



<b>Department : Chemical ENgineering</b>		
<b>Academic Year : 2021-22</b>		
<b>Sr. No.</b>	<b>Programme Code</b>	<b>Name of the Programme</b>
01.	211	B. Tech. Chemical Engineering

Following students have carried out their Internship/ Field Project/Industrial Training for the academic session 2021-22

<b>Sr. No.</b>	<b>Name of the Students</b>	<b>Page No ..... To .....</b>
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17	Madaka Syam Sundhar Naidu GGV/19/1367	48-50
18	Maddu Leela Siva Rama Krishna GGV/19/1377	51-52
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*Chaudhary*

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



**TO IMPROVE THE PRODUCTION OF  
BENZENE IN BENZOYL  
RECTIFICATION PLANT**



Under Guidance of:

**Mr. S. K. Halder**

GM(CCD), CO&CCD SAIL BSP

Submitted By:

SR NO.	NAME	ROLL NO.	UNIVERSITY NAME
1.	AAUSHI PANDEY GGV /19/ 1310 B-TECH (7 <sup>th</sup> SEM) CHEMICAL ENGINEERING	19101101	G.G.V BILASPUR

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



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HUMAN RESOURCES DEVELOPMENT DEPARTMENT

प्रमाणपत्र  
CERTIFICATE

पंजीयन क्र. P-21/7816  
Regn. No. ....

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, This is to certify that Shri / Ku. ....  
Ayushi Pandey

सेमेस्टर विद्यार्थी  
Sixth..... Sem., student of ..... B.Tech..... of ..... G.C.V., Bilaspur..... College / Institute  
(Chemical)


ने अवकाश कालीन प्रशिक्षु के रूप में दिनांक से तक प्रशिक्षण प्राप्त किया ।  
has undergone project based training from ..... 13/06/2022 ..... to ..... 09/07/2022.....  
प्रोजेक्ट

Project ..... Report on "To Improve the Production of Benzene in  
Benzol Rectification Plant,"

इस अवधि में उनका कार्य निम्नानुसार ..... Very Good ..... रहा ।  
His / her performance during the training period has been .....

मिलाई, दिनांक 09/07/2022  
Bhilal, Dated.....

सेल SAIL  
भिलाई इस्पात संयंत्र  
BHILAI STEEL PLANT





## INDEX

- ABOUT SAIL
- INTRODUCTION TO BHILAI STEEL PLANT
- COKE OVEN & COAL CHEMICAL DEPARTMENT (CO&CCD)
- BY-PRODUCT FROM COKE OVEN PLANT
- BENZOL AND ITS PROPERTIES
- PROCESS OVERVIEW
- FACTORS AFFECTING QAULITY AND PRODUCTION
- MODIFICATION FOR IMPREOVEMENT OF PRODUCTION

A handwritten signature in blue ink, which appears to read 'Chandrakant', is written over a white rectangular box.

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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





**TO IMPROVE THE PRODUCTION OF  
BENZENE IN BENZOYL  
RECTIFICATION PLANT**



Under Guidance of:

**Mr. S. K. Halder**

GM(CCD), CO&CCD SAIL BSP

Submitted By:

SR NO.	NAME	ROLL NO.	UNIVERSITY NAME
1.	ABHISHEK RAJ GGV /19/1312 B-TECH (7 <sup>th</sup> SEM) CHEMICAL ENGINEERING	19101102	G.G.V BILASPUR

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



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HUMAN RESOURCES DEVELOPMENT DEPARTMENT

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Regn. No.....

प्रमाणित किया जाता है कि श्री / कुमारी  
This is to certify that **Shri / Ku. Abhishek Raj**

सेमेस्टर विद्यार्थी  
Sem., student of **B.Tech. of C.G.V., Bilaspur, College / Institute**  
(Chemical) कालेज / संस्थान

ने अवकाश कालीन प्रशिक्षु के रूप में दिनांक  
has undergone project based training from **13/06/2022** से तक प्रशिक्षण प्राप्त किया ।  
प्रोजेक्ट to **09/07/2022**

Project ..... *Report on "To Improve the Production of Benzene in Benzol Rectification Plant."*

इस अवधि में उनका कार्य निष्पादन  
His / her performance during the training period has been **Very Good** रहा ।

मिलाई, दिनांक  
Bhilai, Dated **09/07/2022**

भिलाई इस्पात संयंत्र  
BHILAI STEEL PLANT

प्रमोद (प्रशिक्षण अधिकारी)  
Bhilai Steel Plant



## INDEX

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- MODIFICATION FOR IMPROVEMENT OF PRODUCTION

A handwritten signature in blue ink, reading 'Chandrashekhar', is written over a horizontal line.

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





A PROJECT REPORT  
ON

“MANUFACTURING OF POLYESTER CHIPS FOR YARN.”

A PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENT FOR CERTIFICATES.

OF

B.TECH IN CHEMICAL ENGINEERING

PREPARED BY

RANVEER RAJ	GGV/19/1396
AKASH DEEP	GGV/19/1315
VIVEK MEHTA	GGV/19/1447



GURU GHASIDAS VISHWAVIDYALAYA  
(A CENTRAL UNIVERSITY)  
DEPARTMENT OF CHEMICAL ENGINEERING  
AT:KONI, PO-KONI,DIST.-BILASPUR  
CHHATTISGARH, (495009).





SDSPL/HRD/INTERN/35/22

Date 14/06/2022

**TO WHOM IT MAY CONCERN**

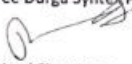
We are glad to inform you that Mr. Akash Deep from Guru Ghasidas Vishwavidyalaya, Bilaspur has successfully completed his internship from 14<sup>th</sup> May 2022 to 14<sup>th</sup> June 22 .

During his internship, we found him extremely inquisitive and hard working. He was very much interested to learn and also willing to put his best efforts and get in to the depth of the subject to understand it better.

His association with us was very fruitful and we wish him all the best for his future endeavors.

Thanking you!!

For Shree Durga Syntex Pvt Ltd.

  
Authorized Signatory



Regd. Office & Factory Address  
Block No. 128, 129, 130 & 175, Plot No. Z & E, Palsana, Village- Jolwa, Dist.: Surat, Pin-394 305.  
Ph.: 99740 93573 / 74, 02622 274477 / 274478, Website: www.shreedurgasyntex.com  
CIN : U17119GJ2003PTC041979 GSTIN : 24AARCD9994P17V



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*Chaudhary*

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



13<sup>th</sup> Jun 2022

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. ATULKRISHNA having (Enrollment No: GGV/19/1323)-  
of GURU GHASIDAS VISHWAVIDYALAYA, KONI, BILASPUR, C.G-492009, has undergone  
Industrial Training in ENGINEERING Department, Unit - III in our organization from  
12<sup>th</sup> May 2022 to 10<sup>th</sup> Jun 2022.

During this period, we found him to be hard working and committed and we wish him all the  
best in his future endeavors.

With Best Wishes.

For Aurobindo Pharma Limited

  
ANVSR Arjaneyulu  
Assistant Manager-HR

**AUROBINDO PHARMA LTD**

Unit III - 313 & 314, Bachupally, Bachupally (Mandal), Medchal - Malkajgiri District, Telangana State, INDIA. Pin - 500 090, T.S., INDIA

Tel: + 91 40 2304 4086/405 Fax: + 91 40 2304 4056 / 59

Regd. Off.: Plot No. 2, Meinti Vihar, Amanpet, Hyderabad - 500 038, T.S., INDIA Tel: + 91 40 2373 8370 Fax: + 91 40 2374 7340, Email: info@aurobindo.com

PAR No. AABCA7366H



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### INFORMATION ABOUT THE COMPANY

Aurobindo Pharma Limited is an Indian multinational pharmaceutical manufacturing company headquartered in HITEC City, Hyderabad, India. The company manufactures generic pharmaceuticals and active pharmaceutical ingredients. The company's area of activity includes six major therapeutic/product areas: antibiotics, anti-retrovirals, cardiovascular products, central nervous system products, gastroenterologicals, and anti-allergics.

The company commenced operations in 1988-89 with a single unit manufacturing semi-synthetic penicillin (SSP) in Puducherry. Aurobindo Pharma became a public company in 1992 and listed its shares in the Indian stock exchanges in 1995. Aurobindo Pharma also has a presence in key therapeutic segments such as neurosciences, cardiovascular, anti-retrovirals, anti-diabetics, gastroenterology and cephalosporins, among others.

Aurobindo Pharma features among the top 10 companies in India in terms of consolidated revenues. Aurobindo exports to over 125 countries with more than 70% of its revenues derived out of international operations.

*Chaudhri*

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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





A Report on Overall Study in Tar Distillation Process with a  
Case Study on Maximum Yield of Naphthalene




RINL VISHAKAPATNAM STEEL PLANT


Submitted By

B. PARIMALA (100009176)



Under the esteemed Guidance of

  
Shri.D.J.V.S.S.N BRAHMAM  
Dy. General Manager (O)/ CO & CCP

डी.जे.वी.एस.एस.एन. ब्रह्मम  
D.J.V.S.S.N. BRAHMAM  
उप महा प्रबंधक (अ) / सी ओ व सी सी वि  
Dy. General Manager (Oprn.) CO & CCP  
आर आई एन एल, विशाखपट्टनम इस्पात संयंत्र  
RINL, Visakhapatnam Steel Plant  
विशाखपट्टनम-530 031


  
Shri.A.BAPUJI  
ए. बापुजी / A. BAPUJI  
उप महा प्रबंधक (अ) / सी ओ व सी सी वि  
Dy. General Manager (CO & CCP)  
कोक ओवन विभाग / Coke Oven Dept.  
आर आई एन एल, विशाखपट्टनम इस्पात संयंत्र  
RINL, Visakhapatnam Steel Plant  
विशाखपट्टनम / VISAKHAPATNAM-530 031





**राष्ट्रीय इस्पात निगम लिमिटेड Rashtriya Ispat Nigam Limited**  
**विशाखापत्तनम इस्पात संयंत्र Visakhapatnam Steel Plant**  
**तकनीकी प्रशिक्षण केंद्र, Technical training Institute**  
**विशाखापत्तनम Visakhapatnam-530031**


Reg.No. : 100009176  
प्रमाणपत्र Certificate



प्रमाणित किया जाता है कि श्री /This is to certify that Mr./Ms. BUTTI PARIMALA student of  
(वर्ष/पाठ्यक्रम/शाखा-Year/course/Branch) 3/BE/B TECH/CHEMICAL विद्यार्थी ने from  
**GURU GHASIDAS VISWA VIDYALAYA, BILASPUR** से has undergone  
**4 Week प्रशिक्षण training** विशाखापत्तनम इस्पात  
संयंत्र के at Visakhapatnam Steel Plant in COKE OVEN & COAL CHEMICALS PLANT (CO&CCP) विभागों में  
department from दि. 09-05-2022 से to 04-06-2022 प्राप्त तक किया |

परियोजना शीर्षक The Project Title is OVERALL STUDY IN TAR DISTILLATION PROCESS WITH A CASE STUDY  
ON MAXIMUM YIELD OF NAPHTHALENE है।  
प्रशिक्षण अवधि में उनका आचरण His/Her conduct during the period of training  
is GOOD है।

स्थल/Place : Visakhapatnam  
दि./Date : 16-06-2022



उपस्थित प्रशिक्षण के प्रमुख  
Supervisor of Training (a. Chandrasekar)  
के.सी.टी. संस्थान, बिलासपुर, छ.ग.  
सहायक प्रबंधक (प्रशिक्षण) Assistant General Manager (Training)  
कोनी-बिलासपुर विश्वविद्यालय/Technical Training Institute  
आर.जी.डी.ए.ए.ए. विश्वविद्यालय, बिलासपुर, छ.ग. 495009, Visakhapatnam Steel Plant  
बिलासपुर - 495009 (C.G.)

*Chandrasekar*

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



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*Chaudhary*

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



गुरु घासीदास विश्वविद्यालय, बिलासपुर  
Guru Ghasidas Vishwavidyalaya, Bilaspur

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

AN INTERNSHIP REPORT ON

“EXTRACTION OF CRUDE OIL & REFINING”

*Submitted in partial fulfilment for the award of degree*

**BACHELOR OF TECHNOLOGY**

**IN**

**CHEMICAL ENGINEERING**

**NAME OF INTERN:** Bolla, Vennela

**ENROLLMENT NO:** GGV/19/1326

**ROLL NO:** 19101109

**DEPARTMENT:** Chemical Engineering

**PROJECT GUIDE:** MR.K. MAURYA

**GUIDE DESIGNATION:** SUPTDG GEOLOGIST, SUB SURFACE TEAM, ONGC  
KARAIKAL

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





OIL AND NATURAL GAS CORPORATION LIMITED

CAUVERY ASSET - HR/ER - IR  
NERAVY COMPLEX, KARAIKAL - 609 604.  
Ph.No: 04368 - 235076 Fax.No : 04368 - 238126

No. : CA/KKL/HR/HRD/STU.TRG/MBA/2021-22/035

Date: 24.05.2022

Work Centre : Cauvery Asset, Karaikal

**CERTIFICATE**

This is to certify that Ms. Bolla Vennela Student of Third year, B.Tech, Chemical Engineering, Guru Ghasidas Vishwavidyalaya, Bilaspur has undergone Summer/Winter/Industrial Training at ONGC from 10.05.2022 to 24.05.2022. She has successfully completed her project work / Inplant training in the discipline of Chemical. During the training, she took keen interest in the assigned work. We wish her all success in her academic endeavors and life.



B. Aruldevi  
24/05/2022  
Co-ordinator Training  
ONGC

बी. अरुलदेवी / B. ARULDEVI  
सीट नं. 124 इन्दिरा चौक, नई दिल्ली / Sr. HR Executive  
कोनी, बिलासपुर, केन्द्रीय विश्वविद्यालय  
ONGC, Cauvery Asset, Karaikal

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*Chandrukan*

वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
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प्रौद्योगिकी संस्थान / Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





## INTRODUCTION

Oil has been used for lighting purposes for many thousand years. In areas where oil is found in shallow reservoirs, seeps of crude oil or gas may naturally develop, and some oil could simply be collected from seepage or tar ponds. We know of tales of eternal fires where oil and gas seeps would ignite and burn.

Soon, oil had replaced most other fuels for mobile use. The automobile industry developed at the end of the 19th century, and quickly adopted the fuel. Gasoline engines were essential for designing successful aircraft. Ships driven by oil could move up to twice as fast as their coal-fired counterparts, a vital military advantage. Gas was burned off or left in the ground.

