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## Synthesis of Biofuel from vegetable oils

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### ABSTRACT

Biodiesel is a renewable, clean burning diesel replacement that is reducing dependence of foreign petroleum, creating jobs and improving the environment. Made from recycled cooking oil, soya bean oil and animal fats. Growing concern regarding energy resources and the environment has increased interest in the study of alternative sources of energy. To meet increasing energy requirements there has been growing interest in alternative fuel. The utilization of liquid fuels such as biodiesel produced from cooking oil by transesterification process. The most promising options for the use of conventional fossil fuels.

**Keywords:** cooking oil, potassium hydroxide, methanol, sodium thiosulphate.

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## INTRODUCTION

Biodiesel is a diesel fuel that is made by reacting vegetable oil with other common chemical. Biodiesel may be used as diesel in its pure form or blended with petroleum-based diesel no modification are required, and the result is a less expensive, renewable , clean-burning fuel. Biodiesel is better for the environment because it is made from renewable resources and has lower emissions compared to petroleum diesel. It is less toxic than table salt biodegrades as fast as sugar produced domestically with natural resources, its use decreases our dependence on imported fuel and contributes to our own economy. (Garlapati et al.,2013).

Used vegetable oil described as a renewable fuel as it does not add any extra carbon dioxide gas to the atmosphere, as opposed to fossil fuels, which cause change in the atmosphere. Vegetable oil from plant sources is the best starting material to produced biodiesel because the conversion of pure triglyceride to fatty acid methyl ester is high and the reaction time is relatively short. The most common way to produced biodiesel by transesterification, catalyzed chemical reaction involving vegetable oil and alcohol to yield fatty acid alky esters and glycerol. (Thirumarimurugan et al.,2012).

The use of edible vegetable oils for biodiesel production has recently been of great concern because they complete with food material. as the demand for vegetable oils for food has increased tremendously in resent years, it is impossible to justify the use of these oils for fuel used purposes such as biodiesel production. Hence, the contribution of non-edible oil will be significant as a non-edible plant oil source for biodiesel production (mulimani et al.,2012).

## METHOD:

A graduated cylinder measure 20 ml methanol in 100ml beaker. Mass out 0.70-gram potassium hydroxide and add to methanol beaker. Gently stir to dissolve. This may take 10 minutes. Use graduated cylinder to measure 100 ml oil and pour into 250 ml beaker . place this beaker of oil on hot plate upto temperature reaches 120<sup>0</sup>c ,remove the beaker and turn the hot plate off. Carefully pour the hot oil into the jar . slowly add the methanol solution. Put the lid on the jar and shake the mixture for 15 minutes. Allow the mixture to sit for minute. The cloudy mixture of biofuel and glycerine .let this sit overnight .

Examine the content of jar. The brownish liquid at the bottom is glycerin and the colorless liquid on the top is biofuel. Decant the biofuel into a graduated cylinder. Record the volume of biofuel. (Wagner,E.P.;Koehle,M.A.;Moyle,T.M.;Lambert 2010,87,711-712.)

**Methodology for Lipid:****Determination of Iodine value of oil:**

The iodine value is a measure of the degree of unsaturation in an oil. It is constant for a particular oil or fat. Iodine value is useful parameter in studying oxidative rancidity of oils since higher the unsaturation the greater the possibility of the oils to go rancid.

**Principle:**

The oils contain both saturated and unsaturated fatty acids . Iodine gets incorporated into the fatty acid chain whenever the double bond exist , Hence the measure of the iodine absorbed by an oil , gives the degree of unsaturation. Iodine value/number is defined as the 'g' of iodine absorbed by 100g of the oil.

**Procedure:**

1. Weigh 0.5 or 0.25 gm of oil into an iodine flask and dissolve in 10ml chloroform.
2. Add 25 ml of hanus iodine solution using a pipette, draining it in a definite time. Mix well and allow to stand in dark for exactly 30 min with occasional shaking.
3. Add 10ml of 15% potassium iodide , shake thoroughly and add 100ml of freshly boiled and cooled water, washing down any free iodine on the stopper.
4. Titrate against 0.1N sodium thiosulphate until yellow solution turns almost colourless.
5. Add a few drops of starch as indicator and titrate until the blue colour completely disappear.
6. Toward the end of titration , stopper the flask and shake vigorously so that any iodine remaining in solution in  $\text{CHCl}_3$  is taken up by potassium iodide solution .
7. Run a blank without sample . (William Horowitz 12th edition ,1975).

**RESULTS AND DISCUSSION:**

Biodiesel production is a process of producing biodiesel, biofuel, through the chemical reaction of transesterification and the esterification. In the present work potassium hydroxide is used to produced the biofuel. this involves vegetable oil being reacted with short chain alcohol. methanol is used to because of its low cost, however grater conversion of biofuel. the lipids accumulated by the oleaginous cells can then be trans esterified to form biodiesel. this increase the efficacy of biofuel synthesis.

**CONCLUSION**

The major part of all energy consumed worldwide comes from petroleum, charcoal and natural gas. However , these sources are limited ,and will be exhausted in the near future .Thus, Biodiesel

is an alternative and renewable fuel . the catalyst used in production of biodiesel are acids, bases and enzymes. Transesterification is a commonly used method to reduced the viscosity of the biodiesel . this purpose this method reduced the viscosity of oil using acid or base as catalyst in presence of methanol and ethanol. The paper concentration on the development of economically viable as well as ecofriendly will affect the biodiesel production .

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