

BIODIESEL PRODUCTION



Biodiesel Production Methods



Rapeseed
(Canola)

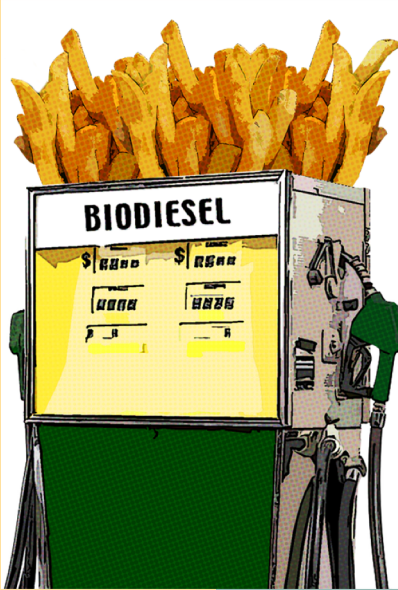
Source: Wikipedia

3- *Micro-emulsification*

Among the physical properties of raw vegetable oil, which makes it to be not directly used as fuel, is its viscosity. The formation of micro-emulsion is one of the potential solutions for solving the problem of vegetable oil viscosity. Micro-emulsion is dispersion made of water, oil, and surfactant(s) that is an isotropic and thermodynamically stable system with dispersed domain diameter varying approximately from 1 to 100 nm, usually 10 to 50 nm. The components of a biodiesel micro-emulsion include diesel fuel, vegetable oil, alcohol, and surfactant and cetane improver in suitable proportions. Alcohols such as methanol and ethanol are used as viscosity lowering additives, higher alcohols are used as surfactants and alkyl nitrates are used as cetane improvers.[7]



PRODUCE



The most eco-friendly source for biodiesel production is used cooking oil.

Source: bgprod

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4- *Transesterification*

Transesterification is the main convenient method to produce biodiesel from oil and fat feedstock types, which chemically resembles petroleum diesel. Through this method, oils and fats (triglycerides) are converted to their alkyl esters with reduced viscosity to near diesel fuel levels. This product is thus a fuel with properties similar to petroleum based diesel fuel, which enable it be used in existing petroleum diesel engines without modifications. Generally, transesterification is a reversible reaction, which simply proceeds essentially by mixing the reactants usually under heat and/or pressure. However, if some kind of catalyst is added to the reaction, it will be accelerated.[7]

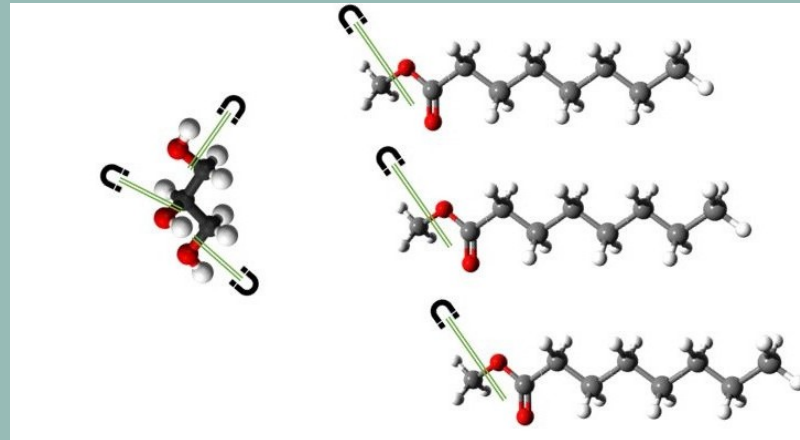
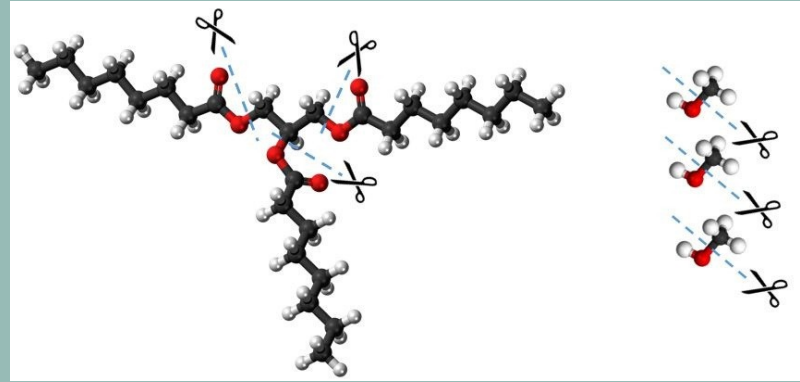


