

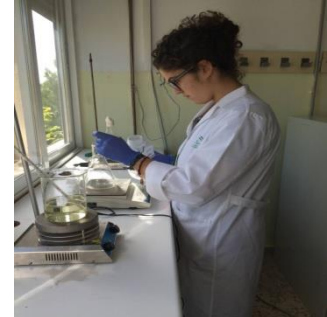


## OBTAINING BIODIESEL FROM USED KITCHEN OILS

**BIODIESEL:** Alternative combustible from petroleo

### CONCEP OF BIODIESEL

- Diesel oil that is obtained through the transesterification of triglycerides originating from vegetable oils and/or animal fats.
- Is very similar to the diesel obtained from petroleum and can be used as its substitute in diesel cycle engines.



### OBJET

- Production biodiesel
- Production glicerina
- Not increase CO2 emissions
- Get rid of residue

(Organic residue however are biodegradables is difficult to get off)

### BASIS

Is obtained through the transesterification of triglycerides originating from vegetable oils and/or animal fats

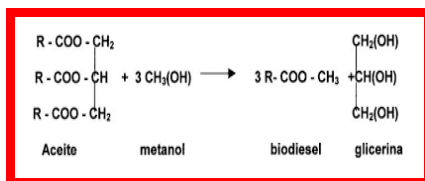


Metanol	100	10	100	10
Etanol	100	15	105	10



### THE TRANSESTERIFICATION PROCESS

- Consists of combining the vegetable oil with a light alcohol, (methanol or etanol) in an acid or alkali medium.
- Which produces an alcohol substitution in the esters that the fatty acids form with the glycerol.
- Obtained: glycerine (or glycerol) and biodiesel (or methyl ester)
- Are immiscible (they separate spontaneously)
- The potassium hydroxide is catalyst to accelerate the reation.
- This process does not require the input of energy.



### THE MAIN ADVANTAGE OF BIODIESEL THAN COMBUSTIBLES FROM PETROLEO

- It has a higher level of cetano (achievement)
- It doesn't contain sulphur, which are responsible for acid rain.
- Reduces CO<sub>2</sub>, CO, particle and aromatic hydrocarbon emissions.
- Spills of this fuel in river and sea waters are less polluting and less lethal
- They degrade more quickly than petroleum fuels.
- Its transport and storage is safer (its flash point is higher).
- It is less irritating to human skin.
- It acts as a lubricant for engines, prolonging their life.



## MATERIAL

- 500ml Erlenmeyer (conical) flask.
- Spatula or measuring spoon
- Precision scales
- 10ml test tube
- Magnetic shaker/stirrer with heating plate
- One 500ml, one 100ml and two 250ml beakers
- Funnel
- 500ml separating funnel
- Base and clamp for the separating funnel



## REACTANS

- 1g NaOH (caustic soda/lye).
- 100 ml methanol
- 250 ml oil.

## PREPARATION OF THE MATERIAL

### 1. Preparation of caustic soda in methanol

- Dissolve 1g of caustic soda in 100mg of methanol.
- Dissolve it in a 500ml Erlenmeyer flask stoppered with a cotton plug.
- Shake carefully by rotating the flask.

!!!!!! Take precautions as caustic soda is highly corrosive, and gives off heat and vapour when dissolving !!!!!!!



### 2. Producing Biodiesel

- Filter the used oil to eliminate impurities.
- Heat 250ml of oil to 40°C in a beaker on a heating plate.
- Slowly and with great care add the caustic soda-methanol mix.
- Stir for 20 minutes.
- Pour all the beaker contents into the separating funnel and leave standing for 24 hours at room temperature.
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- Two phases are separated with an interphase, glycerol below and biodiesel above.

### 3. Recovering the obtained products

- Open the tap of the separating funnel:
- Collect the glycerol from the lower phase in one of the 250ml beakers.
- Collect the interphase in the 100ml beaker
- The biodiesel from the top phase in the second 250ml beaker.
- The glycerol is used to make vanishing cream or glycerine soap

