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VNC - 2020 TASU

VIDYAVARDHINI'S NATIONAL CONFERENCE ON TECHNICAL ADVANCEMENTS FOR SOCIAL UPLIFTMENT

VNC - 2020 TASU

4TH APRIL, 2020

Organized by:
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About us:

Vidyavardhini means a Body committed to enhancement of Knowledge. Vidyavardhini was established as a registered society in 1970 by late Padmashri H. G. alias Bhausaheb Vartak for the noble cause of education in rural areas.

Vidyavardhini's College of Engineering and Technology, Vasai is located on the sprawling campus of Vidyavardhini, spread over an area of 12.27 acres. It is a short, two minutes walk from Vasai Road (W) Railway Station. The college is also accessible by road from Mumbai.

Vidyavardhini Society received approval from AICTE to start the new college of Engineering & Technology with effect from July, 1994. The college is affiliated to the University of Mumbai for the four year degree program leading to the degree of Bachelor of Engineering in six branches.

Objective of VNC 2020 TASU

Technology has always been potential tool for simplifying the way we do things. Present time demands directing the technological advancements towards addressing societal challenges such as improving health care, education environment, sanitation, agriculture, smart city, etc., VNC 2020 TASU aims to provide an opportunity to researchers, academicians, Industrialist and students to interact and share their ideologies and contributions made for social upliftment with the aid of technological advancements.

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Proceedings of VNC - 2020 TASU will be published with ISBN number

1. Selected Papers will be published in International Journal of Information Technology, Published by Springer Nature, ISSN: 2511-2104 (Print Version), ISSN: 2511-2112 (Electronic Version)
2. All papers will be published in IJERT, ISSN: 2278-0181

Important Dates:

Submission of full length paper
15TH Feb 2020
Paper Acceptance Notification
22ND Feb 2020
Submission of Final Version of Paper
29TH Feb 2020
Registration Deadline
5TH March 2020
PPT Submission
20TH March 2020
Conference
4TH April 2020

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Category of Delegates / Authors	Indian Authors & Delegates (in INR)
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Producer Gas Generation by Agricultural Waste

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Abstract— **Gasification is a thermo- chemical which converts solid biomass into a mixture of producer gas that can be used in thermal applications like furnace, driers etc. The gasification technology is now considered to be in an advanced stage of development. It would be especially useful for small scale industries which produce biomass by-products. In this project, we have used briquettes for test using sugarcane bagasse, groundnut shell and skin, sawdust as a raw material. Once briquette formation is completed, the briquettes will be used in a Downdraft gasifier. The principle is based upon heating the briquette for a specific temperature causing chemical reaction within the gasifier and resulting formation of producer gas. The purpose of the project is not only to generate producer gas but also to enable agricultural waste disposal in the specific manner. The aim of this process is to highlight the results of gasification in Downdraft gasifier using multiple agricultural waste.**

Keywords—Downdraft gasifier, Producer gas, Agricultural Waste, Producer gas efficiency,

I. INTRODUCTION AND SCOPE

Today, the world demand for renewable energy sources which is the key factor in the revival of the use of gasification systems, which was in strong decline after the advent of petroleum. Gasification systems are successfully applied to the production of energy from biomass. They also represent an attractive alternative to the well-established thermal treatment systems for the recovery of energy from solid wastes. Utilization of waste is the need of hour today. The waste which cannot be degraded by biochemical route like agricultural waste can be converted into useful fuel through the process called Gasification. Gasification is a thermo-chemical process which converts solid biomass into a mixture of combustible gases that can be used in thermal applications. The gasification process is a series of chemical reactions. The chemical kinetic model shows that the degree of complete reaction depends on temperature and reaction duration. Gasification of solid biomass converts it to gas often referred to as producer gas which is mainly composed of CO, CO_2, CH_4, H_2 and N_2 (if the gasification agent is air)

The useful gas or combustible gas components are CO, H_2 and CH_4, which if available in sufficient quantity [1] Producer gas derived from biomass can be used in IC engine with some modifications. Spark ignition (SI) engine can be made to run entirely on producer gas and compression ignition (CI) engine replaces 60% - 80% fuel oil by using producer gas [2]

II. CONCEPT OF GASIFICATION

Gasification is most simply incomplete combustion. It is burning solid fuels like wood or biomass without enough air to complete combustion, so the output gas still has combustion potential. The combustible gas is then piped away to burn elsewhere as needed. The downdraft gasifier process can be divided into four zones. The first or uppermost dry zone receives solid carbonaceous material from the top, that is dried in air drawn through the first zone. Through the first zone, the solid carbonaceous material heats up and it undergoes pyrolysis, where this biomass breaks down into charcoal, tar gases and tar vapors in liquid state. Pyrolysis is the application of heat to biomass in the absence of air/oxygen. In the combustion zone where the air/oxygen is supplied in an adequate quantity, so the most of the tar and char produced burned or cracked in combustion zone and it to generate heat to run reduction zone. Combustion zone passes carbon dioxide (CO2) or water vapor (H2O) across a bed of red-hot charcoal (C) in the reduction zone. In the reduction zone, carbon in the hot charcoal is highly reactive with oxygen; it has such a high oxygen affinity that it strips the oxygen off water vapor and carbon dioxide, and redistributes it to as many single bond sites as possible. The oxygen is more attracted to the bond site on the C than to itself, thus no free oxygen can survive in its usual diatomic O_2 form. All available oxygen will bond to available C sites as individual O until all the oxygen is gone. When all the available oxygen is redistributed as single atoms, reduction stops. Through this process CO_2 is reduced into carbon to produce two CO

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