A National Level Technical Poster Presentation

TECHPOST 2019

18th September 2019

SOUVENIR

BHARATI VIDYAPEETH COLLEGE OF ENGINEERING
Sector - 7, CBD Belapur, Near Kharghar Railway Station,
Navi Mumbai - 400614

In association with
"The Indian Institute of Chemical Engineers"

Our Inspiration

Hon. Late Dr. Patangrao Kadam
M.A., L.L.B., Ph.D.
Founder: Bharati Vidyapeeth University, Pune

Our mission at Bharati Vidyapeeth is to identify and prepare leaders of the new millennium and also to cope up with the increasing demand of leaders in the modern society. Engineering college is a workshop where today's youth shaped up as effective managers of tommorrow. Apart from the study of their regular syllabi, the students should get fair and proper opportunities to express their views and ideas, which plays vita role in the modern era. The youth should be moulded and filed with courage, self-determination and dedication must be in position to overcome any sort of difficulty with introspection. Keeping this in mind, we should start brainstorming process of engineering skills among students as they are building blocks of tomorrow's society. I am sure "Hard work brings surprising results." and we are second to none in this sphere and believe finally " Success is ours."

Dr. S. S. Kadam
Chancellor, Bharati Vidyapeeth
Deemed University, Pune

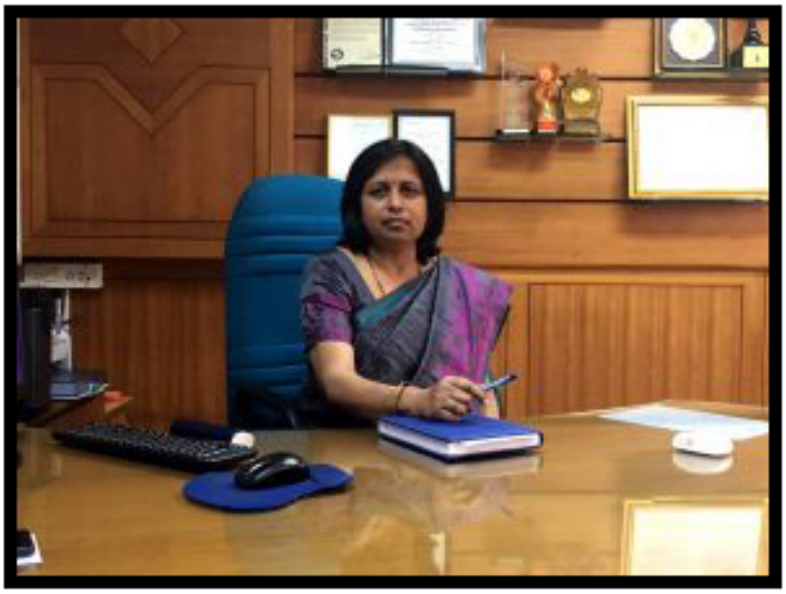
Bharati Vidyapeeth College of Engineering, Navi Mumbai has been a crucial platform in career building of thousands of students. Reputed for its high standards in Engineering Education, the college is continuously attracting most of the major recruiters in its placement drive. This builds a very special bond between students, colleges and industries.

Dr. V. P. Kadam
Secretary, Bharati Vidypeeth, Pune

The College has a very special place in my heart. The caring faculty and friendly academic environment make the college different and a respectable institution in the field of engineering education. The student centric academic structure aims at overall development of the students and also in developing outstanding professional skills. The co-curricular and extra-curricular activities develop versatile engineers who actively contribute a lot in their professional and social life. The out of box thinking and innovative approaches are important qualities of a genuine engineer. Aiming at developing world class engineers, we would definitely fulfill the demands of the fast paced industries.

Dr. V. J. Kadam
Director, Bharati Vidyapeeth Educational Complex, Navi Mumbai

Academic is the backbone for all the fields to grow. Seeing this fact today's time needs spontaneous intellectual growth that is not at all possible without the help of technology. Bharati Vidyapeeth Engineering College is no exception but I have to say it's a milestone which has made its own name in nation and worldwide. We have a chain to support each other everywhere and a strong believe to soar in the sky.



Dr. S. D. Jadhav
Principal, Bharati Vidyapeeth College of Engineering, Navi Mumbai

The college has developed excellent infra-structural facilities with well-equipped laboratories and an enriched library, which are updated regularly. The facilities and in-depth teaching is improvising students to understand the recent trends of Engineering and Technology. The College provides not only technical education to students but also conducts many co-curricular and extra-curricular programs, which ensure multifaceted development of students. With all the laurels we have achieved till date, I am sure we will keep providing a gamut of professional Engineers and Technocrats, backed by top most

ABOUT INSTITUTION

Late Dr. Patangrao Kadam the founder of Bharati Vidyaeeth was a man of vision. Realizing the increasing need of engineering in the society and industry. He established Bharati Vidyaeeth's College of Engineering in Navi Mumbai in 1990. Since its establishmentthe college has grown to become one of the leading Engineering Education Institution in Navi Mumbai.

ABOUT BHARATI VIDYAPEETH

Bharati Vidyapeeth is the one of the largest network of educational institutions in India and overseas. Comprising of 190 units of schools and colleges in the field of Engineering Medicine ,Management and Architecture ,it has spreaded its wings for all round development parallel with its objective i.e."Social transformation through dynamic education." Always a step ahead, in May 1995 the department of human resources development, Government of India, on the recommendations, of the University Grants Commission accorded the status of Deemed University to 26 institutions of Bharati Vidyapeeth. In the year 2000, three more institutions were accorded the same status. India's top most academic chieftain Bharati Vidyapeeth is devoted to achieve number of academic excellences and achievement .

The Department of Chemical Engineering, BVCOE at Navi Mumbai region is one of the premier chemical engineering departments in the country. It has 21 years history of innovation and creativity in both teaching and in research. Aside from excellence in fundamental research, the department has made significant contribution to the chemical industry to achieve our vision through its expertise in chemical process engineering, stimulation, optimization and control and seperation processes. There are currently nine outstanding faculty members who exce in diverse facets of modern edge chemical engineering research both in traditional areas such as environmental engineering, kinetics and catalysis and polymers as well as in emerging areas such as advanced materials and nanotechnology etc. There are currently 250 undergraduate students in our department studying for B.E. degree. There are highly trained and motivated technical support-faculty members who provide

ABOUT TECHPOST

The department of Chemical Engineering of Bharati Vidyapeeth College of Navi Mumbai has taken up this initiative to give the building engineering students and providing an opportunity and a platform to show of their innovative and exploring minds through different research topics under various chemical engineerig streams and fields of work. The event mainly focus on Green Technology inorder to come up with innovations in Green Technology.

FOUNDER

Late. Dr. Patangrao Kadam

CHIEF PATRON

Dr. S. S. Kadam,
The Chancellor, Bharati Vidyapeeth

Dr. V. P. Kadam,
Secretary, Bharati Vidyapeeth

PATRON

Dr. V. J. Kadam
Campus Director, Bharati Vidyapeeth,
Navi Mumbai

Dr. S. D. Jadhav
Principal, Bharati Vidyapeeth College Of Engineering
Navi Mumbai

Dr. S. P. Shingare
Head, Department Of Chemical Engineering

CONVENER

Dr. M. V. Bagal
Department Of Chemical Engineering

CO-CONVENER

Prof. M. A. Suryawanshi
Prof. G. B. Kumbhar
Department Of Chemical Engineering

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HOD Chemical Engineering

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Convener

Dr. M. V. Bagal

Department of Chemical Engineering

Co - convener

Prof. M. A. Suryawanshi

Department of Chemical Engineering

Prof. G. B. Kumbhar

Department of Chemical Engineering

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Prof. A. G. Thokal
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Siddhesh Sable
Nishant Pokharkar
Pranay Patil
Indrali Sarpotdar
Dixon Arockia
Swapnil Singh
Gangapriya Nair

PANEL OF EXPERTS FOR EVALUATION

Chief Guest

Dr. Jayant Umarye
(Head, R&D, Godrej Industries Ltd.)

Shri. Dhananjay Kale
(Sr. Manager, HRD, RCF Ltd. Chembur)

Dr. Arati Barik
(M. G. M. College of Engineering)

Dr. Samir Nimkar
(Bharati Vidyapeeth Institute of Technology)

Prof. N. T. Satav
(S.S. Jondhale College of Engineering)

Table of Contents

Institute Vision & Mission

Vision

Social Transformation through Dynamic Education

Mission

To impart quality education to meet the needs of industry, profession and society; and to achieve excellence in teaching, learning and research

Department Vision & Mission

Vision

The chemical engineering department seeks to prepare chemical engineers to pursue their goals as successful careers of Entrepreneurs and Eminent Researchers which benefits the public welfare through its service that is rigorous and challenging.

Mission

- Excel in engineering practice, research, and management in industries.
- Expands the knowledge through its scholarly pursuits.
- Think critically and creatively, especially about the use of technology to address local and global problems.
- To develop technology to serve social needs.

TECHPOST Objective

- To provide a platform to students to enhance their technical skills.
- To improve presentation skills of students.
- To encourage professional interaction among students.

