A

Project Report

On

FORMULATION AND EVALUATION OF AN EFFECTIVE GLASS CLEANING SOLUTION

BACHELOR OF TECHNOLOGY

in

CHEMICAL ENGINEERING

UNDER THE GUIDANCE OF

Dr. Neeraj Chandrakar
And
Mr. Satyajit Bhattacharjee

SUBMITTED BY

Aryan Singh(22021113)

DEPARTMENT OF CHEMICAL ENGINEERING
SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, CHHATTISGARH,
BILASPUR-495009, INDIA

DEPARTMENT OF CHEMICAL ENGINEERING
SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, INDIA

CERTIFICATE

This is to certify that the project entitled "FORMULATION AND EVALUATION OF ANEFFECTIVE GLASS CLEANING SOLUTION" a review report submitted by **Aryan Singh(2202113)** in fulfillment of requirement for the degree of **Bachelor of technology in Chemical engineering** is a record of bonafide and original research work carried out by them under our guidance and this project does not include any work which has previously been submitted for the award of other degree ,diploma, associate-ship , fellowship ,or other similar title of them .We ,further clarify that the work report in this project was carried out independently by the candidates.

Guided By

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Signature_____
Mr. Satyajit Bhattacharjee
Assistant Professor
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Approved By

Signature_____
Dr. Raghwendra Singh Thakur
Head of Department
Department Of Chemical Engineering
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Bilaspur, Chhattisgarh

TABLE OF CONTENT

Abstract

Developing an effective glass cleaning solution involves a strategic approach to formulation and evaluation, ensuring optimal performance, safety, and environmental sustainability. This study aimed to design a glass cleaner that delivers a streak-free finish, efficiently removes dirt, grease, and grime, and is safe for users and the environment. The formulation combined a carefully chosen blend of surfactants, solvents, and pH adjusters to enhance cleaning efficiency and compatibility with various glass surfaces. Ethanol and isopropyl alcohol were incorporated for their quick-drying properties, while ammonia or acetic acid provided grease-cutting capabilities. Surfactants emulsified oily residues, and deionized water was used as a solvent base to prevent streaking caused by impurities. Comprehensive performance tests assessed cleaning efficiency, streak resistance, drying time, and compatibility with tempered, laminated, and mirrored glass surfaces, with comparative benchmarking against leading commercial products. Environmental impact was minimized through the use of biodegradable ingredients and reduced volatile organic compounds (VOCs) to meet regulatory standards. Safety evaluations ensured the product's low toxicity and compatibility with skin, making it suitable for household use. The optimized formula demonstrated excellent cleaning performance, leaving glass surfaces clear and streak-free, while users appreciated its ease of application, pleasant fragrance, and quick drying time. Sustainability assessments confirmed compliance with eco-friendly standards, establishing the product as a greener market alternative. This study demonstrates the potential to create a high-performing, user-friendly glass cleaning solution that meets consumer needs while addressing environmental and safety objectives.

A

mini project report

on

"Simulation of the production of Sulphuric acid by Contact process using Aspen HYSYS"

BACHELOR OF TECHNOLOGY

in

CHEMICAL ENGINEERING

Submitted by:-

Janhavi Patel

Under the Guidance of:-

Dr.Raghwendra Singh Thakur

(Head of Department)

Department of Chemical Engineering

Department of Chemical Engineering

School of Studies of Engineering & Technology

Guru Ghasidas Vishwavidyalaya, Bilaspur

(C.G.)

DEPARTMENT OF CHEMICAL ENGINEERING

School Of Studies Engineering & Technology

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University Established By The Central University Act 2009 No. 25 of 2009)

CERTIFICATE OF APPROVAL

It is certified that the mini project "Simulation of the production of sulfuric acid by contact process using Aspen Hysys ". Submitted by:- Janhavi Patel (22021119) in partial fulfillment of the requirements of the award of the degree of Bachelor of Technology in Chemical Engineering, School of Studies Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur, is carried out in the Department of Chemical Engineering during session 2024-25 under supervision and guidance of Dr. Raghwendra Singh Thakur (Head of Department) Department of Chemical Engineering, School of Studies Engineering & Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G).

Approved BY

Dr. Raghwendra Singh Thakur

Head of Department

Department of Chemical Engineering

School of Studies of Engineering & Technology

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16/12/24

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CO- GUIDED BY

Dr. Ghoshna Jyoti

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ABSTRACT

This study aimed to simulate the production of sulfuric acid by contact process using Aspen Hysys V11 making some assumptions and using hypothetical reactors. Antoine Model is used as a fluid package in this simulation where the values of minimum and maximum temperature and the coefficients (A through F) are estimated for each component. The increase in boiler outlet temperature shows a linearly decreased relation with waste energy heat flow. Inlet water temperature shows no effect on the molar enthalpy of the sulfuric acid product and the value of molar enthalpy of the sulfuric acid product remains constant. Air temperature also shows no effect on product sulfuric acid flow rate. Flu gas temperature shows a linearly increased relation with absorber inlet water temperature for the range of 10 to 120℃ and sharply increases for the range of 120 to 130℃ and finally becomes roughly constant after 130℃ with the increase of absorber inlet water temperature.

