

ABSTRAK

Biodiesel dapat diproduksi dari minyak nabati, hewani, biomassa dan bahan lainnya yang memiliki asam lemak sehingga ketersediaannya di alam sangat melimpah salah satunya minyak CPO yang diaplikasikan sebagai minyak goreng. Penggunaan minyak goreng di kalangan industri rumah tangga maupun industri lainnya sering kali terbuang percuma setelah di gunakan minyak goreng bekas tersebut dapat dimanfaatkan menjadi biodiesel. Katalis kimia pada metode transesterifikasi menggunakan alkohol dinilai tidak ramah lingkungan karena menggunakan bahan yang bersifat B3, Sintesis biodiesel non-alkohol dapat dilakukan dengan menggunakan *metyl asetat* yang merupakan *green solven* tanpa katalis kimia dan menambahkan elektrolisis untuk membantu proses reaksi. Penelitian ini dilakukan dengan memvariasikan konsentrasi dari *methyl acetate* : minyak goreng bekas, 1:2 1:3 1:4 dan 1:5, tegangan arus listrik 30, 40 dan 50 Volt, dan waktu reaksi 25, 50, 75 dan 100 menit. Diperoleh biodiesel (*methyl ester*) diperoleh sebesar 3,84 % Area *retention time* 21.908 dan 2,12 % Area *retention time* 23.715. Berdasarkan hasil uji GC-MS pada sampel konsentrasi 1:3 dengan voltase 50 Volt dan waktu reaksi selama 100 menit dan meningkat pada konsentrasi 1:5 sebesar 9 %.

Kata Kunci : Biodiesel, *Methyl Acetate*, Interesterifikasi, Elektrolisis

ABSTRAK

Biodiesel is a common fuel produced from vegetable oil, animal fats, biomass, and other raw materials containing fatty acids, making it abundantly available in nature. One example is Crude Palm Oil (CPO), which is frequently used as cooking oil. The utilization in households and other industries often results in waste, but this cooking oil can be used to produce biodiesel. Furthermore, chemical catalysts in the transesterification method using alcohol are considered environmentally unfriendly due to the classification as B3 substances. Non-alcohol biodiesel synthesis can be carried out with methyl acetate, which is a green solvent, without chemical catalysts, and by incorporating electrolysis to assist the reaction process. Therefore, this study aimed to reduce the use of chemicals and improve process safety by applying electrolysis in the reaction process. The experiment was conducted by varying the concentration of methyl acetate to used cooking oil at ratios of 1:2, 1:3, 1:4, and 1:5, electric current voltages of 30 volts, 40 volts, and 50 volts, as well as reaction times of 25, 50, 75, and 100 minutes. The result showed that the biodiesel yield was 4% for the 1:3 concentration sample with a voltage of 50 volts and a reaction time of 100 minutes, which increased to 9% at a concentration of 1:5.

Keywords: Biodiesel, Methyl Acetate, Interesterification, Electrolysis