Plastic Waste to Fuel or Biofuel

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Abstract - This project is concerned with the methods of changing plastic waste to fuel known as pyrolysis which is thermal degradation of materials in an atmosphere devoid of oxygen. This is accomplished by applying tremendous heat to the plastic causing degradation into smaller hydrocarbon products which include liquid fuel, gas and char residue among other things. The liquid fuel can be upgraded further to produce various useful hydrocarbons such as diesel and gasoline, and the gases may be used as a means of recovering energy. This project aims to show how plastic waste which is usually a problem can be turned into a useful source of fuel to cut down waste and improve energy practices. This project can be described as an important strategy in addressing two key problems of global significance: management of plastic waste and sustainable energy generation. With the increase of global plastic pollution and fossil fuels waning, there is an urgency in coming up with new strategies to resolve these environmental dilemmas. Such a solution includes the process of changing plastic waste into diesel fuel which not only reduces plastic waste but also enables the harnessing of an energy source.

I.INTRODUCTION

In the face of rising environmental concerns, plastic waste has emerged as a significant challenge, impacting ecosystems and contributing to pollution worldwide. One innovative solution is the conversion of plastic waste into fuel, offering a dual benefit: waste reduction and energy recovery. This project explores the feasibility of transforming non-recyclable plastics into usable fuels through processes like pyrolysis, depolymerization, or gasification. By breaking down plastic polymers at high temperatures in an oxygen-free environment, hydrocarbons can be recovered and converted into liquid fuels, such as diesel or gasoline.

The project focuses on understanding the science behind these processes, evaluating the energy output, and assessing the environmental impact of the fuel produced. The approach not only helps manage plastic waste more effectively but also offers a renewable energy alternative, contributing to circular economy principles. Through this study, we aim to address the pressing issue of plastic pollution while promoting sustainable practices in fuel production. Plastic waste, particularly non-recyclable plastic, represents a significant portion of global pollution, threatening marine life, ecosystems, and human health. This project aims to tackle this issue by exploring the conversion of plastic waste into fuel. Through advanced thermochemical processes, plastic materials are transformed into synthetic fuels, creating a renewable energy source. This study will analyze the efficiency of various methods, such as pyrolysis and depolymerization, to break down plastics and assess their potential to produce high-energy fuels. By turning waste into a resource, this approach could play a key role in addressing both environmental pollution and energy shortages.

II.OBJECTIVES

- Propose an alternative idea to reduce plastic waste.
- To prepare fuel from plastic waste.
- To determine the properties of obtained fuel.

III.METHODOLOGY

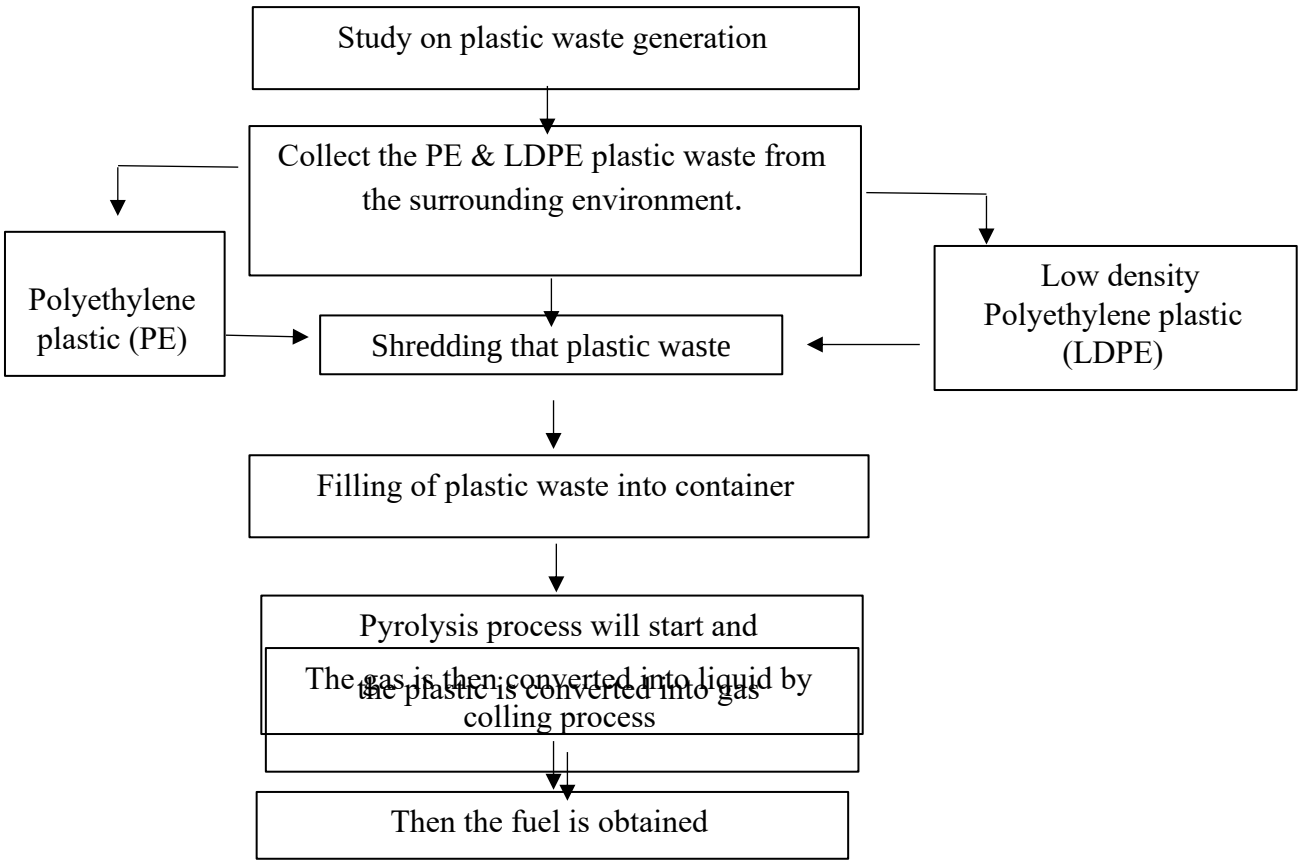

Fig.no.1: Model of plastic waste to fuel

Result and discussion

Property: Density

SAMPLE 1

Weight of beaker = w1 = 45.16gm

Weight of beaker with fuel = w2= 58.65gm

Volume of sample = 20ml

Density = mass/volume

= w2-w1/20

= 58.65-45.16/20

= 0.67g/cc

SAMPLE 2

Weight of beaker = w1 = 45.16gm

Weight of beaker with fuel = w2= 67.12gm

Volume of sample = 30ml

Density = mass/volume

= w2-w1/30

= 67.12-45.16/30

= 0.73g/cc

SAMPLE 3

Weight of beaker = w1 = 45.16gm

Weight of beaker with fuel = w2= 71.85gm

Volume of sample = 40ml

Density = mass/volume

= w2-w1/40

= 71.85-45.16/40

= 0.66g/cc

IV.CONCLUSIONS

From this project proposing the alternative solution for the plastic waste reduction. By the pyrolysis process the fuel is obtaining. The obtained fuel will be used for burning purpose for industrial use. The remaining generated gas will be used for burning process. From approximate 1kg of plastic waste approximately 80-100ml liquid fuel is obtained. The plastic waste is reduced from environment.

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VI. REFERENCES

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