 minutes so that the weed can get used to the solution and then I will start taking readings. I will take ten readings one every 30 seconds this will take me up to 5 minutes. After this I will do the same for 0.5%, 0.75% and 1.0% of NaHCO$_3$ during all these experiments I will be using the same piece of pond weed.

Diagram

Prediction

I predict that the more concentration of NaHCO$_3$ I use then the faster the rate of oxygen bubbles that will be given off.

Fair Testing

In the experiment I want it to be a fair test so that I can get accurate results so I will be using a measuring cylinder so that I will get the same amount of solution each time. I will be using the same amount of pond weed, as the experiments will run over a number of lessons. I will also want it to be the same temperature so that that will not be able to cause any differences. I will also want the same light intensity that is why I will be using a ruler to measure the 20cm gapping each time. I will also be leaving it for the same amount of time so that it will all be fair.

Results

A table to show the results from our experiment

Experiment one

	0sec	30 sec	60 sec	90 sec	120 sec	150 sec
water	0	0	0	0	1	1
0.25%	0	0	1	1	2	2
0.5%	0	33	67	101	134	170
0.75%	0	2	3	10	14	17
0.1%	0	13	25	29	33	39

	180 sec	210 sec	240 sec	270 sec	300 sec	Average
water	1	1	3	3	3	1
0.25%	3	3	4	5	5	2
0.5%	203	238	274	307	340	170
0.75%	18	25	27	33	43	17
1.0%	46	51	56	61	68	38

Experiment two

	0sec	30 sec	60 sec	90 sec	120 sec	150 sec
water	0	2	3	4	8	9
0.25%	0	6	8	12	13	16
0.5%	0	0	20	41	67	108
0.75%	0	95	180	287	395	503
1.0%	0	1	3	4	5	6

	180 sec	210 sec	240 sec	270 sec	300 sec	Average
water	11	14	15	15	15	9
0.25%	20	25	31	36	43	19
0.5%	225	284	340	389	446	175
0.75%	602	707	819	932	1040	505
1.0%	9	9	11	12	12	7

Conclusion

I have come to the conclusion that the higher the concentration of $NaHCO_3$ I use then the faster the rate of oxygen bubbles that will be given off. This is what I said in my prediction.

This pattern does not happen when I have had to change my piece of pond weed as the practical ran over a couple of lessons.

Looking at my results they back up my prediction as the graph shows the more concentration I use the more oxygen bubbles given off and I am right saying that when I start the experiment in a new lesson the number of bubbles that are given off is less.

Evaluation

Looking back my method and my results they are pretty accurate. My results are good and I would be happy to use my results to say that the higher the amount of $NaHCO_3$ I use then the faster the rate of oxygen bubbles that will be given off. I can also come to a clear conclusion that when I have had to start with a new piece of pond weed the number of oxygen bubbles has dropped. In my

method I could write about why I think that there will be any anomalous results if any.

To see if this works in dark we could cut out the lamp so we could do the experiment in dark but it would have to be the same density of darkness otherwise it wouldn't be a fair test.