CALCULATION OF THICKNESS OF PRESSURE USING AI IN PROCESS EQUIPMENT DESIGN

Submitted by

Name	Roll No.
Abhishek Singh	22021104
Vineet Yadav	22021164

Session 2024-2025

Guided by

Dr. Anuradha N. Joshi

(Associate Professor)

Department of Chemical Engineering

School of studies of Engineering & Technology

Guru Ghasidas University (A Central University)

Bilaspur (C.G) December 16, 2024

CERTIFICATE OF APPROVAL

This is to certify that the project entitled **"CALCULATION OF THICKNESS OF PRESSURE VESSEL USING AI"** submitted by **Abhishek Singh & Vineet Yadav** in partial fulfilment of the requirement of credits in Third year of **Bachelors of Technology, Chemical Engineering** is a record of bonafide and original research work carried out by them under my guidance and this project does not include any work which has previously been submitted for the award of other degree, diploma, associate-ship, fellowship, or other similar titles to them. I, further certify that the work reported in this project was carried out independently by the candidates.

Approved by

Dr. Raghwendra Singh Thakur
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Guided by

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School of studies of Engineering and Technology
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Abstract

The use of artificial intelligence (AI) into process vessel design in chemical engineering is a game-changing technology that improves operational efficiency, safety, and creativity. This abstract investigates AI's numerous applications in this sector, focusing on its influence at various phases of vessel design and operation. AI techniques, notably machine learning and data analytics, are increasingly being used to optimise the design parameters of processing vessels. These technologies make it easier to analyse large information generated by simulations and real-time operations, allowing engineers to forecast performance outcomes and discover the best design configurations. For example, AI-driven models may increase mixing efficiency in stirred containers by studying fluid dynamics and improving impeller designs depending on particular fluid parameters, such as viscosity and density. Furthermore, AI improves the capability of predictive maintenance in process vessels by using sensor data to monitor equipment health and detect probable breakdowns. This proactive strategy cuts downtime and maintenance costs, resulting in safer and more dependable operation.

A

Minor Project Report

On

Study on Conversion of Biomass into Syngas

For the partial fulfillment of the Award of

Bachelor of Technology

In

Chemical Engineering

Submitted By

Akshat Pandey(22021108)

Nitish Kumar Roy(22021170)

Naga Magadasu(22021122)

Shambhavi Kumari(2201153)

Kashish Sain(22021121)

Under The Guidance of

Dr. Gautam Prasad Dewangan

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BILASPUR, CHHATTISGARH-495009, INDIA

CERTIFICATE

This is to certify that the project entitled " STUDY ON CONVERSION OF BIOMASS INTO SYNGAS " a review report submitted by Akshat Pandey(22021108), Kashish Sain(22021121), Naga Madasu(22021122), Shambhavi Kumari(22021153), Nitish Kumar Roy(22021170) engineering is a record of Bonafide and original research work carried out by them under our guidance and this project does not include any work which has previously been submitted for the award of other degree ,diploma, associate-ship , fellowship ,or other similar title of them .We further clarify that the work report in this project was carried out independently by the candidates.

16/12/2024

Approved by
Dr. Raghwendra Singh Thakur
Head of Department
Department of Chemical Engineering,
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A
Minor Project Report
on

Review on How Artificial Neural Networks (ANNs) Transform Predictive Maintenance in Industry

Submitted in partial fulfilment of the requirement of credits in 5th semester of

Bachelor of Technology
in
Chemical Engineering

Submitted by

Amisha Kumari (22021109)

Session 2024-25

Guided by

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Department of Chemical Engineering
School of Studies of Engineering and Technology
Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh
Dec 2024

CERTIFICATE OF APPROVAL

This is to certify that the project entitled " **Predictive Maintenance Using Artificial Neural Networks (ANN) for HVAC Systems"** submitted by **Amisha Kumari** (Roll No. : 22021109), **in partial fulfilment of the requirement of credits in 5th semester of Bachelor's of Technology, Chemical Engineering** is a record of bonafide and original research work carried out by them under our guidance and this project does not include any work which has previously been submitted for the award of other degree, diploma, associate-ship, fellowship, or other similar titles to them. We, further certify that the work reported in this project was carried out independently by the candidate.

Approved by

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A

Mini project report

on

"Caffeine Extraction from Tea Waste"

Submitted By-

Ankit Raj (22021110)

Under The Guidance Of –

Dr A.N. Joshi

Associate Professor

Department of Chemical Engineering

GGV, Bilaspur(C.G)

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ABSTRACT

Caffeine is a widespread naturally occurring xanthine derivative found in a variety of plants but commonly found in coffee beans and tea leaves. Caffeine containing products have been consumed for hundreds of years for their taste, aroma and CNS stimulating properties. We estimated the amount of caffeine present in tea and coffee, which people consume regularly. We extracted caffeine from these using 'liquid-liquid separation' method. As an extracting solvent, we have used chloroform in which caffeine is highly soluble than in any other solvent. Thereafter chloroform from extract was evaporated until only white crystals remained, which were considered to be pure Caffeine.

