

**Transesterification of Soybean and Canola Oil to Produce Biodiesel**

1. PURPOSE

The purpose of this lab is

1. To describe the principle of transesterification.
2. To develop a flow chart for producing biodiesel from vegetable oil.
3. To write the chemical reaction for this process.
4. MATERIALS

300 mL soybean oil (SO) or canola oil (CO)

6 g potassium hydroxide (KOH)

60 mL methanol

Thermometer

Hot plate/stirrer

500 mL beaker

250 mL Erlenmeyer flask with stopper

Storage bottle with lid

Stir bar

Separatory funnel (optional)

1. SAFETY CONCERNS

You must wear goggles and an apron. Methanol is flammable and poisonous. Potassium hydroxide is corrosive.

1. PROCEDURE
2. Measure 300 mL of soybean oil (SO) or canola oil (CO) and pour it into a clean beaker.
3. Heat the beaker with oil to about 45oC. *Make sure your oil stays between 40*o *– 50*o*C. The reaction will not occur if the oil is not at this range.*
4. Measure 60 mL of methanol and pour it into an Erlenmeyer flask.
5. Measure 6 g of potassium hydroxide.
6. Add the KOH to the methanol. Stopper the flask and shake the mixture until the KOH completely dissolves.
7. SLOWLY add the methoxide solution (methanol + KOH) to the oil. Stir for 30 minutes with the magnetic stirrer/hot plate. *Mix solutions slowly to prevent a large temperature change.*
8. Let the mixture stand for 1 hour.
9. Pour off the mixture into a separatory funnel and allow the layers to separate. The top layer will be biodiesel and the bottom layer will be glycerine.
10. Drain away the glycerine layer and pour the remaining biodiesel layer into a storage bottle.
11. CONCLUSIONS
12. Describe the principle of transesterification.
13. Create a flow chart showing the process of producing biodiesel from vegetable oil.
14. Write the chemical reaction for the transesterification process.
15. In the commercial production of biodiesel, 1200 kg of vegetable oil produces 1100 kg of crude biodiesel. How does your yield compare to this? What factors could have an impact on your yield?
16. Describe the appearance of your product. Would there be any concerns for putting this fuel directly into a diesel engine? What further changes would need to be made before doing this?