3rd National Conference on Green Technology and Science for Sustainable Development
© 2020 IJSRST | Volume 5 | Issue 6 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X
International Journal of Scientific Research in Science and Technology

Plastic Wastage Converted into Fuel As An Energy

Altaf Husain Shaikh Hasan*, Dyaneshwar P. Garkal, Ganesh R. Sathe, Tejas S. Dongardive
B.E Scholar, Department of Mechanical, Anuradha Engineering College, Chikhli, Buldana, Maharashtra, India

ABSTRACT

Plastic is an integral part of our modern life which are used in almost all our daily life activities. Over a 280 million of tone's of plastics are produced in an across the worldwide and the used products have become a common feature at overflowing of bins and landfills which is used in across the world. Here, the process of converting the wastage of plastic into fuel is an explained by simple solution for recycling of plastics Converting the wastage of plastics into fuel by holding the great promise for both the environmental and economic scenarios in daily life. Thus, the process of converting plastics into the fuel it is best opportunity for converting the waste plastic material by applying the pyrolysis method which is simplest and economic method. Also the major problem is that over 1.3 billion metric ton of plastic is being manufactured every year to meet the demands of modern world. Disposal of waste plastic is of great concern for everybody as it takes decades to decompose if left at its own. Conversion of plastics to fuel is a hope to solve both the problems. Pyrolysis it is the method in which the thermo chemical of organic matter is decomposed at high temperature which is greater than the 300 degree celcius in the absence of oxygen. But the pyrolysis is efficient method for converting the plastic material into the fuel and use as an alternative fuel in future life.

Keywords : Plastic waste, Pyrolysis, Green technology, Low density plastic waste.

I. INTRODUCTION

Plastics plays an important role in day to day today life, it is a certain application in which they have an over range of conventional materials. Instated of their light weight, durability, energy efficiency ,light weight of plastic waste which with the faster rate of production and more design flexibility, have allowed to break through in the fields of ranging from non-conventional energy source material due to the horticulture and irrigation, water-purification systems and even space flight. Plastic is a very cheaper material which is available in the form waste products by throwing it into the surrounding. Plastic waste management it is the major problem across the world due to its non-degradable property.

Economic of growth and changing of consumption and production patterns are resulting into rapid increase due generation of waste plastics across the whole world.

II. PLASTICS WASTAGE AVAILABLE IN THE ENVIRONMENT

There are three millions of tones of waste plastics are produced every year in the U.K.(United Kingdom). From that only 7% of plastic which are recycled.

But in the present recycling process usually the plastics end up at city landfills or an incinerator.

As the increasing of the technological trend, the engineering profession from the technology plays an important role in the disposal of plastic waste.

The recycling of the plastic is only about one percent of waste plastic in the fuel from waste in developed countries in all over the world where as recycling rate in India is very high up to 20% of waste plastic.
According to the Global Environment Protectional Agency [GEPA] said that by the year 2004 the amount or percentage of plastic thrown away will be 65% greater than that in the 1990's.

III. DEMAND OF FUEL

The current rate of economic growth is an un-sustainable or unavailable without of saving of fossils energy like a crude oil natural gas or coal. world which can consumed of the liquid and petroleum products grows from 186.1 million barrels per day. That why the availability of fuel is decreasing from last few year.
Waste plastic to liquid fuel is also an alternate energy source path, which can be contribute to depletion of fossil fuel as in this process liquid. Fuel with the similar properties energy as that of petrol fuels is obtained.

IV. METHODS

1. Pyrolysis
2. Thermal pyrolysis
3. Catalytic pyrolysis
4. Thermal degradation

1. Pyrolysis: Pyrolysis which can be defined as in general the thermochemical of organic matter is decomposed at high temperature which is greater than the 300 degree celcius in the absence of oxygen.

The pyrolysis reaction which can be carried away with or without the presence of catalyst

2. Thermal pyrolysis:
The thermal pyrolysis is high energy and also as an endothermic process which required the minimum temperature of 300-500 dergree celcius.

and important thing is that the following product is obtained- I. Non condensable gases

3. Catalytic pyrolysis:
The catalytic pyrolysis is the main method which required the homogeneous and heterogeneous catalyst for the conversion of plastic wastage material into fuel. The homogeneous catalyst like aluminium chloride etc and the heterogeneous catalyst like zeolites alumina etc are used .