TECHPOST 2019 Schedule

Schedule for the day
18th September 2019 (Wednesday)

Time	Activity
9.00 am – 10.30 am	Reporting/Poster Check/Refreshments
11.00 am – 11.30 am	Inauguration Ceremony (Architecture Seminar Hall)
11.45 am – 1.00 am	Exhibition (Round 1) (Chemical Department Corridor)
1.00 pm – 1.45 pm	Break (Snacks)
2.00 pm – 2.30 pm	Final Posters (Round 2)
3 pm onwards	Prize Distribution & Closing Ceremony (Architecture Seminar Hall)

List of Abstract

GREEN TECHNOLOGY
(TP-GT01 TO TP-GT28)

TP-GT01

Bio Degradable Plastic from Casein

Siddique Mohammed Wasim
MGM College of Engineering and Technology, Kamothe

Plastic waste disposal is nowadays an inevitable issue of concern because of defying biodegradation attributes of conventional petroleum-based plastics. These conventional plastics are produced from fossil fuel reserves which are in limited stocks again captures attention because of depleting reserves. The scarcity of space for disposal of plastic waste and growing environmental concerns for non-biodegradable synthetic plastics have fueled research towards development of eco-friendly biopolymer materials. It is very difficult to reduce the consumption of plastic products due to their versatile properties, but it is possible to replace petroleum-based plastics with alternative materials that have polymer like properties and that degrade after being discarded. In this paper we present a concept of producing a biodegradable polymer from casein which is protein extracted from milk. Casein extracted from various milk samples is compared for its yield and the sample with maximum yield is then blended with the plasticizers to form a biodegradable polymer. The formed polymer involves minimal use of carbon so is biodegradable and can be used for various low-density polymer applications.

TP-GT02

The Bioleaching of Sulphide Minerals with Emphasis of Copper Sulphides

Bhagyesh. Nandgawle; Srivani. Ganti; Rutuja. Chavan; Riya. Raveendran.
Bharati Vidyapeeth College of Engineering, Navi Mumbai

This review outlines current research in heap bioleaching, particularly in respect of the bioleaching of chalcopyrite, assesses the status of the bioprocessing of copper sulphides and evaluates promising developments. The bioleaching of sulphide minerals is reviewed with emphasis on the contribution from the microbial community, especially attachment and bioleaching mechanisms and the potential benefits to be gained by a greater understanding. The leaching and bioleaching of copper sulphides is examined. The main focus is on heap bioleaching of whole ores, and the development of models to describe heap and dump processes that can be applied in the design phase as well as to optimize metal extraction. The characteristics of chalcopyrite leaching are discussed in respect of those conditions and controls that might be needed to make a heap bioleach commercially productive.

TP-GT03

Carbon Capture and Storage (Ccs) By Carbon Emitting Industries.

Shubham Diwate, Aditya Gawhade, Emad Desai, Preeti Darvesh
Bharati Vidyapeeth College of Engineering, Navi Mumbai

Natural gas has become a major source of energy over the passing decades. However, this dependence on fossil fuels also has its fair share of problems mainly an increase in the amount of carbon emission. Major oil and gas industries are finding it difficult to tackle this carbon emission problem. Most of these industries burn the produced carbon leading to air pollution. The ocean gets a disproportionate share of the carbon dioxide available to the ocean-atmosphere system. The ratio is about 50 molecules of CO 2 in the ocean for everyone in the atmosphere. The main reason is that carbon dioxide readily reacts with water to make soluble species of ions, bicarbonate (formula: HCO 3) rather than trying to fit between the water molecules as a gas. Site selection begins where the problems has stemmed from, oil beds from decades of drilling out of sea floors, industry has become very efficient at mapping and analyzing the topography of these oil reservoirs. The last reason for the ocean's big share of carbon is its biological pump. The biological pump, in essence, removes carbon dioxide from the surface water of the ocean, changing it into living matter and distributing it to the deeper water layers, where it is out of contact with the atmosphere. Thus, when the ocean shares carbon dioxide with the atmosphere, it does so by not only simply taking on carbon dioxide into solution but also by incorporating the carbon dioxide into living organisms.

TP-GT04

Green Concrete

Ajinkya Dalvi; Varad Joshi; Shruti Jadav; Manoj Behra
Bharati Vidyapeeth College of Engineering, Navi Mumbai

Green Concrete is a revolutionary topic in the history of concrete industry. This was first invented in Denmark in the year 1998 by Dr. WG. It has nothing to do with color instead is a concept of blending environment into concrete considering every aspect from raw materials, manufacture over mixture design to structural design, construction and service life. Green concrete is very cheap to produce, since waste products are used as a partial substitute for cement, charges for the disposal of waste are avoided, energy consumption in production is lower, and durability is greater. Thus, the net CO 2 emission are reduced. The reuse of materials also contributes intensively to economy. It can be considered elemental to sustainable development since it is eco-friendly. Nowadays it is being widely used in green building practices

TP-GT05

Jersey/t-shirts from waste plastic bottles

Ritikkumar Singh, Prathmesh Vishwakarma, Aditya Talwadekar, Abhishek Rai
Bharati Vidyapeeth College of Engineering, Navi Mumbai

The studies, experiments and researches done are pertaining to the conversion of waste plastic bottles from sea waste, house waste etc. into jerseys/t-shirts. Plastic is one of the most commonly and widely used objects in our day to day life but when it is disposed of it takes ages to for it to completely get degraded causing various types of pollution. But various studies and researches has led us to conversion of these waste plastic into reusable productive object. So, of such things one of them is a t-shirt a daily wearable garment. Its production is very easy from waste plastic and is very similar to a nylon t-shirt. It is a good alternative for cotton t-shirts. Production of cotton t-shirts totally depends upon the farm yield of cotton from cotton farms. Due to some reasons if the crop fails the production of cotton t-shirt also gets affected.

TP-GT06

Extraction of natural pigments to replace synthetic dyes from algae called *Spirulina Platensis*

Sushant Magdum, Aniket Patil, Mahesh Patil, Shubham Khavare
Shivaji University KITCOEK, Dept. of Biotechnology, Kolhapur

In recent years the plastic consumption has increased manifolds leading to accumulation of plastic waste in large amount. Waste plastic bags being non-biodegradable and its extreme durability make its disposal process difficult. Plastic solid waste (PSW) present challenges and opportunities to the societies regardless of their technological advances and sustainability awareness There is a need for use of materials made from plastics taking into considerations the adverse effects of plastic waste. There have been numerous procedures carried out for processing and recycling of plastic waste, but the use of LDPE plastic for making of internal partitions, tiles and plastic products with antimicrobial properties has not been well explored. Till date, largely research has been done using plastic as reinforcement but very less research has been done for exploring the use of plastic as a parent material with sawdust or fibre reinforcement. This research illustrates the manufacturing of tiles and bricks from LDPE, Low-Density Polyethylene, plastic waste. The LDPE was procured mainly from the plastic bags and other daily used plastic waste.

TP-GT07

Hydrogen: Future of Fuels

Samrudh, Pricilla, Agnel, Ritika Desai, Janhvi Kadam
Bharati Vidyapeeth College of Engineering, Navi Mumbai

Hydrogen fuel is zero emission fuel when burned with oxygen. Unlike other fossil fuels, hydrogen fuel emits only water vapours on combustion. The fuel contains Hydrogen andOxygen.Economy of hydrogen refers to the vision of using hydrogen as a low carbon energy source.(E.g. Replacing natural gas as a heating fuel or gasoline as transport fuel). Hydrogen can be obtained by collecting and processing methane gas obtained from decomposition of Landfills. by steam reforming process. (steam reforming process: - process of producing hydrogen and carbon monoxide from methane.) Carbon monoxide is obtained by reforming process. Major usage of hydrogen gas as a fuel cell is in vehicles. It is also used in space shuttles. Combustion of hydrogen fuel is brought by hydrogen internal combustion engine. Hydrogen fuel cell has similar efficiency to that of gasoline combustion engine.

TP -GT08

Biogas Production from Food Wastes

Tufail Survey, Sheeba Tripathi, Prachi Khamkar
Bharati Vidyapeeth College of Engineering, Navi Mumbai

Food wastes have a high biomethane production potential because of their high organic matter contents. Biogas is a mixture of different gases, i.e., primarily methane (CH4) and carbon dioxide (CO2) and small amounts of water vapor (H2O), hydrogen sulfide (H2S), hydrogen (H2), and siloxanes (Valijanian et al., 2018). Biogas is produced during anaerobic digestion (AD) of organic materials, carried out by a complex microbial community through multiple complicated biochemical reactions. Biogas should be upgraded to biomethane prior to injection into the gas grid or use as a vehicle fuel. Given the unique advantageous of this renewable energy carrier, there has been a renewed interest globally in AD of various organic wastes including food wastes for biogas production. Food wastes are the originally nutritious and safe- for-human-consumption substances after being discarded which no longer have food applications. Biogas can also be produced from sugarcane vinasse. It is one of the resources with a high potential for biogas production. The biogas production from vinasse has both economic and environmental benefits. So here we will study the biogas production, a promising technique for food wastes and MSW management.