Despite attempts at gas transportation as far back as 1821, it was not until after the World War II that welding techniques, pipe rolling, and metallurgical advances allowed for the construction of reliable long distance pipelines, resulting in a natural gas industry boom. At the same time the petrochemical industry with its new plastic materials quickly increased production. Even now gas production is gaining market share as LNG provides an economical way of transporting the gas from even the remotest sites.

With oil prices of 50 dollars per barrel or more, even more difficult to access sources become economically interesting. Such sources include tar sands in Venezuela and Canada as well as oil shales. Synthetic diesel from natural gas and biological sources (biodiesel, ethanol) have also become commercially viable. These sources may eventually more than triple the potential reserves of hydrocarbon fuels.

A handwritten signature in blue ink, which appears to read 'Chandrashekhar'.

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Training Report

On

Summer Internship At SARAS DAIRY,ALWAR.

Subject: Summer Internship

Academic Year: - 2022-23, 7th semester

Prepared by

19101110 - CHAITANYA BAIRWA

BACHELOR OF TECHNOLOGY  
IN  
CHEMICAL ENGINEERING



GURU GHASIDAS VISHWAVIDYALAYA

*Chaudhary*

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**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
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IN : 05AACFA2046G1ZW

(सहकारी विभाग पंजीयन क्रमांक 1650 A दिनांक 2-9-7)



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Alwar Zila Dugdh Utpadak Sahakari Sangh Ltd., Alwar  
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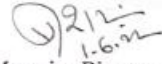
No:- AD/Estt./Trg/2022/ 16766

Dated : 01-06-2022

**TO WHOM SO EVER IT MAY CONCERN**

This is to certified that **Chaitanya Bairwa S/o Sh.Jitendra kumar Bairwa**, Student of B.tech. (Chemical Engineering) 6<sup>th</sup> Sem of GURU GHASIDAS UNIVERSITY , KONI BILASPUR (C.G.) has completed his Practical training in this Organization w.e.f. 11-05-2022 of 21 days in Dairy Plant.

During this period the performance was very good and we wish his success in life.



Managing Director  
AZDUSS LTD, ALWAR.



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E-mail : rsdfalw@yahoo.co.in

(राजस्थान कॉर्पोरेटिव डेवेलपमेंट फंडेशन लि., जयपुर से सम्बद्ध)



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HOMOGENIZER  
HEAT EXCHANGER  
CONVEYOR  
CLEAN IN PLANT (CIP)  
EFFLUENT TREATMENT PLANT (FTP)

*Chaudhary*

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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



SUMMER TRAINING REPORT



**IndianOil**

Under the supervision of

**Mr. Phalguni Pal (CPNM)**

Duration: 16/05/2022 - 15/06/2022

*Submitted to:*

**Mr. Rajendra Prasad, M (MS, L&D)**  
Training & Development Department,  
IOCL, Mathura

*Submitted by:*

**CITRAVEER SINGH**

*In partial fulfilment of requirements for the degree of*

**BACHELOR OF TECHNOLOGY**

**IN**

**CHEMICAL ENGINEERING**



**GURU GHASIDAS VISHWAVIDYALAYA**

1

*Chaudhary*

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प्रौद्योगिकी संस्थान/Institute of Technology  
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टीज प्रभाग  
as Division

Page 1 of 1

इंडियन ऑयल कॉर्पोरेशन लिमिटेड  
मथुरा रिफाइनरी, मथुरा-281 005 (उ.प्र.) भारत  
Indian Oil Corporation Limited  
Mathura Refinery, Mathura-281 005 (U.P.) India  
Tel : 0565-2417989  
Website : www.indianoil.in



HR/TRG/MRSummerTrg/2022-23/5434

Date-15-Jun-2022

**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that Mr. Citraveer Singh a student of B.Tech (Chemical) from Guru Ghasidas Vishwavidyalaya has undergone Summer Internship in Production department of Mathura Refinery ,Indian Oil Corporation Limited for a period from 16-May-2022 to 15-Jun-2022 .

During the course of his training he has successfully completed a research project titled "WASTE WATER TREATMENT IN OIL & GAS INDUSTRY" .We found him keen on acquiring insights into organizational systems & procedures besides being enthusiastic in applying the concepts, theories and undertaking research.We wish him all success in his career.

*RPrasad*  
15/06/2022

Rajendra Prasad  
M(MS,L&D)

राजेंद्र प्रसाद  
Rajendra Prasad  
प्रबंध (प्रोडक्शन सेक्टर, अधिष्ठाता एवं विभागाध्यक्ष)  
Manager (MS, LRN & DE)  
इंडियन ऑयल कॉर्पोरेशन लि.  
Indian Oil Corporation Ltd.  
मथुरा रिफाइनरी, मथुरा -281005  
Mathura Refinery, Mathura-281005

6/15/2022



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*Chaudhary*

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



GURU GHASIDAS VISHWAVIDYALAYA UNIVERSITY  
BILASPUR, CHATTISGARH



AN INTERNSHIP REPORT  
ON  
"SOLVENT RECOVERY SYSTEM"

Submitted in partial fulfilment for the award of degree  
BACHELOR OF ENGINEERING  
IN  
CHEMICAL ENGINEERING

Submitted by  
D.PAVAN MANOJ

INTERNAL GUIDE  
DR.SRI HARI  
T.S.D MANAGER

EXTERNAL GUIDE  
MR. HARI  
HEAD OF S.RS BLOCK

*Chaudhri*

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Tel : 91-40-23704923/24/25, Fax : 91-40-23704926, 23714250  
E-mail : contact@heterodrugs.com URL : http://www.heterodrugs.com  
CIN : U24110TG1989PLC009723

15<sup>th</sup> APRIL, 2022

To

The Head  
GURU GHASIDAS VISHWAVIDYALAYA,  
BILASPUR,  
CHHATTISGARH.

Dear Sir,

With reference to your letter dated 21/03/2022 requesting us to accord permission to one of your students to undergo internship in our organization.

We are pleased to accord permission to Mr. DANDUPROLU PAVAN MANOJ, CHEMICAL ENGINEERING student of your institution to carry out internship in TSD Department at our M/s HETERO LABS LIMITED - I, SURVEY No.10, IDA, GADDAPOTHARAM VILLAGE, JINNARAM MANDAL, SANGA REDDY Dist., Pin code: 502319, T.S., effective from 06-05-2022 to 19-06-2022.

Please note that the student is not entitled for any transportation facility or to receive any stipend/amount during the Project period.

The student has to abide by the rules and regulations of the organization from time to time.

Please advise the student to report at the above Unit HR department as per schedule.

Thanking you,

For Hetero Labs Limited

Authorized signature  
Mr. P. Uday Kumar  
AGM - HR  
Contact No: +91-9989973299  
Email-id: Uday.P@heterodrugs.com  
Website: www.heteroworld.com



Factory : Survey No.10, I.D.A., Gaddapotharam, Jinnaram Mandal, Sangareddy Dist. - 502 319, Telangana, INDIA.  
Phone : (08458) 277106.

*Chaudhary*

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## INTRODUCTION

Solvent recovery systems extract solvents for re-use out of effluent streams they can reduce the demand for purchase of new solvents & process inputs by recovering chemicals that can be reused in production or to flush the system between runs. They can also help manufacturers meet regulatory requirements or process standards by cleaning waste streams before they are released from the plant. The recovery of solvents from effluent can be achieved with a variety of technologies. A common recovery method is solvent distillation systems, but liquid-liquid extraction, absorption systems, film evaporation, crystallization, and membrane separation can also be used, depending on the application. Distillation range is restricted by the azeotropic point. Binary azeotropic mixtures, such as ethanol/water and IPA/water, can be separated into their pure components by distillation by the addition of a third component, so called the entrainer, which forms a ternary azeotrope with a lower boiling point than any binary azeotrope. The vapour moves up the column, and as it exits the top of the unit, it is cooled by a condenser. The condensed liquid is stored in a holding vessel known as the reflux drum. Some of this liquid is recycled back to the top of the column and this is called the reflux. The condensed liquid that is removed from the system is known as the distillate. This cleaning is required to avoid contamination from one batch to the other. Since in one mixing line companies use it for multiple products which also require multiple raw material, therefore cleaning the equipment become a routine process. Most of the industries incinerate the waste solvents.

### THE BOILING POINTS OF MAIN SOLVENTS IN SOLVENT RECOVERY SYSTEM

- Isopropyl Alcohol - 82.5 °C
- Methyl dichloride - 39 °C
- Ethyl Acetate - 77.1 °C
- Acetone - 56 °C
- Toulene - 110.6 °C
- Ethyl dichloride - 83.47 °C

*Chaudhary*

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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
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Guru Ghasidas Vishwavidyalaya, Bilaspur

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

AN INTERNSHIP REPORT ON

“ROLE OF Ni SUBSTITUTION AND IMPREGNATION ON  
PEROVSKITE CATALYSTS TOWARDS CO<sub>2</sub>  
METHANATION”

*Submitted in partial fulfilment for the award of degree*

BACHELOR OF TECHNOLOGY

IN

CHEMICAL ENGINEERING

NAME OF INTERN: DASU VIJAYA KUMAR BHAGAVAN

ENROLLMENT NO: GGV/19/1334

ROLL NO: 191101113

DEPARTMENT: Chemical Engineering

PROJECT GUIDE: Dr. SATYAPPA A SINGH

GUIDE DESIGNATION: ASSISTANT PROFESSOR, DEPARTMENT OF  
CHEMICAL ENGINEERING, BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE,  
PILANI- HYDERABAD CAMPUS

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HoD, Chemical Engineering  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



Birla Institute of Technology & Science (BITS), Pilani  
Hyderabad Campus

INTERNSHIP CERTIFICATE

This is to certify that Mr. Dasu Vijaya Kumar Bhagavan, a student of Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur in B.Tech. Chemical Engineering underwent summer internship at Birla Institute of Technology and Science - Pilani, Hyderabad Campus from May 8, 2022 to July 8, 2022 and worked on the project titled:

**Mechanistic Insights of Core-Shell Nanoparticles for CO<sub>2</sub> Methanation**

He has completed the assigned work to our satisfaction and made good progress to meet the objectives of the project. We wish him success in all his future endeavors.

*A. Satyapaul Singh*

Dr. Satyapaul A. Singh  
Assistant Professor & PI  
Chemical Engineering Department

Place: BITS-Pilani Hyderabad  
Date: July 08, 2022



## 1. Introduction

Carbon dioxide ( $\text{CO}_2$ ) is a greenhouse gas that can trap heat and result in global warming. Unfortunately, since the 20<sup>th</sup> century rapid industrialization has resulted in an explosive rise in energy-consumption globally, resulting in a steady increase in  $\text{CO}_2$  concentration in the atmosphere. An increase in  $\text{CO}_2$  emissions will be continued for the next few decades[1]. Studies have indicated that by 2040, 35.7 Gt of  $\text{CO}_2$  releases into the atmosphere. In recent years there have been intensive efforts devoted to the development of recent technologies for  $\text{CO}_2$  capture, separation, transportation, storage ( $\text{CO}_2$  sequestration), and utilization, as it is predicted that fossil fuels will still be the dominating energy resource in the next few decades.

A transition to a greener energy mix and to more sustainable processes for chemical production is on the way, but it will require years or even decades and huge investments to permeate the market. Moreover, some sectors intrinsically emit  $\text{CO}_2$  (e.g., cement industry). Carbon capture and storage (CCS) and carbon capture and utilization (CCU) can be used to help curb persisting  $\text{CO}_2$  emissions. CCS is an efficient strategy to cut  $\text{CO}_2$  emissions and store carbon in geological formations, but this technology is energy intensive and expensive. Therefore, CCU is a more attractive and promising option. Captured  $\text{CO}_2$  can be used as a renewable resource to produce e.g., long-chain hydrocarbons, which can be used as transportation fuels.

One can convert that  $\text{CO}_2$  into methane of high purity which is none other than natural gas. Natural gas can be used as a fuel which causes less pollution and gives more mileage to the automobiles. Not only as a fuel can methane be used to produce a cleaner fuel that is hydrogen ( $\text{H}_2$ ) and causes no pollution to the environment. The process of producing  $\text{H}_2$  fuel is known as steam reforming of methane which produces  $\text{CO}_2$  and  $\text{H}_2$  along with that reverse water shift gas reaction will also takes place at elevated temperatures. To convert carbon dioxide into methane one of the best methods is the hydrogenation of the carbon dioxide. In

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



**Seminar Report**

On

**Extraction Of Essential Oil From Aromatic Plants**

Submitted in partial fulfillment of the requirements for the  
award of the degree of B.Tech. in Chemical Engineering



**Submitted by**

DIVYA PANDEY

Roll no. 19101114

Enrollment no. GGV/19/1335

Name of department : Chemical  
Engineering (7 sem)

**Under the Guidance of**

DR.RAGHWENDRA SINGH THAKUR

MRS. A.N.JOSHI

DR. GHOSHNA JYOTI

वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
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(Online Start-up Training Program: An Internship)  
Projects & Environment

Organized by: Terra-Green Technologies Pvt. Ltd., in association with Projects & Environment  
Oct 25 to Nov 30, 2021

**CERTIFICATE**  
\_\_\_\_\_ of Completion \_\_\_\_\_  
**DIVYA PANDEY**  
\_\_\_\_\_ from \_\_\_\_\_

GURU GHASIDAS UNIVERSITY

Successfully completed Online Industrial Internship Program on the subject of  
**INDUSTRIAL AND URBAN WASTEWATER MANAGEMENT: STP, ETP AND RO**

with **A** grade.

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**Issuing Date: Nov 30, 2021**

Director  
Terra-Green Technologies Pvt. Ltd





## Abstract

The use of essential oils is receiving increasing attention, as they are good sources of several bioactive compounds. They are nowadays preferred over the synthetic preservatives thanks to their antioxidant and antimicrobial properties. Several studies highlight the beneficial effect of essential oils extracted from medical plants in the cure of human diseases such as hypertension, diabetes, or obesity. However, to preserve their bioactivity the use of appropriate extraction technologies is required. Method: The present review aims to describe the studies published so far on the essential oils focusing on their sources and chemical composition, the technologies used for their recovery and their application as antioxidants in food products. The review has been structured in three parts. In the first part, the various sources and health benefits of essential oil has been studied. In the second part, the most important technologies (i.e. extraction and distillation) have been presented. In detail, the factors affecting the choice of extraction process have been described and compared with innovative and green technologies. Finally, in the last part, the guidelines related to the use essential of oil and its market value has been discussed in detail. Conclusions: In summary, an overview of the aforementioned subjects is presented by discussing the results of the most recent published studies.

