

Variation of Process Conditions of Transesterification at Biodiesel Synthesis from Rubber Seed (*Hevea brasiliensis*) with Ratio of (methanol /oil) is: 8/1 used KOH as Catalyst

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ABSTRACT

Biodiesel synthesis from rubber seed as raw material had been done. The aim of this research are to know 1). characters of biodiesel at variation of temperature and stirring agitation, eq: density, kinematics viscosity, pour point, flash point and heat of combustion; 2). To know the characters of biodiesel suitable based on SNI 04-7182-2006. The research was going on Chemical Laboratory, Chemistry Department , Faculty of Mathematics and Science, Yogyakarta State University and in Petroleum and Coal Technology Laboratory, Chemical Engineering Department, Gadjah Mada University. The rubber sheet was take from PTP IX Tuntang Semarang. There are three steps to synthesis of biodiesel, the first step is pressing process of rubber seed oil from rubber seed, the second step is esterification process, to reduce the FFA of rubber seed oil (using H₂SO₄), and the third step is production of biodiesel from rubber seed oil by transesterification process, use methanol and KOH as catalyst. Transesterification process was going on temperature variation eq: 45, 65, and 85 oC , and at variation of process duration; eq: 60 and 120 minutes, and at Ratio of (methanol / oil) : (8/1). The yield of biodiesel was characterised with some appartuse in Petroleum and Coal Technology Laboratory, Chemical Engineering Department, Gadjah Mada University, and in Chemistry Laboratory of Chemistry Departmen, Faculty of Mathematics and Natural Science, Yogyakarta State University. The characters of biodiesel from rubber seed oil at various process conditions : temperature (45, 65 dan 85 0C) and time (60 and 120 minutes), at Ratio of (methanol/ oil) = 8/1 are: Density value of biodiesel B1, B2, B3, B4, B5 and B6, are: 902,8; 901,7; 887,6; 902,7; 897,9 and 886,93 kg/m³ respectively. The density value of all of biodiesel are suitable with SNI Standard, eq: among 850 – 890 Kg/m³. Viscosity value of biodiesel B1, B2, B3, B4, B5 dan B6 , are: 21.6032; 22.8623; 18.1665; 16.7291; 19.7945 and 20.7268 cSt, respectively. The viscosity value of all biodiesel are higher than value of SNI Standard (2.3 – 6.0 cSt). Pour point value of biodiesel B1, B2, B3, B4, B5 and B6 are: 0; 3; 6; 0, 6; dan 0 0C., respectively, so all of biodiesel are suitable with SNI Standard. (-15 sd 13 0C). Flash point of biodiesel B1, B2, B3, B4, B5 and B6 are: 174; 196; 198; 208; 198 and 184 0C. Pour point of all biodiesel are suitable with SNI Standard. (minimal 100 0C). Heat of combustion of biodiesel B1, B2, B3, B4, B5 and B6 are : 9421.3905; 9724.1315; 9501.3474; 9821.6535; 9023,.50 and 9216.280 cal/g. The value of heat of combustion of all biodiesel are less then value of SNI Standard (10160 – 11000 cal/g).

Kata Kunci: *Rubber seed – time and temperature of transesterification– biodiesel characters*