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Uses of Renewable Fuel

Solaimuthu C[1], Lokesh P[2], Bala Krishnan[3], Kumar M[4], Sharath G[5], Akshit Kochhar[6], Gaurav Bhandary M*[7]

[1,2]Faculty of Mechanical Engineering, RV Institute of Technology and Management, Bengaluru, India.
[3]Professor and Head of Mechanical Engineering, Gnanamani College of Engineering, Namakkal, Tamil Nadu, India.
[4,5]UG Scholars of Mechanical Engineering, Gnanamani College of Engineering, Namakkal, Tamil Nadu, India.
[6,7]UG Scholars of Mechanical Engineering, RV Institute of Technology Management, Bengaluru, India.

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Abstract: Renewable Fuel is a substitute fuels obtained from a variety of feed-stocks, including non-edible and edible oils and animal fats. At present, renewable fuel is mainly created from grown vegetable oils such as jatropha, sunflower oil, palm and soybean. The price of bio-fuel is the main obstacle to commercialization of the product. Bio-fuel produced from non-edible or edible oils is presently not feasible. On the other hand, extensive use of edible oils for bio-fuel production may lead to food crisis. Bio-diesel is just one source, but a very much important fuel. The contribution of cotton-seed as a source for bio-diesel production will be of great importance in the coming day. In India non-edible plant is a widely grown up termed as a divine tree due to its wide relevance in many areas of study. The current study deals with bio-fuel production from raw vegetable, which is mono-ester produced using esterification process. It has high lubricity, clean burning fuel and can be a fuel component for use in existing CI engine. Filtered vegetable oil (bio-fuel) could be used as an alternate fuel for CI engines because the properties like density, kinematic viscosities are very much comparable with petrol-diesel.

Keywords: CI Engine, Raw Oil, Non-Edible Oils, Diesel.

INTRODUCTION

Renewable Energy Fule such as non-edible plant is a large tree growing The bio-diesel was produced from raw oil using trans-esterification process and the same has been used as a substantial fuel for conventional diesel engine without any changes on engine parts [1]. The bio-diesel was produced and has gained international recognition as an engine fuel additive. It is favored for its low toxicity, high degradability, general reduction of engine emissions and its role in sustainable development [2]. The operation was done for the CI engine fuelled with B-100. Alkali-catalysed transesterification much faster than acid-catalysed esterification and is often used generally (Fig 1).

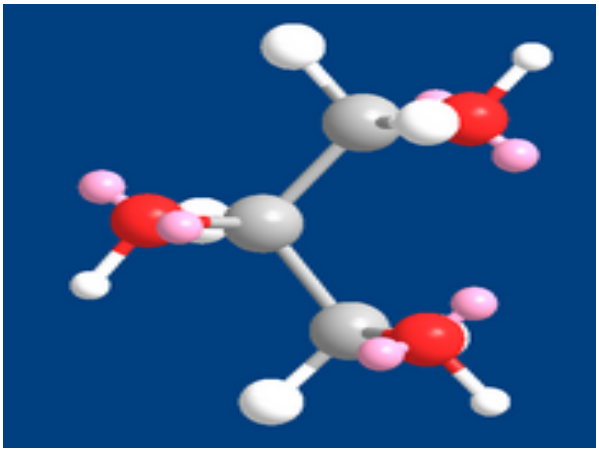

Figure 1: Glycerol Structure

LITERATURE SURVEY

Vegetable oils can be directly used as fuels for running diesel engines. The researchers stated that the esters produced good thermal efficiency and less smoke [3]. The static injection timing had to be improved for better performance with edible and non-edible oils [4]. The researchers concluded that the esters of sunflower oil give better combustion and lower emissions [5]. The researchers concluded that the edible and non-edible oil gives significant reductions in emissions while compared to conventional fuel [6]. The neat rubber seed oil, neat diesel and their different blends were compared in terms of properties, performance, combustion and emissions on single cylinder DI diesel engine at maximum load condition. The blend of rubber seed oil with diesel performed well as compared to neat diesel and neat rubber seed oil. It has been established by the present experiments, that 50-80% of rubber seed oil can be substitute for diesel engine easily in the CI engines without any major modification and operational difficulties [7].

OBJECTIVE

The main aims of the current work are to utilize the various non-edible or edible oils for producing the bio-diesels to reveal the way that multiple aims are created in energy and environmental norms. Bio-fuels are endorsed as replacements for road transport items, but bio-fuel norms is also geared towards socio-economic aims such as strategic aim and agricultural

***Corresponding Author:** Gaurav Bhandary M

purpose such as security of renewable energy applications.

