

ANALISIS PENGARUH SUHU PEMANASAN PADA TRANSESTERIFIKASI MINYAK JELANTA MENGGUNAKAN KATALIS HETEROGEN NaOH DALAM PEMBUATAN BIODIESEL

ABSTRAK

Biodiesel yang diperoleh melalui reaksi transesterifikasi merupakan salahsatu sumber energi alternatif pengganti bahan bakar fosil yang dapat diperbarui.Salah satu bahan baku pembuatan biodiesel adalah minyak jelanta. Penelitian ini bertujuan untuk mengetahui pengaruh suhu reaksi transesterifikasi minyak jelanta menggunakan katalis heterogen NaOH terhadap kualitas biodiesel yang dihasilkan.Reaksi transesterifikasi dilakukan dengan mereaksikan minyak jelanta dan metanol dengan rasio mol 2:1. Katalis yang digunakan sebanyak 1,5 gram. Reaksi dilakukan selama 4 jam pada suhu reaksi 50°C , 60 °C dan 70°C. Hasil analisa reaksi transesterifikasi minyak jelantah menggunakan katalis heterogen NaOH menunjukkan keberhasilan sintesis metil ester (biodiesel).Metilester yang terkandung di dalam biodiesel hasil reaksi adalah metil laurat, metil miristat, metilpalmitat, metil linoleat, metil oleat, metil stearat dan metil risinoleat. Kadar metilrisinoleat menurun seiring naiknya suhu yaitu pada suhu 60 °C dan 70°C. Karakterisasi fisik yang dilakukan terhadap biodiesel dengan variasi suhu 50°C, 60°C dan 70°C adalah densitas, viskositas, bilangan asam, kalor, titik nyala. Densitas biodiesel adalah 0,8524 gr/ml, 0,8300 gr/ml, 0,8230 gr/ml; nilai viskositas adalah 1,65mm²/s, 1,16 mm²/s dan 1,03 mm²/s; bilangan asam 0,54 KOH/g, 0,56 KOH/g, 0,59 KOH/g; kalor 2155 kal/g, 2289 kal/g, 2307 kal/g; titik nyala 122⁰C, 130⁰C, 138⁰C. Karakteristik biodiesel densitas 50°C, bilangan asam, titik nyala telah memenuhi standar SNI. Sedangkan pada karakteristik berupa viskositas dan kalor tidak memenuhi standar SNI.

Kata kunci : Biodiesel, Minyak Jelanta, NaOH, Transesterifikasi, Variasi Suhu Reaksi

**ANALYSIS OF THE EFFECT OF HEATING TEMPERATURE ON
TRANSESTERIFICATION OF WOODEN OIL USING HETEROGEN
CATALYST NaOH IN BIODIESEL PRODUCTION**

ABSTRACT

Biodiesel obtained through the transesterification reaction is one of the alternative energy sources to replace renewable fossil fuels. One of the raw materials for biodiesel production is used cooking oil. This study aims to determine the effect of the transesterification reaction temperature of used cooking oil using a heterogeneous NaOH catalyst on the quality of the biodiesel produced. The transesterification reaction was carried out by reacting used cooking oil and methanol with a mole ratio of 2:1. The catalyst used is 1.5 grams. The reaction was carried out for 4 hours at reaction temperatures of 50 oC, 60 oC and 70 oC. The results of the analysis of the transesterification of cooking oil using a heterogeneous NaOH catalyst showed the success of methyl ester (biodiesel) synthesis. The methyl esters contained in the biodiesel from the reaction are methyl laurate, methyl myristate, methyl palmitate, methyl linoleate, methyl oleate, methyl stearate and methyl ricinoleate. Methyl ricinoleate content decreased with increasing temperature, namely at 60 oC and 70 oC. Physical characterization carried out on biodiesel with temperature variations of 50oC, 60oC and 70oC were density, viscosity, acid number, heat, flash point. The density of biodiesel is 0.8524 gr/ml, 0.8300 gr/ml, 0.8230 gr/ml; the viscosity values are 1.65 mm²/s, 1.16 mm²/s and 1.03 mm²/s; acid number 0.54 KOH/g, 0.56 KOH/g, 0.59 KOH/g; calor 2155 cal/g, 2289 cal/g, 2307 cal/g; flash point 1220C, 1300C, 1380C. Characteristics of biodiesel density 50oC, acid number, flash point have met the SNI standard. Meanwhile, the characteristics in the form of viscosity and heat do not meet SNI standards.

Keywords : Biodiesel, NaOH, Transesterification, Variation of Reaction Temperature, Waste Cooking Oil