PRODUCE



Palm
Source: Verite

Biodiesel Production Methods

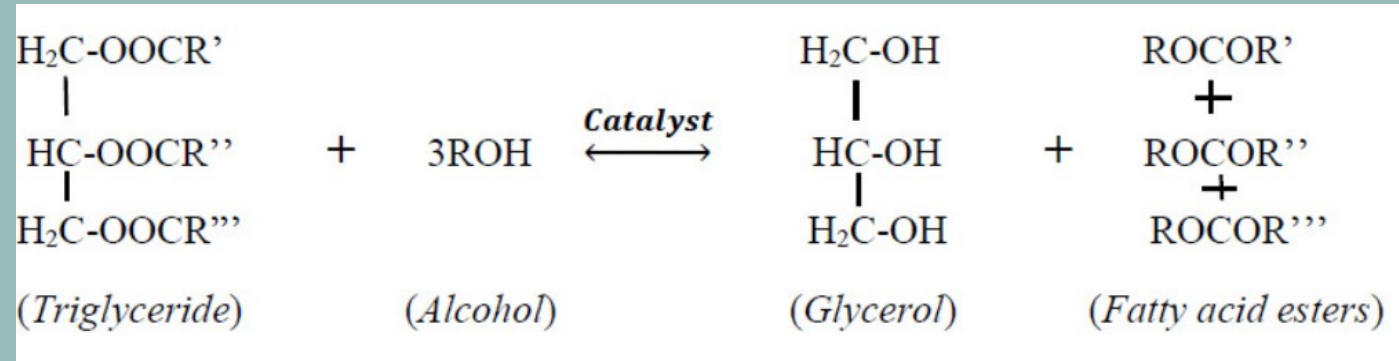


The first diagram shows one triglyceride molecule, and three methanol molecules. During the reaction process these molecules are cleaved / broken apart at the cut-lines on the diagram. and the chemical parts re-combining into Glycerol and Biodiesel[8]

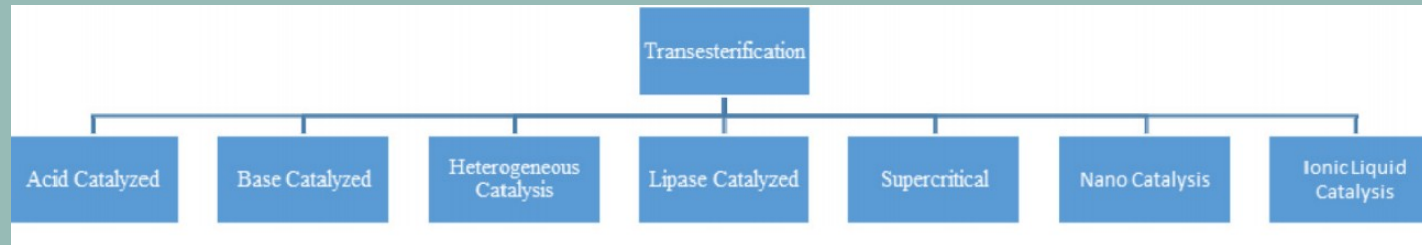


Sunflower seed
Source: HendricksFeed&Seed Co.

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The general chemical reaction depicting transesterification of triglycerides[7]



Schematic depicting major transesterification process types.[7]

REFERENCES

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