

## PRODUCE FIRE GAS BY USING WEASTE PLASTIC

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**ABSTRACT:** *Our project is based on plastic waste disposal. Our project is in first phase so we have started with the basic equipment like burner or electric stove, boiler, rubber pipe, metal pipe. These upper written materials are easily available in the market. Burner is used to heat the boiler. Boiler is connected to metal pipe and metal pipe is connected to the rubber pipe. Heating boiler would heat the plastic material and it will extract the gases from the plastic waste which can be stored or directly used for various purposes.*

### I. INTRODUCTION

These days pollution is the biggest problem in the world so there are many ngos and companies which are trying to control or reduce the production of pollution. So we want to contribute in that direction so we have found a way to contribute in reducing pollution and converting pollutive entities into fuel. Basically our concern is based on the plastic waste. Which is biggest head ache in waste disposal industries. After some of practical experiments we found a way to dispose plastic into ashes and we get some gas which is flammable that could be used as fuel. We have used plastic waste like plastic bags which are used to carry something and food packaging plastic bags. Our project is very useful to the plastic bag disposal industries. Which can be come in handy with gaining flammable gas from disposing plastic bags.

### PLASTIC WASTE IS A PROBLEM

Over 500 billion pounds of new plastic is manufactured each year and roughly 33% of that is single use and thrown away. As so little plastic is recycled, we need to reframe plastic waste as an underused resource vs. one that's destined for the landfill. If all plastic waste made it into the landfill, it would surely be mined in the future, but currently all plastic waste does not make it into our landfills. The United Nations estimates plastic accounts for four-fifths of the accumulated garbage in the world's oceans. We need to stop polluting our oceans with plastic before it is too late, and start collecting all plastics suitable for this new, fairly simple, technology, a technology that is available now.

### II. POLLUTION

#### GROUNDWATER POLLUTION

Water conservation is already a concern in places ranging from California to parts of India, but the world's water is in great danger because of leaking plastics and waste. If you've ever seen a garbage dump, imagine what happens every time it rains – then imagine that being in your drinking water. Groundwater and reservoirs are susceptible to leaking environmental toxins. Most of the litter and pollution

affecting the world's oceans also derives from plastics. This has had terrible consequences on many marine species, which can lead to consequences for those that eat fish and marine life for nutrients – including people.

#### LAND POLLUTION

When plastic is dumped in landfills, it interacts with water and form hazardous chemicals. When these chemicals seep underground, they degrade the water quality. Wind carries and deposits plastic from one place to another, increasing the land litter. It can also get stuck on poles, traffic lights, trees, fences, tower etc. and animals that may come in the vicinity and might suffocate them to death.

#### AIR POLLUTION

Burning of plastic in the open air, leads to environmental pollution due to the release of poisonous chemicals. The polluted air when inhaled by humans and animals affect their health and can cause respiratory problems.

#### EFFECT

##### It Kills Animals

Despite countless TV ads over the years showing ducks or dolphins trapped in six-ring plastic can holders, these items are still used and discarded en masse each day. Whether because the mass of plastic has displaced animals or the related toxins have poisoned them, plastic pollution does a lot of damage to the world's ecosystems.

##### It is Poisonous

Man artificially makes plastic by using a number of toxic chemicals. Therefore, use of and exposure to plastics has been linked to a number of health concerns affecting people around the world. The processes of making, storing, disposing of, and just being around plastics can be extremely harmful to living things.

##### It is Expensive

It costs millions of dollars each year to clean affected areas after exposure, not to mention the loss of life to plants, animals, and people. As land becomes more valuable, just finding a place to put garbage is becoming a problem in many parts of the world.

### III. WASTE GENERATED BY DIFFERENT GENERATORS

#### Municipal Solid Waste

The quantity of waste generated depends on many factors. The most important are population growth, economic growth, and the efficiency of the reuse and recycling system. Both the growth of population and economic development

have resulted in increasing municipal solid waste of India Metropolitan Administration. Change in quantity of municipal solid waste generated is shown in Figure. The municipal solid waste comprised of daily waste produced by households, institutions and businesses is approximately 67% of the total waste generation. The remaining 33% consists of hazardous and non-hazardous industrial waste and hospital waste. Bangkok produces 8,500 on/day of wastes around 3.1 million ton/year, equivalent to 24% of total wastes of the country.

