ABSTRACT

The Generation of Liquid-Liquid Equilibrium Data for the Production and Separation of Crude Coconut Oil Biodiesel

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Fossil fuels are civilization's primary energy source. The harmful environmental effects due its combustion have forced the research and development of safer and more renewable fuels such as biodiesel.

In this work the ethanolysis of coconut oil and the solubility of the crude coconut oil biodiesel-glycerol-ethanol system were investigated. The production of crude coconut oil biodiesel was studied within the range of oil/ethanol molar ratios of 1:6 and 1:9 and the potassium hydroxide catalyst amount of 1.0 wt.% and 1.5 wt.% with respect to the mass of the oil. The reactions were executed at a constant reaction temperature of 313.15 K and atmospheric pressure for 4.5 hours. The solubility curve was determined by turbidometric titration of the crude coconut oil biodiesel-glycerol-ethanol system.

An optimal yield of crude biodiesel was obtained at a coconut oil/ethanol molar ratio of 1:6 and a potassium hydroxide amount of 1.5 wt.%. The solubility curve obtained was a Type I curve.

Keywords: Dawn-Marie Alexander, Transesterification, Ethanolysis, Coconut Oil, Ethanol, Crude Biodiesel, Solubility Curve.