




CHEMICAL
ENGINEERING
DEPARTMENT



Group Photograph taken during Retrospect - Chemical Engineering Alumni Talk Show

C h e m i c a l E n g i n e e r i n g e - M a g a z i n e

 Mission & Vision	02	 Alumni Column	27
 Department Activities	04	 Achievements	28
 T&P Column	15	 Students Corner	32
 Students Speaks	17	 Know Our Staff	33
 Technical Articles	21	 Editor's Column	34

DEPARTMENT OF CHEMICAL ENGINEERING, SRICT



To achieve excellence in Chemical Engineering and allied fields by providing excellent teaching learning experience enabling students to become competent professionals to tackle global issues.

MISSION

- ❖ To provide excellent technical education to students with basics of chemical engineering.
- ❖ To provide theoretical and practical education so that students vigorously apply knowledge in solving chemical engineering problems for sustained development.
- ❖ To inculcate professional ethics among students by exposing them to state of the art technologies in the field.
- ❖ To inspire students for lifelong learning and to develop leadership qualities in their career.

Program Educational Outcomes (PEOs) of Department

- ❖ To impart the fundamentals of chemical engineering and enable them to have a successful career in wide range of core industries.
- ❖ To deliver quality technical education thereby developing sustainable technology in addressing global issues.
- ❖ To prepare graduates who are capable of solving complex chemical engineering problems.
- ❖ To provide practical aspects of chemical engineering to the students by ways of industrial visits, expert lectures and increased industry-institute interaction thereby making students industry ready.
- ❖ To prepare graduates who can effectively communicate, demonstrate leadership qualities with creative thinking and professional ethics.



Message from our leader..

Dear Readers,

During July to November 2022, a lot of activities were organized other than academic activities. Students and faculty members participated in various conferences. Also, the NBA result was declared and we feel happy that the department of Chemical Engineering is re-accredited for three years. The odd semester passes very quickly with a lot of festivals celebrated during the tenure.



A lot of extracurricular activities were held and students participated in those events including the celebration of Garba, the Ganesha festival, technical festivals, etc.

Research is an important focus of activity and our faculty members working on various research projects covering a wide spectrum of areas are making progress and touching the societal requirement. In collaboration with the University's Centre of excellence – Process Safety, we organized one day workshop on process safety where dignitaries from various organizations participated. For students, under the IChE chapter, we organized programs including a training session on MS excel, a paper presentation session, etc. The details of the activities are included in the magazine along with the articles provided by our students and faculty members. We plan many such programs in the next semester that help us connect Diploma engineering, B.E. and M.E. students.

Prof. Dr. Alok Gautam
HoD , Chemical Engineering Department



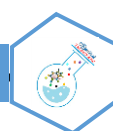
Date	Name of the Industry	Sem	Batch
30.08.2022 and 01.09.2022	Analpa Industries	7	2019
06.09.2022 and 07.09.2022	GNFC, Bharuch		
17.10.2022	Star Oxochem, Jhagadia		
03.09.2022	Oasis Ceramics	5	2020
12.09.2022 and 13.09.2022	Godrej, Valia		



Semester-III students visit at Atul Ltd, Ankleshwar



Semester-VII students visit at GNFC, Bharuch





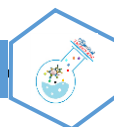
Date	Name of the Industry	Sem	Batch
05.09.2022	Jayshree Aromatics	3	2021
08.09.2022 & 102.09.2022	Atul Ltd, Ankleshwar		
23.11.2022	BEIL, Dahej	5	2020
22.11.2022	ETL, Ankleshwar	1	2022



Semester-V students visit at Godrej Industries



B.E. Semester-III visit at ETL, Ankleshwar

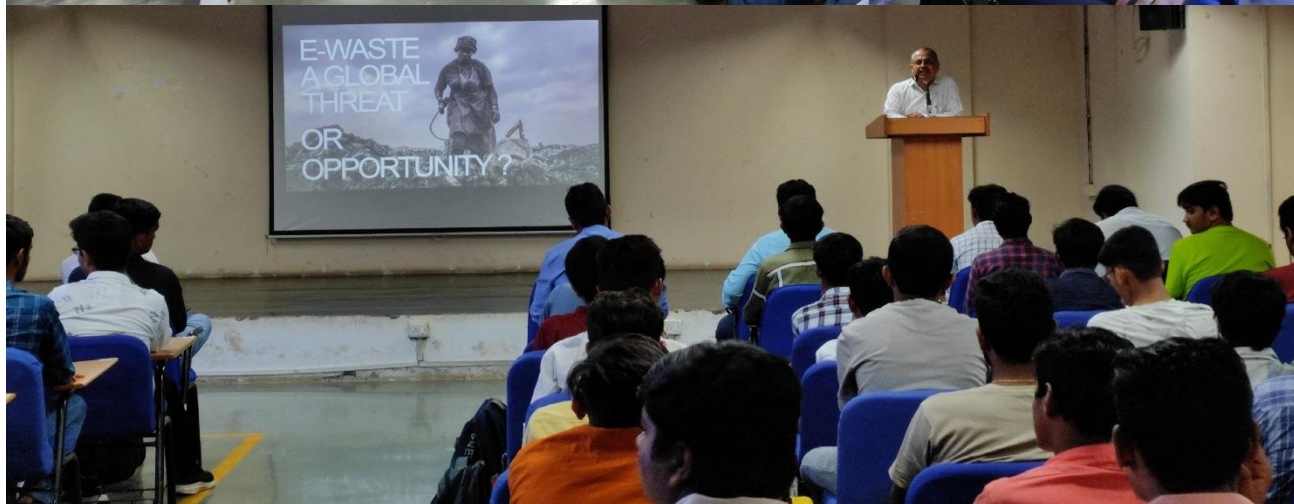




EXPERT LECTURES



Date	Expert	Industry	Topic
07.03.2022	Mr Pinkal Shah	Director and Founder, Shree Polymers	Why Engineering is important?
11.06.2022	Mr. Amol Lakare	Safety consultants , Dekra,	Safety in chemical industries
03/09/2022	Mr. Snehal Tralsawala	Consultant	Fault Tree and Event Tree Analysis
11/10/2022	Mr. Shivam Munshi	Consultant	Carrier Counselling
19/10/2022	Mr. Ajay Pancholi	ESH, Head UPL Ltd.	Process Safety Management
30/11/2022	Dr. Prashant Bhawe	Asso. Professor & HoD, Civil & Env Engg Deptt., VJTI	Application of Chemical Engg. & Concepts of Env. Engg.





