Generation of Biogas From Kitchen Leftovers

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Abstract- *Every day, almost 20000 tonnes of organic waste is produced in India and the waste is dumped or burned. The waste, however, according to our research, can be very useful as it generates biogas (methane) when stored with time. Different organic material lproduces flamable gas at different different quantities. Our project also focuses on amount of biogas generated using different organic materials like kitchen waste, curd, cow dung.*

Keywords- Biogas, Organic waste, kitchen waste, methane, curd, cow dung, project.

I. INTRODUCTION

Biogas is a gas produced by the breakdown of organic matter without oxygen. It is a renewable energy source, in the same way as solar and wind energy. Biogas is generated by the anaerobic processing or fermentation of biodegradable materials, for example biomass, sewage, green waste, spent wash. Biogas comprises primarily Methane (CH4) and Carbon Dioxide (CO2) and may have small amounts of Hydrogen Sulfide (H2S), moisture.

The gases Methane, Hydrogen, and Carbon Monoxide (CO) might be combusted or oxidized with Oxygen. This energy discharge permits biogas to be utilized as a fuel. Biogas can additionally be cleaned and moved up to regular gas guidelines when it gets to be bio methane. Biogas could be processed utilizing anaerobic digesters. Throughout the procedure, as an air tight tank changes biomass waste into methane producing renewable vitality that might be utilized for heating, electricity.

Biogas is clean environment friendly fuel.

Biogas is generated when bacteria degrade biological material in the absence of oxygen, in a process known as anaerobic digestion.

Biogas generally comprise of 55-65 % methane, 35-45 % carbon dioxide, 0.5-1.0 % hydrogen sulfide and traces of water vapour.

II. LITERATURE REVIEW

Biogas is a biofuel produced from the anaerobic fermentation of carbohydrates in plant material or waste (e.g. food peelings or manure) by bacteria. It is mainly composed of methane, with some carbon dioxide and other trace gases. ...

The optimum temperature for biogas production is between 32oC and 35Oc

There are 4 process involved in generation of bio-gas

Hydrolysis
Acidogenesis
Acetogenesis
Methanoge

III. METHOD

We collect kitchen waste in three types of digester.

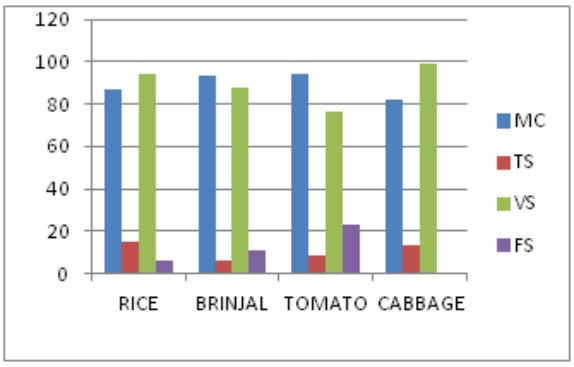
1. in 2 liter water bottle for analysis of gas is flammable or not.
2. in 2 liter container for measurement of produced gas.
3. in 20 liter fabricated digester for production of gas. We add two types of inoculums curd and cow dung to increase the rate of production biogas.

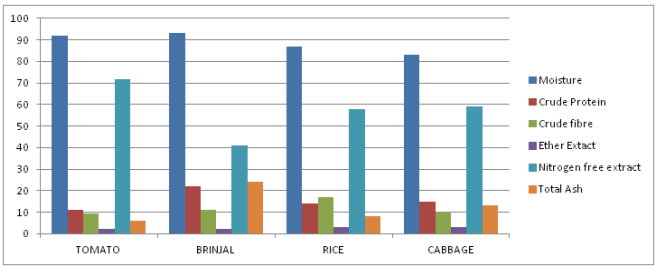
Then we take several tests on kitchen waste which mainly contain brinjal, rice, tomato, cabbage which gives us the amount of total solids, volatile solids, fixed solids and moisture contain present in them which important parameters in generation of biogas. After 3 days interval we take highest and lowest outdoor temperature which affects the generation of biogas. After 25 days we extract the waste slurry from digester for analysis of its properties and characteristics and for this we take several tests which gives us result like moisture content, crude protein, crude fiber, either extract, nitrogen free extract and total ash.

IV. RESULT

Results obtained from the three lab scale digesters for generation of biogas from Kitchen waste are presented and

discussed in this chapter. During these setups various physiochemical parameters were also analyzed. The tests were carried out in YCCE laboratories.





V. CONCLUSION

Kitchen waste of cabbage, rice, brinjal and tomato were kept for anaerobic digestion in three lab scale digesters as well as in containers with different inoculums. Effect of temperature was studied in each setup. Various physiochemical parameters were analyzed. Following conclusions were drawn based on the study.

Upon adjustment of the factors affecting anaerobic digestion, it is felt that co-digestion between Kitchen waste and Cow dung produces biogas without need of nutrient or chemical addition to the system.

Biogas generation in all the digesters fabricated was evident. Pressure build-up in the empty space of each digester was visible after 15 days of start up.

Due to lower temperature, biogas production decreases drastically and may stop, thus, to enhance biogas production, a higher digester temperature than ambient temperature is required.

Moisture content plays very important role in the anaerobic digestion of Kitchen waste. Moisture content below 60%slowed the rate of degradation of organic matter but increases the yield of compost with less leachet production

It will be best alternative under a community level as it will generate biogas as well as will leads to effective waste management. The research was under prototype biogas digester but if made at a big level, it will generate more biogas production and increase their utilization under multiple roles.

Biogas generation in all the digesters constructed was evident. Pressure build-up in the empty space of each digester was observed after 15 days of start up. Combustibility of the biogas generated in the larger digester was tested using a Burner gun that was connected to the gas outlet through a valve. A sustained flame was expected from combustion of the gas, however, not observed.

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