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Production of Biodiesel from Jatropha Curcas Seed Oil using Base Catalysed Transesterification

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Abstract : This work has been carried out to produce biodiesel and investigate how the production from *Jatropha curcas* seed oil catalysed by potassium hydroxide is affected by some factors. The factors considered were catalyst load, methanol to oil ratio and reaction time. Before the production of the biodiesel was accomplished, *Jatropha curcas* oil, which was analysed to ascertain its suitability for the production, was extracted using solvent extraction method with n-hexane as the solvent. The results obtained showed that a methanol to oil molar ratio of 4 with KOH concentration of 2.5% w/w and 75 min reaction time gave the optimum yield of biodiesel. Biodiesel yield was found to reduce with increasing KOH concentration and higher methanol to oil ratio. That was because at higher methanol to oil ratio, the excess methanol was reacting with the KOH to form soap instead of speeding up the production of biodiesel. Also, the important properties of the biodiesel like the flash point, acid value, kinematic viscosity, iodine value, density and saponification value were found to be 156 ^{o}C, 4.77 mgKOH/g, 2.02 cm/s, 48.85 meq/g, 0.874 g/cm^3 and 115.83 mgKOH/g, respectively. These values obtained were compared with specifications of ASTM D6751, and it was established that the *Jatropha curcas* seed oil methyl ester could be used as an alternative to/or blended with petrodiesel.

Keywords: Biodiesel, *Jatropha curcas*, transesterification, solvent extraction.

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