

### Biodiesel production from rapeseed oil by enzyme

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Biodiesel (fatty acid methyl ester, FAME) is attractive as an alternative to fossil fuel. Commercial biodiesel is mainly produced by using chemical catalyst (acid or alkali catalyst) reaction. A number of studies by using enzyme catalyst (lipase) have been investigated in attempts to overcome the issues of chemical catalyst reaction. We have produced a rapeseed oil by using Novozym 435 for the enzyme catalytic process. Then, we obtained three optimum conditions, the molar ratio between oil and alcohol, the reaction temperature, and the water contents, by statistical response surface method (RSM). Statistical analysis shows that the highest conversion rate in the reaction is expected with the reaction temperature of 52.58°C, 1:2.26 (molar ratio) between oil and alcohol, and the water content of 20 wt%. The derived second order equation can be useful to design biodiesel producing process with rapeseed oil by using Novozym 435.