PRODUCTION OF BIODIESEL FROM PALM OIL USING POTASSIUM IODIDE (KI) SUPPORTED ON ALUMINA BEADS

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ABSTRACT

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The growing demands for alternative fuels with the environmental problems motivate the research to create biodiesel fuel from non-renewable sources. The process of transforming palm oil into biodiesel is called transesterification reaction. Transesterification is a process where three mole of alcohol (methanol) and one mole of triglyceride to produce one mole of glycerol and three mole of fatty acid methyl ester. Transesterification of palm oil was carried out over potassium iodide supported by alumina beads with addition of nickel-dopant ($Ni/KI/Al_2O_3$) and without addition of nickel-dopant (KI/Al_2O_3). The objectives of this study are to produce biodiesel from palm oil catalyzed by potassium iodide supported (KI) by alumina beads with addition of nickel-dopant ($Ni/KI/Al_2O_3$) and without addition of nickel-dopant (KI/Al_2O_3) and to determine the effect of mass of catalysts on the yield of biodiesel produced from palm oil. The higher percentage FAME yield was obtained by $Ni/KI/Al_2O_3$. The optimum percentage FAME yield of $Ni/KI/Al_2O_3$ was 42.1% from 4 g mass of catalyst, while for KI/Al_2O_3 was 40.4% from 5 g mass of catalyst, reaction temperature 65°C for 5 hours. The addition of nickel-dopant on catalyst support was enhanced the catalytic activity. The types of fatty acid methyl ester in palm oil were determined by using GC-MS which is lauric acid (C12:0), myristic acid (C14:0) and palmitic acid (C16:0). It can be concluded that $Ni/KI/Al_2O_3$ has higher percentage FAME yield than KI/Al_2O_3.

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