

**PRODUCTION OF BIODIESEL FROM PALM OIL BY USING
CALCIUM OXIDE (CaO) SUPPORTED ON ALUMINA BEADS**

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ABSTRACT

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In this research, the main objectives of this study were to determine the effect of the amount of catalyst loadings on the yield of biodiesel Ca/Al₂O₃ catalyst without dopant and Ni/Ca/Al₂O₃ catalyst with dopant produced from palm oil. Biodiesel was produced by transesterification of palm oil with methanol catalysed by two types of alumina-supported catalysts. In the view of work, homogenous catalysts have more limitation than heterogeneous catalyst. Homogeneous catalyst has caused great impact to environment and market value. The catalysts were prepared by heating a mixture of alumina beads and calcination in the furnace at 700 °C. Transesterification reactions were carried out at 65 °C using a mixture of palm oil and methanol with various mass of catalyst. Ni/Ca/Al₂O₃ gave the highest maximum yield (12.6%) with the optimum mass of catalyst that was 4 g. Followed by Ca/Al₂O₃ (4.2%) with the mass of catalyst was 3 g. The optimum percentage FAME result at 12.6% Ni/Ca/Al₂O₃ with dopant was higher than to the optimum conversion of percentage FAME for Ca/Al₂O₃ without dopant at 4.2%. The types of fatty acid in palm oil were determined by using gas chromatography-mass spectrometry (GC-MS). The fatty acid that determined was palmitic acid, myristic acid and lauric acid. The palmitic acid at retention time 11.687 min followed by 10.183 min for myristic acid and lauric acid at 8.559 min. It can be concluded the percentage of yield or FAMES for Ni/Ca/Al₂O₃ with dopant higher than Ca/Al₂O₃ without dopant.

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