4. Thermal degradation:
Thermal degradation is also the main method as compared the catalytic method. Plastic is fed into a cylindrical chamber with the help of condenser system. Form converting the aromatic hydrocarbon products and liquid is separated from it produced the liquid fuel product.

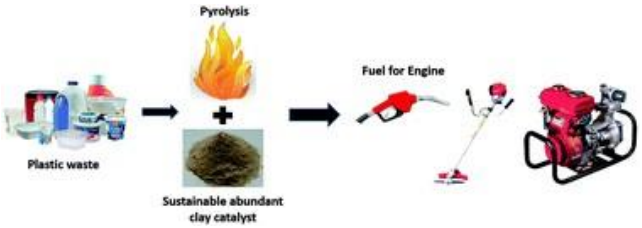

Fig 1. waste plastic technology

V. EQUIPMENT USE IN THIS PROCESS

1. Condenser
2. Reactor

1. Condenser

It is used for the cooled the heated vapour coming out from the reactor. It also has the both inlet and outlet for the cold water run flowing to this area.

2. Reactor
It is a stainless steel tube of length 300mm, internal diameter 225mm, outer diameter 230mm sealed at one end and an outlet tube at the other end. The reactor is made up of stainless steel.

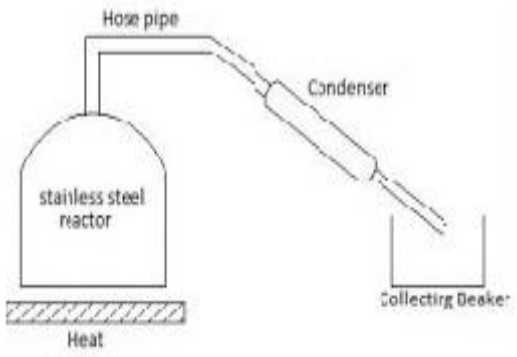

Fig 2. Combined condenser and reactor method

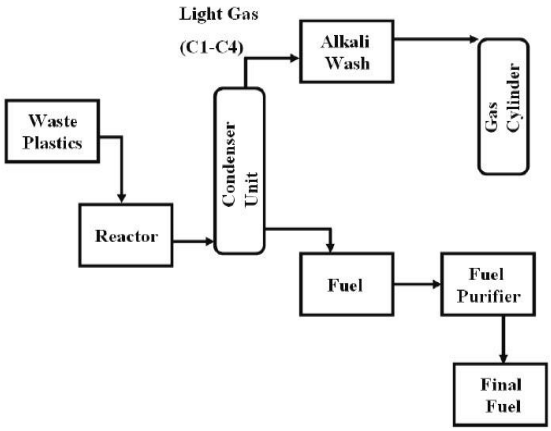

Fig 3. *Flow chart of fuel*

Advantage of pyrolysis process

1. Capital cost is low.
2. Solid liquid and gaseous fuel is produced.
3. Environment problem is reduced .

Disadvantage of pyrolysis process

1. It requires large amount of energy.

VI. CONCLUSION

By converting plastics into fuel, we have solve two problem, one is that the large plastic seas area are reduced and the other is the shortage of fuel. Due to the conversion of waste plastic material into fuel we build clean and green future clean air and sustainable life. From this we can conclude that the properties of the fuel obtained from plastics are similar as to that of petrol.

VII. REFERENCES

[1]. Antony Raja and Advaith Murali, “Conversion of Plastic Wastes Into Fuels”, Journal Of Materials Science and Engineering B 1 (2011) 86-89 . Formerly Part Of Journal Of Materials Science And Engineering, ISSN 1934-8959.

[2]. A.U. Zadgaonkar, Environmental Protection from Plastic Waste Menace, GPEC 2004.

[3]. V. B. Chanashetty and B. M. Patil, "Fuel from Plastic Waste," International Journal on Emerging Technologies, vol. 6, no. 2, pp. 121-128, 2015.

[4]. L. Wang, G.H. Luo, Q. Li, Progress of waste plastics pyrolysis, Chem. Ind. Eng. Progr. 22 (2003) 130-134.