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Faculty of Engineering



BIODIESEL PRODUCTION FROM WASTE PLANT OIL

**A graduation project submitted to the Chemical Engineering Department
in partial fulfillment of the requirements for the degree
of Bachelor of Science in
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ABSTRACT

Biodiesel is known as an alternative diesel fuel in developed countries. Now days, biodiesel became more important due to insufficient amount of the black oil and the regulations of environmental law need a friendly energy sources. Because of the high cost of raw material, WCO were used as raw material instead of conventional method using vegetable oil. In addition, to produce an environmentally fuel with low cost of production. The waste cooking oil (WCO) was collected from a local restaurant in Zliten. The aim of the study was to investigate converting the WCO to biodiesel by Transesterification process. The best conditions were summarized are (temperature of 60°C and the weight ratio of the oil: methane is 6:1 , the ratio of the weight of the catalyst (sodium hydroxide) to the oil ratio is 1%, the time required for the reaction is 60 minutes and the rate of mixing speed 300 rpm) and the production rate reached 64.16% weight.

The results showed that, about 81.3% of the chemical structure was unsaturated fatty acid methylase. Physical properties were found at competitive values for fossil fuels, with a low pH of 0.23 mg KOH/g oil and kinetic viscosity at 3.99 mm²/s at 40°C and cetane number high reached 48.4 with a heat value of 36433 kJ/kg.

It was conclude that, it is possible to deal with the disposal of the WCO and convert it to biodiesel. Therefore, reduction of the environmental risks . To end with suggestion, there are many types of material such as fats, that can be investigated in order to produce the biodiesel.