A

Mini project report

On

Production of Detergent from Rice Husk Sodium Silicate

BACHELOR OF TECHNOLOGY

IN

CHEMICALENGNIEERING

SESSION 2024-25

Under Guidance by

Dr. Sandeep Dharmadhikari

Assistant professor

Department of Chemical Engineering

Guru Ghasidas Vishwavidyalaya

Submitted by

Matcha Swathi

Roll no: 21021127

Enrollment number: GGV/21/01527

Department of Chemical Engineering

School of Studies of Engineering &Technology

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)

CERTIFICATE OF APPROVAL

This is to certify that the project entitled **"Production of detergent from rice husk sodium silicate"** a review report submitted by Matcha Swathi (21021127) in fullfillment of requirement for the degree of Bachalor of technology in Chemical egineering is a record of bonafide and original research work carried out by them under our guidance and this project docs not include any work which has previously been submitted for the award of other degree, diploma, associate-ship, fellowship, or other similar title of them. We, further clarify that the work report in this project was carried out independently by the candidates.

Approved by	Guided by
Dr. Raghwendra Singh Thakur	Dr. SANDEEP DHARMADHIKARI
Head	Assistant Professor
Department of Chemical Engineering	Department of Chemical Engineering
School of Studies Engineering and Technology	School of Studies Engineering and Technology
Guru Ghasidas University, Bilaspur, Chhattisgarh	Guru Ghasidas University, Bilaspur, Chhattisgarh

Abstract

This project report explores the innovative utilization of Rice Husk Sodium Silicate for the production of detergent. Rice husk, an abundant agricultural residue, is transformed into sodium silicate, a crucial raw material in detergent manufacturing. The process involves the extraction of silica from rice husk ash, followed by the synthesis of sodium silicate. The resulting sodium silicate serves as a key ingredient in formulating environmentally friendly detergents. This report delves into the methodological intricacies, economic feasibility, and environmental impact of this sustainable approach. The findings underscore the potential of leveraging agricultural waste to meet the demand for detergent production while promoting resource efficiency and reducing environmental footprint.

The report presents a comprehensive analysis of the economic viability and sustainability aspects associated with integrating rice husk sodium silicate into detergent manufacturing processes, offering insights into potential cost savings and environmental benefits. Through experimental validation and theoretical modeling, this research contributes to the advancement of eco-friendly detergent production methods, leveraging agricultural waste as a valuable resource for sustainable industrial applications.

A

MINI PROJECT REPORT

on

"Advancements in Wastewater Treatment and Reuse: A Comprehensive Review"

Submitted in partial fulfilment of the requirement for the award of

BACHELOR OF TECHNOLOGY

in

CHEMICAL ENGINEERING

Submitted by

Mayank Dewangan

Under the Supervision of

Dr.Raghwendra Singh Thakur

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Department of Chemical Engineering

School of Studies of Engineering and Technology

Guru Ghasidas Vishwavidyalaya,Bilaspur

16 December 2024

Department Of Chemical Engineering
School of Studies of Engineering and Technology
Guru Ghasidas Vishwavidyalaya ,Bilaspur (C.G)

Certificate

This is to certify that the project entitled, **"Advancement In Wastewater Treatment And Reuse "** submitted by **MAYANK DEWANGAN (RollNo:22021124)** in partial fulfilments for the requirements for the award of Bachelor of Technology Degree in Chemical Engineering is a Bonafide record of the work carried out by them under my supervision and guidance.

This is to certify that the above statement made by the student is correct to the best of my knowledge.

Signature of

Dr. Raghwendra Singh Thakur

(Head of Department)

Place: Bilaspur

Date: 16 December 2024

Abstract:

A brief summary of the paper highlights the significance of wastewater treatment, the main advancements, applications, and health implications.

Wastewater treatment and reuse technologies have improved significantly, offering efficient and sustainable solutions for water conservation. New methods and systems can effectively remove pollutants, conserve water, and produce clean water for reuse. These innovations have the potential to protect public health, support economic growth, and ensure a reliable water supply for future generations

"INNOVATIVE WAYS FOR CAPTURING GREEN HOUSE GASES USING BIOCHARCOAL TECHNIQUES AND BENEFITS"

DEPARTMENT OF CHEMICAL ENGINEERING

(SCHOOL OF STUDIES OF ENGINEERING AND TECHNOLOGY, GURU GHASIDAS VISHWAVIDYALAYA)

MINI PROJECT

BY

MOHIT AASHUTOSH HARSHVARDHAN (ROLL NO:22021125)
RAHUL KUMAR (ROLL NO:22021139)
BISHAL SAHANI (ROLL NO:22021116)

CERTIFICATE

This is to certify that thesis entitled **"INNOVATIVE WAYS FOR CAPTURING GREEN HOUSE GASES USING BIOCHARCOAL TECHNIQUES AND BENEFITS"** submitted by Mohit Aashutosh Harshvardhan, Bishal Sahani and Rahul Kumar in partial fulfilment of the requirements for degree of Bachelor of Technology in Department of Chemical Engineering is a record of Bonafide and original research work carried out by them under our guidance and the thesis does not include any work which has previously been submitted for the award of other degree, diploma, associate-ship, fellowship, or other similar title to them. We further certify that the work reported in this thesis was carried out independently by the candidates.

