

## Optimization of a solvent-free batch process for transesterification of edible oils with lipase

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Manufacturing lipid products from natural resources normally yields significant amounts of low-value fats and oils next to the focused high valued processes. With better refining technologies these resources can be turned into value added products or at least converted into useful energy sources. Fats are possible to be converted into glycerine and fatty acid esters by alcoholysis. Fatty acid esters can be used instead of petroleum in ovens or diesel engines to provide thermal energy or, if purified, as food additives. Also, Monoglycerides, which are widely used as emulsifiers in the food industry and yield higher market prices than oils. The chemically catalyzed reaction of lipids with alcohols is simple to carry out, but can generate many side products like soaps and free fatty acids which can be tedious to remove from the reaction mixture. As an alternative the lipase catalyzed reaction is more selective and ideally leads only to monoglycerides and fatty acid esters. In this work the enzymatic reaction of edible oil with ethanol by various immobilized lipases in solvent-free system was investigated. For optimization of solvent-free system, the effect of temperature and molar ratio of alcohol to oil was investigated.