PEER LEARNING INITIATIVE



Name of student	Sem	Course Name	PLI Delivered in semester	
Abdullah Chaudhary	3	BC	1	DE
Mahajan Shubham R.	5	CET	3	BE
Chandegra Meet	5	FFO	3	BE
Modi Nisarg Aminesh	5	CET	3	BE
Modi Nisarg Aminesh	5	MO	3	BE
Patel Vishwam K.	5	CET	3	DE
Patel Vishwam K.	5	IS	3	DE
Pathan Shifan	5	FFO	3	DE
Pathan Shifan	5	FFO	3	DE
Smit Patel	5	FFO	3	BE
Utsav Pankaj Patel	5	IS	3	DE
Utsav Pankaj Patel	5	CPT-1	3	DE

Name of student	Sem	Course Name	PLI Delivered in semester	
Aditya Narielwala	7	MO	5	BE
Aditya Narielwala	7	MTO-1	5	BE
Kaushik S Vaijapurkar	7	IPC	5	BE
Kaushik S Vaijapurkar	7	ET	5	BE
Kaushik S Vaijapurkar	7	IPC	5	BE
Kaushik S Vaijapurkar	7	MEBC	3	BE
Kaushik S Vaijapurkar	7	IS	3	DE
Rahul Patel	7	IPC	5	BE
Rahul Patel	7	MO	5	BE
Rahul Patel	7	MO	3	DE
Yash Y Patel	7	MO	5	BE
Yash Y Patel	7	MTO-1	5	BE



Under Peer learning initiative (PLI), senior student delivers technical content to peers making it comfortable and easy students. It also improves communications skills, and professional development.

UNIVERSITY

EXAM RESULTS

D.E., B.E. & M.E.

Semester-II, IV, VI & VIII

Summer-2022



CHEMICAL ENGINEERING BRANCH

Semester	PASS	Result	Semester	PASS	Result
BE-II	57/67	85.07%	D.E.-II	16/62	25.81%
BE-IV	74/77	96.10%	M.E.-II	08/11	72.73%
BE-VI	78/82	95.12%	M.E.-IV	08/08	100%
BE-VIII	70/70	100%			

B.E Chemical Engineering Toppers Semester-VIII, Summer 2022

Name	SPI	CPI	CGPA	Rank (as per CPI)
THAKER YASHKUMAR	10	9.5	9.61	3 rd Rank in GTU - Branch wise
GUPTA SHUBHAM	10	9.49	9.71	4 th Rank in GTU - Branch wise
SAJJAN SNEHA	10	9.47	9.59	6 th Rank in GTU - Branch wise

B.E. Chemical Engineering Toppers Semester-VI, Summer 2022

Name	CPI	SPI	Rank (as per CPI)
SHAH DEEP YOGESH	9.85	9.83	1 st Rank in GTU - Branch wise
HAJARIWALA KRISIL	9.53	9.48	5 th Rank in GTU - Branch wise
VAIJAPURKAR KAUSHIK	9.50	8.91	6 th Rank in GTU - Branch wise
PATEL DHARA	9.49	9.30	7 th Rank in GTU - Branch wise

B.E. Chemical Engineering Toppers Semester-IV, Summer 2022

Name	CPI	SPI	Rank (BRANCH WISE as per CPI)
RAJ ADITYASINH	9.69	9.61	1 st Rank in GTU (Branch wise)
CHANDEGRA MEET	9.68	9.83	2 nd Rank in GTU (Branch wise)
SAINI UMESH	9.38	9.17	2 nd Rank in GTU (Branch wise)
PANDIT DEVARSH	9.34	9.43	2 nd Rank in GTU (Branch wise)
MODI NISARG	9.33	9.04	2 nd Rank in GTU (Branch wise)



Manish Nasit, M.E.
Semester-III student
receiving gold medal for
excellent performance in
semester-II (10/10 SPI)

UNIVERSITY EXAM RESULTS

B.E.

Semester-II, IV, VI & VIII
Summer-2022



CHEMICAL ENGINEERING BRANCH

M.E Chemical Engineering Toppers Semester-IV, Summer 2022

Name	CPI	SPI	Rank (as per CPI)
PADHIYAR BHAVESHKUMAR	9.82	10.00	1 st Rank in GTU - Branch wise
DESAI HIMANSHU	9.22	9.13	4 th Rank in GTU - Branch wise
MANJRAWALA CHINMAY	8.96	6.50	6 th Rank in GTU - Branch wise
DEORE SANJOG	8.90	8.25	8 th Rank in GTU - Branch wise
PRAVIN BHASKAR	8.68	9.13	10 th Rank in GTU - Branch wise

M.E. Chemical Engineering Toppers Semester-II, Summer 2022

Name	SPI
NASIT MANISH RAMESHBHAI	10
MODI PARTHKUMAR M.	9.89
VYAS MITAL BIPINCHANDRA	9.56

B.E. Chemical Engineering Toppers Semester-II, Summer 2022

Name	SPI
VANSH D GOHIL	9.87
HARSH H MEHTA	9.87
DIPALI K PATEL	9.83
AKSHAY C GUPTA	9.78
ROHAN D SURTI	9.78

D.E. (Diploma) Chemical Engineering Toppers Semester-II, Summer 2022

Name	SPI
PRITEE S DIGHE	9.77
VAJIDKHAN V PATHAN	9.73
AXIT D KAPADIA	9.32
RAJKUMAR M PATEL	9.05
PRIYA S DIGHE	8.95



B.E. CE Semester-II Top-5 as per SPI during felicitation program

Chemical Engineering Students Participation in Various Events

Glimpse of Chemical Engineering Students participation during Sci-Technovation



CE Students participating in “Har Ghar Tiranga”



CE Students participating in Garba organized at UPL University

EVENTS

One-day hands-on training program on MS Excel



One-day hands-on training program on MS Excel for chemical engineers is organized by the Department of Chemical Engineering for B.E. Semester-VII students in association with the IChE students' chapter on 21st October 2022.



MAKING ECO-FRIENDLY GANESHA



Rushi Rana - B.E. CE-V

Monika Patel and Snehal Vasava - B.E. CE-V

Priya Dighe and Sakshi Dighe - D.E. CE-III



Pawan Gupta and Kalpesh Patil - B.E. CE-V

Meet Shah and Dipali Patel - B.E. CE-III

Utsav Patel and Vivek Jadav - B.E. CE-V

On the occasion of Ganesh Festival, an activity of making Eco-friendly Ganesha was organized under the banner of IChE on 7th September 2022. Very innovative models of Lord Ganesha were created by the students of Chemical Engineering BE and Diploma.