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Name of student

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Date:

20/12/24

Name and signature of supervisor

A

Mini Project Report

On

" BIODIESEL PRODUCTION : A REVIEW "

Submitted in partial fulfillment of the requirement of the degree of

Bachelor Of Technology

In

Chemical Engineering

Submitted by

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Roll No. – 22021126

Enrollment No. – GGV/22/01526

Under the Supervision of

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No. 25 of 2009)

DEPARTMENT OF CHEMICAL ENGINEERING
School Of Studies Engineering & Technology
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(A Central University Established By The Central University Act 2009 No. 25 of 2009)

CERTIFICATE OF APPROVAL

It is certified that the mini project entitled **"BIODIESEL PRODUCTION : A REVIEW"** submitted by **MUKESH KUMAR** in partial fulfillment of the requirements of the award of the degree of Bachelor of Technology in Chemical Engineering, School Of Studies Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur, is carried out by him in the Department Of Chemical Engineering during session 2024-25 under supervision and guidance of **Mr. Satyajit Bhattacharjee**, Associate professor, Department Of Chemical Engineering, School Of Studies Engineering & Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur.

Guided By

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Assistant Professor
Chemical Engineering
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Signature

Dr. Raghwendra Singh Thakur

Head Of Department
Chemical Engineering
School of Studies of Engineering and
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Bilaspur, Chhattisgarh

ABSTRACT

Biodiesel is a renewable and sustainable alternative to traditional petroleum-based fuels, garnering global attention for its environmental advantages and compatibility with existing diesel engines. This study provides a comprehensive review of biodiesel production from a variety of feedstocks, which include edible oils (such as soybean, palm), non-edible oils (including jatropha) and advanced sources like algal oil. The suitability of these feedstocks is evaluated based on yield, quality, production costs, and regional availability. Various production methodologies, including base-catalyzed transesterification, acid-catalyzed transesterification, supercritical fluid processing, are analyzed to determine their advantages, limitations, and applicability across different feedstocks. A thorough assessment of key biodiesel properties, such as cetane number, viscosity, iodine value, flashpoint, cloud point, and water content, highlights the critical factors influencing fuel performance and compliance with international standards. The findings of this research emphasize the importance of selecting appropriate feedstocks and production techniques tailored to specific economic, environmental, and climatic conditions. This work contributes to the advancement of biodiesel technology by establishing a framework for optimizing feedstock selection and production processes, ultimately aiming to ensure cost-effective and high-quality biodiesel production. Through improved methodologies and strategic sourcing, biodiesel has the potential to play a pivotal role in advancing towards a sustainable energy future.

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A Mini Project report

On

" Visualizing Temperature Dynamics of a Double Pipe Heat Exchanger Using MATLAB & ANNs Technique "

Submitted in partial fulfilment of the requirement of credits in third year of

Bachelor of Technology

In

Chemical Engineering

Submitted By :-

Muskan Kumari (22021128)

Under Guidance of :-

Mr. Vishnu Prasad Yadav

Assistant Professor

Department of Chemical Engineering

School of Studies in Engineering & Technology

Guru Ghasidas Vishwavidyalaya , Bilaspur

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2024-25

CERTIFICATE

This is to certify that thesis entitled " Visualizing Temperature Dynamics of a Double Pipe Heat Exchanger Using MATLAB & ANNs Technique ".

Submitted by -

- **Muskan Kumari (22021128)**

Approved by

Dr. Raghwendra Singh Thakur
Head of Department
Department of Chemical Engineering
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Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.)

Guided by

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Mr. Vishnu Prasad Yadav
Assistant Professor
Department of Chemical Engineering
School of Studies in Engineering and Technology
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ABSTRACT

Double-pipe heat exchangers are widely used in various engineering applications for heat transfer between two fluids. The temperature distribution along both the inner and outer pipes is crucial for analyzing the heat transfer efficiency.In this work, a mathematical model based on heat transfer principles is developed, considering factors such as thermal conductivity, heat capacity, and flow arrangements (counterflow or parallel flow). The model is implemented in **MATLAB**, where numerical solutions for temperature profiles over time and space are obtained.

This study presents the visualization of temperature dynamics in a double-pipe heat exchanger using MATLAB .The results are analyzed to assess the performance of the heat exchanger under different scenarios, providing insights into optimizing heat transfer rates and energy consumption. This approach enhances the understanding of the thermal dynamics in heat exchangers, offering a tool for engineers and researchers in the design and optimization of thermal systems.

