Name:
Class:
Date:

Activity 7.2A: Biofuel Lab

Safety Note

The lab activity should be conducted in a science classroom with splash guards, eyewash station, and basic lab equipment.

1. Chemicals are used during this lab. Wear chemical splash goggles, a chemical-resistant apron, and chemical-resistant rubber gloves during the entire procedure. Avoid contact between skin and liquids.
2. Label all containers with their contents.
3. Work cautiously with hot oil to prevent burns.
4. Follow instructions for proper storage and/or disposal of chemicals.

Materials Needed

- (2) 250 ml graduated cylinders
- (2) 250 ml beakers
- Balance
- Canola oil
- Chemical-resistant apron
- Glass stirring rod
- Goggles
- Hot plate
- Methanol
- Potassium hydroxide (KOH)
- Spatula
- Thermal gloves
- Thermometer
- Weighing paper
- Wide-mouthed jar with lid

Day One

1. Put on your personal protective equipment (goggles, apron, thermal gloves).

2. Mix the methanol and potassium hydroxide (KOH).

A. Measure 20 ml of methanol in a graduated cylinder. Pour the methanol into a 250 ml beaker.

B. Measure 0.7 grams of KOH and add to the beaker of methanol.

C. Stir slowly until the KOH is completely dissolved (8–10 minutes of stirring may be necessary). Do not splash this mixture, as it is very harmful to skin.

3. Heat the canola oil.

A. Measure 100 ml of canola oil in a graduated cylinder. Pour the canola oil into a 250 ml beaker. Note: *This is not the same beaker containing the methanol and KOH mixture.*

B. Place the beaker with the canola oil on a hot plate. Place a thermometer in the canola oil and heat until the temperature reaches 120°C. Note: *Keep the beaker with the methanol and KOH mixture away from the hot plate.*

C. When the oil temperature reaches 120°C, remove the beaker and turn off the hot plate.

D. Carefully pour the heated oil into the wide-mouthed jar.

4. Add the methanol and potassium hydroxide mixture to the heated oil.

A. Slowly add the methanol and potassium hydroxide mixture to the heated oil in the jar. Put the lid on the jar and shake the mixture for 15 minutes. Caution: *The jar may be warm or hot to the touch.*

B. After you have shaken the mixture for 15 minutes, allow it to sit for 60 seconds.

C. Loosen the lid slowly to vent the jar and then retighten the lid.

D. This mixture is a combination of biofuel and glycerin.

5. Let the mixture sit overnight.

6. Clean up your workstation.

Day Two

1. Put on your personal protective equipment (goggles, apron, thermal gloves).

2. Examine the separated biofuel and glycerin solution.

A. The darker liquid at the bottom is glycerin.

B. The clear liquid at the top is biofuel.

3. Decant the biofuel into a graduated cylinder. Decanting is the process of pouring a liquid from a sediment. In this lab, the liquid is the biofuel, and the sediment is the glycerin.

A. Place the glass stirring rod against the point on the mouth of the jar where you will be pouring. (The stirring rod will help keep the glycerin from being poured in

the jar.)

B. Carefully pour the biofuel from the jar into the graduated cylinder. The liquid will run down the stirring rod into the cylinder. Take care not to pour the glycerin into the cylinder.

4. Ask your teacher for instructions on the handling and storage of your biofuel.
5. Clean up your workstation.