

Conversion of *Jatropha curcas* Oil to Ester Biolubricant Using Solid Catalyst Derived from Saltwater Clam Shell Waste (SCSW)

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Abstract : The discarded clam shell waste, fossil and edible oil as biolubricant feedstocks create environmental impacts and food chain dilemma, thus this work aims to circumvent these issues by using activated saltwater clam shell waste (SCSW) as solid catalyst for conversion of *Jatropha curcas* oil as non-edible sources to ester biolubricant. The characterization of solid catalyst was done by Differential Thermal Analysis-Thermo Gravimetric Analysis (DTA-TGA), X-Ray Fluorescence (XRF), X-Ray Diffraction (XRD), Brunauer-Emmett-Teller (BET), Field Emission Scanning Electron Microscopy (FESEM) and Fourier Transformed Infrared Spectroscopy (FTIR) analysis. The calcined catalyst was used in the transesterification of *Jatropha* oil to methyl ester as the first step, and the second stage was involved the reaction of *Jatropha* methyl ester (JME) with trimethylolpropane (TMP) based on the various process parameters. The formed biolubricant was analyzed using the capillary column (DB-5HT) equipped Gas Chromatography (GC). The conversion results of *Jatropha* oil to ester biolubricant can be found nearly 96.66%, and the maximum distribution composition mainly contains 72.3% of triester (TE).

Keywords : conversion, *Jatropha curcas* oil, ester biolubricant, solid catalyst

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