PENGARUH SUHU, WAKTU, KECEPATAN PENGADUKA RASIO MOLAR METANOL TERHADAP EFEKTIFIT TRANSESTERIFIKASI PADA PEMBUATAN BIODIESEL D NYAMPLUNG (*Calophyllum inophyllum L.*)

EFFECTS OF TEMPERATURE, TIME, STIRRING SPEED, CATALYST, AND METHANOL MOLAR RATIO ON THE EFFECTIVENESS OF TRANSESTERIFICATION PROCESS IN BIODIESEL PRODUCTION FROM NYAMPLUNG (Calophyllum Inophyllum L.) SEED

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ABSTRACT

The aim of this research was to find appropriate transesterification conditions at production biodiesel production from Alexandrian laurel (Calophyllum inophyllum L.) seed oil. Nyamplung crude oil before transesterification was given degumming and esterification treatment. Condition process of transesterification is obtained to follow experiment influence of external factor to know affectivity of transesterification process. External factor covered temperature, time, speed of stirring, ratio of methanol molar and catalyst. Some of external factor that having significant transesterificationon effect is optimized to determine accuracy of level factor.

Experiment influence of temperature treatment, time, speed of stirring, ratio molar of methanol and concentration of catalyst is done separately use Completely Randomize Design (CRD). Biodiesel product is measurement viscosity and free fatty acid at end of transesterification. Optimization process is done to get optimum response useResponse Surface Method (RSM). Data is processed with Minitab 14 and SAS V6.12.

Transesterification process of nyamplung oilwhich can yield low of free fatty acid and viscosities is obtained at ratio molar of methanol to oil 6:1, catalyst NaOH 1%, temperature of transesterification 60 °C, time 30 minute and speed of stirring 400 rpm. Optimization from response FFA content, weight of product and methyl ester content from two significant factor effect is obtained at ratio molar of methanol 6,3:1 and optimum catalyst NaOH 1,1%

Keywords: *nyamplung oil, degumming, esterification, transesterification, biodiesel.*

PENDAHULUAN

Pemerintah Republik Indonesia menargetkan tahun 2005-2010 memproduksi biodiesel 2 % dari konsumsi solar (0.72 juta KL) dan pada tahun 2016-2025 memproduksi 5 % dari konsumsi solar (4.7 juta KL (PP No 5 tahun 2006). Indonesia memiliki banyak spesies tanaman penghasil minyak yang dapat digunakan sebagai bahan baku biodiesel. Salah satu jenis minyak rakyat yang dapat digunakan sebagai bahan baku biodiesel adalah minyak nyamplung atau minyak bintangur.

Minyak bintangur hasil pengepresan dengan alat kempa hidrolik mempunyi karakteristik kadar air 0.25 %, densitas