

BIODIESEL SYNTHESISED from NYAMPLUNG SEED OIL (*Callopyllum inophyllum*) AT VARIOUS PROCESS CONDITIONS OF TRANSESTERIFICATION USE KOH AS CATALYST

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ABSTRACT

Biodiesel synthesis with nyamplung seed as raw material had been done. The purposes of this research are to know 1). characters of biodiesel (density, kinematics viscosity, moisture content, acid number and heat of combustion) at various temperature and time process, 2). the characters of biodiesel suitable based on SNI 04-7182-2015. The research was going in Chemical Laboratory, Chemistry Department , Faculty of Mathematics and Science, Yogyakarta State University ; in Center for Forest Biotechnology and Tree Improvement Research and Development, in PAU UGM and in Chemistry Laboratory UII. The nyamplung seeds were take from Pututrejo village, Purworejo, Central of Java.

There are three steps to synthesise of biodiesel, the first step is pressing process with hydraulic presser to take rubber seed oil, after this, decolorization process using active carbon to take clear oil and followed by degumming process to remove gum. The second step is esterification process, to reduce the FFA of rubber seed oil (using 18 M of H₂SO₄ and methanol, at 60 °C and 60 minutes), and the third step is production biodiesel from nyamplung seed oil by trans esterification process, using methanol and KOH as catalyst with ratio of methanol/oil = 8/1). Trans esterification process was performed at various temperature of : 45, 55, and 65 °C, and at various duration of: 60 and 120 minutes.

The density value of biodiesel B1, B2, B3, B4, B5 and B6, which were found to be 897.58; 889.83; 897.68; 896.5; 893.033 and 891.633 kg/m³ respectively. Except B2, the density value of all biodiesels are higher than value of SNI Standard, (850 – 890 kg/m³). The viscosity value of biodiesel B1, B2, B3, B4, B5 and B6 , are 9.9923; 7.5057; 7.9265; 10.898; 8.559 and 6.907 cSt, respectively. All of , the viscosity value of biodiesels are higher than value of SNI Standard (2.3 – 6.0 cSt). The moisture content value of biodiesel B1, B2, B3, B4, B5 and B6 are: 0.0056; 0.0049; 0.0034, 0.0002528; 0.0002541 and 0.00285 % , respectively, the moisture content value of all biodiesels are less than value of SNI Standard. (max: 0,05 %). The acid number of biodiesel B1, B2, B3, B4, B5 and B6 are: 0.355; 0.16; 0.1625; 0.2073; 0.1350 and 0.1350 (mg KOH/ g). The acid number of all biodiesels are less than standart of SNI (max: 0.5 mg KOH/ g). Heat of combustions of biodiesel B1, B2, B3, B4, B5 and B6 are : 9156.8600; 9218.0225; 9322.6015; 9060.086; 9177.54 and 9155.06 cal/g, , all of the heat combustion value are less than value of SNI Standard (10160 – 11000 cal/g).

Kata Kunci: Nyamplung seed oil, various of transesetrification's conditions, biodiesel characters