Testing Biodiesel for Chemical Properties

Materials

thermometer
test tube rack
scale
methanol
parafilm
ice bath
test tubes
microtubes
salt

Procedures

Physical Properties

1. Record color of each biodiesel sample
2. Record odor of each biodiesel sample

pH

1. Use the pH test strips to determine the pH of each biodiesel sample.

Ignition Test

1. Soak a cotton swab in the biodiesel for 30 seconds.
2. Place the soaked cotton swab into a lit bunsen burner and time how long it takes to light.
3. Repeat this procedure for 3 trials and record the average in the data table.

Burn Time / Flame Color / Smoke Color:

1. Soak a cotton swab in the biodiesel for 30 seconds.
2. Place the soaked cotton swab into a lit bunsen burner and place lit cotton swab on a watch glass to record how long it takes the swab tip to burn out.
3. Also record Flame Color and Smoke Color (make visual observations of burning).
4. Repeat this procedure for 3 trials and record the average in data table.

3-27 Conversion Test

1. Measure the temperature of the biodiesel and methanol to ensure that they are both between 20°C to 22°C. (**IMPORTANT:** *Temperature is extremely critical in this test. If either the Biodiesel or Methanol isn't the correct temperature, heat or cool them until they are.)*
2. Add 7 mL of methanol to a test tube
3. Add 1 mL of biodiesel to the test tube.
4. Seal the test tube with parafilm and lightly shake test tube or mix on vortexer.
5. Let sample sit in test tube rack for 10 minutes.
6. Tip the vial at a 45 degree angle for 10-15 seconds and record if any fallout is present. If fallout is detected, it indicates that some of the oil didn't fully react into biodiesel.
7. Repeat steps 1-6 with other sample.

Make Biodiesel from Soybeans

Density

1. Weigh a microtube and record weight.
2. Then add 1 mL of biodiesel to microtube and re-weigh sample. Subtract the weight of the empty microtube. This will give the mass of 1 mL of biodiesel.
3. Divide mass of the biodiesel (g) by volume of biodiesel (1mL) to calculate density of the biodiesel (g/mL).

Cold Flow Test

1. Add 1 mL of biodiesel sample to a microtube.
2. Place the microcentrifuge tube of biodiesel into the refrigerator for 15 min.
3. Remove the tube and invert the tube to see if the biodiesel moves.
4. Record if the biodiesel flows back and forth in the data table.
5. Then place the microtube into the freezer for 15 minutes.
6. Remove the tube and invert the tube to see if the biodiesel moves.
7. Record if the biodiesel flows back and forth in the data table.
8. Repeat for additional samples.

Water Test

1. Add 1 mL of biodiesel sample into a microtube.
2. Add one drop of food color into tube.
3. If drop stays intact, there is very little water in the sample.
4. If drop begins to disperse color, there is water in the sample and it may not burn well.