EVENTS

One-day workshop on Process Safety and Hazard Analysis

A one-day workshop on Process Safety and Hazard Analysis will be held on 8th October 2022. The workshop is organized by the UPL Center of Excellence in Process Safety and the Department of Chemical Engineering. The workshop covers major aspects of process safety like QRA, process hazard analysis, HAZOP and 3D modeling consequences.



UTILIZING WASTE PLASTIC AND METALS FOR ANY USEFUL THINGS



An activity under IICHe banner was conducted on utilizing waste plastic and metals for any useful things. Students came up with novel ideas and implemented them in models. There were approximately 40 participants from the Chemical Engineering department.

EVENTS

Rephrase

An activity under IICChE banner was conducted on utilizing waste plastic and metals for any useful things. Students came up with novel ideas and implemented them in models. There were approximately 40 participants from the Chemical Engineering department. Winners were selected by a panel of jury based on innovative ideas and its implementation in creativity.

Synergy

A presentation competition was organized as per the brochure 8 groups participated in the event.



Academic Audit of Chemical Engineering Department held on 26th November 2022



Presence of Chemical Engineering department faculty members during Rotary Garba Mohotsav 2022

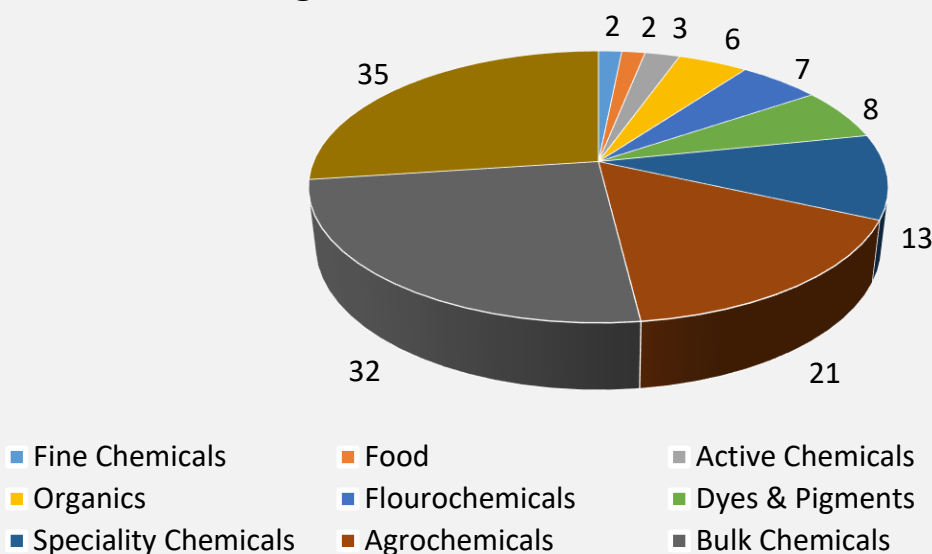


Industrial Training

Admission batch
Winter 2021

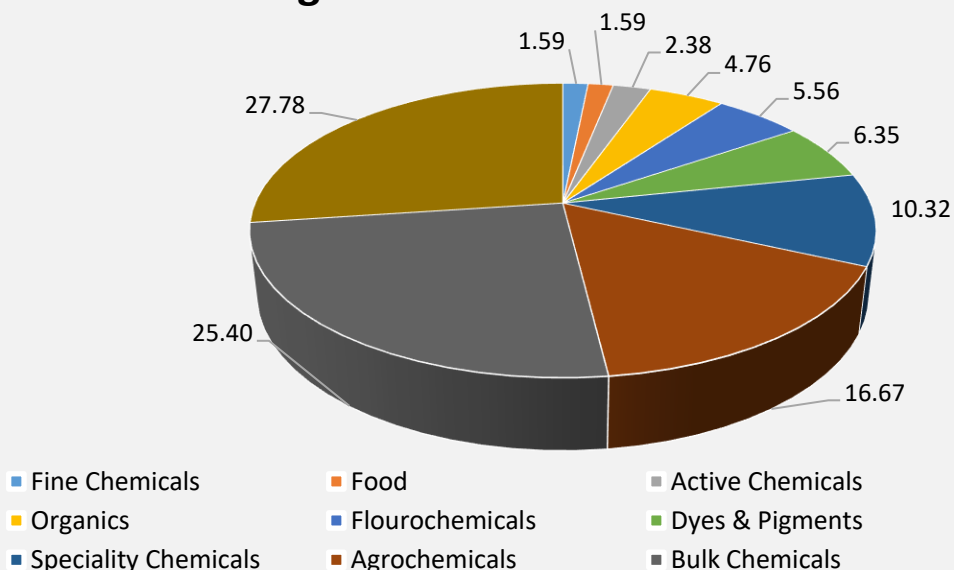
100 % B.E. and D.E. Students have undergone minimum 1 weeks of Industrial Training after completion of Semester-II

(%) Number of students from D.E Sem-2 undergone training in various sectors of chemical industry



D.E.: 62

Number of students from B.E. Sem-2 undergone training in various sectors of chemical industry



B.E.: 67



100% PLACEMENT OF REGISTERED STUDENTS (BATCH 2018-22)

STUDENT NAME	PLACED INDUSTRY
Jill Bhadania	Reliance
Harshrajsinh Bharthania	Asian paints
Pranay K Bhatia	Nocil
Chauhan Akshar	Nocil
Shubham Chauhan	UPL
Dhimant Dave	Fermenich
Desai Nilesh G	UPL
Abhishek A Gandhi	UPL
Jaivil Gandhi	Nocil
Vanrajsinh N Gohil	Asian paints
Gohil Vinaykumar B	Nocil
Shubham Gupta	TCS
Prashant Jadhav	Asian paints
Sakshee Jain	UPL
Kanara Shubham M.	Nocil
Jayrajsinh G Kher	UPL
Shashank J Khetani	UPL
Vibhuti Kishore	Nocil
Tushar R Mistry	UPL
Modi Harsh S	Star oxochem
Kishan R Panchal	UPL
Parmar Akshaykumar T	Sajjan
Bhargavsinh Vashi	GNFC
Harish Verma	Reliance
Pratik Prakash Thakre	Star oxochem