TP-GT09

Biogas Production from Food Wastes

Kundan patil,Aditya patil
Finolex Academy of Management and Technology, Ratnagiri

Food wastes have a high biomethane production potential because of their high organic matter contents. Biogas is a mixture of different gases, i.e., primarily methane (CH4) and carbon dioxide (CO2) and small amounts of water vapor (H2O), hydrogen sulfide (H2S), hydrogen (H2), and siloxanes (Valijanian et al., 2018). Biogas is produced during anaerobic digestion (AD) of organic materials, carried out by a complex microbial community throughmultiple complicated biochemical reactions. Biogas should be upgraded to biomethane prior to injection into the gas grid or use as a vehicle fuel. Given the unique advantageous of this renewable energy carrier, there has been a renewed interest globally in AD of various organic wastes including food wastes for biogas production. Food wastes are the originally nutritious and safe-for-human-consumption substances after being discarded which no longer have food applications. Biogas can also be produced from sugarcane vinasse. It is one of the resources with a high potential for biogas production. The biogas production from vinasse has both economic and environmental benefits. So here we will study the biogas production, a promising technique for food wastes and MSW management.

TP-GT10

Catalysis

Tejas Patil, Naved Nakadar, Vikram Kale
Bharati Vidyapeeth College of Engineering, Navi Mumbai

Catalysis is one of the most valuable principles out of twelve principles of Green Chemistry. Green chemistry is the utilization of a set of principles that eliminates or reduces the use or generation of hazardous substances in the design, manufacture, and application of chemical products and emphasizes hazard reduction as the performance criteria while designing new chemical processes. In recent years, nano catalysis has become an emerging field of science due to its high activity, selectivity and productivity. The nanoscale size, shape and an exceptionally large surface area to volume ratio imparts unique properties to nano catalysts because of the structural and electronic changes which differentiates them from the bulk materials. This minireview mainly focused on describing the fundamental understanding of nano catalysis, how unique catalytic property and other specific properties of nanomaterial depend on its size and structure at the atomic level and the nano catalyst affect the production of any specific reaction and its efficiency. To study, how to implement nanotechnology in chemical industry and how we recover the nano catalyst effectively.

TP-GT11

Agro-Industrial Lignocellulosic Biomass for Bioethanol Production

Lokesh Gawali, Rudra Yadav, Abhishek Bhagat
Bharati Vidyapeeth College of Engineering, Navi Mumbai

Bioethanol is a fuel having high energy potential for energy security and environmental safety over fossil fuel. Bioethanol can be produced from many lignocellulosic resources like sugarcane bagasse, rice straw, wheat straw, corn Stover, etc. sugarcane based raw material contains more glucose than starch-based corn, sweet potato. Production process contains acid treatment, hydrolysis, fermentation followed with distillation. This poster includes the production of bioethanol using lignocellulosic resources and their advancements as fuel.

TP-GT12

Extraction of Pectin from Orange Peels

Salauddin Sufiyan, Jamadar Lavanya, Hrushikesh
KLE Dr M. S. Sheshgiri College of Engineering and Technology, Belgavi

The sweet oranges (Citrus sinensis) are a very commonly growing tree fruit in the world. The present work explores the possibility of separation of essential oils and pectin from the orange peels. It is found from the experimental observations that the peel source, for extraction of pectin, when taken after extracting orange oil through simple distillation gives higher yield than leaching residue [1]. This work uses Soxhlet extraction for the extraction of oil and the pectin is extracted by acid extraction method from the remaining peels. Strong acids are corrosive and may be a potential threat to health. Varying pH solutions of citric acid are used for the pectin extraction. The effect of pH of the acid solutions and mesh size of the orange peels on pectin yield and composition was studied in a citric acid extraction process. The extracted pectin ranged from 7.3 to 52.90% and 5.1 to 71.0% respectively. It was found that extraction pH was the most important parameter influencing yield. These results demonstrate the successful extraction of essential oil and pectin, providing potential benefits for industrial extraction of pectin from an economic and environmental point of view.

TP-GT13

Properties of polluted and non-polluted soil

Pruthvi Patil, Deepali Shah, Sourabh Kshirsagar.
KLE Dr M. S. Sheshgiri College of Engineering and Technology, Belgavi

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The aim of this study is to clarify the effect of soil aggregation on soil physical and chemical properties. Study of soil quality is a very important aspect where quality of soil can be assessed properly. In our study we carried out grain size distribution and physio chemical test to know the minor quality parameter of soil.

TP-GT14

Grey Water Treatments for Surfactant Removal

Atharva Datar, Prerna Patni, Tanvi Suryawanshi, Smreetija Choudhury
Bharati Vidyapeeth College of Engineering, Navi Mumbai

Water has always played a major role in the industrial laundry operations, due to large quantity of universal solvent required for the effective laundering of industrial garments and other textile goods. On an average a laundry uses 15L of water to process 1kg of work and discharges a total of 400$m^3$of waste water daily. Treatment of this kind of waste water is particularly difficult because of high surfactant content. It also contains various organic and inorganic loads generated by the soil that has been washed out. The main importance is to treat the laundry water. In order to remove various impurities in water and also reduce the COD value of the wash's laundry water to a permissible limit. There are various pre-treatment Methods used to purify the industrial laundry waste water before it is discharged. The tested treatment method system are as follows: physio-chemical-treatment (Coagulation, Flocculation and Dissolved Air Floatation, Sand filtration, Ozonation, Granular Activation carbonfiltration, Crossflow Ultrafiltration, Mobilecomposite Material and adsorption). The most feasible methods which can be used on lab scale are Ultrafiltration, Coagulation, Nanofiltration, Adsorption.Analysis of pH, TSS, COD, BOD, turbidity, Conductivity etc. can be performed to check reuse of laundry wastewater. This project deals with study of treatment of laundry waste water using a combination of various methods.

TP-GT15

Green Energy: Bio-Fuel from Micro-Algae

Bhanu Pratap Singh, Prachi Vijaywargiya, Ayush Saxena
Bharati Vidyapeeth College of Engineering, Navi Mumbai

Increasing demand in transport fuel will eventually lead to complete depletion of fossil fuel and can have severe consequences on human life which has led to discovery of many alternative energy sources. Biofuels are a wide range of fuels which are derived from biomass. The term covers solid biomass, liquid fuels and various biogases. Biofuels are gaining increased public and scientific attention, driven by factors such as oil price hikes and the need for increased energy security. Studies have shown that some species of algae can produce 60% or more of their dry weight in the form of oil. Energy, water, agriculture and sanitation, are considered the most essential and vulnerable necessities of healthy lives and prosperous sustainable growth for our nation and the world. Global warming, increased energy consumption, increasing agricultural demand, and new air and water pollution regulations that have been adopted in agriculture have prompted the need for diverse and integrated waste to energy solutions to meet the needs of farmers, the surrounding community, and the environment.

TP-GT16

An experimental design approach for modelling Acid Violet 49 dye adsorption from aqueous solution by activated groundnut husk

Ruchi Kansagra Apoorva kolur
KLE Dr M. S. Sheshgiri College of Engineering and Technology, Belgavi

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Treatment of discharges /effluents containing residual dyes has been a topic of interest for long. Adsorption is a widely accepted process for the treatment of industrial discharges containing dyes. The search for replacement of commonly used adsorbent –activated carbon by locally available materials has gained importance. Adsorption of Acid Violet 49 (AV49) dye using activated groundnut husk to treat effluents was studied and have given promising result. The batch adsorption experimental data were analysed by using Lageregan pseudo- first- order and pseudo-second-order kinetic models and found that adsorption of AV49 onto AGH followed pseudo-second-order kinetic model. The experimental data were fitted to Langmuir and Freundlich isotherm models. The adsorption of AV49onto AGH was fitted satisfactorily with Langmuir isotherm model (R2=0.99 and RMSE=1.53). Based on the experimental investigation it is suggested that AGH is a potential effectual adsorbent for the removal of AV49 from aqueous solution

TP-GT17

Production of activated carbon from coconut shell

Pragathi M., Krushika Mhalshekar, Faizan Dilshad
KLE Dr M. S. Sheshgiri College of Engineering and Technology, Belgavi

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Activation of carbon from coconut shell using zinc chloride has chemical activating agent. In the developing world there are problems related to water and air. Due to industrialisation water and air are contaminated, those are mixed up with impurities leading to health issues and degrading the environment. Activated carbon has wide range of application. It has more absorbing capacity with purifies contaminated air and water by its absorbing properties. A simple, inexpensive and effective activated carbon can be obtained by using agricultural waste by products.

TP-GT18

Cost Effective Water purifier

Tejas Gangan, Neil Dholabhai, AnupSingh.
Bharati Vidyapeeth College of Engineering, Navi Mumbai

India is a country that is struck by poverty, especially the rural India consisting of numerous villages. Though India has ample of sources of water like lakes, ponds, rivers etc. But majority of the water from these sources cannot be consumed directly because of water pollution. There are various water purifiers available in the market like RO, UVetc.but these water purifiers are expensive, need electricity and maintenance, which intern is a major problem for rural India. Major cities do not face such as ever problem of getting pure water but for the small villages, it is a major concern because people from these village either consume the impure water and fall ill or they have to travel miles and miles to obtain safe drinking water. Considering this as a major problem, we try to design a water purifier that works only on solar energy, is cheap and easy to maintain and without use of any solar panels or expensive materials.

