CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY

Name(s)

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Project Number

J0924

Project Title

Does Air Pollution Affect Ocean Life?

Abstract

Objectives

To measure impacts of air pollution on marine life.

Methods

Using water samples collected from the Pacific Ocean, measured the impact on water pH levels using an "artificial" method (injecting CO2 directly into a sample by exhaling into a straw submersed in the water for two minutes) and a "natural" method by lighting a candle that floats atop a separate sample, and then covering the sample so the CO2 is absorbed by the water. PH levels of these two samples as well as a control sample were collected for two weeks using a store bought pH meter, at 24 hour intervals. In addition, to measure the impact of the pH changes to ocean life, mussel shells sourced from dead specimens found in nature where placed in each sample and before-and-after weight measurements and visual inspections were recorded.

Results

The results showed the largest change in pH was in the "straw" sample (the lowest pH level at the end of the experiment), and the impact to the mussel shell in that sample was the greatest as well, as measured by a .02 gram reduction in weight as well as a visual inspection (change in shell coloration and opaqueness).

Conclusions

The experiment demonstrates that long term, direct exposure of CO2 on ocean water has an adverse impact on pH levels (by lowering it), which in turn has an adverse impact on certain shellfish as measured by the impact of the lowered pH levels on the weight and coloration of the shell sample.

Summary Statement

The impact of atmospheric CO2 levels on ocean pH levels and certain marine life.

Help Received

My science teacher helped me refine my hypothesis and objectives, and my father taught me how to enter the data that I collected into Microsoft Excel and create tables and graphs to use in my report and presentation.