Acidification and Carbon Dioxide (Bubbles Lab)

**Topic Introduction:** Ocean Acidification is a major issue in our marine ecosystem. Ocean Acidification raises the amount of the calcium carbonite which lowers the pH on the pH scale. Calcium Carbonite is essential to shelled marine organisms since their shells are made up of calcium. These organisms are essential to the environment since they are a major part of the marine ecosystem and the carbon cycle.  
  
These organisms are essential to the environment since they are a major part of the marine ecosystem and the carbon cycle. The cause of Ocean Acidification is/was the industrial revolution and the CO2 Emission. The large amount carbon dioxide releases in the atmosphere which then enters the ocean.

**Experimental Question:**What will happen to water after we blow CO2 in it, and it absorbs?

**Pre-Lab Questions:**  
1. What gas are you blowing into the water?  
The gas being blown into the water is carbon dioxide, CO2.  
2.What happens to the gas when you blow it in the water?  
When you blow gas into water, the gas will absorb into the water.  
3.How are you measuring change in the water during the lab?  
I am measuring the change in the water by the change of the color.  
4.What does measuring the pH of the water tell us?  
Measuring the pH of the water tells us how acidic the water is.  
5. After studying reactions above, how do you think carbonic acid will affect the pH of salt water?  
Carbonic acid will lower the pH of salt water, making it acidic.

**Hypothesis:** If salt water takes in CO2, then it will take more than the hot, cold, and tap water samples.

**Protocol:** First thing my group and I did was add 100mL of saltwater to a 200mL beaker. Secondly we then added 6-10 drops of the universal indicator into the water. Thirdly, we put saran wrap on top of beaker, then we stuck a straw in the beaker and started to blow CO2 into the water for 2 minutes. During the blowing, we had to record the data every 30 seconds. The **dependent**variable is the pH of the water is every 30 seconds to 2 minutes. The **independent** variable is the type of water (seawater, cold saltwater, hot saltwater and tap water).

**Data Table:**

**Control: Room temp Saltwater**

**A: Tap Water**

**B: Cooled SW**

**C: Heated SW**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Property | 0 | 30 | 60 | 90 | 120 |
| Control pH | 7 | 7 | 6.5 | 6.5 | 6.5 |
| Color | G | G | LG | LG | LG |
| A pH | 7.25 | 7 | 6.5 | 6 | 6 |
| Color | DG | G | LG | Y | Y |
| B pH | 7 | 6.5 | 6.5 | 6.5 | 6.5 |
| Color | G | LG | LG | LG | LG |
| C pH | 7.25 | 7.25 | 7 | 7 | 6.5 |
| Color | DG | DG | G | G | LG |

**Graph:**

**Data Analysis**:  
1**. As you blew through the straw, what were you adding to the water and how did that change the pH?**As I blew through the straw, the CO2 was lowering the pH in the water.  
  
2. **What did the universal indicator tell us about the water?**  
The universal indicator told us the pH of the water through color change.  
  
3. **What does this tell us about the effects of carbonic acid in ocean water?**  
When carbonic acid touches ocean water, it will become more acidic and be harmful for animals underground.  
  
4.**Based on the results of your experimental protocol, which factor affects the pH of the water most, temperature or salt?**  
The temperature of the water affects pH the most.

**Conclusion:** My hypothesis was correct which stated that if i blow CO2 into the water then the water will be more acidic. According to the data i collected, the pH level of the control group and the experimental groups went down. When the pH is lower than 7 it is acidic. The waters pH went from a pH of 7.5 to 7 down to 6 to 6.5. In this experiment I learned that as we pump out more CO2 through this experiment I can see that the ocean is becoming more acidic. Using the Universal Indicator I was able to see how fast Sea Water becomes acidic just by simply blowing CO2 for 2 minutes.