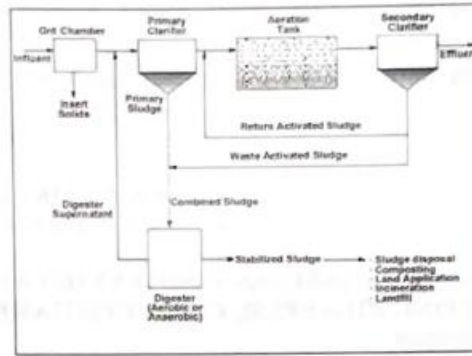
A handwritten signature in blue ink, reading 'Chandrakas', is written over a horizontal line.

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



APROJECTREPORTON

“ WASTEWATERTREATMENTINOILANDGAS  
INDUSTRY ”



SUBMITTED TO

MR. Rajendraprasad ,M(MS,L&D)

INDIANOILCORPORATIONLIMITED,MATHURA  
REFINERY

SUBMITTED BY

FAIYAZ AHMAD

CHEMICALENGINEERING

GURU GHASIDAS VISHWAVIDYALAYA,  
KONI, BILASPUR, CHHATTISGARH  
495009

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प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



क्राइनेरीज प्रभाग  
Refineries Division

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Mathura Refinery, Mathura-281 005 (U.P.) India

Tel. : 0565-2417989  
Website : www.indianoil.in



HR/TRG/MRSummerTrg/2022-23/5436

Date 15-Jun-2022

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. Faiyaz Ahmad a student of B. Tech (Chemical) from Guru Ghasidas Central University, has undergone Summer Internship in Production Department of Mathura Refinery, Indian Oil Corporation Limited for a period from 16-May-2022 to 15-Jun-2022.

During the course of his training he has successfully completed a research project "ETP OR WASTE WATER TREATMENT PLANT OIL & Gas Refinery". We found him keen on acquiring insights into organizational systems & procedures besides being enthusiastic in applying the concepts, theories and undertaking research. We wish him all success in his career.

*Rajendra Prasad*  
15/06/2022  
Rajendra Prasad  
M(MS, L&D)

राजेंद्र प्रसाद  
Rajendra Prasad  
प्रबंधक (प्रबंधन सेवाएं, अधिपत्य एवं विकास)  
Manager (MS, L&N & DEV)  
इंडियन ऑयल कॉर्पोरेशन लि.  
Indian Oil Corporation Ltd.  
मथुरा रिफाइनरी, मथुरा - 281005  
Mathura Refinery, Mathura-281005



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7. Anaerobic Lagoons
8. Bibliography and References

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विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





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Guru Ghasidas Vishwavidyalaya, Bilaspur

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

AN INTERNSHIP REPORT ON

“EXTRACTION OF CRUDE OIL & REFINING”

*Submitted in partial fulfilment for the award of degree*

**BACHELOR OF TECHNOLOGY**

IN

**CHEMICAL ENGINEERING**

NAME OF INTERN: KARANAM.LIKITH SAI

ENROLLMENT NO: GGV/19/1353

ROLL NO: 19101119

DEPARTMENT: Chemical Engineering

PROJECT GUIDE: MR. K. MAURYA

GUIDE DESIGNATION: SUPTDG GEOLOGIST, SUB SURFACE TEAM, ONGC  
KARAIKAL

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





OIL AND NATURAL GAS CORPORATION LIMITED

CAUVERY ASSET - HR/ER - IR  
NERAVY COMPLEX, KARAIKAL - 609 604.  
Ph.No: 04368 - 235076 Fax.No: 04368 - 238126

No. : CA/KKL/HR/HRD/STU.TRG/BTECH/2022-23/033

Date: 24.05.2022

Work Centre : Cauvery Asset, Karaikal

**CERTIFICATE**

This is to certify that *Mr. Karanam Likith Sai* Student of *Third year, B.Tech, Chemical Engineering, Guru Ghasidas Vishwavidyalaya, Bilaspur* has undergone *Summer/Winter/Industrial Training* at ONGC from *10.05.2022 to 24.05.2022*. He has successfully completed his project work / Inplant training in the discipline of Chemical. During the training, he took keen interest in the assigned work. We wish him all success in his academic endeavors and life.



*B. Aruldevi*  
*24/05/2022*  
Co - ordinator Training  
ONGC

बी. अरुलदेवी / B. ARULDEVI  
सीएच आर एन असाईन / Sr HR Executive  
ओएन जी सी, काराकल कॉम्प्लेक्स  
ONGC, Cauvery Asset, Karaikal



## INTRODUCTION

Oil has been used for lighting purposes for many thousand years. In areas where oil is found in shallow reservoirs, seeps of crude oil or gas may naturally develop, and some oil could simply be collected from seepage or tar ponds. we know of tales of eternal fires where oil and gas seeps would ignite and burn.

Soon, oil had replaced most other fuels for mobile use. The automobile industry developed at the end of the 19 th century, and quickly adopted the fuel. Gasoline engines were essential for designing successful aircraft. Ships driven by oil could move up to twice as fast as their coal fired counterparts, a vital military advantage. Gas was burned off or left in the ground.

Despite attempts at gas transportation as far back as 1821, it was not until after the World War II that welding techniques, pipe rolling, and metallurgical advances allowed for the construction of reliable long distance pipelines, resulting in a natural gas industry boom. At the same time the petrochemical industry with its new plastic materials quickly increased production. Even now gas production is gaining market share as LNG provides an economical way of transporting the gas from even the remotest sites.

With oil prices of 50 dollars per barrel or more, even more difficult to access sources become economically interesting. Such sources include tar sands in Venezuela and Canada as well as oil shales. Synthetic diesel from natural gas and biological sources (biodiesel, ethanol) have also become commercially viable. These sources may eventually more than triple the potential reserves of hydrocarbon fuels.

A handwritten signature in blue ink, appearing to read 'Chandrashekhar', is written over a horizontal line.

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**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



A Report on Overall Study in Tar Distillation Process with a  
Case Study on Maximum Yield of Naphthalene



RINL VISHAKAPATNAM STEEL PLANT

Submitted By

K.MANJULATHA (0009213)

Under the esteemed Guidance of

  
Shri.D.J.V.S.S.N BRAHMAM

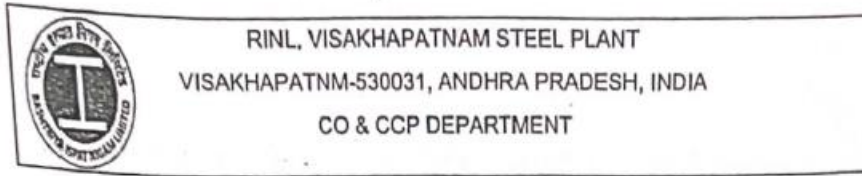
Dy. General Manager (O)/ CO & CCP

  
Shri.A.BAPUJI

Dy. General Manager (O)/ CO & CCP

उप महा प्रबंधक (सी ओ व सी सी पी)  
Dy. General Manager (CO & CCP)  
कोक ओवेन विभाग / Coke Oven Dept.  
आर.आई.एन.एल, विशाखपट्टणम इस्पात संयंत्र  
RINL, Visakhapatnam Steel Plant  
विशाखपट्टणम / VISAKHAPATNAM

डी.जे.वी.एस.एस.एन. ब्रह्मम  
D.J.V.S.S.N. BRAHMAM  
उप महा प्रबंधक (सी ओ व सी सी पी)  
Dy. General Manager (Oprn.)/CO & CCP  
आर.आई.एन.एल, विशाखपट्टणम इस्पात संयंत्र  
RINL, Visakhapatnam Steel Plant  
विशाखपट्टणम/VISAKHAPATNAM-530 031



CERTIFICATE

This is to certify that the summer project report entitled "A Report on Overall Study in Tar Distillation Process with a Case Study on Maximum Yield of Naphthalene". It is a Bonafide record of work done by K. MANJULATHA (100009213) in partial requirements for the award of the B. TECH in the department of chemical engineering during the academic year 2019-2023.

  
Dy. General Manager (Oprn.)  
डी.जे.वी.एस.एन. ब्रह्मम  
D.J.V.S.S.N. BRAHMAM  
उप महा प्रबंधक (प्र) / सी ओ व सी सी पि  
Dy. General Manager (Oprn.) / CO & CCP  
आर आई एन एल, विशाखपट्टणम इस्पात संयंत्र  
RINL, Visakhapatnam Steel Plant  
विशाखपट्टणम/VISAKHAPATNAM-530 031





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*Chaudhary*

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**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
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A Report on Study Of Water Treatment Using Biological Degradation  
and Chemical Process for Recirculation and Discharge of Effluent Water  
Of Coke Oven



RINL VISAKHAPATNAM STEEL PLANT

Submitted by

K.THRISHA

(100009178)

Under the esteemed guidance of

Shri. B. SRINIVAS

Dy. General Manager (O)

Shri. A. BAPUJI

Dy. General Manager (M)

ए. बापुजी / A. BAPUJI  
उप महा प्रबंधक (सी ओ व सी सी पी)  
Dy. General Manager (CO & CCP)  
कोक ओवन विभाग / Coke Oven Dept.  
आर.आर्.एम.एल. विशाखपट्टणम इस्पात संयंत्र  
RINL, Visakhapatnam Steel Plant  
विशाखपट्टणम/VISAKHAPATHAM-530 031



राष्ट्रीय इस्पात निगम लिमिटेड Rashtriya Ispat Nigam Limited  
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तकनीकी प्रशिक्षण केंद्र, Technical training Institute  
विशाखापत्तनम Visakhapatnam-530031

Reg.No. : 100009178  
प्रमाणपत्र Certificate



प्रमाणित किया जाता है कि श्री /This is to certify that Mr./Ms. KODAVALI THRISHA student of

(वर्ष/पाठ्यक्रम/शाखा-Year/course/Branch) 3/BE/B TECH/CHEMICAL विद्यार्थी ने from

GURU GHASIDAS VISWA VIDYALAYA,BILASPUR से has undergone

4 Week प्रशिक्षण training विशाखापत्तनम इस्पात

संयंत्र के at Visakhapatnam Steel Plant in COKE OVEN & COAL CHEMICALS PLANT (CO&CCP) विभागों में

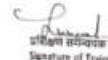
department from दि. 09-05-2022 से to 04-06-2022 प्राप्त तक किया |

परियोजना शीर्षक The Project Title is STUDY OF WATER TREATMENT USING BIOLOGICAL DEGRADATION  
AND CHEMICAL PROCESS FOR DRINKING, RECIRCULATION AND DISCHARGE WATER है।

प्रशिक्षण अवधि में उनका आचरण His/Her conduct during the period of training  
is GOOD है।

थल/Place : Visakhapatnam

दि./Date : 16-06-2022

  
प्रशिक्षण संयोजक का हस्ताक्षर  
Signature of Training Co-Ordinator  
एच गणेश बाबु/M Ganesh Babu  
सहायक महासंचालक (प्रशिक्षण)/Assistant General Manager (Training)  
तकनीकी प्रशिक्षण संस्थान/Technical Training Institute  
आर आर एन स्टील विशाखापत्तनम इस्पात संयंत्र, VIZAG, VISAKHAPATNAM Steel Plant  
विशाखापत्तनम - 530031/Visakhapatnam-530031



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*Chaudhri*

वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



## PROJECT REPORT

ON "Study of crystallization process of naphthalene fraction in crystallizers of tar distillation plant for improvement of naphthalene yield."

BY  
LUCKY PANDEY

P21/7446



सेल SAIL

AT BHILAI STEEL PLANT, BHILAI

Students from:



गुरु घासीदास विश्वविद्यालय, बिलासपुर  
Guru Ghasidas Vishwavidyalaya, Bilaspur

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*Chaudhary*

वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
HoD, Chemical Engineering  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





मानव संसाधन विकास विभाग  
HUMAN RESOURCES DEVELOPMENT DEPARTMENT  
प्रमाणपत्र  
CERTIFICATE

पंजीयन क्र. P-21/7446  
Regn. No. ....

प्रमाणित किया जाता है कि श्री / कुमारी  
This is to certify that Shri / Ku. .... *Lucky Pandey* .....

सेमेस्टर विद्यार्थी  
Sem., student of ..... B.Tech. .... of ..... G.G.U., Bilaspur, ..... College / Institute  
(Chemical) कालेज / संस्थान

ने अवकाश कालीन प्रशिक्षु के रूप में दिनांक से तक प्रशिक्षण प्राप्त किया ।  
has undergone project based training from ..... 02/05/2022 ..... to ..... 28/05/2022 .....

प्रोजेक्ट "Report on " Study of Crystallization Process of Naphthalene Fraction in  
Project ..... Crystallization of Tar Distillation Plant for Improvement of Naphthalene Yield." .....

इस अवधि में उनका कार्य निम्नानुसार रहा ।  
His / her performance during the training period has been ..... Excellent .....

भिलाई, दिनांक 28/05/2022  
Bhilai, Dated .....

*Lucky*  
DR. ANIL KISHOR PANDAY  
DIRECTOR (C.G.U.-F&D)  
BILASPUR (Jawahar Education Building)

सेल SAIL  
भिलाई इस्पात संयंत्र  
BHILAI STEEL PLANT





Duration: From May 2,2022  
To: May 28,2022  
Date of Submission: May 27,2022

Title of the Project: "Study of crystallization process of naphthalene fraction in crystallizers of tar distillation plant for improvement of naphthalene yield."