TP-GT19

Optimization of Biodiesel Production

Shruti Shinde, Saurabh Patil, Nabraz Shaikh, Ayush Jadhav
Bharati Vidyapeeth College of Engineering, Navi Mumbai

Sustainable industrial growth requires safe and environment friendly resources of raw material for energy. Biological resources of raw material form basics of sustainable energy for future research, production and economy. Fossil fuels has problem of limited resources, environmental pollution and cost. Hence considerable attention has been given to biodiesel production as an alternative to Petro-diesel. This paper discusses the comparative study of biodiesel (FAME) using raw materials such as algae, waste cooking oil, soybean oil and non-edible oils (oil from soapnut seeds and jatropha seed). It includes effect of different parameters such as (methanol/oil) molar ratio, catalyst, reaction temperature, etc.

TP-GT20

CO_2 capturing prototype

Tejas Kolhe, Vathsala Poojary, Waris Shaikh, Ashay Shirbhate
Bharati Vidyapeeth College of Engineering, Navi Mumbai

It is well known that carbon dioxide plays a dominant role in the greenhouse gas family. Global climate changes lead to high interest in the technologies relevant to the carbon dioxide capturing that is one of the potential methods to reduce greenhouse gas emissions. We are building and studying a prototype air contactor that absorbs carbon dioxide from ambient air for 5-6 days outdoor operation to test our PVC/SS packing-based contactor design in an operational environment. Our operation with pulsed liquid flow allows us to fully wet the surface of our structured packing with a brief period of full flow, then to cut flow for duration of several minutes to let the liquid slowly react away as CO_2 is absorbed. The prototype contactor is manufactured from PVC or stainless steel depending on the cost per-surface-area, solvent used and pressure drop on per-surface-area basis. This prototype focuses on wet-scrubbing air contactor design that is rooted in the gas scrubbing and cooling tower industries and to regenerate our captured purified pipeline-quality CO_2.Extraction and usage of pure CO_2 from guanidine complex or Na_2CO_3 by slight heating or titration can be done.

TP-GT21

Hydrogen as Fuel

Gaurav Malshikare, Bhavesh Birwadkar, Ajinkya Mohite
Bharati Vidyapeeth College of Engineering, Navi Mumbai

Hydrogen is notable for its unique properties making it the most viable alternative fuel for electricity generation and engine power. This element is highly abundant and is being used in numerous applications industrially. But hydrogen can be an important source of fuel and with the proper knowledge of its different technologies, innovations for hydrogen fuel production can then be addressed. Steam reforming of natural gas is the widely used hydrogen production technology. But environmentally safe production had been a pressing issue. Hence, a shift to a cleaner and more sustainable primary energy source is very essential. The different hydrogen production techniques using two primary energy resources as well as the developments, the gaps, and the further improvements needed to be made. To a certain extent, there are some common solutions to the where and when of deploying renewable energy: stronger electricity grids, better demand management, the use of embedded generation, and in the longer term, the developments of the hydrogen economy.

TP-GT22

Cellulose Carbon Aerogel/Ppy Composites for High-Performance Supercapacitor

Prarthana Langi, Akshra Patil, Swetha Boda, Wallabh Borkar
Bharati Vidyapeeth College of Engineering, Navi Mumbai

Energy storage and conversion systems have recently attracted great interest in application of various electronic devices. Conductive polymers are promising pseudocapacitive materials for supercapacitors due to their low cost, low environmental impact, high pseudo capacitance, and ease of fabrication. However, the poor cycling stability limits their application. Here, we use cellulose as a carbon precursor to prepare a hierarchical porous carbon aerogel as a support for conductive polymer polypyrene (Poppy). The hierarchical porous architecture not only enables the efficient penetration and uniform loading of Poppy throughout the carbon network, but also ensures a rapid transfer of electrolytes and the high accessibility of Poppy. The as-prepared hybrid shows a high specific capacitance of 387.6 F g-1 (0.5 A g-1 in 1.0 M H2SO4) and excellent cycling stability (92.6 % capacitance retention after 10000 cycles). This work provides an effective method to sustainably fabricate porous composite electrodes from renewable cellulose for supercapacitor.

TP-GT23

Microfluidics

Nishant Pokharkar, Mustakim Kazi, Rohan Gaykar, Anand Shinde
Bharti Vidyapeeth College of Engineering, Navi Mumbai

Microfluidics is a physics of fluid when flow take place through channel which are having characteristics length scale of micron or less. Physics of this flows drastically changes when compared to nano scale continuum approximation fails. Surface forces like surface tension becomes Important and they are used for driving the flow through this channel. In lab on is one of the applications in which entire functionality of lab is fitted on a single CD. This CD contains large number of microchannels. Sample is added at centre which is mixes with reagents and result of number of tests can be obtained.

TP-GT24

Extraction of Oxalic Acid from Rice Husk

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Extraction of oxalic acid produced from rice husk was carried out by the method of nitric acid oxidation of carbohydrates. The variable ratios of HNO3:H2S04 used were 60:40, and 50:50. The variable ratio of 60:40 gave the maximum yield and at a maximum temperature of 75°C. Rice husk sample gave a percentage yield of 53.2 and 81.0, at temperatures of 55 °C and 75 °C respectively.

TP-GT26

Effect of Use of Carbon Neutral Biomass Fuel in Co-Firing of The Coal Power Plant

Mohammed Arif Deshmukh, Rahul Gupta, Ammar Jawadwala, Indrali Sarpotdar
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Coal is the most important source of electrical power in the world today. The electricity is generated from coal in a coal power plant. A traditional coal power plant needs various types of unit operations to run the plant successfully. Out of these, Boiler, Steam turbine, Condenser, Generator, Transformer, etc. are the most crucial one. Hence, these fuels have many advantages over coal. The most recognizable technology for manufacturing of this fuel is torrefaction. Torrefaction increases its calorific value and improves various physical properties and therefore it becomes suitable to co-fire in a coal power plant. Apart from it, the torrefied biomass does not contribute much to the emission of harmful gases as compared to coal. The only gases emitted from burning of torrefied biomass are CO2, Water(steam), Organic compounds ,etc. Co-firing of biomass also reduces the cost of equipment needed to wash out the harmful gases. The improved properties of biomass after torrefaction make it an attractive solid fuel for (energy) conversion processes as combustion and gasification.

TP-GT27

Synthesis of Curcumin from Curcuma Longa For Health Benefits

Prajakta Gavane, Pranali Bhatt
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Turmeric (Curcuma longa L. Family: Zingiberaceae) is a widely cultivated spice in India and other Asian countries. Curcumin is the main colouring substance in Curcuma longa and two related compounds, demethoxycurcumin and bisdemethoxycurcumin are altogether known as curcuminoids. Turmeric is rich in curcuminoids, and recognized for their broad spectrum of biological activities. It has several types of biological and pharmacological activities, including anticancer, anti-inflammatory and antioxidant properties, etc., Based on the various papers and reports about curcumin importance, we have shown more interest to deal the isolation process of curcumin from turmeric in the easy and fast manner with high recovery. Applying the extraction on industrial scale and then further increasing its Bioavailability is a challenge that we have tried to overcome. The poster will give you an overall perspective about the curcumin in terms of large-scale production.

TP-GT28

Antifouling

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Antifouling coatings are unique to the marine environment.They are used to prevent the settlement and growth of marine organisms on structures immersed in the ocean. Antifouling paints that continuously release one or more biocides through the paint surface have been the primary method of antifouling prevention on ships and other marine vessels for more than a century.coatings have been developed based on both copper oxide and tributyltin compounds. These coatings commonly referred to as ablative or self-polishing coatings, are designed to erode slowly in service. These paints and coatings are harmful to human health and environment as they contain organometallic substances, such as tributyl tin (TBT), and heavy metals, such as lead and chromium. All theeffects, importances, Applications and uses of anti-fouling are briefly discuss in this poster.

MODELLING & SIMULATION
(TP-MS01 TO TP-MS03)

TP-MS01

Modelling and Development of Empirical Equation for Viscosity of Motor Oil - Engine Lubricants

Sourabh Kshirsagar, Varsha Gadad, Pundlik More, Annapurneshwari Dharwad
KLE Dr M. S. Sheshgiri College of Engineering and Technology, Belgavi

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Motor oils are blended using base oils composed of petroleum-based hydrocarbons, consisting of carbon and hydrogen, or polyalphaolefins (PAO) or their mixtures in various proportions, sometimes with up to 20% by weight of esters for better dissolution of additives. The bulk of typical motor oil consists. One of the most important properties of motor oil in maintaining a lubricating film between moving parts is its viscosity. The viscosity of a liquid can be thought of as its "thickness" or a measure of its resistance to flow. The viscosity must be high enough to maintain a lubricating film, but low enough that the oil can flow around the engine parts under all conditions. Another important property of motor oil is its Total Base Number (TBN), which is a measurement of the reserve alkalinity of an oil, meaning its ability to neutralize acids. The resulting quantity is determined as mg KOH/ (gram of lubricant). Analogously, Total Acid Number (TAN) is the measure of a lubricant's acidity.

