



BIO FUELS AS AN ALTERNATIVE: A SHORT REVIEW

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Abstract: The world is getting modernized and industrialized day by day which result in increase of vehicles and engines. But on other hand the energy sources used in these engines are restricted and decreasing gradually. The dramatic increase in usage of fossil fuels has also caused unprecedented changes to the global environment and climate. The need of a renewable, sustainable and alternative fuel for engines arises so that all the aspect is able to cover. This situation leads to seek an alternative fuel for engines that are bio fuels. Bio fuels are a non-toxic, eco-friendly and renewable alternative fuel that can be used in engines with slight modification. Bio fuel is currently expensive but could be produced from low-cost. In this paper study on different bio fuels has been reviewed to explore the benefits of it's over fossil fuels as an alternative fuel.

Index Terms - Bio energy, Diesel, Fossil fuels, engines, Bio fuels.

INTRODUCTION

The availability of energy resource plays a basic part in the development of a country. All the human energy needs are at present fulfilled from the fast depleting fossil energizes directly results in serious environment consequences. In the course of the most recent centenary, there has been more than 20 times increase in the utilization of energy overall and every single notable source with the exception of hydropower and atomic power are the limited sources and eventually are prone to be depleted in not so distant future [1.2]. The quick increase in the utilization of fossil The availability of energy resource plays a basic part in the development of a country. All the human energy needs are at present fulfilled from the fast depleting fossil energizes directly results in serious environment consequences. In the course of the most recent centenary, there has been more fuels is coming into environmental change which is contemplated as the most crucial ecological issue of the present century and the late focus thus shows that the discharge of green house gases to the climate have added to the increase in the worldwide mean temperature by around 0.8°C during the previous century. The effect of environmental change on the biological community and human social orders has encourage to grow eco-friendly and renewable sources like solar, wind, small hydro, biomass, etc. Renewable energy sources in general and biomass energy in particular is competent of reducing our leaning on foreign import there by increasing the security of energy supply. The ethanol and biodiesel are the two liquid bio fuels that can replace substitute gasoline, diesel respectively. Production and utilization of the bio fuel would give rise to new economic opportunities in term of generation of job opportunities in rural areas in addition to immune the environment [3,4]. Biodiesel and ethanol got from biomass food stocks can give optional replacement to Petro diesel and gas individually. Biodiesel can be gotten from various delectable and non-consumable oil assets and non-eatable seed plant. The oil from these plants can be transesterified by preferable system relying upon its FFA content for the formation of biodiesel that can be utilized to run engines.

BIODIESEL

Bio-diesel consists of mono alkyl esters obtained from vegetable oils, creature or old cooking fats. Bio-diesel contains no petroleum diesel, yet it can be mixed with petroleum diesel. Mono-alkyl esters of long chain unsaturated fats (biodiesel) is an encouraging replacement of Petro diesel fuel that can be originated from regular, renewable assets, for example, wide assortment of vegetable oils and creature fats. These assets are nontoxic and biodegradable. The term, biodiesel, was first introduced in the United States during 1992 by the National Soy development Board (presently National Biodiesel Board), which has instigated the commercialization of biodiesel in the USA [5].

- Bio-diesel is a clean burning fuel.
- Bio-diesel does not have any toxic emissions like mineral diesel.
- Bio-diesel is made from any vegetable oil such as Soya, Canola, Palm, Coconut, mustard, peanut or from any animal fat like Lard or Tallow.

- Bio-diesel is a complete substitute of Mineral diesel.



Fig: Bio-diesel [13]

SEPARATION OF BIO-FUELS

Solution to the viscosity problem has approached in at least four ways [6,7]:

- by dilution
- by preparation of methyl esters trans-esterification
- by micro emulsification
- by Pyrolysis or thermal cracking

PROPERTIES OF BIO-FUEL

If fuel is to be used in the existing engines, some required properties of the fuel such as kinematic-viscosity, the self-ignition response, the net heating value, the gross heating value and density must be considered [8,9,10].

Viscosity: The bearing infusion in open ignition chamber through spout and example of fuel splash chooses the instance of burning and thermal productivity of the engine. Viscosity assumes a fundamental part in the ignition. Low viscosity can give rise to unreasonable inside pumping spillage where as high consistency can expand framework weight to unsuitable levels and will impact infusion amid shower atomization. This effect is elementary especially at low speed or light load condition as immaculate vegetable oils have high consistency. The subordinators of vegetable oils are called creatures and have low kinematics consistency than that of oils. The monoesters can give stable arrangements in extensive variety of extents with diesel fuel, vegetable oils and with alcohol as well. They can be solubilizers and can likewise make it conceivable to impact the viscosity of mixed oils.

Self-ignition response: It is carried out by the cetane number and for a decent diesel fuel the quality must be not lower than 45. The cetane number of vegetable oils is not exactly the diesel. The cetane number of monoesters, on a normal, is over that of vegetable oils. For instance, neem and karanji oils with diesel mixes of 10% level have cetane number around 40-45 and at 20% level have cetane number around 35-40.

The energy content or heating value: The specific heating values of the various vegetable oils are nearly the same. They run from 30.5-40.5MJ/Kg and for energizes it are around 42.4MJ/Kg. The calorific or warming estimation of vegetable oils is more, it decreases the amount took care of and to augment gear working reach. It is constantly attractive for vegetable fills to have warming esteem closer to diesel oil at 35-40.

Pour point, cloud point and flash point: Initial two properties are important for cool climate operation. For acceptable working, the evaluations of both are well beneath the point of solidification of oil utilized. Streak point is important from wellbeing approach. The temperature condition chosen for all intents and purposes is as high as expected under the circumstances. Average estimations of vegetable fills ranges between 50 and 110 c expansion of vegetable oil with diesel to frame a mix ought not diminish the flash point temperature.

ALTERNATIVE FUELS

The selection of alternative fuels for IC-engines include the following factors [10,11,12].

- Should be available in plenty and derived continuously from renewable sources.
- They should have high specific energy content.
- Should permit easy transportation and storage.

- Should cause less environmental pollution.
- Should be safe in handling.

The various alternative fuels for compression ignition engines are as follows.

- Ethanol
- Methanol
- Bio-gas
- Compressed natural gas
- Natural gas
- Hydrogen
- Methane
- Liquefied petroleum gas
- Vegetable oils

BENEFITS OF USING BIO-FUEL

Important outcomes of localized energy generation using bio-fuel in developing countries are as follows [12]:

- As fuel in stationary or mobile engines for water pumping (irrigation), grain milling, transportation, lighting and heating and cooking.
- Poverty reduction, especially that of women, by stimulating economic activities in rural areas by using the products of such plants for the manufacture of soap, medicines, lubricants, chemicals, fertilizers, insecticides.
- Environment improvement through land reclamation, erosion control, enhanced soil fertility, a better microclimate and GHG mitigation i.e. expanded options for carbon dioxide abatement.
- A reduced consumption of firewood and residues in rural areas hence a decrease in the deforestation rate.
- An increase in the gross domestic product (GDP).
- A reduction of expenditure of imported fuels for rural consumption.
- The establishment of decentralized energy generation based on the use of plant oil.

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