SERIAL NO.	NAME OF STUDENT	REGISTRATION/ROLL NO.
1	Shivansh Singh Rajawat	P21/7444
2	Lucky Pandey	P21/7446
3	Shaurya Chaurasia	P21/7447
4	Rishabh Verma	P21/7449

Project Area: Coke Oven& Coal Chemical Department, Bhilai Steel Plant

# सेल SAIL

## Abstract

Bhilai Steel Plant, rightfully known as the flagship unit of SAIL is also one of the best integrated steel plants in the country and world. The gigantic complex comprises several departments and shops; all interwoven and

*Chaudhary*

वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
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प्रौद्योगिकी संस्थान/Institute of Technology  
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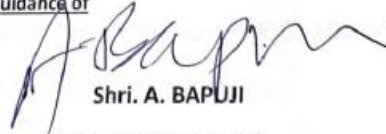
RINL VISAKHAPATNAM STEEL PLANT

Submitted by

MADAKA SYAM SUNDHAR NAIDU  
(100009382)

Under the esteemed guidance of

Shri. B. SRINIVAS  
Dy. General Manager (O)

  
Shri. A. BAPUJI  
Dy. General Manager (M)

ए. बापुजी / A. BAPUJI  
उप महा प्रबंधक (सी ओ व सी सी पी)  
Dy. General Manager (CO & CCP)  
कोक ओवन विभाग / Coke Oven Dept.  
आर.आई.एन.एल, विशाखपट्टणम इस्पात संयंत्र  
RINL, Visakhapatnam Steel Plant  
विशाखपट्टणम / VISAKHAPATNAM-530 03



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विशाखापत्तनम इस्पात संयंत्र Visakhapatnam Steel Plant  
तकनीकी प्रशिक्षण केंद्र, Technical training Institute  
विशाखापत्तनम Visakhapatnam-530031

Reg.No. : 100009382  
प्रमाणपत्र Certificate



प्रमाणित किया जाता है कि श्री /This is to certify that Mr./Ms. MADAKA SYAMSUNDHARNAIDU student of

(वर्ष/पाठ्यक्रम/शाखा-Year/course/Branch) 3/BE/B TECH/CHEMICAL विद्यार्थी ने from

GURU GHASIDAS VISWA VIDYALAYA, BILASPUR से has undergone

4 Week प्रशिक्षण training विशाखापत्तनम इस्पात

संयंत्र के at Visakhapatnam Steel Plant in COKE OVEN & COAL CHEMICALS PLANT (CO&CCP) विभागों में


department from दि. 09-05-2022 से to 04-06-2022 प्राप्त तक किया |

योजना शीर्षक The Project Title is STUDY OF WATER TREATMENT USING BIOLOGICAL DEGRADATION  
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प्रशिक्षण अवधि में उनका आचरण His/Her conduct during the period of training  
is GOOD है।

Place : Visakhapatnam

Date : 16-06-2022

  
प्रशिक्षण संयंत्र के प्रशासक  
Signature of Training Co-Ordinator  
एन. गणेश बाबु / M. Ganesh Babu  
सहायक महासंचालक (प्रशिक्षण) Assistant General Manager (Training)  
तकनीकी प्रशिक्षण संस्थान / Technical Institute of Training Institute  
आर. आई. एन. एल. बिलासपुर इस्पात संयंत्र, (RIL), Visakhapatnam Steel Plant  
विशाखापत्तनम - 530031/Visakhapatnam-530031





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*Chaudhary*

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**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



गुरु घासीदास विश्वविद्यालय, बिलासपुर  
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IN

CHEMICAL ENGINEERING

NAME OF INTERN: M.L.Siva rama krishna

ENROLLMENT NO: GGV/19/1377

ROLL NO: 19101125

DEPARTMENT: Chemical Engineering

PROJECT GUIDE: MR.K. MAURYA

GUIDE DESIGNATION: SUPTDG GEOLOGIST, SUB SURFACE TEAM, ONGC  
KARAIKAL

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



I would like to express my special thanks of gratitude to the MR.MAURYA, SUPERVISOR  
GEOLOGIST, SUB SURFACE TEAM, ONGC KARAIKAL for giving the Industrial  
Training opportunity under him on the Crude oil Extraction and Refining.

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internship for 15 days.

I would like to express my honourable gratitude to my college GURU GHASIDAS  
VISWAVIDYALAYA, School of Studies and Engineering, Chemical Engineering  
department for their support.

#### ABOUT ONGC



The Oil and Natural Gas Corporation (ONGC) is an  
indian oil and gas explorer and producer, headquartered in new delhi . ONGC  
was founded on 14 August 1956 by the government of india . It is a public  
sector under taking whose operations are overseen by the ministry of petroleum

*Chaudhary*

वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



A

Seminar Report on

**SOLAR POND**

Prepared by

MAHI JAISWAL

ROLL NO: 19101126

GGV/19/1370

Session: 2019-2023

*Submitted in partial fulfilment of the requirement of the degree of B. TECH in CHEMICAL ENGINEERING*



DEPARTMENT OF CHEMICAL ENGINEERING, INSTITUTE OF  
TECHNOLOGY, GURU GHASIDAS VISHWAVIDYALAYA

(A CENTRAL UNIVERSITY)

, BILASPUR (C.G.), 495009

*Chaudhary*

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
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Certificate No. INPTC/CUZ/AU/11/46  
Date of Issue: 30th April, 2022

**Online Internship Program (OIP)**  
25th February to 30th April, 2022 (40 hrs)

**Indian Institute of Chemical Engineers**  
Dr. H. L. Roy Building, Jadavpur University Campus, Kolkata- 700 032

**CERTIFICATE OF COMPLETION**

This certificate is hereby awarded to  
**MAHI JAISWAL**

from .....  
GURU GHASIDAD UNIVERSITY

who has successfully completed the INTERNSHIP PROGRAMME on the subject  
CHEMICAL PROCESS TECHNOLOGY (CPT) following all necessary criteria of the Institute  
with "A+" Grade.

**Grading System :**  
A+: 90-100%  
A: 75-89%  
B+: 65-74%  
B: 55-64%



  
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President, IIChE

  
P K Saxena  
Honorary Registrar, IIChE

  
Dr. Avijit Ghosh  
Honorary Secretary, IIChE  
Convener, OIP



## ABSTRACT

Solar ponds are probably the simplest and least expensive technology for conversion of solar energy to thermal energy. The solar pond is unique in its ability to act both as collector and as storage. The cost of solar pond per unit area is considerably less than that of any active ponds attractive for district significant quantities of fossil fuel in low- temperature heating applications in non-urban areas.

A handwritten signature in blue ink, which appears to be 'Chandrakant', written over a horizontal line.

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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
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AN INTERNSHIP REPORT ON

“ROLE OF Ni SUBSTITUTION AND IMPREGNATION ON  
PEROVSKITE CATALYSTS TOWARDS CO<sub>2</sub> METHANATION”

*Submitted in partial fulfilment for the award of degree*

BACHELOR OF TECHNOLOGY IN

CHEMICAL ENGINEERING

NAME OF INTERN: MANDALI RAJASHEKHAR

ENROLLMENT NO: GGV/19/1372

ROLL NO: 191101127

DEPARTMENT: Chemical Engineering



PROJECT GUIDE: SRIKANTH

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





**NAGA HANUMAN SOLVENT OILS PVT., LTD.,**

 D No 7B-15-45, Maruhi Nilayam Puppavart Veedhi, Eastern Street,  
ELURU - 534 001, AP., INDIA Phone : 08812-235378, Fax : 08812-242378,  
W : H O : 08812 - 235378 Cell : 77997000 71 to 74 

Ref: \_\_\_\_\_ Date: \_\_\_\_\_

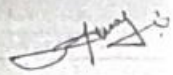
Date: 14.06.2022

**TO WHOM SO EVER IT MAY CONCERN**

This is to certify that Mr. Mandii Rajashekhar S/o Laxmi Koteswara Rao, Student of Chemical Engineering, at Guru Ghasidas Vishwavidyalaya, Bilaspur, Has successfully completed Industrial Field Training in Naga Hanuman Solvent Oils Pvt Ltd., Muppavaram, from 10.05.2022 to 10.06.2022 as a part of his curriculum.

We wish him all the best in her future endeavours.

For Naga Hanuman Solvent Pvt Limited.,

  
Prasad,  
Asst Manager-HR.





## NAGA HANUMAN SOLVENTS OILS PRIVATE LIMITED

- Established in 10<sup>th</sup> June 2004.
- Most Valuable Company in India.
- Market Value around 650.0 Lakhs.
- Progressive firm in the production of Fish feeds, Poultry feeds and Cattle feeds of high Nutritional Quality.
- It is a Private Unlisted Company.

Naga Hanuman Solvent Oils Private Limited is located in West Godavari Andhra Pradesh India and it is a part of the Grain and oilseed Milling Industry.

Naga Hanuman Solvent oils Private Limited has 134 total Employees across all of its locations. There are 3 companies in the Naga Hanuman Solvents Oils Private Limited Corporate Family.

Naga Hanuman Solvent Oils Private Limited is a non-government company, incorporated on 10<sup>th</sup> June 2004, it is a private unlisted company.

Company's authorized capital stands at 650.0 lakhs and has 67.51635% paid-up capital which is Rs. 438.86 Lakhs. Naga Hanuman Solvents Oils Private limited last annual general meet happened on 30<sup>th</sup> September 2017.

Naga Hanuman Solvent Oils Private limited is majority in manufacturing (food stuffs) Business from last 18 years and currently companies' operations are active. Current board members and Directors are MALLIPUDI.MADHURI LAKSHMI, NUKALA.BALAJI, RAMAKRISHNA NUKALA and AMMAJI.NAKULA.

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



A

SEMINAR REPORT ON

**INDUSTRIAL WASTEWATER TREATMENT &  
MANAGEMENT**

**BY**

MUSKAN PARMAR

ROLL NO – 19101130

GGV/19/1379



*Submitted in Partial Fulfilment of the requirement of  
The degree of B.Tech in CHEMICAL ENGINEERING*

DEPARTMENT OF CHEMICAL ENGINEERING, INSTITUTE  
OF TECHNOLOGY, GURU GHASIDAS VISHWAVIDYALAYA

(A CENTRAL UNIVERSITY)

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Projects & Environment

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(Online Start-up Training Program: An Internship)

Organized by: Terra-Green Technologies Pvt. Ltd., in association with Projects & Environment

Oct 25 to Nov 30, 2021

**CERTIFICATE**  
\_\_\_\_\_ of Completion \_\_\_\_\_  
**MUSKAN PARMAR**  
\_\_\_\_\_ from \_\_\_\_\_  
GURU GHASIDAS UNIVERSITY

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INDUSTRIAL AND URBAN WASTEWATER MANAGEMENT: STP, ETP AND RO (OSTP-2021)

A=90% and above  
B=80-89  
C=70-79%  
D=60-69%

with **A** grade.

Certificate ID: TG/2021/13641  
Issuing Date: Nov 30, 2021

Director  
Terra-Green Technologies Pvt. Ltd

ISO 9001 2015 CERTIFIED

CIVIL ENGINEERING REGISTRATION BOARD  
INSIRE





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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
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कोनी, बिलासपुर - 495009 (छ.ग.)



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Koni, Bilaspur - 495009 (C.G.)



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Guru Ghasidas Vishwavidyalaya, Bilaspur

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AN INTERNSHIP REPORT ON

“EXTRACTION OF CRUDE OIL & REFINING”

*Submitted in partial fulfilment for the award of degree*

BACHELOR OF TECHNOLOGY

IN

CHEMICAL ENGINEERING

NAME OF INTERN:P.Sai Deepak Malya

ENROLLMENT NO:GGV/19/1383

ROLL NO:19101132

DEPARTMENT:Chemical Engineering

PROJECT GUIDE:MR.K. MAURYA

GUIDE DESIGNATION: SUPTDG GEOLOGIST, SUB SURFACE TEAM, ONGC  
KARAIKAL

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
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## ABOUT ONGC



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प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
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सेल SAIL

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड  
STEEL AUTHORITY OF INDIA LIMITED

WITH



GURU GHASIDAS VISHWAVIDYALAYA  
BILASPUR (CHHATTISGARH)

PROJECT REPORT

ON

TO DESIGN SUITABLE HEAT EXCHANGER (PLATE TYPE, SHELL TYPE AND TUBE ETC.) FOR  
EFFICIENT COOLING OF HOT DEBENZOLISED SOLAR OIL FROM 100 °C TO 35 °C USING  
TECHNICAL WATER AT 30 °C. OIL FLOW RATE 135 M<sup>3</sup>/HR.

UNDER GUIDANCE OF

Mr. ANAND SHUKLA (GM CO & CCD)

*Anand Shukla*

वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
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**CERTIFICATE**

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पंजीयन क्र. P.217445  
 Regn. No.

छात्र / छात्रिका  
 College / Institute  
**Sixth Sem., student of B.Tech. of G.G.U. Bilaspur. College / Institute (Chemical)**

ने अवकाश कालीन प्रशिक्षु के रूप में दिनांक से तक प्रशिक्षण प्राप्त किया है  
**has undergone project based training from 02/05/2022 to 28/05/2022**

प्रोजेक्ट **Report on "Design of Suitable Heat Exchanger for Efficient Cooling of Solar Oil/ Wash Oil in BRP- II"**

इस अवधि में उनका कार्य निम्नानुसार  
**His / her performance during the training period has been Excellent**

मिलाई, दिनांक 28/05/2022  
**Bhilai, Dated 28/05/2022**

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**संयंत्र प्रमुख**

**संयंत्र**  
**इस्पात संयंत्र**  
**BHILAI STEEL PLANT**





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*Chaudhrikan*

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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



## A PROJECT REPORT ON

“MANUFACTURING OF POLYESTER CHIPS FOR YARN.”

A PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENT FOR CERTIFICATES.

OF

B.TECH IN CHEMICAL ENGINEERING

PREPARED BY

RANVEER RAJ	GGV/19/1396
AKASH DEEP	GGV/19/1315
VIVEK MEHTA	GGV/19/1447



GURU GHASIDAS VISHWAVIDYALAYA  
(A CENTRAL UNIVERSITY)  
DEPARTMENT OF CHEMICAL ENGINEERING  
AT:KONI, PO-KONI,DIST.-BILASPUR  
CHHATTISGARH, (495009).





SDSPL/HRD/INTERN/34/22

Date 14/06/2022

**TO WHOM IT MAY CONCERN**

We are glad to inform you that Mr. Ranveer Raj from Guru Ghasidas Vishwavidyalaya, Bilaspur has successfully completed his internship from 14<sup>th</sup> May 2022 to 14<sup>th</sup> June 22 .

During his internship, we found him extremely inquisitive and hard working. He was very much interested to learn and also willing to put his best efforts and get in to the depth of the subject to understand it better.

His association with us was very fruitful and we wish him all the best for his future endeavors.

Thanking you!!

For Shree Durga Syntex Pvt Ltd.

Authorized Signatory





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## PROJECT REPORT

ON "Study of crystallization process of naphthalene fraction in crystallizers of tar distillation plant for improvement of naphthalene yield."

