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Abstract Details

Title: Biodiesel Production from Neem Oil Using Two Step Transesterification

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Abstract: Currently, most of the biodiesel is produced from the edible/refined type oil using methanol and alkaline catalyst. However, large amount of non-edible type oils and fats are available in our country. In this study, crude neem oil is used as alternative fuel for biodiesel production. The difficult with alkaline transesterification of these oils have contained large amounts of free fatty acids (FFA). These free fatty acids quickly react with the alkaline catalyst to produce soaps that inhibit the separation of the ester and glycerin. A two-step transesterification process is developed to convert the high FFA oils to its mono-esters. Using 100 ml of oil, the optimum combination of parameters for pretreatment were found to be .45 v/v methanol-oil-ratio,0.5%v/w H2SO4 acid catalyst, 50˚C and 45 min reaction time. After pretreatment of neem oil, transesterification reaction was carried out with 0.3:1 methanol-to oil ratio, 1%KOH as alkaline catalyst, 1hr reaction time and 55˚C reaction temperature to produce the fatty acid methyl ester. This two step process gave maximum average yield of 90±2%.

Keywords: Biodiesel, free fatty acid, Neem oil, pretreatment, transesterification.