IV. BLOCK DIAGRAM

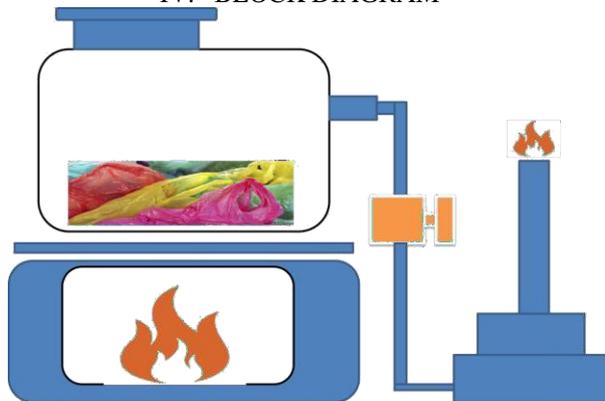


Fig- block diagram of system

HARDWARE USED

- gas burner
- electrical stove
- metal pipe
- gas pipe

1) ELECTRICAL STOVE

- Induction cookers are quite popular and widely used as it has many advantages unlike the gas cook tops and electrical stoves. Some of the major differences of the induction cooker and electric stove are discussed in the following sections.
- Light and portable: The induction cookers are basically light and portable. It can be carried around easily unlike the electrical stove which is quite heavy. Moreover, it is quite easy to install the induction cookers on kitchen countertops.



Fig 4.1(a) induction cooker

- Energy efficient: Compared to the electrical stoves, the induction cookers are quite energy efficient. In induction cookers, heat is seldom wasted while cooking food. Electric stoves require more energy compared to the induction cookers.
- Safe and user friendly: Unlike the other cooking appliances, which involve gas and more electric power, the induction cooker is safe to use as it seldom heats up or causes any type of health hazard. Uniform heat: Induction cookers heat and cook the food in a uniform heat. It works when the induction coils present in the cooker heats up and creates a magnetic field. Therefore the pots placed on the induction cooker should be stainless steel based or induction based pots. Only compactable pots can be used on induction cookers to cook food.
- Heat adjustability: Unlike the electric stove, the induction cookers have adjustable heating facilities. Different heat can be adjusted for boiling, frying, cooking and stewing. It also takes minimal time to cool. Improved functions: The induction cooker is in-built with a number of functions. Today a variety of induction cookers with advanced features are available in many of the online stores. Compared to the electrical stoves, the induction cookers are safe with automatic shut-down features in case of any possible hazards. Today majority of the kitchens include induction cookers as it is both safe and efficient.

Electric stove

Power: 220-240V 50Hz 500-2000W

Material: Plastic and Ceramic

Payment: 30% deposit, balance before shipment

Specifications

- 1) Material: Steel & Ceramic
- 2) Size: upon different wattage
- 3) Power: 220-240V, 500W-2000W
- 4) One piece packed in a plastic bag and then in a box
- 5) Finishing: black powder coated
- 6) 6700PCS a 20GP container, 16700PCS a 40HC container.

Wattage(W):	300	500	800	1000	1500-2000
Base diameter:	115m m	146 mm	168 mm	186mm	190mm

Facture & other informations

- Traditional and simple
- Easy operate
- Price is very cheap and economic
- Suitable market: South-East Asia, Africa and Middle East.
- OEM order is available

**BURNER :**



Fig 4.1(b) Burner

Many chemistry experiments require something to be heated. This is done with one of several types of laboratory burners. The lab burners at Howe High School use propane gas delivered through the gas outlets at student lab stations. a proper lab burner flame Before attempting to light any lab burner, check to see that the jet hole between the base and the burner tube is free of obstruction. If chemicals have covered this jet, the burner will not operate properly. After attaching the hose to the gas outlet, turn the handle on the outlet parallel to the nozzle to open the gas valve. The gas valve is turned off by turning the handle 90 degrees in either direction. Carefully check to see that you hear gas escaping from the mouth of the burner tube. When you are sure that you have gas, bring the head of the striker over the burner and squeeze the striker handle. The spark produced will ignite the gas and your burner is lit. Adjust the air control vent so that the flame has the proper color pictured here. A yellow flame is an indication of a lack of oxygen, meaning that the air vent needs to be opened. The hottest part of the burner flame is just at the top of the bright blue inner cone. Normal heating is done with an object at the top of the light blue outer cone, while strong heating is done with an object at the top of the bright blue inner cone. To heat a container gently, move the container back and forth through the outer cone.

**Flame Temperature Distribution**

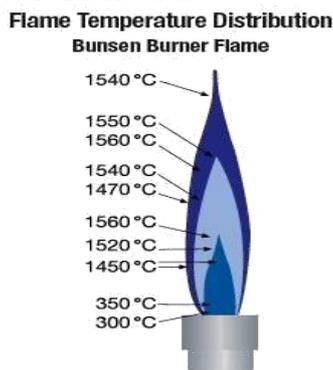


Figure 3.

Fig 4.1(c) flame temperature distribution

The flame can also be adjusted by adjusting the gas flow. Major adjustments in gas flow are made by turning the handle on the natural gas valve. The height and intensity of the Bunsen burner flame depend on both the gas flow and the amount of air available for combustion. If either of these two

gases is too high, the flame will continually “blow out.” If this happens, turn off the gas and close the air vents, allow the burner to cool for 30 seconds, and relight the burner with less gas and air pressure.

