

Title (25)	:	Optimization of based catalyzed transesterification and characterization of palm oil methyl ester
Journal	:	AIP Conference Proceedings
Document Type	:	Conference Paper
Publisher	:	AIP Publishing
UniKL Author	:	Muzafar Zulkifli; Ahmad Naim Ahmad Yahaya
Link to Full Text	:	https://pubs.aip.org/aip/acp/article-abstract/2923/1/040013/3279808/Optimization-of-based-catalyzed?redirectedFrom=fulltext
Link to Scopus Preview	:	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85190686211&doi=10.1063%2f5.0196660&partnerID=40&md5=8bc4db70e52d2d2369570b90fbf755f7
Abstract	:	<p>Biodiesel is an environmentally friendly alternative to traditional petrol diesel, described as the mono-alkyl esters of vegetable oils or animal fats. Commonly, produced through transesterification with methanol or ethanol as alcohol with the help of a catalyst to increase the reaction rate and shift the equilibrium to the right. This study was conducted to determine the ideal operating conditions for alkaline-catalyzed transesterification to obtain the highest yield of FAME (%). The transesterification process was done using palm oil as feedstock reacted with methanol and assisted with potassium hydroxide(KOH) as the catalyst. Four different variables are done in the research which are the molar ratio (methanol: oil), reaction temperature (°C), reaction time (min), and catalyst loading (%). The highest yield obtained was at molar ratio 15:1, reaction temperature of 60°C, the reaction time of 120 min, and catalyst loading of 1% where the yield obtained was 87.47%, 87.73%, 87.97%, and 89.93%. However, according to a Minitab simulation, the optimum yield of 91.65% could be reached by performing the transesterification process with a molar ratio of 15:1, a reaction temperature of 60°C, a reaction time of 90 minutes, and a catalyst loading of 2%. Next, the physicochemical properties of the FAME were determined for its saponification value, iodine value, viscosity, and moisture content using the ASTM method referring to the biodiesel fuel standard ASTM D 6751.</p>