Biodiesel Production from RBD Palm Oil by Using Double Promoted Catalyst (CaO/MgO/γ-Al₂O₃) in Fluidized Bed Reactor

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**Abstract**

Biodiesel is one of alternative energy for fuel which made from transesterification reaction between vegetable oil and methanol. All this time, biodiesel production was using homogeneous catalysts such as NaOH or KOH. However, this process has several weaknesses, such as include the formation of soap as a byproduct and complexity of separation between biodiesel and catalyst that is why heterogeneous catalyst was developed.

In this study we investigated CaO/MgO/γ-Al₂O₃ as catalyst. The catalyst was made by precipitated CaO and MgO to γ-Al₂O₃ using acetid acid as precursor in 3 hours. Next, drying it in the oven for 12 hours at 110°C and calcinations for 5 hours at 700°C. The catalyst is used in the transesterification process with the variable mass of catalyst 4, 7, 10, 13, 16 gram, flow rate of reactants 4, 7, 10, 13, 16 ml/min, and temperature 125, 150, 175, 200, 250°C.

From the experiment we got that the best yield and conversion of biodiesel is 0.642 gr biodiesel/gr oil and 63.975% when we using mass of catalyst 16 gram at 225°C with flow rate of 4 ml/minute.

**Keyword**: Biodiesel, Heterogeneous Catalyst, Palm Oil Transesterification.