

## Lab Report Template

### Problem

How to separate 25% oil from 75% water mixture.

### Hypothesis

If we apply a multiprocess filtration system, then we will remove 100% of oil from the mixture.

### Materials

- 25%/75% oil/water solution
- 600 ml. beaker
- 3-6 coffee filters
- 1-2 pieces of cheesecloth
- 1-2 pieces of paper towel
- Funnel
- Computer

### Procedures

1. Research different modes for removing oil from the oil/water solution.
2. Gather all materials needed for filtration device.
3. Setup filtration device.
4. Agitate water to mix in oil.
5. Slowly pour water/oil mixture into the filtration device.
6. Have teacher examine water quality once reached 100+ ml. of H<sub>2</sub>O for inspection of water quality.
7. If water is determined to have oil residue, repeat steps 3-6 until filtration is complete. (may revisit step 1 if wanting to try a new filtration system).
8. Once water is fully filtered, clean up materials and area. Return all reusable materials to their designated area.
9. Proceed to data collection and analysis of results.

### Data Collection

After the first filtration consisting of cheese cloth and coffee filters, there is a thin layer of oil left. The second filtration consisted of coffee filters. There were still small amounts of oil left in the water. The last filtration system was a layer of paper towels. After the last filtration, there were miniscule amounts of oil present. It was noted that oil had a higher tensile strength with like molecules, allowing the filter to stop the oil while allowing water to pass through the filtration system.

## **Analysis of Results**

Oil has a density that is lighter than water. Oil is hydrophobic, causing the separation from the water and making mixing difficult. The molecules of oil stick together and will stay at the top. The particle size of oil is also larger than that of water. Through a multi-process filtration system, we are able to filter oil out of the water, starting with the larger particles.

## **Conclusions**

Through a multi-process filtration system, we were able to get a majority of the oil out of the water. In the real world with an oil spill in the ocean, our system would be hard to accomplish. This system would be best suited for land based oil spills that are directly related to drinking and fresh water sources. Although this system can be implemented into an ocean/large body of water setting, with vast space in an ocean/large body of water setting, this systems would not be cost effective compared to other conventional sponge and sun UV light methods of containing the oil and waste.