ABSTRACT

PRODUCTION OF BIODIESEL FROM CATAPPA SEED OIL USING REACTIVE EXTRACTION METHOD

By

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This research was conducted to study transesterification of catappa seed oil (Terminalia catappa L.) using H$_2$SO$_4$, HNO$_3$, and NaOH as catalyst. Preliminary tests showed that utilization of H$_2$SO$_4$ led to formation of black product, and utilization of NaOH was found to result in soap formation, while using HNO$_3$, no such problems were encountered. For these reasons, the catalyst used for the rest of study was HNO$_3$. Transesterification was carried out using two methods, e.g conventional method and reactive extraction method. The conventional method was carried out by extracting catappa seed oil and then the oil was subjected to transesterification. In the reactive extraction method, oil extraction and transesterification were conducted simultaneously. The products were analyzed to determine density, viscosity, flash point and then analyzed by GC-MS to identify the components contained in the product. The results obtained indicate that the viscosity and density showed of the product of transesterification using reactive extraction method are close to the values in the national standard of SNI 04-7182-2006, but the flash point is lower than the value of the national standard. Characterization of the products using GC-MS demonstrated the presence of various components. In addition to methylester, several components belong to carboxylic acids, alkanes, alcohols, and aldehydes were detected, suggesting that complete transesterification has not been achieved. However, combustion test showed that the products exhibit better combustion properties than those of the oil.

Keywords: Biodiesel, catappa oil, transesterification, reactive extraction.