

Conceptual design of Biodiesel process and Economic analysis

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Biofuels are valuable sources of sustainable energy. Interest in them will rise tremendously in the coming years due to the perspective of a dramatic shortage of oil and gas reserves, simultaneously with an accelerated worldwide demand in fuels, namely in the large emergent economies.

Biodiesel consists of a mixture of fatty - acid esters. Fatty - acid methyl esters(FAME) are the most involved because methanol is the cheapest alcohol, but other alcohols, namely ethanol, may be employed as well. The manufacturing process is based on the transesterification of triglycerides by alcohols to fatty esters, with glycerol as a byproduct. In this way, highly viscous triglycerides are converted in long - chain mono esters presenting much lower viscosity and better combustion properties. Homogeneous or heterogeneous catalysis are used to enhance the reaction rate. Raw materials are vegetable oils, preferably nonedible, but also different wastes, such as used frying oils or animal fats (tallow).

In this research, conceptual design of alkali-catalyzed production of biodiesel from vegetable oil was studied and also economic analysis was performed.