BY

I. RISHABH VERMA  
P21/7449



सेल SAIL

AT BHILAI STEEL PLANT, BHILAI

Students from:



गुरु घासीदास विश्वविद्यालय, बिलासपुर  
Guru Ghasidas Vishwavidyalaya, Bilaspur

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*Chaudhary*

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
HoD, Chemical Engineering  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



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CERTIFICATE

Regn. No. P-217449

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This is to certify that Shri / Ku. *Rishabh Verma*

सेमेस्टर विद्यार्थी  
Sixth Sem., student of B.Tech. of G.G.U., Bilaspur. College / Institute  
(Chemical)


ने अवकाश कालीन प्रशिक्षण के रूप में दिनांक  
has undergone project based training from 02/05/2022 to 28/05/2022

प्रोजेक्ट  
Project "Study of Crystallization Process of Naphthalene Fraction in  
Crystallization of Tar Distillation Plant for Improvement of Naphthalene Yield"

इस अवधि में उनका कार्य निम्नानुसार  
His / her performance during the training period has been Excellent

बिलासई, दिनांक 28/05/2022  
Bhilai, Dated 28/05/2022

सेल SAIL  
भिलाई इस्पात संयंत्र  
BHILAI STEEL PLANT





## Abstract

Bhilai Steel Plant, rightfully known as the flagship unit of SAIL is also one of the best integrated steel plants in the country and world. The gigantic complex comprises several departments and shops; all interwoven and interdependent in a way that the plant functions uninterruptedly and creates new heights of performance and achievements regularly.

Since BSP is dependent on production of steel, we need iron in blast furnace to produce steel. To satisfy the demand of Blast Furnace we need coke as a fuel and reducing agent from coke oven. From the coke oven gas coming out from batteries many valuable chemicals like tar, ammonia and Benzol are recovered and gas cleaned in the by-products plant is used as a fuel

Hot Pressed Naphthalene is one of the most important products of tar distillation plant. Since it is the most expensive product of SAIL, the improvement in its yield is an important task.

The crystallization is the most important process in the production of naphthalene in the fractionating tank. Therefore, the crystallization process of naphthalene has been studied

*Chaudhary*

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**HoD, Chemical Engineering**  
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सेल SAIL

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड  
STEEL AUTHORITY OF INDIA LIMITED

WITH



GURU GHASIDAS VISHWAVIDYALAYA  
BILASPUR (CHHATTISGARH)

PROJECT REPORT

ON

TO DESIGN SUITABLE HEAT EXCHANGER (PLATE TYPE, SHELL TYPE AND TUBE ETC.) FOR  
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प्रौद्योगिकी संस्थान/Institute of Technology  
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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





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CERTIFICATE

पंजीवन क्र. P-21/7442  
Regn. No.....

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कालेज / संस्थान  
सेमेस्टर विद्यार्थी ..... *B.Tech..... of .....G.G.U., Bilaspur..... College / Institute* .....  
Sixth ..... **Sem., student of** .....  
ने अवकाश कालीन प्रशिक्षु के रूप में दिनांक ..... से तक प्रशिक्षण प्राप्त किया ।  
**has undergone project based training from** ..... *02/05/2022..... to .....28/05/2022.....* .....  
प्रोजेक्ट *Report on " Design of Suitable Heat Exchanger for Efficient Cooling of Solar Oil/ Wash Oil in BRP- II."* .....  
**Project** ..... रहा ।  
इस अवधि में उनका कार्य निष्पादन ..... *Excellent* .....  
**His / her performance during the training period has been** .....

भिलाई, दिनांक 28/05/2022  
Bhilai, Dated.....

सेल SAIL  
भिलाई इस्पात संयंत्र  
BHILAI STEEL PLANT

## Abstract



### PROJECT TITLE

To design suitable Heat Exchanger (Plate Type, Shell Type and Tube etc.) for efficient cooling of hot debenzolised solar oil from 100 °C to 35 °C using technical water at 30 °C. Oil Flow rate 135 m<sup>3</sup>/hr.

Benzol Recovery Plant (BRP) is a part of the Coke Oven and Coal Chemical Department. BRP is responsible for the recovery of Benzol, which is basically a mixture of benzene, toluene, xylene and few hydrocarbons, from the coke oven gas. Before the recovery of Benzol in BRP the coke oven gas is made free of tar and ammonia. The recovery of benzol is accomplished in series of scrubbers using solar wash oil. Solar wash oil is an expensive product obtained from oil refineries. The benzol in wash oil is separated using steam. During the process of extraction of benzol from coke oven gas, the solar wash oil reaches a temperature of about 1250°C. The gas after passing through the ammonium sulphate plant passes through the primary gas cooler where it is being quenched with the help of a cold water results it reaches the temperature of (33-38) °C, after that it is being treated with solar oil or wash oil in the series of scrubber results the solar oil will absorb the benzol present in it, for the better absorption of benzol oil it is recommended that the temperature difference between the solar oil and the gas should lie between (3-5) °C. The wash oil thus obtained is termed as debenzolised wash oil and has to be cooled to a temperature of about 480°C to be recycled and reused for economical running of benzol recovery plant. The process of cooling can be accomplished by using different types of heat exchangers. The process and different types of heat exchangers available are studied in detail and using the most economical type of heat exchanger and the design calculations are carried out.



वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



## PROJECT REPORT

ON "Study of crystallization process of naphthalene fraction in crystallizers of tar distillation plant for improvement of naphthalene yield."

BY

SHAURYA CHAURASIA  
19101139

P21/7447



सेल SAIL

AT BHILAI STEEL PLANT, BHILAI

Students from:



गुरु घासीदास विश्वविद्यालय, बिलासपुर  
Guru Ghasidas Vishwavidyalaya, Bilaspur

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

*Chaudhary*

वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
HoD, Chemical Engineering  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





मानव संसाधन विकास विभाग  
HUMAN RESOURCES DEVELOPMENT DEPARTMENT

प्रमाणपत्र  
CERTIFICATE

पंजीयन क्र. P-21/7447  
Regn No.....

प्रमाणित किया जाता है कि श्री / कुमारी  
This is to certify that **Shri / Ku. Shaurya Chaurasia**

Sixth Sem., student of B.Tech. of G.G.U., Bilaspur. College / Institute  
(Chemical) कालेज / संस्थान

ने अवकाश कालीन प्रशिक्षु के रूप में दिनांक से तक प्रशिक्षण प्राप्त किया।  
has undergone project based training from 02/05/2022 to 28/05/2022.

प्रोजेक्ट Report on "Study of Crystallization Process of Naphthalene Fraction in  
Project Crystallization of Tar Distillation Plant for Improvement of Naphthalene Yield."

इस अवधि में उनका कार्य निष्पादन रहा।  
His / her performance during the training period has been Excellent.

मिलाई, दिनांक 28/05/2022  
Bhilai, Dated.....  
प्रमुख, मानव संसाधन विकास विभाग  
Incharge, MCDM (HRD)  
Bhilai, Bilaspur



भिलाई इस्पात संयंत्र  
BHILAI STEEL PLANT







## **Abstract**

**Bhilai Steel Plant, rightfully known as the flagship unit of SAIL is also one of the best integrated steel plants in the country and world. The gigantic complex comprises several departments and shops; all interwoven and interdependent in a way that the plant functions uninterruptedly and creates new heights of performance and achievements regularly.**

**Since BSP is dependent on production of steel, we need iron in blast furnace to produce steel. To satisfy the demand of Blast Furnace we need coke as a fuel and reducing agent from coke oven. From the coke oven gas coming out from batteries many valuable chemicals like tar, ammonia and Benzol are recovered and gas cleaned in the by-products plant is used as a fuel**

**Hot Pressed Naphthalene is one of the most important products of tar distillation plant. Since it is the most expensive product of SAIL, the improvement in its yield is an important task.**

**The crystallization is the most important process in the production of naphthalene in the fractionating tank. Therefore, the crystallization process of naphthalene has been studied**

*Chaudhary*

वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



## PROJECT REPORT

ON "Study of crystallization process of naphthalene fraction in crystallizers of tar distillation plant for improvement of naphthalene yield."

BY

I. SHIVANSH SINGH RAJAWAT  
P21/7444



सेल SAIL

AT BHILAI STEEL PLANT, BHILAI

Students from:



गुरु घासीदास विश्वविद्यालय, बिलासपुर  
Guru Ghasidas Vishwavidyalaya, Bilaspur

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

*Chaudhary*

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
HoD, Chemical Engineering  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



मानव संसाधन विकास विभाग  
HUMAN RESOURCES DEVELOPMENT DEPARTMENT

प्रमाणपत्र  
CERTIFICATE

पंजीयन क्र. P-21/7444  
Regn. No. ....

प्रमाणित किया जाता है कि श्री / कुमारी *Shivansh Singh Raiawat*  
This is to certify that *Shri / Ku.* ....

सेमेस्टर विद्यार्थी *Sem., student of* .....  
B.Tech. of *G.G.U., Bilaspur.* ..... College / Institute  
(Chemical) कालेज / संस्थान


ने अवकाश कालीन प्रशिक्षु के रूप में दिनांक से तक प्रशिक्षण प्राप्त किया ।  
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प्रोजेक्ट *Report on " Study of Crystallization Process of Naphthalene Fraction in*  
Project *Crystallization of Tar Distillation Plant for Improvement of Naphthalene Yield."* .....

इस अवधि में उनका कार्य निम्नानुसार रहा ।  
His / her performance during the training period has been *Excellent* .....

मिलाई, दिनांक *28/05/2022*  
Bhilai, Dated .....

सेल SAIL  
भिलाई इस्पात संयंत्र  
BHILAI STEEL PLANT



गुरु घासीदास विश्वविद्यालय  
कोनी, बिलासपुर - 495009 (छ.ग.)



## **Abstract**

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*Chaudhankar*

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
HoD, Chemical Engineering  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





सेल SAIL

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड  
STEEL AUTHORITY OF INDIA LIMITED

WITH



GURU GHASIDAS VISHWAVIDYALAYA  
BILASPUR (CHHATTISGARH)

PROJECT REPORT

ON

TO DESIGN SUITABLE HEAT EXCHANGER (PLATE TYPE, SHELL TYPE AND TUBE ETC.) FOR  
EFFICIENT COOLING OF HOT DEBENZOLISED SOLAR OIL FROM 100 °C TO 35 °C USING  
TECHNICAL WATER AT 30 °C. OIL FLOW RATE 135 M<sup>3</sup>/HR.

UNDER GUIDANCE OF

Mr. ANAND SHUKLA (GM CO & CCD)

*Anand Shukla*

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



**मानव संसाधन विकास विभाग**  
**HUMAN RESOURCES DEVELOPMENT DEPARTMENT**

**प्रमाणपत्र**  
**CERTIFICATE**

पंजीयन क्र. P-217443  
Regn No.....

प्रमाणित किया जाता है कि श्री / कुमारी  
This is to certify that **Shri / Ku. Shreerang Mishra**

सेमेस्टर विद्यार्थी  
Sixth Sem., student of .....**B.Tech. of G.G.U., Bilaspur. College / Institute**  
(Chemical) **कालेज / संस्थान**

ने अवकाश कालीन प्रशिक्षु के रूप में दिनांक  
has undergone project based training from **02/05/2022** से तक प्रशिक्षण प्राप्त किया। **28/05/2022**

प्रोजेक्ट **Report on "Design of Suitable Heat Exchanger for Efficient Cooling of Solar Oil Wash Oil in BRP- II"**  
इस अवधि में उनका कार्य निम्नानुसार-  
His / her performance during the training period has been **Excellent**

बिलाई, दिनांक **28/05/2022**  
Bhilai, Dated .....

**Dr. J.P. Singh**  
Head, HRD Department  
Bhilai, Bilaspur

**सेल SAIL**  
**भिलाई इस्पात संयंत्र**  
**BHILAI STEEL PLANT**



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*Chaudhankar*

वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



AN INDUSTRIAL TRAINING REPORT ON  
"NET ZERO EMISSIONS AND ENERGY OPTIMIZATION"

HINDUSTAN PETROLEUM CORPORATION LIMITED - VISAKH REFINERY



SUBMITTED BY:  
SHUBHANGI SWARAJ  
B.TECH (CHEMICAL ENGG.)  
7<sup>TH</sup> SEM  
GGV, BILASPUR, CG

*Chaudhary*

वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





हिन्दुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड

(भारत सरकार का मान्य) रजिस्टर्ड ऑफिस 17 जामशेदी टाटा रोड, मुंबई - 400 020

HINDUSTAN PETROLEUM CORPORATION LIMITED

(A GOVERNMENT OF INDIA ENTERPRISE) REGISTERED OFFICE: 17 JAMSHEDJI TATA ROAD, MUMBAI-400 020

CIN : L23201MH1952GQ1000050



विशाख रिफाइनरी, पोस्ट बॉक्स नं. 15, विशाखपट्टनम-530 011 (आंध्रप्रदेश), फोन - 2895000, 2895100  
VISAKH REFINERY, POST BOX NO. 15, VISAKHAPATNAM-530 011 (A.P.), PHONES : 2895000, 2895100

HR:RK:VSI:2022:01

Visakh Refinery  
August 09, 2022

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms. SHUBHANGI SWARAJ (Roll No: GGV/19/1425) from Guru Ghasidas Vishwavidyalaya, Bilaspur has successfully completed Virtual Internship in Operations Department, VR from 14-05-2022 to 27-06-2022 at HPCL, Visakh Refinery on the topic - Net Zero Emissions And Energy Optimization.

*Ravi Kumar*

Ravi Kumar  
Sr. Manager - HR

श्री गुरु गहासीदास विश्वविद्यालय  
कोनी, बिलासपुर - 495009 (छ.ग.)  
17 जामशेदी टाटा रोड, मुंबई - 400 020  
फोन : 2895000, 2895100



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*Chaudhankar*

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



A PROJECT REPORT  
ON



"Design, Construction and Performance Analysis of a  
5 Kg Laboratory Ball Mill"

In  
'Associated Smelters Pvt. Ltd, Navi Mumbai'

Partially submitted by Sohan Sahu

OF

B.TECH IN CHEMICAL ENGINEERING

PREPARED BY

SOHAN SAHU

GGV/19/1423



GURU GHASIDAS VISHWAVIDYALAYA  
(A CENTRAL UNIVERSITY)  
DEPARTMENT OF CHEMICAL ENGINEERING  
AT: KONI, PO-KONI, DIST.-BILASPUR  
CHHATTISGARH, (495009).

