Making Biodiesel Instructions

Materials

Methanol
Potassium hydroxide
glass jar
200mL beaker
magnetic stir bar
hot plate
separatory funnel
ring stand w/ring
graduated cylinder
serological pipette
distilled water

Procedure

Part 1: Making the Biodiesel (Day 1)

1. Under a fume hood measure out 60mL of methanol and add to glass jar, then seal jar quickly.
2. Weigh out 1.5g of KOH (Potassium Hydroxide) and quickly add it to the jar of methanol. Seal jar immediately and shake to dissolve. Make sure to not leave the cap off of the KOH for too long because it is hydroscopic.
3. At the lab station, in a clean beaker, warm 150mL of oil sample to 50^{O}C. Once oil is at 50^{O}C, add it to the jar of methanol/KOH solution.
4. Add magnetic stir bar to the jar, loosely place lid back on jar and place jar back on magnetic/stirring hot plate to heat to 50^{O}C and stir on high for 15 min.
5. Remove the jar from heat and pour mixture into a labeled separatory funnel for 24 hours to allow for separation of the raw biodiesel and glycerin.
6. Repeat steps 1-5 with other oil sample. Make sure samples are properly labeled.

Data for Part 1: (Day 1)

Visual Observations from Part 1 of Making Biodiesel

(make sure to describe waste vs virgin samples)

1. Immediately upon adding the methoxide, what was noticed about the vegetable oil? Was there any change in color in each sample?
2. What did the solution look like after it began stirring?

Making Biodiesel

Part 2: (Day 2)

Data from Washing Renewable Diesel

1. Now that the biodiesel has rested for 24 hours in the separatory funnel, describe your sample.

2. Record the following characteristics of your biodiesel sample: color, consistency, odor

Initial Removal of Glycerin

1. Drain the glycerin from the biodiesel samples into your jar, using a graduated cylinder record the amount of glycerin retrieved from sample (for use in formula below, in step 7).

- *Note: Crude renewable diesel contains impurities such as soap, incompletely transesterified glycerides, and methanol and must be cleaned/washed prior to use).*

Wash and Dry Renewable Diesel

1. Using a serological pipette, slowly add a total of 20 mL distilled water down the side of the separatory funnel to the raw renewable diesel.

2. Remove separatory funnel from the ring stand and gently rock the separatory funnel back and forth for five minutes to wash the renewable diesel. *(Do not shake vigorously).*

3. Place funnel back into ring stand and wait 10 minutes for the mixture to separate into two layers. Discharge the bottom “soapy” layer. Remove soap/glycerin waste into a waste flask.

4. Using pH paper or probe, test the pH of the “soapy” layer and record below.

5. Repeat washing procedure steps 1-3 for a second washing.

6. Allow to settle overnight.

7. Measure the quantity of biodiesel in a graduated cylinder and record.

8. Calculate the % yield of your biodiesel production using the following equation:

% Yield = [Volume Biodiesel / (Volume Biodiesel + Volume Glycerin)] x 100%