



The purposes of this research are to study the stirring of biodiesel in reactor and the production from beef tallow, emphasizing on optimized quantity and quality. Biodiesel is produced in a laboratory from beef tallow by transesterification reaction added with methanol and sodium hydroxide. Parameters such as, amount of catalyst, reaction time and reaction temperature, are varied to obtain an optimum values. Biodiesel quality is considered in each condition by yield and purity of methylester. Then properties of biodiesel and biodiesel standards are compared. Beef tallow oil then mixes and stirs with sodium methoxide in a 5 liter-batch reactor with circulation rate in reactor at 35 litre per minute. Two types of propellers are used which are six flat bladed-turbine and four bladed-45° inclined propeller, at a propeller speed of 600, 900 and 1200 rounds per minute. The samples of 5 millilitre are collected from the reactor at 5, 10, 15, 20, 30 and 60 minutes under optimum parameters. When circulation and stirring is considered, samples are collected from reactor by 5 millitre at 1, 2, 3, 4, 5, 10, 15, 20, 30 and 60 minutes. At the optimum condition, it is found that the molar ratio of methanol to oil is 6 : 1 with 0.5% (w/v) sodium hydroxide catalyst, reaction time is 30 minutes and reaction temperature is 50 °C. The final yield for biodiesel of the optimum condition is 91.5 % (v/v) with 97.6 % purity. And propeller type is four bladed-45° inclined propeller at speed of 1200 rounds per minute, stirring time at 5 minutes. The purity of biodiesel is 97.4%. When circulation is focused, the reaction takes 20 minutes which is 1.5-2 times longer than only when stirring is considered. It is noted that the effect of circulation and stirring does not show a better performance significantly due to the requirement of pumping system, resulting in an ineconomical production. Biodiesel produced from 5 litre-batch reactor costs 31.45 baht while that produced from a 50 litre-reactor costs 24.59 baht which is cheaper than B5 14.3%. It can be concluded that the biodiesel produced in this research is suitable to use as an alternative fuel in agricultural applications. Even though it is properties do not meet the standard of commercial biodiesel available in the market, its properties, at least, meet the requirement for the standard of community biodiesel.