**Title :** Biodiesel Production from Waste Cooking Oil and Fresh Cooking Oil Using Commercial CaO Catalyst

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# ABSTRACT

This research aims to study the biodiesel production via heterogeneous transesterification from waste cooking palm oil (WCO) and fresh cooking palm oil (FCO) using commercial calcium oxide (Com CaO) as a catalyst. 0.5%wt. Com CaO catalyst calcined at 800 °C for 4 hour was used in the transesterification reaction. For biodiesel production experiment, methanol-to-oil ratio 14:1, reaction temperature 65 °C and time 3 hour was a control condition. The biodiesel products from WCO and FCO were analyzed methyl ester content by Gas Chromatograph (GC). The obtained result showed that biodiesel was the major product and glycerin was the byproduct. It found that the methyl ester (ME) yield was achieved at 62.27% for WCO and 58.53% for FCO. In addition, fresh and used Com CaO catalysts were characterized by SEM-EDS. For fresh catalyst, calcined catalyst had rougher and more porous surface, compared to uncalcined catalyst. For used catalyst, it occurred the agglomeration of particles both before and after washing with hexane. EDS result showed that fresh catalyst had higher Ca content (36.25%wt.) than used catalyst (16.46%wt. for WCO and 18.39%wt. for FCO).

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