

Atinudda Ratchatasot 2011: Development of Continuous Biodiesel Production with Static Mixer, Ultrasonic and Microwave. Master of Engineering (Chemical Engineering), Major Field: Chemical Engineering, Department of Chemical Engineering. Thesis Advisor: Associate Professor Thongchai Srinophakun, Ph.D. 78 pages.

Even through most of biodiesel productions are batch processes, a combination of static mixer, microwave, ultrasonic, centrifugal and washing are proposed as the continuous biodiesel production. A computational fluid dynamics (CFD) is used to design of the static mixer and the continuous washing equipment. Both palm oil with 6:1 methanol to oil ratio and 1% wt potassium hydroxide are experimental used. In this part, the conventional stirred tank temperature is controlled at 60 °C, the static mixer, the microwave and the ultrasonic flow rate are set at 3 L/min. As a result, the static mixer showed the optimal condition for continuous biodiesel production. Washing operation includes the centrifugal separators suitable for separate between biodiesel and glycerol with the flow rate 1.5 L/min. The flow rates of biodiesel and water at 1:1 ratio varied from 1.5, 3.0 and 4.5 L/min, and the washing cycle from 3, 4 and 5 times. The result shows that the washing flow rate does not significantly affect to the purity of biodiesel and the cycle at 3 times is the optimal for continuous washing biodiesel production.

Student's signature

Thesis Advisor's signature

___/___/___