

### **Problem 7.3.5: Separating Oil and Water**

**Members:** Liz, Tyler, and Lindsey

#### **Background History**

With our previous labs information, we learned that there are a wide variety of methods to clean up oil. The four methods of oil spill cleanup are biological treatment, chemical treatment, oil water separation, and mechanical recovery. In biological treatment, marshes and wetlands will filter oil through soil particles. In mechanical recovery, you can use a variety of machines and tools of separation. In oil water separation, sponges have been used to remove water and skimming materials. In chemical treatment, microbes have been used to eat the oil out of materials and various solvents and surfactants are used as well. From previous knowledge, we know that oil cleanup has to be quick, because oil will start harming the environment through the harm of animals and plants.

#### **Setup**

***Prediction:*** We believe using a mixture of biological treatment and mechanical treatment will remove oil from the water. Our biological treatment will be a coarse sand and our mechanical treatment will be coffee filters.

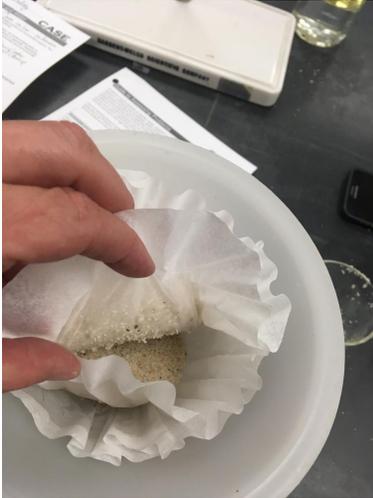
In our setup we thought of a variety of materials in order to filter the water through and remove oil. Our oil separation item uses a variety of layers and sandy soils to separate the oil. Filters were also used in between layers. Follow below for a setup of our experiment.

1. Acquire 200 grams of coarse sand, three coffee filters, one large quart mason jar, 1 large funnel, and one 25% and 75% oil water mixture.
2. Put one coffee filter into the funnel and put approximately 1/3rd of the sand on top of the filter.
3. Repeat Step 3 until you run out of sand.
4. Once your filter funnel apparatus is completed put it on top of the mason jar.
5. Make observations of apparatus and oil water mixture before you move on.
6. Ask your teacher for the okay to move on.
7. Slowly add the water on the top layer, but make sure it does not go over the top filter
8. Make observations of apparatus and oil water mixture.

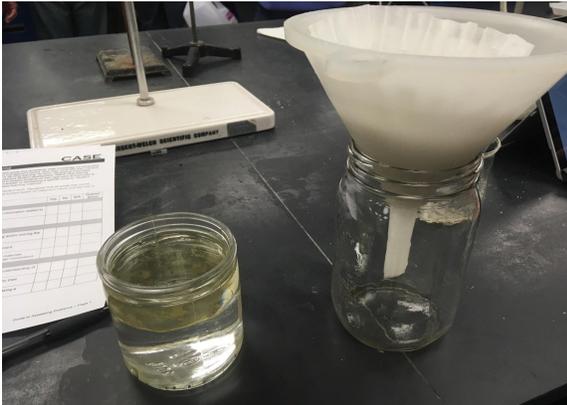
#### **Observations**

Oil Water Appearance Table	Mason Jar	Funnel
Before Pouring	Cloudy Mixture	Clean Sand/Filter
After Pouring	Clear, but some residue	Oil remained in sand and filter

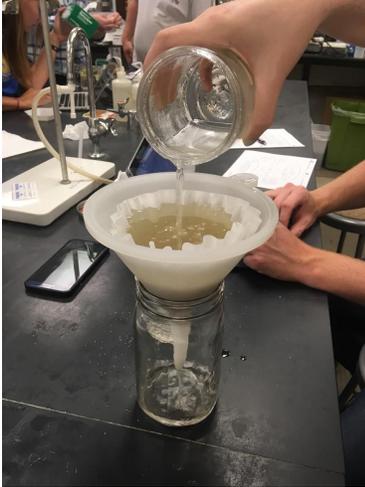
## Photos of Apparatus and Procedure



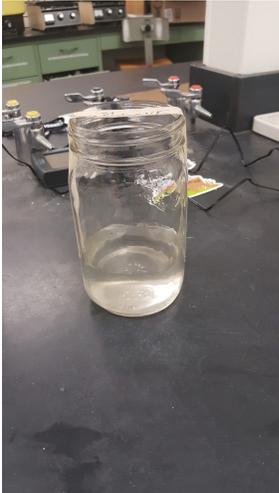
1. Compare your filter and apparatus to the one in the photo. You can see there is three layers of filters and sand.



2. Place funnel into mason jar as pictured above.



3. Pour oil water mixture into filtering system and be sure not to go over the tops of the filters.



4. Observe results!

### **Conclusions**

By using a mixture of oil spill cleanup treatments, we were able to successfully filter more than 100ml of water from the oil. Using a biological treatment, coarse sand, and a mechanical treatment, coffee filters, we were able to filter a majority of the water away from our oil and save the world. Our project would provide some comfort in knowing that most of the oil was removed from the water so it won't harm plants and animals. Our solution would be a quick solving solution and took our group five minutes to come up with. There would have to be a lot of discarded sand in order for it to work, but for a quick fix until something more major can be found, it will have to do.