

Preparation of Biodiesel from cooking oil

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Abstract— In recent times biodiesel fuel has made it more attractive in the point of view of environment benefits. The cost of biodiesel is profit oriented in comparison to petroleum-based diesel fuel. The high cost is primarily due to the raw material, mostly neat vegetable oil. Profitable source for biodiesel production is cooking oil. However, the unwanted particles present in oil can affect the transesterification reaction and the biodiesel properties. This paper attempts to review various technological methods of biodiesel production from cooking oil. The analytical methods for high quality biodiesel fuel from cooking oil have also been summarized in this paper. The properties of biodiesel fuel from used cooking oil were also checked and compared with those of standard diesel fuel.

Keywords— *Transesterification, cooking oil, biodiesel.*

I. INTRODUCTION

Biodiesel can be made from a variety of oils, fats, and greases. It can provide an business for vegetable oils and animal fats and allow farmers to grow the fuel. Biodiesel is a renewable source of energy that can help reduce pollution. It harms in small amount hence contributes less to global warming because the carbon content in the fuel was removed from the air by the raw material.

In addition, biodiesel produces less air pollution than diesel made from fossil fuels. A study found that using pure biodiesel in local buses results in considerable reduction in life cycle emissions of total particulate matter. Biodiesel and its blend have larger cetane number than that of diesel, resulting in earlier combustion. Due to this difference in cetane number, the use of biodiesels lessers the ignition delay compared to standard fuels. The cylinder pressure increases due to higher cetane number and the reduced ignition delay. The other reason for improved combustion is higher oxygen content in biodiesels. In comparison with conventional diesel fuels, biodiesels promote more complete combustion and thus effectively reduce emissions, carbon monoxide and smoke.

II. PROBLEM DEFINITION

1. Recent studies shows that the oil is main or efficient source of energy.
2. Due to increase in demand for clean fuels biodiesel becomes the grester relief source of problem.
3. After heating oil up to 60 C the problem arises as the separation and the how to know that the layer is separated.
4. The use of used cooking oil minimizes waste to the disposal, which contaminate water. hence various methods of preparation of biodiesel must be searched which is don't lead to any harmful impact

III. PROPOSED METHODOLOGY

- Heat 250ml of oil at 60° C to remove moisture content.
- Add NaOH into 160ml of methanol and heat separately. After 15min mix both solutions in a beaker.
- Stir the mixture at 60° about 25-30 minutes.
- After 30 minutes transfer mixture into a separating flask and shake thoroughly.
- Let the mixture be settle upto 24Hrs at room temperature.
- Separate the glycerin and crude biodiesel.

To improve the quality of biodiesel add equal amount of water into conical flask and shake thoroughly and leave to settle and decant and the water out.

IV. OBJECTIVES

1. Identification and selection of feedstock for preparation of biodiesel
2. Collection and purification of seeds.
3. Preparation of biodiesel by using esterification and trans-esterification reactions.
4. Preparation for blends of biodiesel with diesel fuel.
5. Quality testing of all biodiesel with blends along with diesel fuel.(Density, viscosity, flash point, fire point, cetane no, calorific value, cloud point, moisture)
6. Engine performance analysis of all blends. (Brake power, brake thermal efficiency, indicated power, brake specific fuel consumption, braking torque.)
7. Combustion analysis-preparation of heat balance sheet.
8. Search of best blends that will substitute diesel fuel without modification in diesel engine.
9. Smoke analysis for all blends with diesel fuel.

V. FUTURE SCOPE

Biodiesel and waste oils may not eradicate the world's energy problem, yet it could be a good fuel additive and alternative fuel for many uses. As the stock of fossil fuel is getting depleted, emphasis should be given to renewable sources of fuel such as sustainable bio-fuel crops and tree-borne oilseeds. It is expected that the price of biodiesel will be lower than the price of conventional diesel fuel in the near future. The small partial replacement of diesel with biodiesel will alleviate the pressure on existing diesel oil resources and decrease import case of diesel fuel.

VI. CONCLUSION

In this project various type of blends from jatropha, karanja, palm oil are made and their performance characteristic on IC Engine are tested, to compare the result between all different type of blends. And finally to decide which blend of these oils are effective in economy as well as safe from environment point of view. This will lead to reduction in pollution due to biodiesel. The use of these seeds as a raw material for biodiesel production has proved to be of substantial value as compared with other choices of raw materials of various origins. Hence there is a need of producing alternative fuel which in this case biodiesel which will solve the problem. For greater efficiency multiple blends should be tested for different feasible and infeasible properties.

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