

Performance and Emission Analysis of Waste Tyre Bio-Diesel from Pyrolysis Oil

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Abstract- There is an increase in the production and consumption of tyres the day go by. All tyres need to be disposed after their usefulness, as waste. The needs to manage this waste from tyres become more apparent. This leads to pyrolysis, which is a way of making to become very useful to us by recycling them to produce fuel oil. In this study, tyres wastes were used for the pyrolysis to get fuel oil that has the same physical properties as the fuel used in aviation industry (JP-4). The experiment was carried out in such a way on, thermal pyrolysis

INTRODUCTION

This compendium of technologies aims to present an overview of the technologies available for converting waste tyres into a resource. It emphasizes the typical methods for converting waste tyres into solid, liquid and gaseous fuels as well as the direct combustion of waste tyres for specific applications.

Tyres which are suitable for each type of fuel and the potential problems posed by contamination by undesirable materials. depict flowcharts of typical production systems for solid, liquid and gaseous fuels and refers to other technologies used in the steel, cement and lime manufacturers.

TPO as a Fuel in IC Engines:

Williams et al [6] studied the compounds present in TPO along with its combustion in a ceramic lined furnace. Their investigation revealed that TPO has PAH in high concentrations. They found high SO₂ and NO_x emissions. To avoid PAH, they proposed combustion under excess oxygen conditions.

PYROLYSIS OIL:

Pyro: heat, lysis: breakdown into parts. Pyrolysis is chemical reactions in which large molecules are broken down into smaller molecules. Simplest example of pyrolysis is cooking in which complex

food molecules are broken down into smaller & easy to digestible molecules

PRINCIPLE

In our experiments, commercialize available shredded tyres were procured and washed before pyrolysis. One of the most favorable and effective disposing method is pyrolysis, which is environmental friendly and efficient way. Pyrolysis is the thermal degradation of solid wastes at high temperatures (300-900°C) in the absence of air (and oxygen). As the structure of products and their yields can be considerably modified by catalysts, results of pyrolysis in the absence of catalyst were presented in this article Pyrolysis of waste tyres was carried out in an indigenously designed and fabricated reactor.

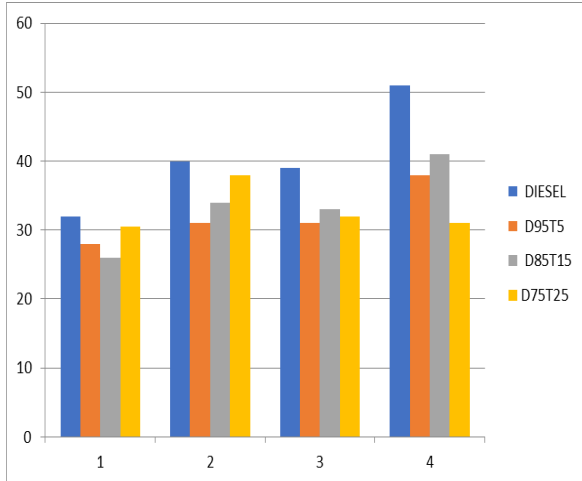
EMISSION CHARACTERISTICS

Internal Combustion engine emissions have been major contributor to air pollution regulated pollutants are carbon monoxide (CO), NO_x, and unburned fuel or partly oxidized HC

HC EMISSION:

HC emission is higher in diesel achieve to the blend. HC emission increase in different load. HC emission lower in case of D75T25. the higher HC emission is the diesel at the load 9 kg. HC emission at the D95T5 at the load 7 kg.

The effect of different tyre pyrolysis oil blends with varying loads on Hydrocarbon emissions From above graph its being concluded that the Hydrocarbon emission from T5D95, T25D75 tyre pyrolysis oil blend is lesser than the diesel as well as all other blends taken for experiment at all loading conditions



ADVANTAGES:

- Corrosion is less.
- No need of engine modification.
- Residue can be used as paraffin wax.
- Less amount of residue and large amount of product.
- Tyre wastes can be reduced

DISADVANTAGES:

- Large amount of the input is needed.

APPLICATIONS:

- It can be used in the industrial fuel production and consumption
- It can also be used for the domestic purposes also.

CONCLUSION

A strong multidiscipline team with a good engineering base is necessary for the Development and refinement of advanced computer programming, editing techniques, diagnostic Software, algorithms for the dynamic exchange of informational different levels of hierarchy. Simulation techniques are suitable for solving some of the problems.

We gained a lot of practical knowledge regarding, planning, purchasing, assembling and machining while doing this project work. We are proud that we have completed the work with the limited time successfully. The “PERFORMANCE AND EMISSION ANALYSIS OF WASTE TYRE BIO-DIESEL FROM PYROLYSIS OIL “is working with satisfactory conditions. We are able to understand the

difficulties in maintaining the tolerances and also quality.

We have done to our ability and skill making maximum use of available facilities. Thus, we have developed an “EXTRACTION OF BIO-DIESEL FROM TYRE WASTE MATERIAL” which helps to know how to achieve extraction of bio fuel from plastics. By using more techniques, they can be modified and developed according to the application.

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