CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
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Project Number
S2407

Project Title
pHishing for Truth: How pH Levels Affect pHish

Abstract

Objectives/Goals
This project is designed to prove that zebrafish (Danio rerio) will completely avoid an area with a high pH level due to the presence of potassium hydroxide (KOH).

Methods/Materials
20 zebrafish were placed in a 20 gallon tank with the bottom four inches filled with water. The tank was then divided into 4 quadrants. Approximately 33 grams of KOH were added to the tank, in order to simulate a household drain cleaner with a high pH level. As the KOH dissociated in the water, the fish's positions throughout the tank were recorded once every minute for 20 minutes.

Results
The zebrafish were unable to completely avoid the rapidly dissociating KOH. As a result, 12 of the 20 zebrafish suffocated within one minute of exposure. The fish's deaths were undoubtedly caused by an overdose of KOH. 33 grams noticeably dissociated in the water too rapidly for the fish to successfully avoid, resulting in the majority of the fish dying.

Conclusions/Discussion
Because the quantity of KOH used dissociated too rapidly, thus killing 12 of the 20 zebrafish, the results were different than what was expected. The results proved that contaminants in water have detrimental effects on aquatic life. However, the designated purpose of the experiment was unable to be proven due to the deaths of the experimental subjects. In order to receive the accurate effects of increasing pH levels on the general behaviors of fish, the quantity of the contaminant added to the water must be more carefully monitored.

Summary Statement
This experiment is designed to demonstrate the effects of increasing pH levels on fish behaviors.

Help Received
Parents helped feed fish; Shawn Noren and Geoff Von Saltza answered any questions; Geoff Von Saltza allowed the use of lab equipment; Jane Holte gave insight on pH and KOH; Charlotte Rosenfield suggested the use of zebrafish; $500 Intel Research Grant provided by COSMOS summer camp.