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BIODIESEL PRODUCTION FROM VEGETABLE OILS: AN OPTIMIZATION PROCESS

D. HYMAVATHI[1], G. PRABHAKAR[2] & B. SARATH BABU[3]

[1]SRF, Department of Chemical Engineering, S.V. University College of Engineering, Tirupati, Andhra Pradesh, India

[2]Professor, Department of Chemical Engineering, S.V. University College of Engineering, Tirupati, Andhra Pradesh, India

[3]Assistant Professor, Department of Chemical Engineering, S. V. University College of Engineering, Tirupati, Andhra Pradesh, India

ABSTRACT

Biodiesel production has received considerable attention in the past as a biodegradable and non polluting fuel. The production of biodiesel by transesterification process employing alkali catalyst has been industrially accepted for its high conversion and reaction rates. The use of methoxide as a catalyst to perform the transestirification reaction into biodiesel in this work. The effect of the most relevant variables of the process such as reaction temperature , molar ratio between alcohol and oil, amount of catalyst and amount of free fatty acids fed with oil have been analyzed .for this purpose , an ideal sunflower oil using lauric acid and palm oil, coconut oil also used. The alcohol used was methanol. Fats and oils are chemically reacted with alcohol to produce chemical compounds known as fatty acid methyester (Biodiesel). Glycerol, used in pharmaceuticals and cosmetics industry along with many other applications, is produced in this reaction as a product. The cost of biodiesel, however, is main hurdle in commercialization of the product. The used cooking oil as raw material, adoption of batch transesterification process and recovery of high quality glycerol from biodiesel product stream are primary option to be considered to lower the cost of biodiesel.

There are four primary ways to make biodiesel, direct use and blending, micro emulsions, thermal cracking and transesterification. Transesterification reaction is effected by molar ratio of glycerides to alcohol, catalyst, reaction temperature ,reaction time and free fatty acids water content of oils or fats .the process of transesterification and its downstream operatons also addressed. The transesterification of free fatty acid using this homogeneous catalyst appears as a great alternative and producing high conversion around 98.2%.

KEYWORDS: Biodiesel, Glycerin, Vegetable Oils, Ethanol, Methanol, KOH and NaOH