

Sudaporn Sukchinda 2012: Developing Biodiesel Production from Waste Cooking Oil by Supercritical Reaction. Master of Science (Environmental Science), Major Field: Environmental Science, Department of Environmental Science. Thesis Advisor: Associate Professor Vittaya Punsuvon, Ph.D. 113 pages.

The objective of this research was to study the optimum condition of biodiesel production from waste cooking oil using supercritical reaction, which could reduce waste to environment. In this work the process parameters of molar ratio of methanol to oil 30:1 to 60:1, temperature 250 to 350°C, reaction time 5 to 45 minute, water content 0 to 5% and 500 rpm of stirring rate were studied. The property of the biodiesel obtained at the optimum condition was analyzed and compared to the community biodiesel standard of Thailand.

The result from this study showed the optimum conditions for biodiesel production from waste cooking oil using supercritical methanol were molar ratio of methanol to oil 50:1, temperature of 330°C, reaction time as 30 min and water content as 0 wt%. This condition gave 91.77% of fatty acid methyl esters. The quality of biodiesel met community biodiesel standard of Thailand.

The result comparison of biodiesel production showed that supercritical reaction gave higher purity and shorter time than transesterification reaction. In addition, glycerol obtained from this process had higher purity.

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Thesis Advisor's signature