

Effect of alkali catalyst on biodiesel production from mixtures of soybean oil and waste cooking oil

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The traditional alkali-catalyzed transesterification for synthesis of biodiesel from mixtures of soybean oil and waste cooking oil was carried out in a laboratory scale reactor. The effect of sodium hydroxide (NaOH) concentration as catalyst was investigated. The reaction temperature and stirring speed were maintained constant for 2 hours at 65°C and 600 rpm. For system equipped by agitation, and considered on rotational speed and length of rotor or in this case, magnetic bar, the G-force for this system was 10.062. The optimum condition was obtained at 0.75 wt% NaOH, mixing ratio of feedstock of 60%WCO-SO. The result showed increasing in the amount of NaOH gave a positive effect on a small percentage of waste cooking oil in mixture of feedstock, and negative effect on a greater percentage of waste cooking oil, it was due to that NaOH as alkali catalyst is very sensitive to qualities of feedstock, especially free fatty acid content of feedstock. Free fatty acid inhibited rate of transesterification reaction, and it caused side reaction; saponification reaction. It leads to complicated purification process and reduction of biodiesel as final product.