**GAS PIPE**



Fig 4.1(d) Gas pipe

A cylinder bank consists of two sets of manifold. On each manifold the required number of cylinders which can meet the total gas demand of the Colony are connected. As stated earlier a bank consists of 2 batteries or sets of cylinders( or 2 manifolds), one in active mode and the other reserve. A manifold is basically a seamless pipe of 1” diameter. Its length is determined by the number of cylinders which are connected to it (about 10”/per cylinder). Threaded nipples are welded on the manifold. Each point of connection of the cylinder to the manifold has got a click-on adaptor, a cylinder pigtail and a non-return valve. An adaptor is like a pressure regulator which is fitted directly onto the cylinder. However, unlike the regulator, the adaptor does not reduce the pressure. When adaptor is turned on, gas starts flowing out of the cylinder at unreduced pressure thus coming out of the cylinder at full cylinder pressure. A cylinder pigtail is a flexible wire-braided rubber tube which has a brass nut on both ends. Its one end is screwed on the adaptor and the other end on the non-return valve. When a pigtail is damaged it can be easily replaced by unscrewing the old one & screwing in the new one. A non-return valve, whose one end is screwed on the cylinder pigtail and whose second end is screwed on the threaded manifold nipple, shuts off the gas supply coming out of an individual cylinder to the manifold in case the cylinder pigtail of that cylinder bursts. The non-return valve also shuts off supply if there is a fault in the adaptor or the connection is loose. Thus, there is no interruption in the gas supply system & all other cylinders continue to supply the gas except the cylinder which has a defective adaptor or pigtail. In the meantime, the defective pigtail/adaptor is replaced. When we open the adaptor on each cylinder, gas starts flowing from each cylinder to the common manifold & thus manifold gets a huge supply of gas which is sufficient to meet the demand of entire Colony.

**4.2 ADVANTAGES**

- Eco friendly method of plastic disposal
- We can get gas which can be used as fuel

**4.3 APPLICATION**

- In vehical
- The gas is use in house

4.4 PLASTIC

Plastic is a high molecular weight material that was invented by Alexander Parkes in 1862. [1] Plastics are also called polymers. The term polymer means a molecule made up by repetition of simple unit. For example, the structure of polystyrene can be written in a form as shown in Figure.

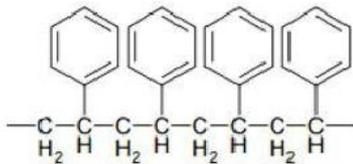


Figure 1-1 Common expression of polystyrene molecular structure

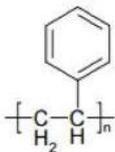
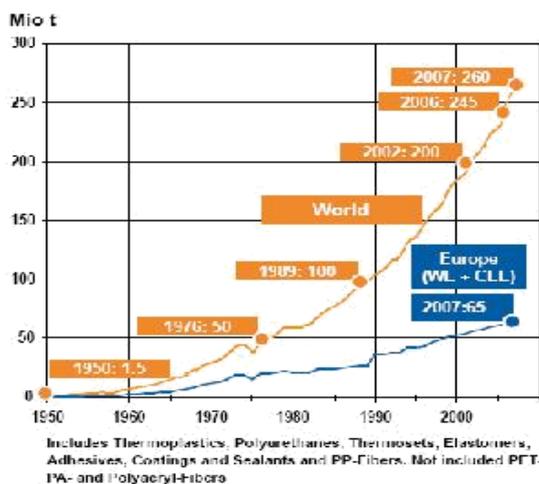


Figure 1-2 A simplified expression of polystyrene molecular structure

Fig 4.4(a) expression of polystyrene molecular structure

The repeating unit of the polymer is in the brackets with a subscript, n, to represent the number of the unit in this polymer molecule. [2] Plastic is one of the most commonly used materials in daily life which can be classified in many ways such as based on its chemical structure, synthesis process, density, and other properties. In order to assist recycling of the waste plastic, Society of Plastic Industry (SPI) defined a resin identification code system that divides plastics into the following seven groups based on the chemical structure and applications [3]: PET (Polyethylene Terephthalate) HDPE (High Density Polyethylene) PVC (Polyvinyl Chloride) LDPE (Low Density Polyethylene) PP (Polypropylene) PS (Polystyrene) Other The above seven types of plastics are marked on various plastic products as follows



Plastic production in the world and in Europe from 1950 to 2007 [4]

Fig 4.4(b) Plastic production graph

V. CONCLUSION

Our project is method so we can get rid of plastic bag waste and also get flammable gas so it means ecofriendly way for plastic disposal .it helps reducing the soil pollution.

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