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ISSN: 2090-4568
Journal of Advanced Chemical Engineering

Perspective

Production of Biogas and its Thermodynamic Analysis in Power Generation Techniques

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DESCRIPTION

Biogas production is used for regenerative power generation from natural residues. It is the end product that is biologically mediated and this process is known as "Anaerobic digestion". It is composed of methane and carbon dioxide. It can be used for cogeneration, automotive fuel, or as a renewable energy source for natural gas. A two cylinder, indirect injection diesel engine of stationary type is being used as the first experimental test bed in this work and the variation of quality is provided by mixing natural gas and carbon dioxide.

Methane in biogas can also be used as a feedstock in industrial processes. The biogas plants are basis for circular economy concepts that are aimed to nutrient reuse, reduction of greenhouse gas emissions and biorefining. A data acquisition system for cylinder pressure and crank angle is being used successfully and some emissions measurements are also available, particularly for CO and O_2.

The process of biogas processing opens up new possibilities for its uses, as it can replace the natural gas, and used in large quantities. However, increase the cost of biogas production is upgraded. Therefore, it is important to have an optimized treatment in the terms of low energy consumption and high efficiency, which results in high methane content in the treated gas.

The methane contributes 23 times more to greenhouse gases than the carbon dioxide, and it is also very important to minimize or possible to avoid methane emissions from the treatment processes. This means that methane levels in off-gases, water from water scrubbers, or other streams in the treatment are minimized. Anaerobic digestion converts organic material into biogas, a renewable fuel that could be used to produce electricity, heat or as vehicle fuel.

To increase the quality of the raw biogas, it is usually cleaned by the unwanted substances such as hydrogen sulphide, oxygen, nitrogen, water and particulates. The main reason is to prevent corrosion and mechanical wear of the equipment in which the biogas is used. The purified gas is liquefied and the concentration of methane is increased by dynamic flash evaporation of the nitrogen. The degradation of natural of organic material results in the production of biogas by microorganisms under anaerobic conditions.

Upgrading biogas to biomethane was initiated as an alternative to using biogas directly due to the low demand for generation of heat. It can be upgraded by means of biomethane with the use of various technologies for transportation of fuel in widely used Natural Gas Vehicle (NGV) engines. The low GHG emissions from biomethane are used in vehicles throughout the supply chain, it is one of the best renewable transportation fuel options and therefore biomethane is a renewable energy source. It may contribute to your goals.

Compared to developed countries the development of biogas has focused on large-scale agricultural and commercial power and thermal plants, it is mainly produced in small-scale domestic digesters and used as fuel for cooking and lighting. To develop a domestic biogas system it provides people with for cooking as an alternative energy source, reduces the consumption of firewood, it avoids deforestation, reduces indoor air pollution, and improves soil fertility.

CONCLUSION

Today the biogas sector is growing rapidly and new achievements are laying the groundwork for configuring biogas plants as advanced bioenergy plants. This process has been known since ancient times and has been widely used in homes to provide heat and electricity for hundreds of years. This summarizes the state of the art and presents future prospects related to anaerobic digestion processes for biogas production. Furthermore, the early development of biogas industry to the most recent advances provides perspective opportunities for the optimization of process.

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Received: 01-Aug-2022, Manuscript No. ACE-22-18404; **Editor assigned:** 04-Aug-2022, PreQC No. ACE-22-18404 (PQ); **Reviewed:** 24-Aug-2022, QC No. ACE-22-18404; **Revised:** 31-Aug-2022, Manuscript No. ACE-22-18404 (R); **Published:** 07-Sep-2022, DOI: 10.35248/ 2090-4568.22.12.250.

Citation: Zheng P (2022) Production of Biogas and its Thermodynamic Analysis in Power Generation Techniques. Adv Chem Eng. 12:250.