ABSTRACT

Biodiesel is an alternative and renewable energy sources. Biodiesel is also more environmentally benign than fossil fuel. This fuel which is called FAME (*Fatty Acid Methyl Ester*) is produced by transesterification of vegetable oils or animal fats and alcohol with aid of catalyst. The commonly used catalyst in transesterification is homogeneous one, but heterogeneous catalyst, CaO is used in this research due to the easy of phase seperation between the catalyst and product compared to homogenous one. In this research, the biodiesel is produced by the reaction of CPO (*Crude Palm Oil*) and methanol. Preliminary studies indicates that the FFA (*Free Fatty Acid*) content in CPO is relatively high, 3,722%. Therefore it needs to perform preliminary process, which is esterification process to reduce FFA content. The result indicates that the maximum biodiesel product is 74,595% and achieved in the following reaction parameters; reaction temperature of 70°C, reaction time of 1,5 h, catalyst dosage of 1,5%, and methanol/oil molar ratio of 9:1. Catalyst dosage seems to be dominant factor in the production of biodiesel in this research, but molar ratio of methanol does not give significant influence for production biodiesel. As-synthesized biodiesel has physical or chemical properties that comply with SNI (*National Standart of Indonesian*).

Keywords: Esterification, Transesterification, Biodiesel, Heterogeneous catalyst.