Keywords: **MATLAB , Heat Exchanger and ANNs (Artifical Neural Network)**

A
mini project report
on

"Synthesis of Nano-Calcium Oxide from Waste Eggshell by Sol-Gel Method"

Partial fulfillment

Bachelor of Technology
in
Chemical Engineering

Submitted By-
Nishukant (22021130)
Soumyashree (22021157)
Vedant Soni (22021160)
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Under The Guidance Of -

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DEPARTMENT OF CHEMICAL ENGINEERING
School Of Studies Engineering & Technology
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(A Central University Established By The Central University Act 2009 No. 25 of 2009)

CERTIFICATE OF APPROVAL

It is certified that the mini project entitled **"Synthesis of Nano-Calcium Oxide from Waste Eggshell by Sol-Gel Method"** submitted by **Nishukant ,Vedant Soni, Priyanjana Malakar, Soumyashree, Abhishek Kumar And Adarsh Kumar** in partial fulfillment of the requirements of the award of the degree of Bachelor of Technology in Chemical Engineering, School of studies Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur, is carried out by them in the Department of Chemical Engineering during session 2024-25 under supervision and guidance of **Dr. Anil Kumar Chandrakar**, Professor, Department of Chemical Engineering, School of Studies Engineering & Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G).

Guided By

Signature_____

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Professor
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Approved By

Signature_____

Dr. Raghwendra Singh Thakur

Head Of Department
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Abstract

Solid waste management is one of the major concerns that we deal with, in today's world due to the rising amounts of waste generated by households, industries, and food production. Improper handling of this waste, such as landfilling leads to environmental pollution, foul smell, and health issues. As for solid food waste management sustainable solutions, like reusing eggshell waste into valuable materials such as calcium oxide nanoparticles provide an eco-friendly way to reduce waste. It also addresses environmental degradation which we have done our study upon. In this study, we have synthesized eggshell waste into calcium oxide (CaO) nanoparticles using the sol-gel method which is considered the optimal method due to its simplicity, low cost, and ability to operate at low temperatures and pressures. Raw eggshell is first dried and crushed into 150 BSS size (British Standard System), where 150 BSS equals to 105 μm then it is dissolved into HCl to form CaCl2 solution by slowly adding drop by drop solution of NaOH to form Ca(OH)2 gel and finally the gel is dried at 900°C for 1hr. Fourier-transform infrared spectroscopy (FTIR) was used to characterize the synthesized nanoparticles. This study presented an opportunity to convert waste into useful nanomaterials that would add to sustainable waste management.

Studying the Fluidized-Bed Drying of Rice

Report submitted to
Guru Ghasidas Vishwavidyalaya
in partial fulfilment for the award of the degree of

Bachelor of Technology in
Chemical Engineering

by

Omprakash Meena

(21021133)

Under the supervision of

Mr. Vishnu Prasad Yadav

Department of Chemical Engineering Guru Ghasidas Vishwavidyalaya

December, 2024

CERTIFICATE

This is to certify that the project entitled "**Studying the Fluidized-Bed Drying of Rice**" submitted by Omprakash Meena (Roll No.: 21021133) **in partial fulfilment of the requirement of credits in third year of Bachelor of Technology, Chemical Engineering** is a record of Bonafide and original research work carried out by them under our guidance and this project does not include any work which has previously been submitted for the award of other degree, diploma, associate-ship, fellowship, or other similar titles to them. We, further certify that the work reported in this project was carried out independently by the candidate.

Approved by

Dr. Raghwendra Singh Thakur
Head of Department
Department of Chemical Engineering
School of studies of Engineering and Technology
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School of studies of Engineering and Technology
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Bilaspur, Chattisgarh

ABSTRACT

This study evaluates the fluidized-bed drying of rice to optimize drying parameters and improve rice quality metrics. Fluidized bed dryers (FBDs) offer efficient drying by ensuring uniform heat and mass transfer. Experiments were conducted on a laboratory-scale FBD using rice samples at controlled moisture levels under varying temperatures (40°C-80°C) and airflow velocities (1 m/s-5 m/s), with and without ventilation.

Key quality parameters such as Head Rice Yield (HRY), Whiteness Index (WI), Water Uptake Ratio (WUR), and Elongation Ratio (ELR) were assessed to determine the impact of drying conditions. Results indicate that higher drying temperatures and bubble fluidization regimes significantly reduced drying time while preserving quality. Ventilation improved HRY by reducing thermal stress and maintained superior WI values.

The findings highlight the potential of fluidized-bed drying for improving drying efficiency and product quality in rice processing. This approach paves the way for industrial-scale applications, enhancing productivity and maintaining rice quality. Future work should explore economic scalability and operational feasibility in real-world settings.

A Minor Project Report
On
Soap Making Process

Submitted in partial fulfilment of the requirement of credits in
Third year of

Bachelor of Technology
in
Chemical Engineering

Submitted by

OMPRAKASH

Session 2024-25

Guided by

Dr. Neeraj Chandraker
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(A Central University Established By The Central University Act 2009
No. 25 of 2009)

CERTIFICATE OF APPROVAL

It is certified that the mini project entitled **"Soap Making Process"** submitted by **Omprakash** in partial fulfillment of the requirements of the award of the degree of Bachelor of Technology in Chemical Engineering, School of studies Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur, is carried out by them in the Department of Chemical Engineering during session 2024-25 under supervision and guidance of **Mr. Satyajit Bhattacharjee** & **Prof. Neeraj Chandraker**, Department of Chemical Engineering,School of Studies Engineering & Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G).

