

**PRODUCTION OF BIODIESEL USING POTASSIUM HYDROXIDE
SUPPORTED ON ALUMINA (KOH/Al₂O₃)**

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ABSTRACT

PRODUCTION OF BIODIESEL USING POTASSIUM HYDROXIDE SUPPORTED ON ALUMINA (KOH/Al₂O₃)

In this study, waste cooking oil (WCO) was used to produce biodiesel using KOH supported onto alumina (KOH/Al₂O₃) as catalyst. Three parameters were studied to find the optimum conditions which are catalyst loading, reaction time and the reusability of the catalyst. Al₂O₃ was impregnated with KOH and characterized using thermogravimetric analyzer (TGA) before the catalyst was calcined at 700°C for 3 hours. The reaction was refluxed with constant conditions at temperature of 65°C, 10% KOH-Al₂O₃, methanol to oil ratio of 12:1 for 3 hours. The reaction time was studied using optimum catalyst loading which is 7 wt.% catalyst amount and the reaction was varied from 1 hour - 4 hours reaction. The highest yield of biodiesel obtained was 73.7% in 2 hours of reaction. At the end of the study, the reusability of the catalyst was studied. 3 cycles of reaction was done using used catalyst from the previous reaction of 2 hours yield determination and found the decreasing pattern of yield after 4 cycles of reaction. Hence, the optimal conditions for this catalyst were reaction temperature at 65°C, 10% KOH-Al₂O₃, methanol to oil ratio of 12:1, 7 wt.% catalyst loading at 2 hours reaction time with the highest yield of biodiesel is 73.7%.