TP-MS02

Simulation of Cumene Process

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In this process, computational simulation of cumene process is carried out using Aspen PEA .Process Integration was based on the recompression of the product column top stream in order to generate heat which can be used in reboiler .In this technology the purge column which were used in the cumene production were replaced by the two flash vessels to optimize the operating costs and maximize the yields. The energy use in the industrial sector represents critical burden in regard to greenhouse gases emissions since it contributes to approximately 21% of the total CO_2 emitted. So, the author implemented a Multi Objective Optimization (MOO)to explore the trade-offs among economic and safety objectives. The heat generated which is used in the reboiler is source of good alternative. The use of gas expander in the reactor product stream to generate electricity which is used as partial source of electricity.

TP-MS03

Design of a continuous Thickener using Numerical Techniques and Spread Sheet

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Continuous Flow Thickener is structure in which wastewater is stored for some time to remove the suspended particles present in the water. These particles settle at the bottom of the tank and are removed using scrapers. Maintenance costs are low in case of sedimentation tanks and therefore suitable for large capacity effluent treatment plants characteristic curve data obtained from batch settling test. Hence an attempt is made to use numerical techniques (numerically differentiation and interpolation) and solve this design problem analytically. Results obtained from forward, backward and central difference formula were compared. Spread sheet and Programming techniques are used to design a thickener. The advantage of this work is estimation of thickener diameter can be made and thus help in making decisions about the sequence of operations and equipment to be used in effluent treatment plant.

NANOTECHNOLOGY
(TP-NT01 TO TP-NT10

TP-NT01

Application of Nanotechnology in Medicine

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Nanotechnology is a part of science and technology about the control of matter on the atomic and molecular scale – this means things that are about 100 nanometres across. It includes making products that use parts this small, such as electronic devices, catalysts, sensors, etc. It has various applications in different fields. Nanotechnology is being used in developing countries to help treat disease and prevent health issues. The umbrella term for this kind of nanotechnology is Nanomedicine. Nanotechnology is also being applied to or developed for application to a variety of industrial and purification processes. Purification and environmental clean-up applications include the desalination of water, water filtration, wastewater treatment, groundwater treatment, and other nano remediation. In industry, applications may include construction materials, military goods, and nano-machining of nano-wires, nano-rods, few layers of graphene, etc. Also, recently a new field arisen from the root of Nanotechnology is called Nanobiotechnology.

TP-NT02

Applications of Nanotechnology in Cancer Treatment.

Swapnil Hajare, Prathamesh Jagdale, Shreyas Surve, Vaibhav Chavan.
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The study & control of phenomenon & materials at length scales below 100nm & quite often they make a comparison with human hair which is about 80,000nm wide is considered in Nanotechnology.Nanotechnolgy is manipulation of matter with at least one dimension sized from 1 to 100 nanometres. Nanotechnology as defined by size is naturally very broad includes fields of sciences as Surface sciences, Semiconductor physics, Molecular Engineering, Chemical Engineering etc. Nanoparticles have wide range in medical sciences but also in engineering. Chemical engineers play a vital role in development of Nanomaterials. Recent improvement in engineering at Nanoscale level have led to development of variety of new novel nanoscales platforms E.g.; - Gold Nanoparticles, Paramagnetic Nanoparticles etc. which are currently under development & investigation. Nanoscale objects with hydrophobic surface administered in Vivo are taken up by reticuloendothelial system. It also has potential to generate highly effective therapeutic agents.

TP-NT03

Atomic Force Microscopy

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Nanotechnology is the technology or process used for manipulating systems at molecular scale. Atomic Force Microscopy in the method that allows detection of nano-structural information by working at nanoscale of 10^{-9} meters. It's a scanning process in which process images are obtained by interaction between probe and surface. With improved methodologies, AFM has established its applications in wide range of fields including biological, material and food sciences and chemistry. AFM works by sensing the surface of material. Methods like feedback control and without feedback control with sub-methods contact, non-contact and tapping are used as per the requirements. FM is an optimistic approach towards the technical scanning and imaging and can be a great benefit for combining techniques

TP-NT05

Waste Water Treatment by Nanotechnology Using Nanofiltration Polymeric Membrane

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The usage of water in the 21st century for domestic Drinking, washing, etc.] and for industrial purpose has increased on large scale and so has its wastage. This in turn has caused scarcity of fresh water, leaving no option but to find alternative for treatment of waste or used water. Nanotechnology is just the modification of atoms on a nano scale. Nano filters used can not only treat waste water by removing harmful and unnecessary, unwanted material but also to soften water, The advantage of using Nanofiltration for softening is that during the process of retaining Calcium(Ca) and Magnesium (Mg) ions, while passing small hydrated movement ions , filtration in performed without adding extra sodium ions are used in ion exchangers. Nanofiltration membranes are available in a wide range in market, providing numerous operations for targeting mass removals of specific or group of constituents.

TP-NT06

Anti-HIV Treatment Using Narorobots

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Currently, there is no cure and no preventive vaccine for HIV/AIDS. Combination antiretroviral therapy has dramatically improved treatment, but it has to be taken for a lifetime, has major side effects and is ineffective in patients in whom the virus develops resistance. Nanotechnology is an emerging multidisciplinary field that is revolutionizing medicine in the 21st century. It has a vast potential to radically advance the treatment and prevention of HIV/AIDS. In this review, we discuss the challenges with the current treatment of the disease and shed light on the remarkable potential of nanotechnology to provide more effective treatment and prevention for HIV/AIDS by advancing antiretroviral therapy, gene therapy, immunotherapy, vaccinology and microbicides.

TP-NT07

Nanotechnology

Gunjan Baviskar Siddharth Kulkarni Ankit Shelar Famt
Finolex Academy of Management and Technology, Ratnagiri

A nanotechnology is a unit of length in the metric system, equal to one billionth of a meter Technology is the making usage and knowledge of tools, machine and techniques, in order to solve a problem or perform a specific function. The study of controlling or manipulating of matter on an atomic and molecular scale. Generally, nanotechnology deals with structured sized between 1-100 nanometre in at least one dimension, and involves developing or modifying material or devices within that size. The ever concept was presented in 1959 by the famous professor of physics Dr. Richard P. Feynman. Invention of scanning 22behaviour22 microscope in 1981 and fullerene in 1985 led to the emergence of nanotechnology. The term nanotechnology has been termed by Norio Taniguichi in 1974.

TP-NT08

Synthesis and Characterization of Nanoparticles (Tio_2)

Mallikarjun Umbarji, Mayank Sharma, Anushri Udakekar, Karan Patwa
KLE Dr M. S. Sheshgiri College of Engineering and Technology, Belgavi

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Nanoparticles can be defined as particles ranging from 1 to 100 nm diameter, have become widely utilized because of their unique physicochemical properties. Among these nanoparticles titanium dioxide (TiO_2) is frequently used in various application. Nanotechnology explore electrical, optical and magnetic activity as well as structural 23behaviour at molecular or sub molecular level. The purpose of the present manuscript is determination of an improved synthesis of TiO_2 nanoparticles with condition that could be easily reproducible in industry both in terms of energy saving and cost reduction. The synthesis and characterisation are done by the means of analytic techniques such as X-ray diffraction (XRD) and scanning electron microscopy (SEM).

TP-NT09

Membrane distillation

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Membrane distillation (MD) is an emerging thermally driven membrane process in which a hydrophobic microporous membrane separates a heated feed solution and a cooled receiving phase. The temperature difference across the membrane results a water vapour pressure gradient, causing water vapour transfer through the pores from high vapour pressure side to the low one. Some of the key advantages of membrane distillation processes over conventional separation technologies are: relatively lower energy costs as compared to distillation, reverse osmosis, and pervaporation; a considerable rejection of dissolved, non-volatile species; much lower membrane fouling as compared with microfiltration, ultrafiltration, and reverse osmosis; reduced vapour space as compared to conventional distillation; lower operating pressure than pressure-driven membrane processes and lower operating temperature as compared with conventional evaporation

TP-NT10

Nano sponges

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Nano sponge is a modern category of material and is made up of tiny particles with a narrow cavity of few nanometres. These narrow cavities can be filled with various types of substances. These tiny particles are having a capability due to which it is able to carry both hydrophilic and lipophilic substances. These are three-dimensional scaffold (backbone) or network of polyester that are capable of degrading naturally. The industrial revolution has played a critical role toward the increase of CO_2 concentration in environment. The elevated levels of CO_2 in the atmosphere has contributed to extreme climate change and global warming, hence rises the importance of detecting and controlling levels of CO_2 produced. Physisorption on nano sponges allows to reversibly store significant amounts of gas at room temperature and atmospheric (or moderate) pressure, thus preventing the risks deriving from handling high-pressure compressed gas and the technological constraints related to the low temperature of liquefied gas. Due to these remarkable properties it is used from water purification to industrial application to effective drug delivering system

POLYMER TECHNOLOGY
(TP-PT01 TO TP-PT08)

TP-PT01

Polymer Technology Advancement

Neel Kantharia,Neha Parmar,Dhruv Hirpara
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Polymers have become a very crucial part of the life of a human being. From the plate that we eat on to the bed that we sleep is made up of one or more polymers. The applications of polymers are uncountable but we can still see it around us. The industry of polymers especially plastics has grown from heaps and bounds and has reached the level of perfection. Plastics finds a variety of uses in the medical, industrial, automotive etc. We hereby like to elaborate this topic. The main reason why the polymers have such a huge advancement is that the properties of the polymers are far better than the natural things which are used as an alternative. But the most important problem which arises is that the polymers especially plastics are very difficult to degrade. But at the end our lives are incomplete without the use and help of these plastic polymer products. Hence these applications are undeniably perfect and best for the use of the common man.

