

ABSTRACT

Biodiesel fuel is more important because of the depletion and uncontrollable prices of fossil fuel resources. Biodiesel are produced by the transesterification reaction of vegetable oils and animals' fats with a catalyst and methanol. Crude palm oil (CPO) is used as the raw material of biodiesel by using heterogeneous catalyst, calcium oxide (CaO). The results showed that the presence of free fatty acid and water in CPO are 3,722 % and 0,367 % exceed allowed amount. Therefore, Pre treatment through esterification reaction is needed to reduce the presence of free fatty acid and water. The optimal biodiesel obtained is 73,455 % with variable catalyst calcinations temperature 900⁰C, reaction temperature 70⁰C, reaction time 60 minutes, catalyst dosage 0,5 % and molar ratio methanol/oil of 9:1. To study the effect of CaCO₃ calcination on the formation of biodiesel, the catalyst is heated from 700⁰C-1100⁰C and analyzed with X ray diffraction. The purification of the synthesized biodiesel uses citrate acid which function to eliminate the remaining calcium and analyzed by TLC. Physical and chemical characteristics of biodiesel are water presence 0,046 %, kinematical viscosity 3,815 cSt, density at 886 Kg/m³, acid number at 0,770 and flash point at 175⁰C. Characteristics of biodiesel indication that resulted-biodiesel has obeyed the SNI-04-7182-2006

Keywords : Biodiesel, transesterification, esterification, calcinations, X ray diffraction, TLC