Guided By

Signature_____

Dr. Neeraj Chandraker

(Associate professor)
Department Of Chemical Engineering
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Mr. Satyajit Bhattacharjee
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Particular **page no**

Abstract

This soap-making project was an exploration of transforming basic ingredients into high-quality, functional, and aesthetically pleasing products. Using the chemical process of saponification, where fats and oils react with lye, we developed an in-depth understanding of the science behind soap production. By carefully controlling variables such as ingredient ratios, temperature, and curing times, we created soaps with diverse properties, including moisturizing, exfoliating, and antibacterial effects, tailored to different needs. The use of natural additives, such as essential oils, dried herbs, and natural colorants, allowed us to experiment with unique formulations and designs, blending scientific precision with artistic creativity.

The project also highlighted the importance of sustainability, as we focused on incorporating eco-friendly ingredients and packaging to produce soaps that are not only effective but also environmentally responsible. This initiative underscored the significance of precision, patience, and attention to detail, as small deviations in the process had noticeable impacts on the quality and characteristics of the final product. Additionally, it offered insights into the commercial and artistic potential of soap-making, demonstrating how this craft can cater to niche markets and promote sustainable practices.

Beyond the technical and creative aspects, the project served as a valuable hands-on learning experience, bridging theoretical knowledge with practical application. It enriched our understanding of chemical reactions, problem-solving, and the role of innovation in product development. The experience inspired further exploration into advanced techniques, alternative ingredients, and sustainable methods, setting a foundation for future endeavors in soap-making. Overall, this project not only provided an educational platform but also fostered creativity, environmental awareness, and an appreciation for the intricate balance between science and artistry in crafting functional products for everyday use.

BIODEGRADABLE PLASTIC

Submitted to: Dr. Saurabh Meshram

Associate Professor, Department of Chemical Engineering, ITGGV

Submittedby:PRASHANT SAHAY

School of Engineering &Technology
Guru Ghasidas vishwavidyalaya
Bilaspur(C.G)

Department of Chemical Engineering

December 16 ,2024

Abstract

This project investigates the development of biodegradable plastics derived from renewable resources, addressing the urgent need to reduce plastic pollution and its environmental impact. Biodegradable plastics such as polylactic acid (PLA), polyhydroxyalkanoates (PHAs), and starch-based polymers were explored for their properties, production methods, and applications. The study highlights sustainable raw materials, efficient production technologies, and potential industrial uses while examining the biodegradation process and environmental benefits. Results demonstrate that these plastics provide a viable alternative to traditional polymers, with applications spanning packaging, agriculture, and medical fields.

CERTIFICATE FOR APPROVAL

This is certify that the project entitled **"BIODEGRADABLE PLASTIC"** Submitted by **PRASHANT SAHAY** in partial fulfilment of credits in third year of **Bachelor's in technology ,chemical engineering** is recorded of Bonafide and research work carried out by them under our guidance and this project does not include any work which has been submitted for the award and other degree ,diploma , associate ship ,fellowship or other similar titles to them . we further certify that the work reported in this project was carried out independently by the candidate.

Approved by

Dr .Raghwendra Singh Thakur

Head

Department of Chemical engineering

School of studies of engineering and

Technology

Guru ghasidas vishwavidyalya

Bilaspur , chattisgarh

Guided by

Dr. Saurabh Meshram 16/12/24

Associate professor

Department of Chemical eng.

The Effect of Calophyllum and Inophyllum on Whitening and Acne Elimination

A Mini Project Report Submitted in partial fulfilment of the requirement of the degree of **Bachelor of Technology *in* Chemical Engineering**

Submitted by

Prathamesh Prashant Nagapure

Session 2023-24

Guided by

Dr Gautam Prasad Dewangan
Assistant Professor
Department of Chemical Engineering
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Department of Chemical Engineering
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(A central university established by the central university Act, 2009)

CERTIFICATE OF APPROVAL

This is to certify that the project entitled **" The Effect of Canophyllum and Inophyllum on Whitening and Acne Elimination"** submitted by **Prathamesh P Nagapure** (Roll No. : 21021137) in fulfilment of the requirements for the degree of **Bachelor of Technology** in **Chemical Engineering** is a record of bonafide and original research work carried out by them under our guidance and this project does not include any work which has previously been submitted for the award of other degree, diploma, associate-ship, fellowship, or other similar titles to them. We, further certify that the work reported in this project was carried out independently by the candidate.

Approved by

Dr. Raghwendra Singh Thakur
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Dr. Gautam Prasad Dewangan
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Bilaspur, Chhattisgarh

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A Minor Project report On

"Preparation of Liquid Handwash."

Submitted By: - Prince Kumar Singh

Roll No. :22021136

Under Guidance of:

Satyajit Bhattacharjee (Assistant Professor)

DEPARTMENT OF CHEMICAL ENGINEERING

INSTITUTE OF ENGINEERING AND TECHNOLOGY GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University established by the Central Universities Act No. 25 of 2009)

ACKNOWLEDGEMENT

I have taken efforts in this project. I am highly indebted to **Satyajit Bhattacharjee (Assistant professor)** for their guidance and constant supervision as well as for providing necessary information regarding the project and also for their support in completing the project. I would also like to express our special gratitude towards our parents for their kind cooperation and encouragement which help us complete this project.

