

ABSTRACT

In the present study use of blended oils for biodiesel production has been described successfully. Fatty acid methyl ester production from Coconut-Linseed and Coconut-Canola Blended oils mixed in 1:1 ratio have been optimized by selecting five different variables; Catalyst concentration (A), Methanol to oil molar ratio (B), Reaction time (C), Reaction temperature (D) and Stirring Rate (E) and effect of these variables on biodiesel yield was studied by using a design of fifty experiments based on Response Surface Methodology. Highest yield from coconut-linseed blended oil was 98.3% at 0.25% KOH, 6:1 ratio of methanol to oil in 30 minutes at 25°C and 600 RPM. While coconut-canola blended oil produced maximum yield (96.8%) at 0.75% KOH, 6:1 alcohol to oil ratio in 1h at temperature of 50°C and 450 RPM. FTIR and FT-Raman spectroscopy confirmed the conversion of blended oils to corresponding fatty acid methyl esters. Fuel properties of biodiesel produced from Coconut-Linseed blend oil were determined which meet the standards. By-product of transesterification reaction i.e crude Glycerol has also been refined successfully through a series of physical and chemical steps and properties of refined glycerol were found comparable with that of commercial glycerol. FTIR analysis of crude, refined and commercial glycerol was also performed which ensured the removal of maximum functionalities from crude glycerol during treatment process.