*Chaudhary*

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



**ASSOCIATED SMELTERS PRIVATE LIMITED**  
CIN : U27100MH1980 PTC 022322

W-40, TTC-MIDC, Thane Belapur Road,  
Rabale, Navi Mumbai, Maharashtra, 400701  
Website : www.asmelters.in

Tel. : (022) 27892836  
Mob. : 9322694225, 9819598860  
Email : info@asmelters.in / a.smelters@yahoo.co.in

**TO WHOMSOEVER IT MAY CONCERN**


This is to certify that Mr. Sohan Sahu, bearing Roll No. 19101143, and currently studying in the third year of B. Tech. in Chemical Engineering from Institute of Technology, Guru Ghasidas Central University, Bilaspur was with our Company, M/s Associated Smelters Pvt. Ltd. as an industrial trainee for the period of 10 June 2022 to 29 June 2022.


As a part of his training he observed and prepared report on the working of

- Ball Mill
- Rotary Furnace

During the course of his training, we found him to be competent, industrious and punctual. We wish him the very best success in his future endeavours.

For Associated Smelters Pvt. Ltd

  
Sagar J. Tipnis  
Director







## Design, Construction and Performance Analysis of a 5 Kg Laboratory Ball Mill

**Abstract-** In this study, a 5 kg laboratory ball mill has been designed, constructed, and its performance analysed. This was achieved by using Bond's equation to calculate the specific and shaft powers required to drive the mill at the specified capacity, and also to size the mill. After the fabrication of the ball mill, grinding test was conducted with the mill, using limestone as the feed material. This was followed by the particle size analysis of the ground product from the mill in order to determine the performance of the mill. The design results show that the minimum shaft power required to drive the ball mill is 0.2025 horsepower, the length of the mill at a fixed mill diameter of 210 mm is 373 mm, and the required shaft length and diameter are 712.2 mm and 30 mm respectively. The results of the particle size analysis, before and after the grinding test, show that the values of  $F_{50}$ ,  $F_{10}$ ,  $P_{80}$ , and  $P_{10}$  of the limestone that was fed into the mill are 650 microns, 1950 microns, 47.5 microns and 85 microns respectively. The fabricated ball mill is efficient in its performance as the value of  $P_{80}$  of the products from the mill (85 microns) is less than  $P_{80}$  (100 microns) used in the design of the ball mill.

**Keywords:** laboratory ball mill, bond's equation, shaft power, milling efficiency.

### 1. Introduction

Size reduction, or comminution, is an important operation in mining and mineral processing. It is important because it can be used to: (i) produce a finer, more marketable product, with specific size distribution; (ii) expose or liberate a valuable mineral so that it can be extracted from the ore; or (iii) increase the surface area available for subsequent processing (Kelly, 1992). Size reduction is accomplished through the process of crushing and grinding. Crushing, which is the first mechanical stage of comminution, is accomplished by reducing the size of run-of-mine ore down to 25 mm (1 in) using equipment that compress the ore against rigid surfaces. The equipment can also reduce the size of the ore by impacting it against surfaces in a constrained path. Grinding is the final stage of comminution. It accepts feed from the crushing stage, which ranges in size from 5 – 25 mm, and reduces it to a size of about 10 – 200 microns.

The principle purposes of grinding are: (i) to obtain the correct degree of liberation in mineral processing; and (ii) to increase the specific area of the valuable minerals for hydrometallurgical treatment, i.e.

leaching. Grinding can be accomplished by using rod mills or ball mills. Rod mills are generally used as coarse grinding machines while fine grinding is performed in ball mills, using steel balls as the grinding medium.

A ball mill consists of a cylindrical vessel mounted on a stand at both ends which allows rotation of the vessel around the center axis. The mill is driven by a girth gear bolted to the shell of the vessel and a pinion shaft moved by a prime mover. The prime movers are usually synchronous motors equipped with an air clutch or gear transmission. After the mill is charged with the starting material (rock, ore, etc.) and the grinding ball media (balls), the milling process takes place. The milling process occurs during rotation as a result of the transfer of kinetic energy of the moving grinding media into the grinding product.

The design of a ball mill can vary significantly depending on the size of the required mill, the equipment used to load the starting material (feeders), and the system for discharging the output product. The size of a mill is usually characterized by the "length-to-diameter" ratio, which frequently varies from 0.5 to 3.5. The starting material can be loaded either through a spout feeder or by means of a single or double helical scoop feeder. Based on the discharge system, ball mills are commonly classified as overflow discharge mills, grate discharge mills, and center periphery discharge mills. Several ball mills have been invented for laboratory size reductions, pilot scale reductions, and industrial grinding purposes. All these inventions have been done to proffer solutions to the problem of size reduction in mineral processing.

Irrespective of the ball mill inventions mentioned above, which have been developed to solve the problems encountered during size reduction in mineral processing, laboratory ball mills are seldom available in Nigerian markets. Most times, these ball mills are imported from other countries. Again, with the need for Nigeria to revitalize her manufacturing sector in order to increase productivity that will help to boost Nigeria's Gross Domestic Product (GDP), there is the need to encourage the design and production of locally made ball mills, which will be used in the country's educational sector and the solid mineral sector. These have prompted the drive to design and fabricate this laboratory ball mill, hence, supporting the industrialization of the country.

वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
HoD, Chemical Engineering  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



सेल SAIL

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड  
STEEL AUTHORITY OF INDIA LIMITED

WITH



GURU GHASIDAS VISHWAVIDYALAYA  
BILASPUR (CHHATTISGARH)

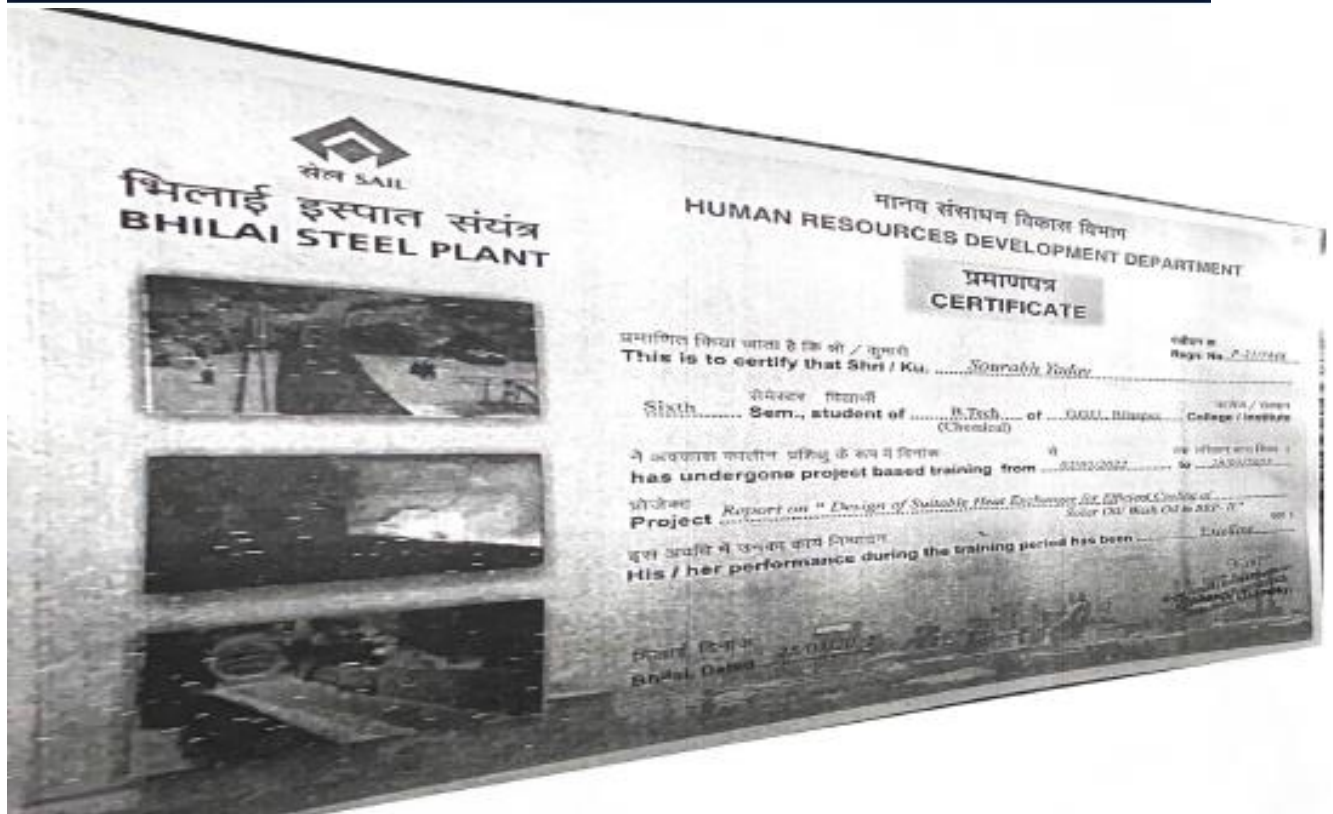
PROJECT REPORT

ON

TO DESIGN SUITABLE HEAT EXCHANGER (PLATE TYPE, SHELL TYPE AND TUBE ETC.) FOR  
EFFICIENT COOLING OF HOT DEBENZOLISED SOLAR OIL FROM 100 °C TO 35 °C USING  
TECHNICAL WATER AT 30 °C. OIL FLOW RATE 135 M<sup>3</sup>/HR.

UNDER GUIDANCE OF

Mr. ANAND SHUKLA (GM CO & CCD)



*Chaudhary*

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
 प्रौद्योगिकी संस्थान/Institute of Technology  
 गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
 Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





## Abstract



### PROJECT TITLE

To design suitable Heat Exchanger (Plate Type, Shell Type and Tube etc.) for efficient cooling of hot debenzolised solar oil from 100 °C to 35 °C using technical water at 30 °C. Oil Flow rate 135 m<sup>3</sup>/hr.

Benzol Recovery Plant (BRP) is a part of the Coke Oven and Coal Chemical Department. BRP is responsible for the recovery of Benzol, which is basically a mixture of benzene, toluene, xylene and few hydrocarbons, from the coke oven gas. Before the recovery of Benzol in BRP the coke oven gas is made free of tar and ammonia. The recovery of benzol is accomplished in series of scrubbers using solar wash oil. Solar wash oil is an expensive product obtained from oil refineries. The benzol in wash oil is separated using steam. During the process of extraction of benzol from coke oven gas, the solar wash oil reaches a temperature of about 1250°C. The gas after passing through the ammonium sulphate plant passes through the primary gas cooler where it is being quenched with the help of a cold water results it reaches the temperature of (33-38) °C, after that it is being treated with solar oil or wash oil in the series of scrubber results the solar oil will absorb the benzol present in it, for the better absorption of benzol oil it is recommended that the temperature difference between the solar oil and the gas should lie between (3-5) °C. The wash oil thus obtained is termed as debenzolised wash oil and has to be cooled to a temperature of about 480°C to be recycled and reused for economical running of benzol recovery plant. The process of cooling can be accomplished by using different types of heat exchangers. The process and different types of heat exchangers available are studied in detail and using the most economical type of heat exchanger and the design calculations are carried out.

*Chaudhary*

वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
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सेल SAIL

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड  
STEEL AUTHORITY OF INDIA LIMITED

WITH



GURU GHASIDAS VISHWAVIDYALAYA  
BILASPUR (CHHATTISGARH)

PROJECT REPORT

ON

TO DESIGN SUITABLE HEAT EXCHANGER (PLATE TYPE, SHELL TYPE AND TUBE ETC.) FOR  
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प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



**मानव संसाधन विकास विभाग**  
**HUMAN RESOURCES DEVELOPMENT DEPARTMENT**

**प्रमाणपत्र**  
**CERTIFICATE**

पंजीकृत क्र. **Regn. No. P-21/7441**

प्रमाणित किया जाता है कि श्री / कुमारी  
**This is to certify that Shri / Ku. Vinay Kumar Pali**

सेमेस्टर विद्यार्थी  
**Sixth Sem., student of B.Tech of G.G.U., Bilaspur College / Institute**  
(Chemical)

ने अवकाश कालीन प्रशिक्षु के रूप में दिनांक से तक प्रशिक्षण प्राप्त किया।  
**has undergone project based training from 02/05/2022 to 26/05/2022**

प्रोजेक्ट  
**Project Report on "Design of Suitable Heat Exchanger for Efficient Cooling of Solar Oil/ Wash Oil in BRP- II"**

इस अवधि में उनका कार्य निम्नानुसार रहा।  
**His / her performance during the training period has been Excellent**

बिलास, दिनांक  
**Bilaspur, Dated 28/05/2022**

**Chaudhankar**

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## Abstract



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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





A PROJECT REPORT  
ON

“MANUFACTURING OF POLYESTER CHIPS FOR YARN.”

A PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENT FOR CERTIFICATES.

OF

B.TECH IN CHEMICAL ENGINEERING

PREPARED BY

RANVEER RAJ	GGV/19/1396
AKASH DEEP	GGV/19/1315
VIVEK MEHTA	GGV/19/1447



GURU GHASIDAS VISHWAVIDYALAYA  
(A CENTRAL UNIVERSITY)  
DEPARTMENT OF CHEMICAL ENGINEERING  
AT:KONI, PO-KONI, DIST.-BILASPUR  
CHHATTISGARH, (495009).



*Chaudhary*

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**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





SDSPL/HRD/INTERN/33/22

Date 14/06/2022

**TO WHOM IT MAY CONCERN**

We are glad to inform you that Mr. Vivek Mehta from Guru Ghasidas Vishwavidyalaya, Bilaspur has successfully completed his internship from 14<sup>th</sup> May 2022 to 14<sup>th</sup> June 22 .

During his internship, we found him extremely inquisitive and hard working. He was very much interested to learn and also willing to put his best efforts and get in to the depth of the subject to understand it better.

His association with us was very fruitful and we wish him all the best for his future endeavors.

Thanking you!!

For Shree Durga Syntex Pvt Ltd.