Prince Kumar Singh

(Roll No. :22021147)

CERTIFICATE OF APPROVAL

This is to certified that the project entitled **"Preparation of Liquid Handwash: A review report"** submitted by **Prince Kumar Singh (Roll No. : 22021136)** in fulfilment of the requirements for the degree of **Bachelor of technology** in **Chemical Engineering** is a record of Bonafide and original research work carried out by them under our guidance and this project does not include any work which has previously been submitted for the award of other degree, diploma, associate-ship, fellowship, or other similar titles to them. We, further certify that the work reported in this project was carried out independently by the candidate.

Approved By	**Guided By**
Dr. Raghwendra Singh Thakur	Satyajit Bhattacharjee
Head of Department	Assistant Professor

Department Of Chemical Engineering School Of Studies Of Engineering And Technology Guru Ghasidas Vishwavidyalaya Bilaspur, Chhattisgarh (495009)

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A Mini Project Report

On

Preparation of Lye Soap from Glycerine

Submitted in partial fulfillment of the requirement of the degree of

Bachelor Of Technology

In

Chemical Engineering

Submitted by

Name	Roll no
Priyanka Kumari	22021138

Guided By

Mr. Satyajit Bhattacharjee
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Department of Chemical Engineering

School of Studies of Engineering and Technology

Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh

CERTIFICATE OF APPROVAL

This is to certify that the project entitled "**Preparation of lye soap from glycerine** "submitted by **Priyanka kumari** in partial fulfilment of the requirement of credits in Third year of **Bachelor of Technology, Chemical Engineering** is a record of Bonafide I, further certify that the work reported in this project was carried out independently by the candidate.

Guided by

Mr. Satyajit Bhattacharjee
Assistant Professor
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School of studies of Engineering
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Bilaspur, Chhattisgarh

Approved by

Dr.Raghwendra Singh Thakur
Head
Department of Chemical Engineering
School of studies of Engineering
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Bilaspur, Chhattisgarh

ABSTRACT

Saponification is the process of converting fats or oils into glycerol and soap by reacting with alkalis such as potassium or sodium hydroxide. This process is crucial for understanding the chemical makeup of soap and its applications. This review article focuses on the product's historical and modern applications while providing a thorough understanding of the chemistry and saponification process. This article explains the process of saponification, which turns natural fats or oils into soap and glycerol by using an alkali like KOH or NaOH. We explain the steps involved in saponification, which include the hydrolysis of the ester link, the creation of soap molecules, and the impact of the fatty acid chain on the soap's properties. Glycerol, another economically useful byproduct, has multiple uses across many industries and a reputation for sustainability. We also assess the impact of several factors on the soaps, such as temperature, alkali content, mixing techniques, curing times, and additive usage.

A Minor Project report On

"Preparation of Liquid Handwash."

Submitted By : - Rahul Kumar

Roll No. : 22021140

Under Guidance of:

Dr. Raghwendra Singh Thakur

DEPARTMENT OF CHEMICAL ENGINEERING

INSTITUTE OF ENGINEERING AND TECHNOLOGY GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University established by the Central Universities Act No. 25 of 2009)

CERTIFICATE OF APPROVAL

This is to certified that the project entitled **"Preparation of Liquid Handwash : A review report"** submitted by **Rahul Kumar (Roll No. : 22021140)** in fulfilment of the requirements for the degree of **Bachelor of technology** in **Chemical Engineering** is a record of Bonafide and original research work carried out by them under our guidance and this project does not include any work which has previously been submitted for the award of other degree, diploma, associate-ship, fellowship, or other similar titles to them. We, further certify that the work reported in this project was carried out independently by the candidate.

Approved By

Dr. Raghwendra Singh Thakur

Head of Department

Guided By

Dr. Raghwendra Singh Thakur

Department Of Chemical Engineering School Of Studies Of Engineering And Technology Guru Ghasidas Vishwavidyalaya Bilaspur, Chhattisgarh (495009)

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A Mini Project Report

On

" Simulation of Flash Drum,Absorber And Heat Exchanger"

Of

Bachelor of Technology

In

Chemical Engineering

Submitted By :-

Raj Chandrakar

Under Guidance of:-

Dr. Anuradha N.Joshi

Associate Professor

Department of Chemical Engineering

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Guru Ghasidas Vishwavidyalaya, Bilaspur

(C.G.)-495009

2024-25

CERTIFICATE

This is to certify that the project entitled **"Simulation of Flash Drum, Absorber And Heat Exchanger"**. Submitted by **Raj Chandrakar (22021141)** in partial fulfillments for the requirements for the award of Bachelor of Technology Degree in Chemical Engineering is a Bonafide record of the work carried out by them under my supervision and guidance. This is to certify that the above statement made by the student is correct to the best of my knowledge.