STUDENT NAME	PLACED INDUSTRY
Patel Devang V	Reliance
Patel Dhruv V	Reliance
Patel Hetkumar J	Lanxess
Jyot Patel	Convergence
Patel Kirtankumar V	Parshwnath Colourants
Patel Meet V	Reliance
Nikunj Patel	TCS
Patel Parajkumar V	Reliance
Patel Priyen R	Sajjan
Patel Rajkumar P	Sajjan
Vasu Patel	Nocil
Vismaykumar J Patel	UPL
Patel Yashkumar M	Nocil
Jayesh Prajapati	UPL
Jyoti Rakholiya	UPL
Hardeepsinh M Rana	UPL
Rana Rajdipsinh P	Parshwnath Colourants
Sneha Sajjan	UPL
Bhargavsinh J Solanki	Lanxess
Mayur S Suryavanshi	UPL
Yash J Suvagiya	Nocil
Yashkumar D Thaker	Parshwnath Colourants
Vaghasiya Harsh	Nocil
Sahdevbhai Vasava	Sajjan



PLACEMENT OF REGISTERED STUDENTS (BATCH 2019-23)

PLACEMENT DRIVE BATCH for the ongoing batch 2019-23

1	BHATT MEET NILESH
2	BISWARI HARSH DILEEP
3	DUA PRATHAM RAJUBBHAI
4	GEHLOT KANISHK AVINASH
5	PRATHAM SANJIV GOYAL
6	HAJARIWALA KRISIL VIJAYKUMAR
7	MONIKA JADIYA
8	LAD PRIYANK URESHKUMAR
9	PANCHAL VIRAJKUMAR AASHISHBHAI
10	PANELIYA RAJ SURESHBHAI
11	PAREKH CHINTAN DHARMENDRABHAI
12	PARMAR RAJVEERSINH TAKHATSINH
13	PARMAR VIRALKUMAR NATVARBHAI
14	PATEL DAIVIK SANJAY
15	PATEL DHARABEN KALPESHBHAI
16	PATEL KINJALBEN ISHWARBHAI
17	PATEL OM GANPATLAL
18	PATEL RAHULKUMAR PRAVINBHAI
19	PATEL YASH YOGESHBHAI
20	SHAH DEEP YOGESH
21	SHAH SMITKUMAR BIRENKUMAR
22	VAIJAPURKAR KAUSHIK SANDEEP
23	YADAV BHARGAVSINH GIRISHKUMAR

23 Students got placed in CE branch



Student Speaks

IIT Roorkee Experience

Kaushik Sandeep Vaijapurkar - CE Sem 7



I am Kaushik Sandeep Vaijapurkar from Chemical Engineering, Sem 7. I visited IIT Roorkee for a conference from 8-10 September. The journey was 5 days. These 5 days were a stepping stone in my life. From our class, Smit, and Dhruvpal had gone to present their paper at the conference. We were selected for the poster presentation category.

We all had different topics. My topic was "bio fertilizers combined with bio waste" can help us grow the crops' productivity. Paper under the theme "best out of waste". My paper included a deep study of more than 70 research papers that were published latest from here 2019 to 2021. The paper helps people to understand the importance of bio fertilizers and how we can maximize the effect of bio fertilizers and increase the quality of our soil. According to US statistics, our soil quality is degrading day by day by using chemical fertilizers. Till now one-third of the fertile land has already been desertified and it is predicted them by 2050 there will be a worldwide food crisis. To prevent it we need to shift towards bio fertilizers. How we can solve this problem? Everybody knows that bio fertilizers are good but to compensate for the demand of the current growing population people have shifted towards chemical fertilizers to give large production easily. So now comes up the topic that how we can increase the efficiency of bio fertilizers for that we must add bio-waste to it to increase its efficiency by a factor of x . We must add the bio waste according to the crop's specific requirements.

Student Speaks

IIT Roorkee Experience...



For example in a Maharashtra belt near Nashik people focus on grapes. Now for that grapes are the type of crop that required Phosphorus in the NPK ratio more than a regular grain crop so the bio waste type that which we're going to use here instead of cow dung to liquidity the bio fertilizers we can go for Ash of chicken feathers also a compost of chicken feathers can help to provide the phosphorus and to help the plant grow faster than the conventional approach of cow dung). Similarly, I presented 12 different bio base wastes which help increase the nutrients according to the crop's need so that we can mix it is available. I am also thankful to SRICT for motivation and support.



Student Speaks

NIT Warangal Experience

Smit Shah - CE Semester 7

It is an amazing experience to visit NIT Warangal for a presentation. The topic of the presentation is Simulation Studies of Methanol – Methyl Acetate Separation by Extractive Distillation Using Anisole, Methyl Isobutyl Ketone, 1-Propanol and Water.



From the simulation study, I get to know that water is the best suitable green solvent to separate the Methanol - Methyl Acetate solution. For the presentation, I show the different comparisons of the graph for different solvents. Also, show the result of the simulation study for understanding.



Student Speaks

ARE EVs ENVIRONMENT FRIENDLY?

VISHWAM PATEL, B.E. CE Semester-V

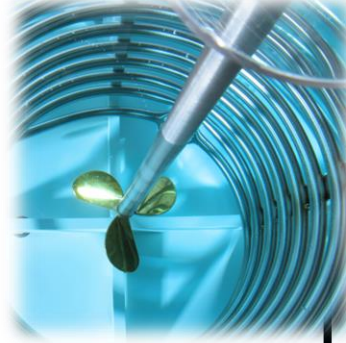


Transportation is a fundamental requirement of modern life, especially in India. As we know Petrol and diesel vehicles are highly polluting and are being quickly replaced by Fully electric vehicles. The availability of fossil fuels is limited. The emissions impact of EVs is much lower than Internal combustion engine Vehicles (ICEV). ICEVs emit almost 3 times more CO² than average EVs. The Article of Accelerated e-Mobility Revolution for India's Transportation mentioned that 'Fully electric Vehicles have Zero tailpipe emissions and are better for the environment 'But, Are EVs are Environment Friendly? One of the most important parts of EVs is the battery. Li-Ion battery is mostly used to make a Battery for EVs. Li-Ion, Lithium, Nickel Cobalt, Manganese (LiNCM) As per the name it Consists of a family of named Components that made a Li-Ion battery. Lithium Cobalt and Nickel are also known as Rare Earth Elements (REE). The highest reserve of Lithium is in South America. That place is Known as the 'Lithium Triangle. The Mining And Extraction processes are Mostly done by the Machinery that consumes Fuel as Fossil fuel or Coal. Worldwide Transportation of Li is done by the ship that Runs on the source of heavy Fuel Oils. Both of the Extraction and Transportation Processes emit a higher amount of CO². Semiconductors, the essential Part of the Electric Controlling Units (ECU) That control Everything from Breaks and Headlights to the latest Gadgets Such as Parking Cameras, Radar. A typical Semiconductor manufacturing Facility uses Two to Four million Gallons of Ultra-Pure water per day. Even The majority of Electricity is Produced by Thermal Power stations by Burning Coal that emits CO². As Per the Data from the blog Covered by Prof. Damien Ernst, University Of Liège. Electric Car Become Green after Running Around 6,97,612 km. One last message to whosoever is Reading this - EVs need more improvement in Environment aspects. But It can be a better Replacement of an Internal Combustion Engine vehicle.

