Name(s)

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Project Number

J0611

Project Title

A Bio-Friendly Oil Spill Remover

Abstract

Objectives

There is one main problem that is tainting our oceans day by day, yet very few are taking action. Oil spills dump thousands of tons of oil into our precious oceans, damaging the environment. There are many solutions that people have come up with, but everyone always retreats to the most inexpensive and harmful solution: oil dispersants. However, there are many natural, abundant materials that can be used instead of these harmful chemicals. I wanted to find out which bio friendly substance would be the most effective in cleaning up oil spills.

Methods

I started by choosing 5 absorbents that are easily found and are known for their absorbing properties. The 5 absorbents I chose are: hair, oak bark, super-absorbent polymer, cheesecloth, and ferrofluid. First I hypothesized that Super Absorbent Polymer would absorb the most oil and be the best solution to clean up these spills because it can absorb from 50 to 500 times its size.

In the first test, I used the coffee-filter method to weigh and measure how much oil left the substance. This was done to discover how much weight each substance gained from absorbing the oil around it. Each material was tested 10 times to get accurate results. I performed a second experiment to use another method to discover how well each product absorbed the oil in the petri dish. When using the ferrofluid, I wanted to find out if the amount of drops placed in the oil tainted water would affect how well it absorbed the surrounding oil. Keeping the oil as the control variable in this procedure, the amount of oil remaining in the petri dish gradually increased as the amount of drops of ferrofluid increased. This means that the amount of drops doesn t drastically affect the absorption. I conducted another procedure by programming the robot to move a bottle in a wave motion, imitating the waves of the ocean. I conducted the same steps as procedure 1 to ensure that the absorbent would work in the real ocean, not only in my prototype.

Results

After conducting my entire experiment, my results showed that hair absorbed the most amount of oil, and the polymer did not in fact absorb as much predicted.

Conclusions

The polymer did not in fact absorb as predicted. Though it absorbed all the oil in the container, it also absorbed the water. This means that it would not be the ideal solution because it would drink up much of the salt water in our ocean. The substance with the most amount of weight gain was hair, mostly because it is an adsorbent to oil and doesn t soak up the oil.

Summary Statement

My project tests 5 absorbent materials to see which one would be the most effective in cleaning up oil spills.

Help Received

I would like to thank my coach for guiding me throughout the project, and my family for encouraging me.