TRANSESTERIFICATION OF PALM OIL FOR BIODIESEL PRODUCTION USING CaO AS HETEROGENEOUS CATALYST

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LIST OF ABBREVIATIONS

BET	: Branauer-Emmett-Teller
DAG	: Diacylglycerols
DMSO	: Dimethyl sulfoxide
ER	: Eley-Ridael
FAME	: Fatty Acid Methyl Ester
FFAs	: Free Fatty Acid
LHWW	: Langmuir-Hinshel-wood-Hougen-Watson
min	: minute
MPS	: Mean Pore Size
TAGs	: Triacylglycerols
TGA	: Thermogravimetric Analysis
THF	: Tetrahydrofuran
WCO	: Waste Cooking Oil
rpm	: retention per minute

ABSTRACT

TRANSESTERIFICATION OF PALM OIL FOR BIODIESEL PRODUCTION USING CAO AS HETEROGENEOUS CATALYST

Biodiesel is an alternative to classic diesel fuel because it is derived from a fuel from vegetable oil or animal fat and is a capable substitute for petroleum-derived diesel. Transesterification is the most widely used method in synthesize of biodiesel. Recently, application of heterogeneous catalyst has attracted considerable interest in biodiesel production compared to homogenous catalyst. Thus, Calcium oxide (CaO) supported with alumina beads impregnated with nickel (II) nitrate hexahydrate, Ni $(NO_3)_2.6H_2O$ as a dopant. The parameter studied was catalyst loading of 0, 2, 4, 6 and 8 wt%. CaO was prepared at calcination temperature of 700°C after characterized by thermogravimetric analysis (TGA). In this study, the highest yield 24.24% was obtained from transesterification reaction at optimum condition of 5 h, 1:25 methanol-oil molar ratio and 65°C of reaction temperature with 4 wt% of catalyst loading. Apart from that, gas chromatography mass spectrometer shows that the presence of methyl ester peak which are hexadecanoic methyl ester, $C_{17}H_{34}O_2$ and Methyl 11-Octadecenoate,$C_{19}H_{36}O_2$.