

Section: BIOFUELS
Commercial Biodiesel Production Methods

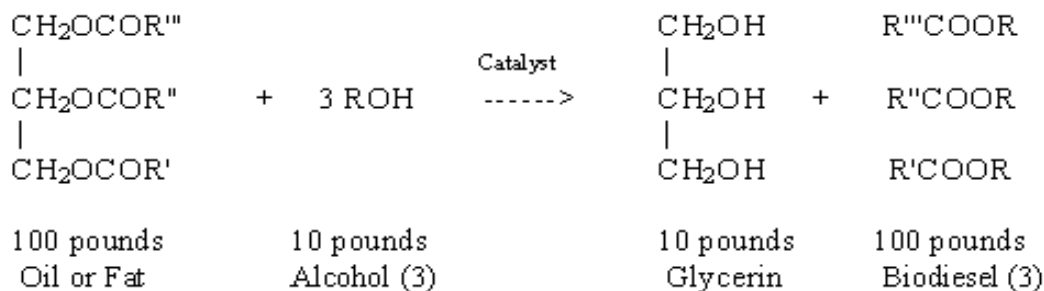
The production processes for biodiesel are well known. There are three basic routes to biodiesel production from oils and fats:

1. Base catalyzed transesterification of the oil.
2. Direct acid catalyzed transesterification of the oil.
3. Conversion of the oil to its fatty acids and then to biodiesel.

Most of the biodiesel produced today uses the base catalyzed reaction for several reasons:

- * It is low temperature and pressure.
- * It yields high conversion (98%) with minimal side reactions and reaction time.
- * It is a direct conversion to biodiesel with no intermediate compounds.
- * No exotic materials of construction are needed.

The chemical reaction for base catalyzed biodiesel production is depicted below. One hundred pounds of fat or oil (such as soybean oil) are reacted with 10 pounds of a short chain alcohol in the presence of a catalyst to produce 10 pounds of glycerin and 100 pounds of biodiesel. The short chain alcohol, signified by ROH (usually methanol, but sometimes ethanol) is charged in excess to assist in quick conversion. The catalyst is usually sodium or potassium hydroxide that has already been mixed with the methanol. R', R'', and R''' indicate the fatty acid chains associated with the oil or fat which are largely palmitic, stearic, oleic, and linoleic acids for naturally occurring oils and fats.



Source:

National Biodiesel Board, Fact Sheet "Biodiesel Production and Quality,"
<http://www.biodiesel.org/resources/fuelfactsheets/default.shtm>
http://www.biodiesel.org/pdf_files/fuelfactsheets/prod_quality.pdf

Note: The term glycerin may include glycerol and related co-products of the glycerol production process.