DESIGN

List of Compositions of Fatty Acids:

Mahua	
O. acid	37 to 44%
Palmitic Acid	25 to 26%
Stearic Acid	21 to 32%
Linoleic acid	9.1 to 16 %
Arachidic	0.2% to 2.9%

Jatropha	
O. acid	43.1 %
Linoleic acid	34.3 %
Palmitic acid	14.2 %
Stearic acid	6.9 %
Other acids	1.4 %

Pongamia	
O. acid	45.1 to 72 %
Linoleic acid	11 to 19 %
Eicosenoic acid	10 to 13 %
Behenic acid	5.1 to 4.9 %
Palmitic acid	4.1 to 8.1 %
Stearic	3 to 9 %
Arachidic acid	3.1 to 5.1 %
Lignoceric acid	0.9 to 4.1 %

Almond	
O. acid	59 to 70%
L. acid	9 to 20%
P. Acid	7 to 8%
S. Acid	1 to 3%
A. L Acid	1 to 2%

Coconut	
L. acid	39 to 50%
Myristic acid	16 to 20%
Palmitic acid	3 to 10%
Capric acid	3 to 7 %
Oleic	1 to 7 %
S. acid	1 to 4 %
Linoleic acid	1 to 3 %

Neem	
O. acid	50.1 to 62%
Stearic	15.1 to 25.2%
Palmitic acid	14.1 to 17.1 %
Linoleic acid	3.1 to 16.1 %
Arachidic acid	1.1 to 4.0%
M. acid	0.3 to 3.1%

Safflower	
L. acid	69 to 81%
O. acid	3 to 14%
P. Acid	1 to 8%
Stearic Acid	1 to 3%
A. L. Acid	1 to 2%

Sunflower	
L. acid	59 to 71%
O. acid	16 to 20%
P. Acid	1 to 8%
S. Acid	1 to 6%
A. L. Acid	1 to 2%

Fig 2 shows that the flow chart of bio-fuel production. The chemical compounds, C_{16}-C_{18} and C_6-C_{12} give carbon chain. The esters of isopropyl act as good agents. But, these items are fatty acids only.

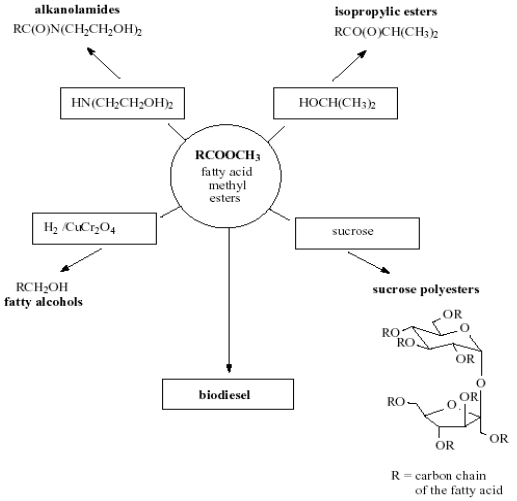

Figure 2: Bio-Fuel Production

METHODOLOGY

Bio-diesel production is the method of producing the bio-fuel, bio-diesel, through the chemical rejoinders of esterification and transesterification (Fig 3). This involves edible or non-edible or animal fats and oils being reacted with short-chain alcohols (typically methanol or ethanol). The alcohols used should be of low molecular weight.

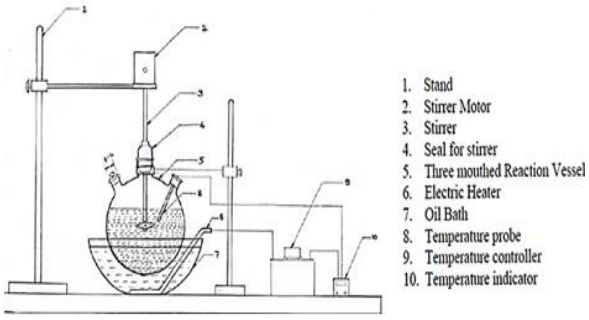

Figure 3: Bio-Fuel Production

CONCLUSIONS

Bio-fuel generation from oil palm by a process that use ethanol produced from the solid scums of the

***Corresponding Author:** Gaurav Bhandary M

same palm instead of methanol, offered degree of integration and decrease of environmental impacts compared to the individual production of bio-fuel.

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***Corresponding Author:** Gaurav Bhandary M