Reference

1. <https://e-amrit.niti.gov.in/benefits-of-electric-vehicles>
2. Journal of industrial ecology by Troy R. Hawkins, Bhawna Singh, Guillaume Majeau-Bettez, and Anders Hammer Strømman

CHEMICAL ENGINEERING MAGAZINE ARTICLES

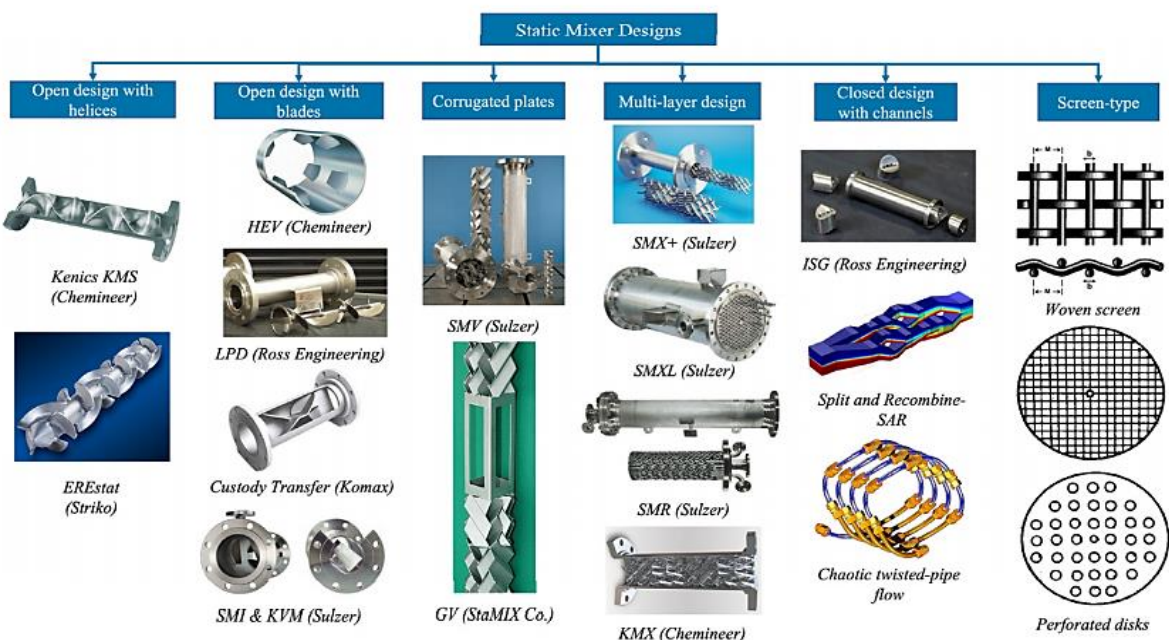


Current advances in liquid-liquid mixing in static mixers

- Shraddha Pandya, Lecturer, Chemical Engineering Department

Mixing is a key feature of most modern industrial processes, covering a broad spectrum of applications from consumer goods in the food, pharmaceutical, and cosmetic industries to the chemical and petrochemical, pulp and paper, polymer, mineral processing, and biotechnology sectors. Static or motionless mixers consist of a series of identical inserts or elements, arranged in a structured configuration, which can be installed in pipes, channels, columns or reactors. These inserts are added to promote a chaotic mixing behaviour by dividing and redistributing the flow streamlines sequentially, following radial and tangential directions to the main flow.

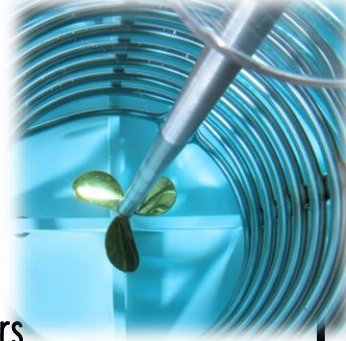
There is an extensive range of commercial static mixers which can be sorted either by application or design. Static mixers can be categorized into 6 main families based on their geometrical construction: (i) Open designs with helices (ii) Open design with blades (vortex generators) (iii) Corrugated plates (iv) Multi-layer design (v) Closed designs with channels (vi) Screen-type designs



Classification based on geometrical construction

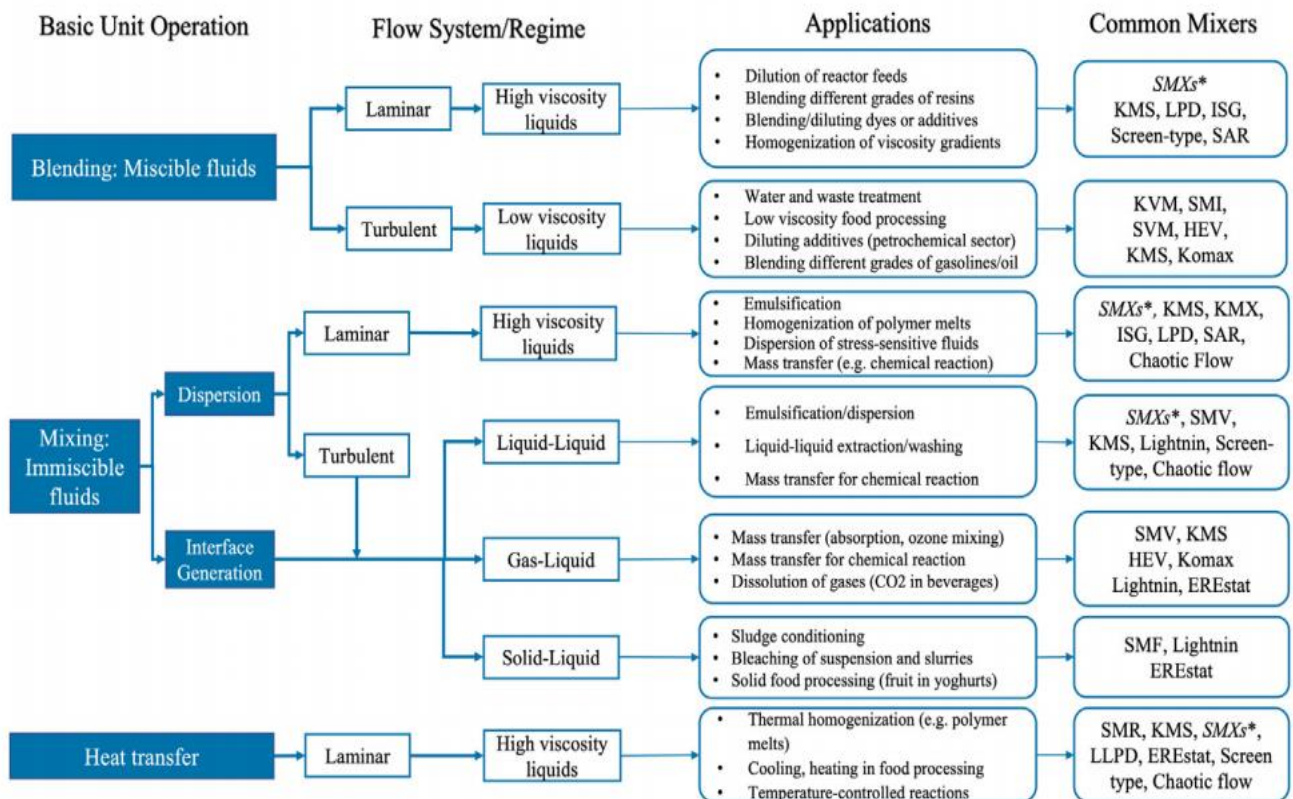
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CHEMICAL ENGINEERING MAGAZINE ARTICLES



