PRODUCTION OF BIOGAS IN SEWAGE SLUDGE
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Abstract -This review is about the production of biogas from sludge. The sludge collected from the municipal treatment plant undergoes various test procedures for the purpose to know the properties of sludge. The detailed properties and production of gas from sludge is determined. The experimental work is carried with the help of bio gas digester.

Keywords-digester, pressure valve, sludge, gas cylinder.

1. Introduction
In order to reduce the required amount of fuel many methods are arised and reasearch are undergone to make the plan efficient. but some of the projects are getting success but the cost is not efficient. in case of this, to reduce the cost efficient and increase the production of amount of renewable fuel the ozonation method of digesting sludge is used and the availed. In india the sewage water is either directly discharged into water bodies or it will be treated and then disposed into the waterbodies. the disposed water is free from organics, toxic gases, etc., and that water can be safely discharged to watercourses. The stages are primary, secondary and tertiary. In this primary process involves the settlement of settleable solids is removed. The secondary process involves the removal of biodegradable material. The microorganisms consume dissolved and suspended organic matter, producing carbon dioxide and other by-products. The organic matter also provides nutrients and increase the community of microorganisms and the density of microorganism is increase and settled down at the bottom of the clarifier tank. Tertiary process involves the process of tertiary treatment consists mainly of chemicals added to clean the final effluent, which are reclaimed before discharge. the Balancing sludge from all the treatment are collected and then it is treated in to a gravity precipitator in which the sludge is thickened more than 50% and then digested to form a renewable fuel.
Literature review:
In order to reduce the demand of fuel in future and to increase and improve the qualities of the fossil fuel by utilizing the sources in our country. the use of biodegradable substances in anaerobic digestion of sludge as a renewable fuel in order to reduce the waste disposal in water bodies. the gas generated from organic digestion under anaerobic conditions by mixed population of microorganisms, is an alternative energy source, which has been commenced to be utilized both in rural and industrial areas. there are various methods used in the production of biogas in which the ozonation method is efficient and economic. So this method is used.

BIOGAS:
Biogas typically refers to a mixture of different gases produced by the breakdown of organi matter in the absence of oxygen. biogas can be produced from the raw materials such as agricultural waste manure, municipal waste, plant material, sewage, green waste or food. biogas is a renewable energy resource. biogas can be produced by anaerobic digestion with anaerobic organisms, which digest material inside a closed system or fermentation of biodegradable material. Natural generation of biogas is an important part of biochemical carbon cycle. It can be used both in rural and urban areas.

CHARACTERISTICS OF SEWAGE:
Sewage is a waste water from the house, municipal, hotel, school, colleges etc. the raw sewage will have high COD in nature.

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<tbody>
<tr>
<td>Odour</td>
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<tr>
<td>Ph</td>
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<tr>
<td>COD</td>
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<td>1000-1500</td>
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<tr>
<td>Volatile solids</td>
<td>60-80</td>
</tr>
<tr>
<td>BOD</td>
<td>100-300</td>
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PROCESS OF EVALUATION OF BIOGAS IN SEWAGE SLUDGE:
The sewage water undergoes three treatment.
1. PRIMARY PROCESS
2. SECONDARY PROCESS
3. TERTIARY PROCESS

PRIMARY PROCESS:

In this process the water is allowed to screening where the floating materials will be screened off then it is come to the grit chamber where the settleable solids are sedimented in the tank and the over flow water will be collected and filtration process is done. The sedimented sludge are called as primary sludge where they are fermented to form microbes. The fermentation process will increase the carbon content in sewage water. The biogas chamber will form the 65% of methane and 35% carbon dioxide and hydrogen sulphide. This mixture of gases is known as the biogas. This is the normal process done to collect the bio gas from the sewage sludge.

BIOGAS A RENEWABLE FUEL:

Biogas is a renewable fuel where it extends upto the source is there since the human kind lives the source of waste from the earth is more. So, biogas is a renewable energy like solar, wind, tidal etc…

EXPERIMENTAL SETUP:

The sewage water that collected from the houses is gone under screening where the floating materials are removed. Then the water is under grid chamber test where the suspended particles are reduced, the organic matter are less to 3%. The settleable suspended particles are known as primary sludge. The primary sludge is treated into anerobic process in a digestor. The sludge is mixed with a period of 5hrs in a rotation by a rotator. While mixing the primary sludge, the breaking of complex particles into smaller will take place (fermentation). The digestor is connected with an outlet pipe with a pressure gauge that controls the pressure of a gas to avoid from danger and also a gate valve to open or close the pipe. After the fermentation process the gas are entered into the gas chamber where the caustic soda in crystallized form is sprayed into the gas. The H2S is turned into sodium sulphate (salt) because it is a corrosive gas that can corrode pipes and cause leakage and damage.

The chemical reaction of H2S is H2S + 2
NaOH Na₂S+2H₂O.
Now the extracted gas is collected in a cylinder and used as a fuel for vehicles or house purpose.

**ADVANTAGES**
It produces organic fertilizer. It reduces the greenhouse effect and no emission of greenhouse gas to atmosphere. Reduction of global warming. Simple and less expensive. It is a ecofriendly gas. It is a renewable, as well as a clean, source of energy. It reduces soil and water pollution.

**DISADVANTAGES**
Biogas can be explosive when mixed with air, so special care is to be taken while working on it. It has less gas density. It contains impurity. It will work only above 37°C. Toxic gases like hydrogen sulfide (H₂S) which corrode the metals.

**CONCLUSION:**
Biogas is an important sustainable energy that obtained from sludge. To develop an efficient and environmental friendly ways to convert a sludge into a biogas as a clean renewable fuel for multi purpose. In order to obtain biogas production as high and reduce sludge disposal in a simple and very low scale method further investigation are needed.

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