Authorized Signatory



Regd. Office & Factory Address  
Block No. 128, 129, 130 & 175, Plot No. Z & E, Palsana, Village- Jolwa, Dist.: Surat, Pin-394 305.  
Ph.: 99740 93573 / 74, 02622 274477 / 274478, Website: www.shreedurgasyntex.com  
CIN : 1117119G12003PTC041979 GSTIN : 24AARCD8894P17V



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*Chaudhary*

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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



AN INTERNSHIP REPORT  
ON  
**SOLVENT RECOVERY  
SYSTEM**

*Submitted in partial fulfilment for  
the award of degree*

**BACHELOR OF ENGINEERING**

IN

**CHEMICAL ENGINEERING**

*Submitted by*

**Banoth Sriram Sainath**

**7<sup>th</sup> Sem (18101005)**



**INTERNAL GUIDE**

**HARIKUMAR**

**EXTERNAL GUIDE**

**JANAKIRAMAIAH**

*Chaudhary*

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



June 02, 2022

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. BANOTH SRIRAM SAINATH S/o. RAMANADHAM Hall Ticket No. 18101005 a student of B Tech (Chemical) from GURU GHASIDAS VISHWAVIDYALAYA (CENTRAL UNIVERSITY) - BILASPUR (C.G.) has undergone Internship work in our organization from May 10, 2022 to June 10, 2022 and has completed project on SOLVENT RECOVERY SYSTEM (SRS).

He is sincere, hardworking and his conduct during the period is commendable.

We wish him all the best for his future endeavours.

for Raghava Life Sciences Pvt. Ltd.,

  
Authorised Signatory

Raghava Life Sciences Pvt. Ltd.  
Raghava Pride, B-2-603/1/27, Krishnapuram Street,  
Road No 10, Banjara Hills, Hyderabad - 500 034, Telangana  
☎ 040 - 23343333

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## INTRODUCTION

Solvent recovery systems extract solvents for re-use out of effluent streams they can reduce the demand for purchase of new solvents & process inputs by recovering chemicals that can be reused in production or to flush the system between runs. They can also help manufacturers meet regulatory requirements or process standards by cleaning waste streams before they are released from the plant. The recovery of solvents from effluent can be achieved with a variety of technologies. A common recovery method is solvent distillation systems, but liquid-liquid extraction, absorption systems, film evaporation, crystallization, and membrane separation can also be used, depending on the application. Distillation range is restricted by the azeotropic point. Binary azeotropic mixtures, such as ethanol/water and IPA/water, can be separated into their pure components by distillation by the addition of a third component, so called the entrainer, which forms a ternary azeotrope with a lower boiling point than any binary azeotrope. The vapour moves up the column, and as it exits the top of the unit, it is cooled by a condenser. The condensed liquid is stored in a holding vessel known as the reflux drum. Some of this liquid is recycled back to the top of the column and this is called the reflux. The condensed liquid that is removed from the

A handwritten signature in blue ink, appearing to read 'Chandrakant', is written over a horizontal line.

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



Report  
On  
Offline Summer Internship Programme  
(OSIP-2022)

Chemical Engineering

*Submitted in Partial Fulfilment of the Requirements for the mandatory Industrial Internship training programme*

Submitted by:

*Tellaganji Amman joseph*

Department of Chemical Engineering

Guru Ghasidas Vishwavidyalaya

Bilaspur, Chhattisgarh



*May to June, 2022*

Oil & Natural Gas Corporation (ONGC)

Rajahmundry

ONGC, Godavari Bhavan, Base Complex, Rajahmundry-533 106, East Godavari District  
(A.P.) Telephone: 0883-2424348 (Office), 0883-2434386 (Fax)

[www.mail.ongc.co.in](http://www.mail.ongc.co.in)

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ऑयल एण्ड नेचुरल गैस कॉर्पोरेशन लिमिटेड

राजहमंड्री, झारखंड - 813 001 (ऑयल एण्ड नेचुरल गैस कॉर्पोरेशन लिमिटेड का कार्यालय)

Oil and Natural Gas Corporation Limited

Rajahmundry Asset - K.G. PG Bldg - Goddard Bldg, Base Complex,

Rajahmundry - 533 106 (A.P.)

Phone: 0863 2431570-85 Fax: 0863 247788

Circle: COARNGC

STAFF TRAINING INSTITUTE  
RAJAHMUNDRY

NO: RTY/STI/PW/ 2022-23

DT: 10.06.2022

PROJECT COMPLETION CERTIFICATE

This is to certify that Mr TELLAGANJI AMMAN JOSEPH, student of GURU GHASIDAS VISHWAVIDYALAYA-CHHATTISGARH, pursuing B.Tech(CHEMICAL ENGINEERING), has successfully completed the High Standard project work at ONGC, Rajahmundry, from 19.05.2022 to 10.06.2022, on the topic "THE PRINCIPLE WORK OF CASE STUDY ON VARIOUS PRODUCTION OPERATIONS AT DIFFERENT GGS, GCS AND REFINERY IN ONGC RAJAHMUNDRY ASSET" under the guidance of SHRI P. JAGANNADHA RAO GM(P), ONGC, RAJAHMUNDRY.

During the Project Work he performed effectively in the assigned Project Work. We wish him all success in his future endeavour.

G SRIRAM

Staff Training Institute  
ONGC, Rajahmundry

G SRIRAM  
SR HR EXECUTIVE-6T  
ONGC RAJAHMUNDRY





## INTRODUCTION

ONGC: THE COMPANY WHICH ENSURES OUR NATION'S ENERGY SECURITY

ONGC IS THE FLAGSHIP NATIONAL OIL COMPANY OF INDIA, A MAHARATNA WITH INTEREST IN E&P, REFINING, LNG, POWER, & NEW SOURCES OF ENERGY.

ONGC Group of Companies comprises of Oil and Natural Gas Corporation Limited (ONGC- The Parent Company); ONGC Videsh Limited (OVL - a wholly owned subsidiary of ONGC); ONGC Nile Ganga BV (ONG BV- a wholly owned subsidiary of OVL) and Mangalore Refinery and Petrochemicals Limited (MRPL - a subsidiary of ONGC).

Oil and Natural Gas Corporation Limited (ONGC) is India's Most Valuable Company, having a market share of above 80% in India's Crude Oil and Natural Gas Exploration and Production. ONGC registered the highest profit among all Indian companies. Its production of Crude oil in year 2017-18 Oil was 22.6 MT and of Natural Gas 23.484 billion Cubic Meters. Crude oil is the raw material used by downstream companies like IOC, BPCL, and HPCL to produce petroleum products like Petrol, Diesel, Kerosene, Naphtha, and Cooking Gas LPG.

ONGC Videsh Limited (OVL) is overseas arm of ONGC, engaged in Exploration & Production Activities. It trans-nationally operates E&P Business in 20 countries, making ONGC the biggest Indian Multinational Corporation. In recent years, it has laid footholds in hydrocarbon acreage in various countries including Ivory Cost and Australia. Nile Ganga BV is a wholly owned subsidiary of OVL and has equity in producing field in Sudan.

Mangalore Refinery and Petrochemicals Limited (MRPL), where ONGC now owns 71.6% equity, were taken over by ONGC in March 2003. Under ONGC's management control, MRPL has seen a major turnaround and its market valuation has increased 1100 %. MRPL has one of the modern refineries in India at Mangalore having annual capacity of 9.69 MMTPA. It is the

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





## Academy of Skill Development

Online Start-up Training Programme:

An Industrial Internship (OSTP-2022)

Internship Report

On

**Industrial Environmental Pollution Management  
(IEPM)**

*Submitted in Partial Fulfilment of the Requirements for the mandatory Internship training programme*

*submitted by:*

Name: Sanjay Kumar Jhingonia

Name: Aman Singh Rajput

Department: Chemical Engineering

Institute: School of Studies of Engineering And Technology

Guru Ghasidas University Bilaspur (C.G.)

*Duration: 17<sup>th</sup> May to 17<sup>th</sup> June 2022*



**Academy of Skill Development**

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हम आत्मनिर्भर भारत का सपना देखते हैं

**Certificate of Completion**

This certificate is hereby awarded to  
**Sanjay Kumar Jhingonia**  
of  
**Institute of Technology Guru Ghasidas University, Bilaspur CHHATTISGARH**  
who has successfully completed the **Industrial Training and Internship on  
Industrial Environmental Pollution Management**  
and developed the project titled  
**RESIZING IMAGE USING BILINEAR INTERPOLATION ALGORITHM IN MATLAB**  
by following all the necessary criteria of the company with grade **A+**.

**Grading System:**  
A+: 75% and above  
A: 65% to 74%  
B: 55% to 64%

Issue Date: 17th June, 2022  
Certification ID: ASD/IEPM/GUR/RES/10680

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Sinha

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Dutta

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OSTP-2022

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*Chaudhary*

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AN INDUSTRIAL TRAINING REPORT

ON

“HYDROGEN—FUEL OF THE FUTURE”

HINDUSTAN PETROLEUM CORPORATION LIMITED - VISAKH REFINERY



SUBMITTED BY:  
ARYAN SAHU  
GGV BILASPUR  
B.TECH CHEMICAL  
IV YEAR  
SESSION (2019-2023)

*Chaudhary*

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**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
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**HINDUSTAN PETROLEUM CORPORATION LIMITED**  
(A GOVERNMENT OF INDIA ENTERPRISE) REGISTERED OFFICE: 17 JAMSHEDJI TATA ROAD, MUMBAI-400 020  
CIN : L23201MH1952GOI008858



विशाख रिफाइनरी, पोस्ट बॉक्स नं.15, विशाखपट्टनम-530 011 (आंध्रप्रदेश), फोन - 2895000, 2895100  
VISAKH REFINERY, POST BOX NO. 15, VISAKHAPATNAM-530 011 (A.P.), PHONES : 2895000, 2895100

HR:RK:VSI:2022:01

Visakh Refinery  
August 12, 2022

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. ARYAN SAHU (Roll No: GGV/19/1322)** from **Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur** has successfully completed Virtual Internship in **Operations Department, VR** from 14-05-2022 to 27-06-2022 at HPCL, Visakh Refinery on the topic - **Hydrogen-fuel Of The Future.**

*Ravi Kumar*

Ravi Kumar  
Sr. Manager - HR

रवि कुमार / RAVI KUMAR  
वरिष्ठ प्रबंधक-मो.सं. / Senior Manager - HR  
एच.पी.सी.एल. - विशाख रिफाइनरी  
H.P.C.L. - Visakh Refinery



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*Chaudhary*

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



# OPERATION MONITORING AND TROUBLESHOOTING OF FCC

Project Report By

Doppalapudy Samuel Sujan (GGV-Bilaspur)



Guide

Mr. Alok Kumar, Senior Engineer – Operations

HINDUSTAN PETROLEUM CORPORATION LIMITED

VIRTUAL INTERNSHIP PROGRAMME

14<sup>th</sup> May 2022 – 4<sup>th</sup> July 2022

वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



हिन्दुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड

(भारत सरकार संस्थान) रजिस्टर्ड ऑफिस 17 जमशेदजी टाटा रोड, मुंबई - 400 020

HINDUSTAN PETROLEUM CORPORATION LIMITED

(A GOVERNMENT OF INDIA ENTERPRISE) REGISTERED OFFICE: 17 JAMSHEDJI TATA ROAD, MUMBAI-400 020

CIN : L23201MH1952GOI008858



विशाख रिफाइनरी, पोस्ट बॉक्स नं. 15, विशाखपट्टनम-530 011 (आंध्रप्रदेश), फोन - 2895000, 2895100  
VISAKH REFINERY, POST BOX NO. 15, VISAKHAPATNAM-530 011 (A.P.), PHONES : 2895000, 2895100

HR:RK:VSI:2022:01

Visakh Refinery  
August 11, 2022

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. DOPPALAPUDY SAMUEL SUJAN** (Roll No: **GGV/19/1337**) from **GURU GHASIDAS VISHWAVIDYALA, KONI BILASPUR** has successfully completed Virtual Internship in **Operations Department, VR** from 14-05-2022 to 27-06-2022 at HPCL, Visakh Refinery on the topic - **Operation Monitoring And Troubleshooting Of FCC**

*Ravi Kumar*  
Ravi Kumar  
Sr. Manager - HR

रवि कुमार / RAVI KUMAR  
सीनियर प्रबंधक - मानव संसाधन / Senior Manager - HR  
एच पी सी एल - विशाख रिफाइनरी  
H.P.C.L. - Visakh Refinery





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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



A  
REPORT OF VOCATIONAL TRAINING  
AT  
ARASMETA CEMENT PLANT



In Partial Fulfillment For The Award Of The  
Degree  
B.TECH  
In  
CHEMICAL ENGINEERING



Institute of Technology, Guru Ghasidas  
University

*Chaudhankar*

वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
HoD, Chemical Engineering  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



NUVOCO

Date: 11/07/2022

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms. Adya Singh, a student of B. Tech Chemical Engineering, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh underwent Industrial Training with us in Production Department from 11<sup>th</sup> May'2022 to 09<sup>th</sup> July'2022.

She has completed the Industrial Training satisfactorily.

  
Sugreev Tiwari  
(Deputy General Manager -HR)  
Date: 11/07/2022



# Process of cement

## Manufacturing

### In

## NUVOCO Arsmeta

## Cement plant

*Chaudhary*

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प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)



DEPARTMENT OF CHEMICAL ENGINEERING

(A Central University Established by the Central Universities Act, 2009 No 25 of 2009)

A

PROJECT REPORT ON

“CRUDE OIL AND NATURAL GAS ”

SUBMITTED BY

AKSHAT JOSHI

Enroll No: - GGV/19/1318

Roll No. : 19101105

B.Tech Chemical Engineering

THE PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE  
B.Tech. (Session: 2019-2023)

UNDER THE GUIDANCE OF

Mr. Nikhil Agarwal

Founder & CEO  
PETROLEUM ENGINEERS  
ASSOCIATION





DEPARTMENT OF CHEMICAL ENGINEERING

GURU GHASIDAS CENTRAL UNIVERSITY BILASPUR (C.G.)

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**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)




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PEA-INT2022-XO&G-0108


COURSE CODE:  
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# INTERNSHIP CERTIFICATE

This certificate is awarded to  
**AKSHAT JOSHI**

For successfully completing a 45 days virtual summer training on the topic  
**"PETROLEUM ENGINEERING DISCIPLINES AND OIL &  
GAS INDUSTRIAL PRACTICES"**  
at Petroleum Engineers Association from 1st July 2022 to 14th August 2022.  
Issued on 15th August 2022 at Deoghar, Jharkhand-814112, India.  
NO. OF CREDITS RECOMMENDED BY P.E.A: 10

  
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Ms. Chhataa Upadhyay  
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## INTRODUCTION

**Crude oil, liquid petroleum that is found accumulated in various porous rock formations in Earth's crust and is extracted for burning as fuel or for processing into chemical products.**

### Chemical and physical properties

Crude oil is a mixture of comparatively volatile liquid hydrocarbons (compounds composed mainly of hydrogen and carbon), though it also contains some nitrogen, sulphur, and oxygen. Those elements form a large variety of complex molecular structures, some of which cannot be readily identified. Regardless of variations, however, almost all crude oil ranges from 82 to 87 percent carbon by weight and 12 to 15 percent hydrogen by weight.