TP-PT03

Process development for the bulk polymerization of functional copolymers for Relative humidity and vapour sensing Applications

Nilesh Deshmukh
Dr. Babasaheb Ambedkar Technological University, Lonere.

Some copolymers have good sensing applications than other copolymers or polymers. In chemical industry as well as in Research and development sector requires correct knowledge of various parameters like relative humidity, detection of various toxic and unwanted gases, vapour sensing of various chemicals. Here we have made the Acrylonitrile (ACN) and Methyl methacrylate (MMA) copolymers for the sensing application. Copolymers are producing by bulk polymerization application of irradiation in GammaChamber-5000 in RTDD Division of Bhabha Atomic Research Centre, Mumbai.For vapour sensing we have taken six chemical vapours they are Acetone, Toluene, Benzene, Ethanol, Methanol, Ammonia. This Capacitive RH sensor shows very good and fast sensing.

TP-PT04

Polymer Technology and Advancements

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Polymers play a pivotal role in living providing basic structural materials and participating in vital life and industrial processes. However, while using plastics, nontoxic environment along with the proper disposal of available plastic polymers is the need of the hour. Treatment of such polymers with bacteria ideonella sakaiensis has been proved to be feasible. The methodologies include usage of organic as well as synthetic materials which are not only cost effective but also less toxic than the conventional methods of production. Some synthetic polymers commonly used are Nylon (e.g. Kevlar and conveyor belts), PTFE, PVC (switch boards), LDPE (textile, labeling, stationary) and HDPE (vinegar, bleach bottle). The futuristic projects of such polymers can be in a biodegradable format (biopolymer) which saves energy and cost. Also highlighting the use of smart polymers which eliminates the chance of wastage.

TP-PT05

Lignin Valorisation into Chemicals, Fuels and Healthcare Products by Microbial Ligninolytic

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Lignin is the second most abundant polymer on earth. It naturally occurs as an integral part of lignocellulose in plants to give them rigidity and structure. Globally, the amount of available lignin in the biosphere is approximately 300 billion tons, with an annual increase of approximately 20 billion tons, thus providing an extensive carbon resource for sustainable production processes. Lignin valorisation promises a hand-in-hand production of added-value chemicals, materials and fuels from a global nonedible renewable resource instead of petroleum and much better economics of existing lignocellulosic processes in the biofuel and the pulp and paper industries. The development of concepts and strategies for upgrading lignin into value-added compounds is clearly one of the hot topics in current chemical, biochemical and biotechnological research. As illustrated, metabolic engineering has bred efficient microbial cell factories for the production of relevant industrial goods from lignin at the laboratory scale and even at the pilot scale. In this regard, a cornerstone for lignin valorisation has been achieved, and it promises exciting possibilities for future upgrading of lignin-containing product streams from the biomass-processing industries

TP-PT06

Synthetic Petroleum-Based Polymers

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The synthetic polymer industry represents the major end use of many petrochemical monomers such as ethylene, styrene, and vinyl chloride. Synthetic polymers have greatly affected our lifestyle. Many articles that were previously made from naturally occurring materials such as wood, cotton, wool, iron, aluminium, and glass are being replaced or partially substituted by synthetic polymers. Clothes made from polyester, nylon, and acrylic fibres or their blends with natural fibres currently dominate the apparel market. Plastics are replacing many articles previously made of iron, wood, porcelain, or paper in thousands of diversified applications. Polymerization could now be tailored to synthesize materials stronger than steel. For example, polyethylene fibres with a molecular weight of one million can be treated to be 10 times stronger than steel.

TP-PT07

Highly Compressible Wood Sponges with a Spring-like Lamellar Structure as Effective and Reusable Oil Absorbents

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Over the years, scientists have developed numerous techniques to clean up oily water, from gravity separation to burning to bioremediation. More recently, researchers have explored 3D porous materials, such as aerogels or sponges, based on various building blocks including synthetic polymers, silica or cellulose nanofibers. However, these are often difficult to fabricate, lack mechanical robustness or are made from non-renewable, nondegradable materials. Herein, we report an effective strategy to create anisotropic cellulose-based wood sponges with a special spring-like lamellar structure directly from natural balsa wood. A subsequent sialylation reaction allowed the growth of polysiloxane coatings on the skeleton. Moreover, the absorbed oils can be recovered by simple mechanical squeezing, and the porous sponge maintained a high oil-absorption capacity upon multiple squeezing-absorption cycles, displaying excellent recyclability. Such an easy, low-cost, and scalable top-down approach holds great potential for developing effective and reusable oil absorbents for oil/water separation.

TP-PT08

Supercritical Fluid Extraction

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Supercritical fluid extraction (SFE) is the process of separating one component (the extractant) from another (the matrix) using supercritical fluids as the extracting solvent. Extraction is usually from a solid matrix, but can also be from liquids. SFE can be used as a sample preparation step for analytical purposes, or on a larger scale to either strip unwanted material from a product (e.g. decaffeination) or collect a desired product (e.g. essential oils). These essential oils can include limonene and other straight solvents. Carbon dioxide (CO2) is the most used supercritical fluid, sometimes modified by co-solvents such as ethanol or methanol. Extraction conditions for supercritical carbon dioxide are above the critical temperature of 31 °C and critical pressure of 74 bars.

WASTE TREATMENT
(TP-WT01 TO TP-WT28)

TP-WT01

Jet Fuel Production from Waste Plastics Via Catalytic Pyrolysis with Activated Carbons

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With the increasing amount of waste plastics being used domestically and industrially, the disposition of those being not reusable is a challenging task. Herein, the catalytic pyrolysis of waste plastics over seven types of commercial and home-made activated carbons was studied in a facile tube reactor. Experiment results revealed that these activated carbons although generated via various physical and chemical activation processes could all exhibited excellent catalytic performance in converting low-density polyethylene into jet fuel and H2-enriched gases. Properties of activated carbons were also characterized by scanning electron microscope, Fourier transform infrared spectrometer, nitrogen gas adsorption, and chemical adsorption. In addition, the production of jet fuel was also achieved from daily waste plastics, which was also confirmed by nuclear magnetic resonance analysis. The present work offers a novel route of converting waste plastics directly into transportation jet fuel.

TP-WT02

Solid Organic Waste Management

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Lahs Eco Engineers manufacture a waste decomposition machine known as Goldust. Goldust is an automatic composting machine which uses thermophilic microorganisms to achieve 85% volume reduction of organic waste. The machine is connected with a motor which rotates the mixing blades to allow uniform decomposition. Organic waste contains 70-80% water content which is evaporated by using a heater and vented put. The remaining mass can be used as compost which is retrieved after 6-8 days. The machine has a capacity range from 10kg/day to 5 tonnes/day. The machine is an efficient, environmental friendly, compact and convenient technology for waste management.

TP-WT03

Waste Management

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Waste management (or waste disposal) are the activities and actions required to manage waste from its inception to its final disposal.[1] This includes the collection, transport, treatment and disposal of waste, together with monitoring and regulation of the waste management process. Waste can be solid, liquid, or gas and each type have different methods of disposal and management. Waste management deals with all types of waste, including industrial, biological and household. In some cases, waste can pose a threat to human health.[2] Waste is produced by human activity, for example, the extraction and processing of raw materials.[3] Waste management is intended to reduce adverse effects of waste on human health, the environment or aesthetics. Waste management practices are not uniform among countries (developed and developing nations); regions (urban and rural areas), and residential and industrial sectors can all take different approaches.

TP-WT04

Water Waste Treatment

Mayur Kakade Shreya Kakade, Arpita Jadhav
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In environment, the usage of water source plays a vital role and it has been used in large amount. However insufficient management of waste water (from industrial sector, agriculture, household, animal, commercial sectors, etc.) increases hygienic risk for growing urban population and thereby hampering poverty alleviation and the sustainable development of our Indian society. However now-a-days various technologies are used in order to convert waste water to consumable form. One such technology- Phyto rid technology promises to be more efficient, cost-friendly and eco-friendly. Phyto rid technology is basically a subsurface mixed flow constructed wetland system developed and internationally patented by National Environmental Engineering Research Institute (NEERI). The Phyto rid technology is based on natural treatment methods such as filtration, sedimentation, nutrient uptake, by plants and microbial action in a constructed system filled with gravels. Specifically identified different species of plants which are known to have good nutrients rates are planted in gravel.