Current advances in liquid-liquid mixing in static mixers By Shraddha Pandya, Asst. Professor

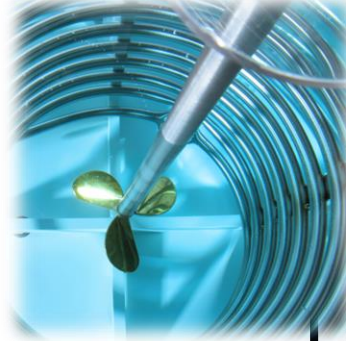
Static mixers have been a topic of research interest for the past couple of decades. The first generation of mixers were designed mostly for miscible mixing based on physical insight and intuition, leading to a scarce understanding of their internal dynamics. However, recent improvement of experimental techniques and the consolidation of computational assisted design and modelling has enabled researchers to elucidate the fluid mechanics behind these devices for single-phase flow. The emergence of robust numerical codes has facilitated the refinement of existing models and the exploration of new conceptual designs.



Common classifications given to static mixers based on their application

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CHEMICAL ENGINEERING MAGAZINE ARTICLES



Current advances in liquid-liquid mixing in static mixers

Nowadays, the applicability of static mixers has been expanded towards complex multiphase flow systems. In particular, static mixers are being employed more frequently with immiscible liquid-liquid systems given their numerous advantages when compared to stirred vessels.

Nowadays, the applicability of static mixers has been expanded towards complex multiphase flow systems. In particular, static mixers are being employed more frequently with immiscible liquid-liquid systems given their numerous advantages when compared to stirred vessels.

Early fundamental studies on droplet breakage in static mixers have been conducted in laminar flow, proposing mechanistic correlations and providing insights into the droplet's deformation and breakup mechanics under varying operational and physico-chemical conditions. Particular emphasis is placed on the local flow characteristics and the detailed interaction with the mixer's geometry. The latest experimental and computational advances over the past decade have continued over similar lines of research, expanding the current knowledge towards a wider range of scenarios. Notably, numerical studies have augmented the hydrodynamic understanding of static mixers.

Reference for figure:

Reference: Current advances in liquid-liquid mixing in static mixers: A review, Juan P. Valdés, Lyes Kahouadji, Omar K. Matar, Chemical Engineering Research and Design 177 (2022) 694-731

CHEMICAL ENGINEERING MAGAZINE ARTICLES



Hydrogen from water an attempt towards future hydrogen economy

By Dr. Dinesh Panday, Asst. Professor

Energy has become a vital requirement of human being like air, water and food. A secure, sufficient and sustainable supply of energy is very crucial for the modern societies. Demand for the provision of energy is increasing rapidly worldwide. As per the report of World Energy Outlook-2020, the energy need turned down due to Covid-19 epidemic in the year 2020, due to restriction on travel and shutting down of manufacturing sectors, however, it was a short term decline and has bounced back as the industrial and other economic activities hit back and energy demand has increased more drastically. As reported in World Energy Outlook in 2018, by 2040 global energy demand could blow up roughly quarter times than the current values.

It is predicted that by 2040, total energy demands of India and China will be equal to the current total energy demand of United States of America and European Union. And this could be realized by tracking the growth in natural gas, wind, solar photo voltaic sector, nuclear and coal and oil in Asia continent in the last two decades. However, coal, oil and natural gas reserves are nonrenewable and depleting at an alarming rate and as a result, there may be huge energy shortage in the near future. Discovery of shale oil and natural gas can delay the prospect of energy shortage for few more decades. However, harsh reality is that, shale oil reserves are limited and its production may decline with time. In addition to the energy crisis, world is also facing the dire consequences of burning fossil fuel such as environment pollution and its catastrophic effect on all animate. In fact deaths due to air pollution are one of the highest in the world, many of the deaths are due to acute respiratory infection in children, other are due to cardiovascular diseases, lung cancer and chronic respiratory diseases in adults. To meet energy demand and to converse environment, it is required to have a very strict energy policy that can address the security and sustainability of energy resources and promote research and development in novel energy sectors. In fact various governments worldwide framed different energy policies to promote research and development in renewable energy sector and subsidizing renewable energy such as PV cells, Biodiesel, Bio-ethanol etc. The EU's revised Renewable Energy Directive (EU) 2018/2001 (RED II), The American Renewable Energy Act of 2021, India's National Policy on Biofuels-2018 Amendment, 2022 etc are the few examples to mention.

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Hydrogen from water an attempt towards future hydrogen economy

In order to remedy the depletion of fossil fuel and their environmental misdeeds hydrogen has been suggested as the energy carrier of the future. In this direction huge amount of research work has been devoted and documented to explore the potential of hydrogen as fuel. It is not a primary energy source, but rather serves as a medium through which energy can be obtained. It is lightest element and yields high energy approximately 122 kJ/g, which is 2.75 times higher than hydrocarbons. Hydrogen as a fuel has low environmental impact at the point of use and does not emit any harmful gases provided the point of origin of hydrogen is renewable such as water electrolysis.

