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**Swami Keshvanand Institute of Technology,
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Table of Contents

SCOPE OF RENEWABLE ENERGY UTILIZATION IN INDIA	1
SCENARIO OF COOLING SYSTEMS POWERED BY SOLAR ENERGY IN INDIA	6
SPEED CONTROL OF DC MOTOR USING ANDROID APPLICATION AND RF	12
SOLAR ENERGY DEVELOPMENT, TRENDS AND INITIATIVES IN CONTEXT OF INDIAN AND RAJASTHAN STATE GOVERNMENT	17
INVENTORY MANAGEMENT OF RESIDENTIAL SOLAR PANELS	26
ZNO/MGO/ITO STRUCTURED SOLAR CELL FOR ULTRAVIOLET PHOTO DETECTOR APPLICATION	33
ELECTRICAL CHARACTERISTICS OF CDS/CDTE BASED INORGANIC SOLAR CELLS: EFFECT OF CDS LAYER THICKNESS	39
A REVIEW ON PERFORMANCE ENHANCEMENT METHODS FOR SOLAR STILL	44
NEW PROSPECT AND HORIZON FOR RENEWABLE ENERGY IN INDIA	52
INVESTIGATION OF THE EFFECTS OF TERNARY DIESEL-ADDITIVES BLENDS ON VCR DIESEL ENGINE	60
COMPARISON OF MECHANICAL BEHAVIOUR OF PP COMPOSITES FABRICATED BY PLASTIC INJECTION MOULDING	65
DESIGN AND SIMULATION OF 3D PRINTED HOVERCRAFT AS A RESUPPLY VEHICLE WITH CFD	71
ELECTRIC POWER GENERATION USING HYBRID SYSTEM-A REVIEW PAPER	80
WIRELESS POWER TRANSMISSION	87
ANAEROBIC CO DIGESTION OF FOOD WASTE: A REVIEW ON SUSTAINABLE APPROACH FOR FOOD WASTE MANAGEMENT AND PRODUCTION OF BIOENERGY	97
FABRICATION AND TESTING OF BANANA FIBRE REINFORCEMENT POLYMER COMPOSITES	103
SELECTION OF OPTIMUM PARAMETERS FOR ELECTRO-CHEMICAL MACHINING (ECM) USING GENETIC ALGORITHM	116
CONVERSION OF PLASTIC WASTE TO FUEL BY PYROLYSIS: A REVIEW	121

CONVERSION OF PLASTIC WASTE TO FUEL BY PYROLYSIS: A REVIEW

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Abstract

It is estimated that over 1.3 billion metric ton of plastic is being manufactured every year to meet the requirements of modern world. Plastic is made by polymerization of hydrocarbons. Plastic is an important material which is strong, durable, and cheap and has numerous other properties.

Disposal of waste plastic is of great concern for everybody as it takes decades to decompose if left at its own. On the other hand, continuous increase in industrialization and urbanization has created measurable rise in the demand of fuels. Nowadays it has become the need to seek the alternate energy sources in the place of conventional fuels. In this scenario, Conversion of plastics to fuel is a hope to solve both the problems.

Pyrolysis is a process which involves thermochemical decomposition of organic matter at high temperature (>370°C) in the absence of oxygen. Products of this process are Pyrolysis Oil, Carbon Black, and Hydrocarbons.

This review paper is focusing the most efficient and widely used method of converting plastics to fuels: 'Pyrolysis' and its effectiveness on resolving both the issues of waste plastic management and the requirement of a good alternative fuel for use.

Keywords: Pyrolysis, Decomposition, Plastic Waste, Green Technology, Waste Management

INTRODUCTION

In the world a total of over 100 million tonnes of plastic is manufactured to meet global plastic demand. This much production and consumption of plastic is a threat to environment as it takes several years to decompose naturally.

According to ASTM (American Society for Testing and Materials) D5033-00 [1], plastic recycling methods are of four types on the basis of final product. The tertiary or chemical recycling degradation is one of the categories. From this method of chemical degradation, liquid fuels and high value added chemicals are produced by waste plastic Pyrolysis fragments. One of tertiary recycling method is pyrolysis. Pyrolysis is a process of decomposing plastics by heating in absence of oxygen generating gaseous and liquids products which can be utilized as fuels. This process can be thermal or catalytic and is an alternative that allows the conversion of polymers into gas and liquid hydrocarbons. The plastic waste is processed to produce petrochemical compounds.

1.1 Thermal Pyrolysis

ICONRER-2021

Renewable energy and sustainable development are the key technologies to offer solutions to the ever-increasing environmental pollutions and depleting conventional fuel reserves. With an aim to discuss the state of art technologies pertaining to the renewable energy domain, RTU (ATU) TEQIP III Sponsored 3rd International Conference on New and Renewable Energy Resources for Sustainable Future (ICONRER-2021) was organized by the Department of Mechanical Engineering, Swami Keshvanand Institute of Technology, Management and Gramothan, Jaipur in collaboration with Rajasthan Technical University and Department of Mechanical Engineering, Assiut University, Assiut (Egypt) from February 11 to 13, 2021. ICONRER is a series of the conference started in 2017 and it was 3rd event of that series.



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