TP-WT05

Development of The Plastic Waste Management

Varaprasad Allur, Sakshi Jain
AISSMS COE; Pune

The quantum of plastic waste in Municipals Solid Waste is increasing due to increase in population, development activities and changes in the lifestyle. As plastic is non-biodegradable in nature, it remains in environment for several years and disposing plastic waste at landfill are unsafe since toxic chemicals leach out into the soil, underground water and pollute the water bodies. Therefore, plastic waste disposal is the major problem for the civic authorities.

TP-WT06

Advances in Membrane Technology for Waste Treatment

Deepali Kadam, Dhanashree, Jagtap, Sejal baviskar
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Research into the use of membrane-based processes in the industry is an interesting area for modern membrane science and technology. Advanced Membrane Technology and Applications covers the fundamental principles and theories of separation and purification by membranes, the important membrane processes and systems, and major industrial applications. The main purpose is to describe and discuss well recognized and also promising aspects of membrane usage in the industry with the focus on waste management and environmental protection, energy conversion and membrane processes. Membrane separation technology has been considered one of the most promising solutions to these problems, as it has a number of advantages: a small footprint, high efficiency, and relatively low costs. The poster also includes coverage of all the major types of membranes, its advantages and disadvantages, includes discussions of important strategic issues and the future of membrane technology.

TP-WT07

Desalination and Water Treatment

Sejal Vahadne, Sanjay Ghare, Ajay Phulwade
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Combined removal of Rhodamine B and Rhodamine 6G from wastewater using novel treatment approaches based on ultrasonic and ultraviolet irradiations. The present work deals with treatment of wastewater containing a mixture of basic dyes from Rhodamine family, i.e. Rhodamine B and Rhodamine 6G using different treatment approaches based on the use of ultrasonic (US) and ultraviolet (UV) irradiations. The approach involving combination of advanced oxidation processes, i.e. US/UV/Fenton resulted in enhanced extent of degradation (Rh-B as 89% and Rh-6G as 84%) as compared to the individual operations(ultrasonic irradiations alone giving degradation of 32 and 52% for Rh-B and Rh-6G, respectively, whereas for UV irradiations alone degradation were 25 and 40% in same order). The maximum COD removal for the mixture of dye solution obtained using combined treatment strategy as US/UV/optimal TiO2 /NaCl and US/UV/optimalTiO2/Ferrous salt were 96 and 97%, respectively. Overall, combined treatment processes in the presence of additives has been established to be effective as compared to the individual oxidation approaches based on the use of irradiations.

TP-WT08

Dairy Waste Management

Mandar Rane, Sikandar Gupta, Aniruddha Desai
Shivaji Rao S. Jondhale College of Engineering, Dombivli

The Dairy Industry is among the most polluting of the Food Industry in volume in regard to its large water consumption. Dairy Industries have shown tremendous growth in size and number in most countries of the world. Dairy Industries produce nearly thousands of litres of effluent waste per day. These Industries discharge waste water which is characterized by high chemical demand, biological oxygen demand, nutrients, and organic and inorganic contents. This waste with high intense foul odour pollutes ecosystem and ground water harbour pathogens causing health hazards. The various recent advancement in the treatment of dairy waste water such as Biological treatment process which includes aerobic process and anaerobic treatments along with these there are certain physic-chemical processes have been discussed and the areas where further research is needed have been identified.

TP-WT09

Fuel from Pyrolysis of HDPE

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Plastic is the most common waste produced from industries and local waste The most common plastic waste from recycle Industries is HDPE. High-density polyethylene **(HDPE):** HDPE is characterized as a long linear polymer chain with high degree of crystallinity and low branching which leads to high strength properties. The various applications contribute about 17.6% in plastic waste category which is the third largest plastic type found in municipal solid waste (MSW). Conical spouted bed reactor (CSBR) provides good mixing with the ability to handle large particle size distribution, larger particles and difference in particle densities. According to them, CSBR had the versatility of handling sticky solid that was hard to handle in fluidized bed reactor**.** The rate of this process is increased by using specific catalyst, Catalysts: Zeolite catalyst. Zeolites are described as crystalline aluminosilicate sieves having open pores and ion exchange capabilities. The ratio of SiO2/Al2O3 determines the zeolite reactivity which affects the final end product of pyrolysis. The products obtained by pyrolysis consists mainly of oil, char and char.

TP-WT10

Pyrolysis

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The objective of this paper is to optimise the liquid product of pyrolysis from as much as 500 g of polypropylene (PP) plastic waste, using a fixed bed type reactor in a vacuum condition (−3 mm H2O),to minimise the oxygen entering the reactor. The vapour flows through the 4-tray distillation bubble capplate column for fractionation by utilising heat from the reactor. Process conditions at 500–650 ◦C and of 580 ◦C optimum liquid oil yield is 88 wt.%, comprising of kerosene in tray I with a volume of 350 ml, gasoline in tray II and III with volume of 228 ml, and tray IV had no condensate. Gas yield is 5 wt.% and the rest is char. At the conditions between 500 ◦C and 560 ◦C, gasoline yield in 6–67 wt.% comprises of kerosene and gasoline. However, at process conditions between 600 ◦C and 650 ◦C yields of 64–83 wt.% comprising of diesel oil was obtained at tray I and II, while kerosene and gasoline were obtained in the next tray. The characteristics of fuel obtained from plastic such as density, viscosity, octane–cetane number, ash content and calorific value have similar properties with those of fossil fuels.

TP-WT11

Development of Electrode and Energy Generation from Wastewater

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Increasing energy demands along with the progress of human civilization is a major global concern as the dominant energy-yielding resources are heavily dependent on natural reserves of fuels available in nature in solid, liquid, and gaseous forms. The limited natural sources are bound to run out, and there is a dire need to develop alternate solutions in order to meet human needs. Renewable energy will one day be a large portion of global energy production and usage. It has demonstrated that wastewater from some of the dirtiest industrial processes can be turned into a carbon source for preparation of energy storage materials. The methodology developed can be used for wastewaters with high 'total organic carbon' content generated by other polluting industries such as tanneries. Besides extraction of carbon material, a combination of adsorption and low-pressure reverse osmosis (RO) can be used to further treat wastewater making it reusable in sugar industries as well as for irrigation purposes. Microbial electrolysis cell and microbial fuel cell are used for generation of energy from wastewater.

TP-WT12

Removal of Harmful Metal Ions from Industrial Effluents

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Environmental pollution particularly from heavy metals in the waste water is the most serious problem in India. Heavy metal ions are major toxic pollutants with severe health effects on humans. Hence their removal is important. Day by day waste materials concentration has been increased to dangerous levels. Heavy metals in industrial effluent include lead, copper, zinc, chromium etc. Conventional treatment methods of heavy metal removal are often limited by their cost and ineffectiveness at low concentrations. There are various efficient methods for removal of heavy metals such as chemical precipitation, ion exchange, reverse osmosis, ultrafiltration, photo-catalysis etc. However, these methods have certain disadvantages such as high reagent requirement, unpredictable metal ion removal, generation of toxic sludge etc. To study heavy metals removal, we must use a simple, economical, effective versatile process. For this study, Adsorption process is most preferred method for removal of toxic contaminants from waste water. Low cost adsorbents include pistachio shell, sand, rice husk, activated carbon, wood sawdust etc. It is evident from the survey that adsorbents are most frequently and widely applied for treatment of metal contaminated wastewater. In the near future, photo-catalytic process will be most promising method for treatment for removal of heavy metal ions.

TP-WT13

Effluent Treatment from Petroleum Refinery

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Refineries are among the major consumers of water due to cooling towers and process usage. During the treatment and refining of crude oil, large quantities of waste water are generated, which require treatment. The quality of this waste water varies with the grade of crude oil and the process used for treating this oil. Refining process generates 0.4-1.6 times waste water of the volume of crude oil proceed. Mixing of this waste water into natural water sources affect the environment and human health due to contamination of hydrocarbon, phenol and dissolved minerals that are toxic in nature. Waste water from petroleum industries and refineries mainly containsoil, organic matter another compound. The treatment of this waste water can be carried out by physical, chemical, and biological treatment processes. The objective of this study is to summarize study and investigate and show a brief detail of different technologies used for the treatment of petroleum wastewater.

TP-WT14

Study of Enzymes for Wastewater Purification

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The introduction and implementation of stringent standards for waste discharge into the environment has necessitated the need for the development of alternative wastewater purification process. A large number of enzymes from various microbes have been reported to play crucial role in wastewater purification process. Enzymes can specifically act on and remove recalcitrant pollutants by precipitation and transformation to other products and can also change the characteristics of a given waste making it more susceptible to purification process or aid in converting waste material to value added products. Recalcitrant pollutants in wastewater can also be treated by using nanotubes carrying oxidative enzymes as laccases and peroxidises. Immobilization of glucose oxidase and chloroperoxidase onto carbon nanotubes maintained their functionality and increased substrate conversion efficiency. The use of enzymes in place of harmful chemical reactions is extremely important to meet the demands for cleaner and greener technologies to preserve the planet.