Crude oils are customarily characterized by the type of hydrocarbon compound that is most prevalent in them: paraffins, naphthenes, and aromatics. Paraffins are the most common hydrocarbons in crude oil; certain liquid paraffins are the major constituents of gasoline (petrol) and are therefore highly valued. Naphthenes are an important part of all liquid refinery products, but they also form some of the heavy asphalt like residues of refinery processes. Aromatics generally constitute only a small percentage of most crudes. The most common aromatic in crude oil is benzene, a popular building block in the petrochemical industry. Because crude oil is a mixture of such widely varying constituents and proportions, its physical properties also vary widely. In appearance, for instance, it ranges from colourless to black. Possibly the most important physical property is specific gravity (i.e., the ratio of the weight of equal volumes of a crude oil and pure water at standard conditions). In laboratory measurement of specific gravity, it is customary to assign pure water a measurement of 1; substances lighter than water, such as crude oil, would receive measurements less than 1. The petroleum industry, however, uses the American Petroleum Institute (API) gravity scale, in which pure water has been arbitrarily assigned an API gravity of 10°. Liquids lighter than water, such as oil, have API gravities numerically greater than 10. On the basis of their API gravity, crude oils can be classified as heavy, medium, and light as follows:

Heavy: 10–20° API gravity

Medium: 20–25° API gravity

Light: above 25° API gravity

Crude oil also is categorised as “sweet” or “sour” depending on the level of sulphur, which occurs either as elemental sulphur or in compounds such as hydrogen sulphide. Sweet crudes have sulphur contents of 0.5 percent or less by weight, and sour crudes have sulphur contents of 1 percent or more by weight. Generally, the heavier the crude oil, the greater its sulphur content. Excess sulphur is removed from crude oil during refining, because sulphur oxides released into the atmosphere during combustion of oil are a major pollutant.

A handwritten signature in blue ink, appearing to read 'Chaudhary', is written over a horizontal line.

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DEPARTMENT OF CHEMICAL ENGINEERING

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A

PROJECT REPORT ON

“CRUDE OIL AND ITS EXTRACTION”

SUBMITTED BY

KANHA SIDAR

Enroll No: - GGV/19/1351

Roll No. : 19101118

B.Tech Chemical Engineering

THE PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE  
DEGREE B.Tech. (Session: 2022-2023)

UNDER THE GUIDANCE OF

Mr. Nikhil Agarwal

Founder & CEO  
PETROLEUM ENGINEERS  
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DEPARTMENT OF CHEMICAL ENGINEERING

GURU GHASIDAS CENTRAL UNIVERSITY BILASPUR (C.G.)

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प्रौद्योगिकी संस्थान/Institute of Technology  
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**KANHA SIDAR**

For successfully completing a 45 days virtual summer training on the topic  
**"PETROLEUM ENGINEERING DISCIPLINES AND OIL &  
GAS INDUSTRIAL PRACTICES"**  
at Petroleum Engineers Association from 1st July 2022 to 14th August 2022.  
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12.	new and old techniques

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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



Training Report

On

Summer Internship At Indian institute of Chemical Engineers.

Subject: Summer Internship

Academic Year: - 2022-23, 7th semester

Prepared by

19101128 – MANGLAM KUMAR SONI

BACHELOR OF TECHNOLOGY  
IN  
CHEMICAL ENGINEERING



GURU GHASIDAS VISHWAVIDYALAYA

*Chaudhary*

वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



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**CERTIFICATE**  
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**MANGLAM KUMAR SONI**

GURU GHASIDAS VISHWAVIDYALAYA

Successfully completed Online Industrial Internship Program on the subject of  
PETROLEUM REFINERY ENGINEERING (PRE)

with A grade.

A=90% and above  
B=80-89  
C=70-79%  
D=60-69%

Certificate ID: TGI/2022/\_\_\_\_\_  
Issuing Date: September 20, 2022

Director  
Terra-Green Technologies Pvt. Ltd





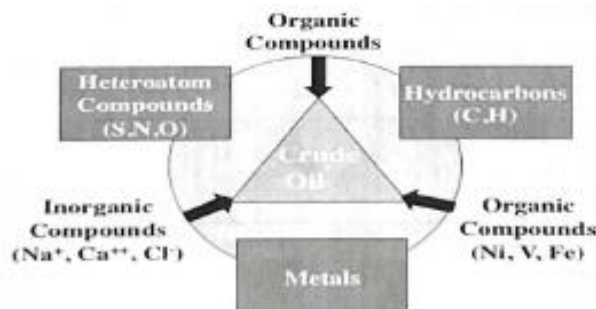
## 1. Introduction: Overview of the Industry

Petroleum and derivatives such as asphalt have been known and used for almost 6000 years and there is evidence of use of asphalt in building more than 600 years ago. Modern petroleum refining began in 1859 with discovery of petroleum in Pennsylvania and subsequent commercialization.

Oil and gas production includes exploration, drilling, extraction, stabilization. The underground traps of oil and gas are called reservoir. Various types of traps are structural traps, stratigraphic traps and combination traps. Most reservoir contain water also along with oil and gas. Reserves are classified as proven, probable and possible reserves. Earlier finding of oil and gas was matter of luck and hit and miss process.

### COMPOSITION OF PETROLEUM (CRUDE OIL):-

Petroleum (Crude oil) consists of mainly carbon (83-87%) and hydrogen (12-14%) having complex hydrocarbon mixture like paraffins, naphthenes, aromatic hydrocarbons, gaseous hydrocarbons (from CH<sub>4</sub> to C<sub>4</sub>H<sub>10</sub>). Besides crude oil also contains small amount of non hydrocarbons (sulphur compounds, nitrogen compounds, oxygen compounds) and minerals. Heavier crudes contains higher sulphur.



Depending on predominance of hydrocarbons, petroleum is classified as paraffin base, intermediate base or naphthenic base-

*Chaudhri*

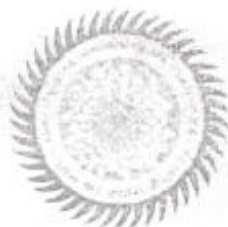
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गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



**GURU GHASIDAS VISHWAVIDYALAYA**  
**BILASPUR (C.G.)**

SEMINAR TOPIC

*“PETROLEUM ENGINEERING DISCIPLINES AND  
OIL & GAS INDUSTRIAL PRACTICES”*



Submitted by

**MD. PARWEJ MUSHARRAF**

**B.TECH (CHEMICAL ENGG.) 7<sup>th</sup> Semester, 4<sup>th</sup> Year**

Submitted to

**Dr. R.S. THAKUR**

**Dr. GHOSHNA JYOTI**

**Mrs. A.N. JOSHI**

**DEPARTMENT OF CHEMICAL ENGINEERING**

विभागाध्यक्ष, रासायनिक अभियांत्रिकी  
**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



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COURSE CODE:  
PEA/INT2022-XO6G


**INTERNSHIP  
CERTIFICATE**

This certificate is awarded to  
**MD PARWEJ MUSHARRAF**

For successfully completing a 45 days virtual summer training on the topic  
**"PETROLEUM ENGINEERING DISCIPLINES AND OIL &  
GAS INDUSTRIAL PRACTICES"**  
at Petroleum Engineers Association from 1st July 2022 to 14th August 2022.  
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NO. OF CREDITS RECOMMENDED BY P.E.A: 10

  
Mr. Nikhil Agarwal  
FOUNDER & CEO  
PETROLEUM ENGINEERS  
ASSOCIATION

  
Ms. Chhataa Upadhyay  
INTERNSHIP COORDINATOR

  
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## Domain of Discussion

Introduction to Petroleum Industry and Hydrocarbon Exploration Practices

Well Logging and Formation Evaluation

Drilling Engineering

Production Engineering

Reservoir Engineering

Enhanced Oil Recovery

Well Intervention

Workover Operations

Unconventional Hydrocarbon Resources

*Chaudhri*

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)





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A

PROJECT REPORT ON

“OIL AND GAS INDUSTRIAL PRACTICES”

SUBMITTED BY

UJJWAL BHATT

Enroll No: - GGV/19/1435

Roll No. : 19101145

B.Tech Chemical Engineering

THE PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE  
B.Tech. (Session: 2019-2023)

UNDER THE GUIDANCE OF

Mr. Nikhil Agarwal

Founder & CEO  
PETROLEUM ENGINEERS  
ASSOCIATION

DEPARTMENT OF CHEMICAL ENGINEERING

GURU GHASIDAS CENTRAL UNIVERSITY BILASPUR (C.G.)

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**HoD, Chemical Engineering**  
प्रौद्योगिकी संस्थान/Institute of Technology  
गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)  
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Mr. Nikhil Agarwal  
FOUNDER & CEO  
PETROLEUM ENGINEERS  
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P.E.A. 2022



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*Chaudhary*

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



Report  
On  
Effluent Treatment Plant

(Online Summer Internship Programme-2022)

(OSIP-2022)

Submitted in partial Fulfilment of the Requirements for the mandatory Industrial Internship training programme

Submitted by

Vechalapu Naveen

Department of Chemical engineering

Guru Ghasidas ViswaVidyalaya

Chhattisgarh



May to June, 2022

Hindustan Petroleum corporation Limited (HPCL)

*Chaudhary*

वेभागाध्यक्ष, रासायनिक अभियांत्रिकी  
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हिन्दुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड  
(भारत सरकार संस्थान) रजिस्टर्ड ऑफिस 17 जमशेदजी टाटा रोड, मुंबई - 400 020  
**HINDUSTAN PETROLEUM CORPORATION LIMITED**  
(A GOVERNMENT OF INDIA ENTERPRISE) REGISTERED OFFICE: 17 JAMSHEDJI TATA ROAD, MUMBAI-400 020  
CIN : L23201MH1952GOI0008658



विशाख रिफाइनरी, पोस्ट बॉक्स नं. 15, विशाखपट्टनम-530 011 (आंध्रप्रदेश), फोन - 2895000, 2895100  
VISAKH REFINERY, POST BOX NO. 15, VISAKHAPATNAM-530 011 (A.P.), PHONES : 2895000, 2895100

HR:RK:VSI:2022:01

Visakh Refinery  
July 29, 2022

**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that **Mr. VECHALAPU NAVEEN** (Roll No: **GGV/19/1441**) From **Guru Ghasidas Vishwavidyalaya** has successfully completed Virtual Internship in **Operations Department, VR** from 14-05-2022 to 27-06-2022 at HPCL, Visakh Refinery on the topic - **Effluent Treatment Plant Performance Monitoring**

*Ravi Kumar*  
Ravi Kumar  
Sr. Manager - HR

रवि कुमार / RAVI KUMAR  
सि.एम.एस. विभागाध्यक्ष - ११  
Sr. Manager - HR



SECTION-B

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*Chaudhary*

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## Academy of Skill Development

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Internship Report

On

**Industrial Environmental Pollution Management  
(IEPM)**

*Submitted in Partial Fulfilment of the Requirements for the mandatory Internship training programme*

*submitted by:*

Name: Sanjay Kumar Jhingonia

Name: Aman Singh Rajput

Department: Chemical Engineering

Institute: School of Studies of Engineering And Technology

Guru Ghasidas University Bilaspur (C.G.)

Duration: 17<sup>th</sup> May to 17<sup>th</sup> June 2022



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**Certificate of Completion**

This certificate is hereby awarded to  
**Aman Singh Rajput**  
of

**Institute of Technology Guru Ghasiadas University, Bilaspur CHHATTISGARH**  
who has successfully completed the **Industrial Training and Internship on  
Industrial Environmental Pollution Management**  
and developed the project titled  
**RESIZING IMAGE USING BILINEAR INTERPOLATION ALGORITHM IN MATLAB**  
by following all the necessary criteria of the company with grade **A+**.

**Grading System:**  
A+: 75% and above  
A: 65% to 74%  
B: 55% to 64%

Issue Date: 17th June, 2022  
Certification ID: ASD/IEPM/GUR/RES/10681

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OSTP-2022

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*Chaudhary*

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Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)



**Report  
On  
Offline Summer Internship Program  
(OSIP-2022)  
Chemical Engineering**

Submitted by:

Chandaluri Sri Harsha

Department of Chemical Engineering

Guru Ghasidas Vishwavidyalaya

Bilaspur, Chhattisgarh



**ROOPA INDUSTRIES LIMITED**

Incorporated with C.IN.: L10100AP1985PLC005582 under the Companies Act, 1956. Corp. Off: 3rd Floor, TGV Mansion, Above ICICI Bank, 6-2-1012, Khairatabad, Hyderabad - 500 004.  
Telangana. Tel No.: +9191541 51038. Fax: +91 40 2331 0379. Email: info@roopaindustries.com, www.roopaindustries.com.  
Regd. Off: 17/745, Alur Road, Adoni-518301, Kurnoor Dist., A. P. INDIA.



Date: 13/06/2022

**TO WHOMSOEVER IT MAY CONCERN**

This is certify that Mr. CHANDALURI SRI HARSHA having (Enrolment No: GGV/18/1306) of Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur, C.G-492009, has undergone Industrial Training in Engineering Department, in our organization from 12<sup>th</sup> May 2022 to 10<sup>th</sup> Jun 2022 on the topic – Operation, Maintenance, handling and trouble shootings of Bulk drug production equipments like Reactors, Centrifuges, Dryers etc.

During this period, we found him to be hard working and committed and we wish him all the best in his future endeavours.

For Roopa Industries Limited,

Authorized Signatory

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# 1.1

## BIOTECHNOLOGY-DERIVED DRUG PRODUCT DEVELOPMENT

STEPHEN M. CARL,<sup>1</sup> DAVID J. LINDLEY,<sup>1</sup> GREGORY T. KNIPP,<sup>1</sup>  
KENNETH R. MORRIS,<sup>1</sup> ERIN OLIVER,<sup>2</sup> GERALD W. BECKER,<sup>3</sup> AND  
ROBERT D. ARNOLD<sup>4</sup>

<sup>1</sup>Purdue University, West Lafayette, Indiana

<sup>2</sup>Rutgers, The State University of New Jersey, Piscataway, New Jersey

<sup>3</sup>SSCI, West Lafayette, Indiana

<sup>4</sup>The University of Georgia, Athens, Georgia

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*Pharmaceutical Manufacturing Handbook: Production and Processes*, edited by Shayne Cox Gad  
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