

# **Biodiesel production from low quality crude jatropha oil using heterogeneous catalyst**

## **Abstract**

In this study, transesterification of low quality crude jatropha oil (acid value > 4mgKOH/g & water content > 1000 ppm) to biodiesel using modified natural zeolite as a solid catalyst was carried out. The effects of various factors consist of the reaction time, molar ratio of methanol to oil, reaction temperature, mass ratio of catalyst to oil and catalyst reusability were investigated. The experimental treatments of a 20:1 molar ratio of methanol to oil, addition of 5wt% catalyst, 70 °C reaction temperature using low quality crude jatropha oil resulted in optimum yield in which the biodiesel content exceeded 96.5% at 6 h. Along with, the recycling experiment results showed modified natural zeolite catalyst had a long catalyst lifetime which maintained sustainable activity (at least 96.5wt% of ester content according to EN14214 limitations) even after being reused for 3 cycles on low quality raw feedstock. The present finding is potential to simplify the biodiesel production and refining process in rural area. This study simplified method of biodiesel production from low quality raw feedstocks with economic and high efficiency catalyst.