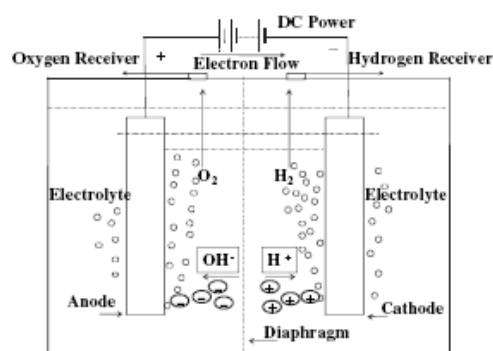


Fig. 1 Water Electrolysis

Water electrolysis

Water electrolysis is an electrochemical process powered by DC electrical energy. In this process water molecule dissociates into hydrogen and oxygen at different electrodes of electrolyzer as shown in the figure 1. The process is best described in the literature and there is no point to detail it again. However, it is important to mention here that the electricity supplied to electrolyzer should have renewable origin such as solar electricity in order to make the whole process completely renewable. Moreover, the overall efficiency of such system is very low and there is huge gap between what technologies can deliver and market driven hydrogen economy require. It has been observed that higher electrolyzer efficiency could be obtained at best combination of its various components such as electrode, electrolytes, diaphragm and process parameters such as temperature, voltage, current electrolyte concentration etc. The judicious combination of these candidates can give the higher energy efficiency at lower cost. The economic optimization of this method is achieved by lowering the over potential and by reducing the consumption of specific energy. This can be realized by choosing the appropriate electrode and electrolyte. The energy required in the water electrolysis process can be reduced by different approaches, like zero-gap cell geometry, development of new diaphragm materials, and especially development of new electro-catalytic materials for electrodes.

Continued on next page..

CHEMICAL ENGINEERING MAGAZINE ARTICLES



Hydrogen from water an attempt towards future hydrogen economy

By Dr. Dinesh Panday, Asst. Professor

To get the best combination of these parameters, experiments have been designed and carried out on an indigenously designed water electrolyzer and optimized the electrolyte concentration for the maximum hydrogen production. Water electrolysis was carried out using Sodium Hydroxide (NaOH), and Potassium hydroxide (KOH) as electrolyte. KOH and NaOH electrolyte concentration was optimized to obtain maximum hydrogen evolution reaction (HER). Electrolysis has been carried out at room temperature using solution of different concentration ranging between 3 to 30 % by wt. at constant 3.5 volt supplied by DC power source and hydrogen flow rate was measured. The optimized concentration found to be 27% and 18% for KOH and NaOH respectively. The possible reason for higher HER was found and illustrated that the conductivity of the KOH is higher than the NaOH for all concentration and is highest at 27%, and 18% concentration.

However, this is not the end, further dedicated research work is require to improve the system efficiency to take the process a commercial stage.

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ALUMNI | Column

The alumni association of our University organized an Alumni Talks Series - 'Retrospect'. Chemical Engineering Students and Alumni actively interacted. Alumni (Mr. Sanket Yadav, Mr. Meet Shah and Ms. Shipra Gupta and Mr. Fenil Modi) working in various fields including process, project and production shared their knowledge and experience with students to help them prepare for the transition from university to work.



Congratulation to Kripanshu Chaturvedi (Alumni of Chemical Engineering, admission batch 2011) for starting a job as Dy. Manager at Gulbrandsen Specialty

Congratulations to Sherubha Kher (Chemical Engineering Admission batch 2015) for winning Gold Award in ACCQC and Quiz among 180 teams.



Congratulation to Aadil Patel (Alumni from Chemical Engineering, Admisison batch 2014) for starting a new position as DCS operator at Camlin Fine Science!

Congratulation to Ruchit Rawal (Alumni from Chemical Engineering, Adm. batch 2011) for starting a new position as Sr. Engineer at Grasim, Vilayat



Congratulations!!

Dr. Shina Gautam filled a PATENT:

A process for extraction of polyhydroxyalkanoates (pha) from secondary treatment

wastewater sludge. Published in the Official Journal of the Patent Office on 1st July, 2022,

Indian Patent Application

No. 202221026715

Dr. Swapna Panda attended One Week STTP on “Sustainable Technologies and Applications of Computational Software (STACS-2022)” 12th–16th October, 2022, SARDAR VALLABHBHAI NATIONAL INSTITUTE OF TECHNOLOGY, SURAT.


INDIAN CHEMICAL ENGINEER
<https://doi.org/10.1080/00194506.2022.2126333>



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A kinetic study of thermal degradation of non-metallic part of printed circuit boards for the combined effect of particle size and catalyst

Vaibhav Pandere^{a,b}, Alok Gautam^{a,b} and Shina Gautam  ^{a,b}

^aDepartment of Chemical Engineering, Shroff SR Rotary Institute of Chemical Technology, Gujarat, India; ^bGujarat Technological University, Chandkheda, Ahmedabad, India

CO-PYROLYSIS OF PCB AND COTTON STALK: TOWARDS ENHANCED PHENOL PRODUCTION AND DEBROMINATION OF PYROLYSIS OIL

Sonalben B. Prajapati^{1,3}, Alok Gautam^{2,3}, Shina Gautam^{2,3*}

¹Government Engineering College, Chemical Engineering Department, Bhuj- 370001, Gujarat, India

²Shroff S. R. Rotary Institute of Chemical Technology, Chemical Engineering Department, Bharuch-393135, Gujarat, India



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UPL University of Sustainable Technology
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International Conference on Energy Summit 2022,
Organized by Energy Cluster, SoE, UPES, Dehradun
for his paper entitles

*'The design and optimization of extractive distillation for
separating the Isoamyl alcohol/Isoamyl acetate binary
azeotrope mixture using green solvent'*




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Chemical and Process Engineering 2022, 43 (2), 171–182
DOI: 10.24425/cpe.2022.140820 

CATALYTIC PYROLYSIS OF METAL FREE PCBs WITH ZSM-5 AND Ca(OH)₂

Vaibhav Pandere^{1,2}, Alok Gautam^{1,2}, Shina Gautam^{1,2*}

¹Chemical Engineering Department, Shroff S. R. Rotary Institute of Chemical Technology, Bharuch-393135, Gujarat, India
²Gujarat Technological University, Chandkheda, Ahmedabad-382424 Gujarat, India

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Chemical and Process Engineering 2022, 43 (2), 193–202
DOI: 10.24425/cpe.2022.140822 