Guided by

Dr. Anuradha N.Joshi
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A Project Report

on

FORMATION OF HERBAL LIPSTICK USING MAHUA OIL

Submitted in partial fulfilment of the requirement for award of degree of

Bachelor of Technology in Chemical Engineering

Submitted by

Mahi Srivastava	22021123
Ramesh Kumar	22021142

Guide

Prof. Amit Jain

Head

Department of Chemical Engineering

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Co-Guide

Mr. Satyajit Bhattacharjee

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DEPARTMENT OF CHEMICAL ENGINEERING

School of Studies of Engineering & Technology

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University Established by the Central University Act 2009 No. 25 of 2009

CERTIFICATE

Certified that the Project Report entitled **Formation of Herbal Lipstick using Mahua Oil** submitted by **Mahi Srivastava** and **Ramesh Kumar** of B.Tech. VI Semester, for partial fulfilment of the requirements for the award of degree in Bachelor of Technology in Chemical Engineering, is according to the students their own investigation carried out by them in the Department of Chemical Engineering, School of Studies of Engineering & Technology, GGV, during the session 2024-25.

Guide

Signature_____

Prof. Amit Jain
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Nicotinic Acid Extraction From Tobacco Waste

A

Mini Project Report

Submitted in partial fulfilment of the requirement of the degree of

Bachelor of Technology in Chemical Engineering

Submitted by

RAUSHAN KUMAR

Session 2023-24

Guided by

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(A central university established by the central university Act, 2009)

CERTIFICATE OF APPROVAL

This is to certify that the project entitled " **Nicotinic Acid Extraction From Tobacco Waste**" submitted by **Raushan kumar** (Roll No. : 22021144) in fulfilment of the requirements for the degree of **Bachelor of Technology** in **Chemical Engineering** is a record of bonafide and original research work carried out by them under our guidance and this project does not include any work which has previously been submitted for the award of other degree, diploma, associate-ship, fellowship, or other similar titles to them. We, further certify that the work reported in this project was carried out independently by the candidate.

Approved by

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Associate professor
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Preparation of Gel-Based Air Freshener with Natural Fragrance

A

Mini Project Report

Submitted in partial fulfilment of the requirement of the degree of

Bachelor of Technology in Chemical Engineering

Submitted by

Ravi Ranjan Kumar

Anwar Sahil Ali

Jitesh Meher

Aayush Kumar

Dimpal Gautam

Harshit Malang

Session 2024-25

Guided by

Dr. Ghoshna Jyoti

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CERTIFICATE OF APPROVAL

This is to certify that the project entitled **"Gel-Based Air Freshener with Natural Fragrance"** submitted by **Ravi Ranjan** (Roll No. : 22021145), **Aayush kumar** (Roll No. : 22021102), **Anwar Sahil Ali** (Roll No. : 22021112), **Dimpal Gautam** (Roll No. : 22021118), **Jitesh Meher** (Roll No. : 22021120), **Harshit Malang** (Roll No. : 21021120) in fulfilment of the requirements for the degree of **Bachelor of Technology** in **Chemical Engineering** is a record of bonafide and original research work carried out by them under our guidance and this project does not include any work which has previously been submitted for the award of other degree, diploma, associate-ship, fellowship, or other similar titles to them. We, further certify that the work reported in this project was carried out independently by the candidate.

Approved by

Guided by

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Dr. Ghoshna Jyoti
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A Mini Project Report

On

"Preparation of Paper From Water Hyacinth"

Bachelor of Technology

In

Chemical Engineering

Submitted By :-

Ravindra Meena

Under guidance of:-

Dr. Neeraj Chandraker,

Associate Professor

Department of Chemical Engineering

Guru Ghasidas University, Bilaspur

A central University and school of studies of engineering and technology,

C.G – (495009), December 2024-25

CERTIFICATE OF APPROVAL

This is to certify that the project entitled "**Preparation of paper from water hyacinth** "submitted by **Ravindra meena** in partial fulfilment of the requirement of credits in Third year of **Bachelor's of Technology, Chemical Engineering** is a record of bonafide and original research work carried out by me under our guidance and this project does not include any work which has previously been submitted for the award of other degree, diploma, associate-ship, fellowship, or other similar titles to them. We, further certify that the work reported in this project was carried out independently by the candidate.

Approved by

Dr.Neeraj Chandraker

Associate Professor

Department of Chemical Engineering

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A Mini Project Report
On
Creatine Monohydrate Making Process

Submitted in partial fulfilment of the requirement of credits in
Third year of

Bachelor of Technology
in
Chemical Engineering

Submitted by

SAGAR KUMAR

Session 2024-25

Guided by

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This is to certify that the project entitled "**Creatine Monohydrate Making Process**" submitted by **Sagar Kumar** in partial fulfilment of the requirement of credits in Third year of **Bachelor's of Technology, Chemical Engineering** is a record of Bonafide and original research work carried out by them under our guidance and this project does not include any work which has previously been submitted for the award of other degree, diploma, associate-ship, fellowship, or other similar titles to them. We, further certify that the work reported in this project was carried out independently by the candidate.

Approved by

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