TP-WT15

Refining of Lube Oil

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Lubricant oils may contain about 90% base oil, generally petroleum fractions also referred to as mineral oils with the remaining fraction being composed of additives like anti-oxidants, metal deactivators, anti-foaming agents, Viscosity improvers, de-emulsifying and emulsifying agents etc. After a certain period of useful life, lubricating oils lose their properties and cannot be used further because of accumulation of contaminants and chemical changes. The base oil however retains its properties. While re-refining of used oil is a viable proposition yet a major portion finds its way into the environment and presents problems of surface and ground water pollution and land contamination. Motor oil picks up a variety of hazardous contaminants when used in engines and transmissions. These contaminants include lead, cadmium, chromium, arsenic, dioxins, benzene and polycyclic aromatics. If used motor oil and the contaminants it contains are disposed of inappropriately and released into the environment, they can harm humans, plants, animals, fish and shellfish. There are several refining processes present that are used to recycle the lube oil. It also contributes to improving of the economy by reducing the import rates.

TP-WT16

Refining of Lube Oil and Its Recycling

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Used oil – as its name implies – is any petroleum -based or synthetic oil that has been used. During normal use, impurities such as dirt, metal scrapings, water or chemicals can get mixed in with the oil or be generated in it due to thermal degradation or oxidation. Therefore, the oil quality gradually decreases to a level that the used oil should be replaced by a new one. Disposing the used oil off in nature creates an intense dangerous pollution. But by proper recovery and refinement of it, a lot of valuable product can be obtained. This article studies one of the best methods of used oil re-refining and compares its product specifications with those of a virgin base oil. The important point to note is that the technology used by Dominion Oil is virtually identical to that used to refine crude petroleum, the difference being that the level of contamination in used oil is much lower than that in crude oil. Used oil is uplifted from centralized collection points at places such as service stations, workshops, recycling depots and factory sites. The oil is burned at temperatures of approximately 1400^{o}C, ensuring complete combustion. At this temperature dioxins are not formed as they may be at lower temperatures. This method has been endorsed by the Department of the Environment as the preferred alternative to re-refining

TP-WT18

Generation of Fuel from Waste by Pyrolysis

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Petroleum products are used in every aspect of life today. With rapid increase in world population, their demand is increasing day by day. But the world's oil supply is fixed since petroleum is formed naturally far too slowly in comparison to the rate at which it is being extracted. As countries develop, industry and higher living standards drive up energy use, most often of oil. India, is quickly becoming large oil consumers. India's oil import is expected to become more than triple from 2005 levels by 2020, rising to 5 million barrels per day. Expanding agricultural production has naturally resulted in increased quantities of waste, agricultural crop residues and agro-industrial by-products. Our project based on purely innovative concept. Waste (agrowaste, tyre, plastic, etc.) is used for the manufacturing of valuable fuel oil reflecting today's environmental requirements. For reusing waste is the best way to overcome the increased demand for petroleum products. In our project waste is converted into fuel by using fixed bed reactor which is substitute for convectional fuel. In this thermal energy is used to convert the higher molecular weight compounds into lower molecular weight compounds (fuel oil).

TP-WT19

Minimisation Process Heat Dissipation to Cooling Tower

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An effective way to increase energy efficiency is to recover waste heat. The basic idea behind waste heat recovery is to try to recover maximum amounts of heat in the plant and to reuse it as much as possible, instead of just releasing it into the air or a nearby river. Our aim is to reuse generated heat instead of just released as auxiliary heat in cooling tower. To minimize heat dissipated from plant by using modern technologies. To increase the company's profit by minimizing utility consumption, reducing cooling needs, minimizing greenhouse gas emission.

TP-WT20

Waste Management

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India generates 62 million tons of mixed waste per annum from which only 15% of waste is recycled and other waste is dumped into grounds. which causes serious diseases and produce toxic chemical. The purpose is to protect environment and health of humans and animals. It can be done by plastic roads construction and by converting landfills into productive land. It reduces environmental population and also create employment. Hence waste can be profitable if it reduces, reuse, recycled.

TP-WT21

Extraction of dyes from Industrial effluents using Domestic Waste

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The dyeing effluents from industries have a latency of high environmental impact on water bodies due to their toxicity. The presence of the dye increases the turbidity of water and contains certain compounds that could be toxic, carcinogenic, and mutagenic to living organisms. The treatment of waste water hence gains highest priority prior to its discharge into the streams. An attempt was made to extract dyes from the effluent by using an adsorbent obtained from domestic waste. Adsorption studies have been carried out using Activated carbon (obtained from Coconut Fiber) as the absorbent to remove Forum blue from aqueous solution. Parameters such as Concentration, pH, Agitation time and Dosage were analysed and optimum conditions were obtained.

TP-WT22

Algal Bacterial Processes for The Treatment of Hazardous Contaminants released by chemical industries

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Microalgae enhance the removal of nutrients, organic contaminants, heavy metals and pathogens from domestic waste water and creates an interesting raw material for the production of high value chemicals i.e. [algae metabolites] or biogas. Chemotrophs obtain energy from oxidation-reduction reactions of inorganic compounds such as ammonia, hydrogen sulphide and iron. Sulphur bacteria are chemoautotrophs which produce energy by oxidizing hydrogen sulphide into sulphur and water. This process is a form of chemosynthesis Nitrifying bacteria oxidize ammonia to create nitrites and nitrates, are an example of bacteria which use autotrophic nutrition, or more specifically, chemoautotrophic nutrition. Thus, eliminating inorganic compounds from the waste water. It is possible to use microalgae to produce the O2 required by acclimatized bacteria to biodegrade hazardous pollutants such as polycyclic aromatic hydrocarbons, phenolics, and organic solvents. Photobioreactors along with algal biomass recirculation is done to speed up the efficiency of algal-bacterial system. Biomass harvest remains a limitation but recent progresses have been made in the selection of flocculating strains, the application of bio flocculants, or the use of immobilized biomass systems.

TP-WT23

Fluidisation

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Ion exchange is the most common process for public water supplies in the United States. There are certain characteristics of water that indicate the quality of the water such as hardness, salinity, alkalinity, etc. To make the water safer for consumption, it is passed through a packed bed of ion exchange resins to remove hardness. In this process of ion exchange, the resins become saturated and have to be regenerated. For regeneration of resins, backwashing takes place. Here, fluidization plays a vital role. Fluidization is a process by which a bed of particulate materials exhibits fluid-like behaviour as a result of fluid flowing through it. For regeneration of resins, fluidization properties of the resins such as minimum fluidization velocity, pressure drop across the bed, porosity of the bed are required. Ion exchange resins is also one of the best methods to reduce heavy metals concentration in waste streams down to levels fulfilling the everyday stricter regulations on the disposal of waste waters.

TP-WT26

Separation Of D-Limonene and Pectine From Sweet Lemon Peels Using Extraction Method

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Citrus fruits are one of the important horticulture crops, with worldwide agricultural production over 80 million tons per year. Although, the fruits used for dessert, they have economic value for their essential oils. Citrus essential oil is obtained as by-products of the citrus processing and the most widely used essential oil in the world. In fact, among the great variety of essential oils, citrus fruit essential oil and their major component have gained acceptance in the food industry since they have been generally recognized as safe, and many foods tolerate their presence. One of the major problems challenging the food industry throughout the world is how to make full utilization of the waste material. These waste materials, as citrus peels and other residues from 60% to 65% of bulk citrus fruit after processing, such residues are normally thrown as waste during processing. Citrus waste contains many useful components which can be extracted and utilized in different products. One of these components is limonene oil and pectin. Hence, citrus peel has become one of the most important sources of commercial limonene oil and pectin.

TP-WT27

Electricity from solid waste using waste to energy (WtE) technology

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Every minute a garbage truck loaded full of plastic is dumped into our sea. It is estimated that by 2050 there will be more plastic than fish in the ocean and that is not a good look for our oceans and that's just the plastic! So how can we get rid of our trash? What if we burn If everybody started piling up garbage in their back yard and burning it openly and singing songs around it could be fun! FOR A MINITUE! Then it would increase toxic pollution which would lead an increase in cancer! This sounds hypothetically scary but what is in reality scary that 41% of globe waste is burned openly currently! The world health organisation estimates that 90% of the world's children breathe toxic air every day! So, if everybody independently burned their garbage outside more people would die. But what if we burned our garbage in an industrial level incinerator and produced something useful like electricity? Waste-to-Energy (WtE) technologies consist of any waste treatment process that creates energy in the form of electricity, heat or transport fuels (e.g. diesel) from a waste source

TP-WT28

Waste management

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India generate close to 26,000 tonnes of plastic per day. Plastics that act as pollutants. Plastic is non-biodegradable solid waste. Plastic is a very important recyclable because it can negatively affect the environment and living beings in many ways. A Government order in November 2015 has made it mandatory for all road developers in the country to use plastic mix in bitumen. Most important reason for proper waste management is to protect the environment and for the health and safety of the population. Plastic, along with bituminous mixes, for road construction, this is to help overcome the growing problem of plastic waste disposal in India. Construction of plastic road is an easier way of disposing of plastic bottles which are found scattered all over. The entire process is very simple. The plastic waste material is first shredded to a particular size using a shredding machine. The aggregate mix is heated at 165°c and transferred to the mixing chamber, and the bitumen is heated to 160°c to result in good binding. It is important to monitor the temperature during heating.

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