ISOLATION AND PURIFICATION OF STEVIOSIDE FROM STEVIA LEAVES

Jignesh Joshi^{1,3}, Alok Gautam^{2,3}, Shina Gautam^{2,3*}

¹Chemical Engineering Dept, Government Engineering College, Valsad, Gujarat, India-382424
²Chemical Engineering Dept, Shroff S. R. Rotary Institute Of Chemical Technology, Bharuch 393135, Gujarat, India
³Gujarat Technological University, Chandkheda, Ahmedabad, 382424 Gujarat, India

Stevia rebaudiana Bertoni which has gained industrial and scientific interests is a suitable nutritional



Started a course “Chemical Engineering for Non-Chemical Engineers at Zydus Lifesciences




Vajid Pathan from Diploma (D.E.), Semester-III Secured 2nd position Innovative ideas for climate change and also secured 3rd position SLOGAN COMPETITION and Group discussion during the event ‘PANCHAMRIT’ held during 26-29 September 2022 organized by EST department.

Biomass Conversion and Biorefinery
<https://doi.org/10.1007/s13399-022-03139-z>

ORIGINAL ARTICLE



Debromination and improved phenol content in fuel oil generated from co-pyrolysis of non-metallic PCB and biomass

Sonalben B. Prajapati^{1,2} · Alok Gautam^{2,3} · Shina Gautam^{2,3} 

Received: 19 May 2022 / Revised: 12 July 2022 / Accepted: 20 July 2022
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Biomass Conversion and Biorefinery
<https://doi.org/10.1007/s13399-022-03515-9>

ORIGINAL ARTICLE

The effect of cotton stalk concentration on morphology and fixing bromine content in char while on co-pyrolysis with non-metal fractions of PCB

Sonalben B. Prajapati^{1,2} · Alok Gautam^{3,2} · Shina Gautam^{3,2} 

Received: 1 September 2022 / Revised: 19 October 2022 / Accepted: 1 November 2022
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Mr. Manish R. Nasit, M.E. Chemical Engineering, Semester-II presented paper on “Removal of heavy metal water” on 18th Oct under the guidance of Mr. Sunil Badgujar.

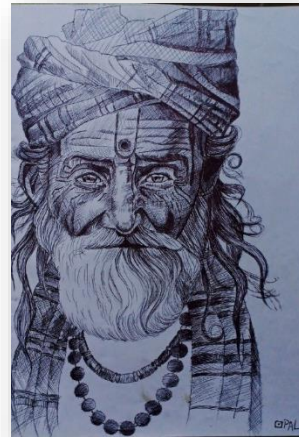
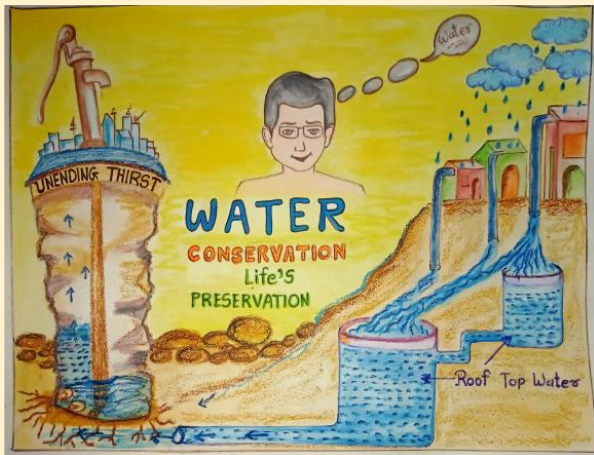


Participation of Chemical Engineering Students at Hackathon 2022



Student's Corner

Water is fundamental to life, but it is a limited resource. Ensuring that people have access to clean water is a significant global challenge. It is essential that there is a balance between supply and demand. This requires behavioral change and technological innovation. More than a billion people (over 10% of the global population) have inadequate access to clean water. Population growth, industrialization and increased agricultural demand are putting increasing pressure on water supplies. UNESCO, together with its center, the International Ground water Resources Assessment Centre (IGRAC), has led the world water Day 2022 Campaign on "Groundwater: Making the Invisible visible" on behalf of UN-water, the Campaign will remain active throughout the year. We need to be aware of water scarcity and think about how to increase the underground water level. In my point of view to increase underground water, we can make a large common tank in the societies, we live in and we can store the unwanted and waste rooftop water in the tank and this water is released at the bottom of the earth's surface to increase the underground water level. For this idea, we can use water which is unwanted and goes into the sewage. If all of us understand about it and make one tank for each society we increase the underground water in a year. To increase and develop the buildings, goods & Construction, Mainly use of Plastics harm on Soil in the form of going garbage the direct gain water not sufficient goes their required level in Soil So underground water not increasing so we can think about it and be aware family and Society to Prevent our future. - **Rushi Rana, B.E. CE Semester-V**



Sketch by
Mahesh Pal,
B.E. CE-
Semester-V



Photography by
Dipali Patel, B.E. CE- Semester-V



Photography by
Vajid Pathan, D.E. CE- Semester-III



Know Our Staff - Chemical Engineering



Dr. Shrikant J. Wagh



Dr. Alok Gautam



Dr. Shina Gautam



Dr. Ravindra Kanawade



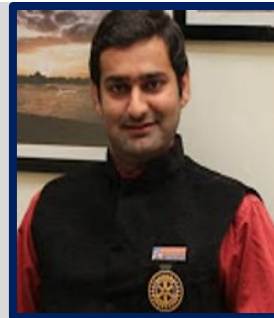
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Mr. Sunil Badgujar



Mr. Hemant Balsora



Dr. Krunal J. Suthar



Mr. Chintan K. Modi



Mr. Sudeep Wadia



Dr. Mriganka Mondal



Dr. Dinesh Pandey



Ms. Dhara Rojivadiya



Ms. Shraddha Pandya

Technical Support Staff



Mr. Praful Mokadam



Mr. Aniruddhsinh Raj



Mr. Darshan Patel



FROM THE DESK OF EDITOR..

The 10th issue of CHEMEZINE (Chemical Engineering e-Magazine) presents the activities conducted throughout the semester. Entire duration semester had festivals at regular interval. We celebrated lot of festivals along with co-curricular activities during the ODD semester 2022-23.

We invite more participation from stake holders of our department. We invite unpublished interesting articles from students and staff members of chemical engineering department.

We extend thanks to our reader. Kindly provide your valuable feedback. **HAPPY READING AND DO WRITE US BACK.**

- Editors

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