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## Effects of Molar Ratio, Catalyst Concentration and Temperature on Transesterification of Triolein with Ethanol under Ultrasonic Irradiation

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The transesterification of triolein with ethanol to make biodiesel fuel was investigated under ultrasonic irradiation to evaluate the effects of the amount of base catalyst (NaOH or KOH), molar ratio of ethanol to triolein, and temperature. Transesterification of triolein with ethanol readily proceeded under 40 kHz ultrasonic irradiation and the most suitable condition at 25°C was a molar ratio of ethanol/triolein of 6/1, base catalyst concentration of 1 wt% for both NaOH and KOH, and reaction time of less than 20 min. In addition, the effect of temperature on the ethanolysis of triolein was investigated. The apparent activation energy estimated under ultrasonic irradiation was almost the same as that reported under stirring. The present results suggest that ultrasonic cavitation provides effective emulsification of triolein and ethanol, resulting in higher rate of transesterification reaction compared with that under stirring.

**Keywords:** [Triolein](#), [Ethanol](#), [Ultrasonic irradiation](#), [Biodiesel](#), [Base catalyst](#), [Transesterification](#)

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