

Report on Online Kaizen 2021
Chemical Engineering Department
L. D. College of Engineering-Ahmedabad

1. Brief Description of the event:

The online Kaizen 2021 for Chemical Engineering Department was conducted on 19th and 20th April 2021 for reviewing 15 teams of final year IDP/UDP projects (total 70 students) and 10 PG dissertation projects. The projects were evaluated by experts from Industry and Professor from other university accompanied by internal evaluators from the institute. Event was conducted on MS Teams from 11:00 am to 4:00 pm. The schedule is given below:

DATE: 19/04/2021 (DAY 1)
GROUP I : FINAL YEAR B.E., CHEMICAL
NAME OF JUDGE: Shri M. N. Vyas (Ex.GM-IPCL)

SR. NO.	ENROLLMENT	PROJECT TITLE	GUIDE NAME
1	170280105039	Nanotechnology in self-cleaning Application	Prof. C. G. Bhagchandani
	170280105046		
	170280105057		
	170280105062		
2	170280105055	Major Engineering Problem in Solvent Recovery in Distillation Unit	Prof. S. M. Dutta
	170280105034		
	170280105029		
	180283105006		
	170280105035		
3	170280105014	Synthesis of black TiO ₂ for visible light photo catalysis	Prof. T. S. Rajaraman
	170280105012		
	170280105013		
	170280105011		
4	170280105036	Synthesis of furfural from bagasse for lube oil treatment	Prof. N. J. Ambegaonkar
	170280105060		
	170280105058		
	170280105040		
	170280105050		
5	180283105014	Production of Hydrogen and Recovery of Aluminium from Waste Aluminium	Prof. P. B. Patel
	170280105061		
	170280105045		
	170280105001		
	170280105002		
6	170280105024	Design internal / External cooling system for diazotization batch reactor to reduce ice consumption	Prof. P. B. Patel
	170280105043		
	170280105005		
	170280105004		
	170280105051		

7	170280105053	Acetylene conversion optimization	Dr. S. R. Shah
	170280105038		
	170280105044		
	170280105047		
	170280105054		
8	170280105064	Manufacturing of Titanium dioxide (TiO ₂)	Prof. R. P. Bhatt
	160280105007		
	170280105009		
	170280105017		

DATE: 20/04/2021 (DAY 2)
GROUP II : FINAL YEAR B.E., CHEMICAL
NAME OF JUDGE: Shri M. N. Vyas

SR. NO.	ENROLLMENT	PROJECT TITLE	GUIDE NAME
9	170280105041	Modelling and simulation of distillation column by using MATLAB	Prof. R. R. Patel
	180283105008		
	170280105018		
	180283105017		
	180283105012		
10	170280105015	Biodisel production by using nanocatalyst	Prof. H. N. Pandya
	170280105031		
	170280105052		
	170280105059		
11	170280105025	Solar Refrigeration system	Prof. A. N. Vaghela
	170280105027		
	170280105063		
	170280105003		
12	180283105002	Fertilizer driven forward osmosis	Prof. S. M. Dutta
	180283105003		
	180283105011		
	180283105013		
	180283105016		
13	170280105028	Extraction and characterization of oil from date seed	Prof. P.B.Patel
	180283105015		
	180283105009		
	170280105020		
	170280105021		
14	170280105006	Manufacturing of Polypropylene	Prof. R. S. Ruperi
	170280105007		
	170280105022		
	170280105048		
	180283105004		
15	170280105037	Extraction and characterization of vitamin from fruit peel	Prof. C. G. Bhagchandani
	170280105023		
	170280105026		
	170280105032		
	180283105005		

DATE: 20/04/2021 (DAY 1)
GROUP III : FINAL YEAR M.E. CHEMICAL (CAPD)
NAME OF JUDGE: Dr.Dharamshi Rabari(Professor, Ahmedabad University)

Sl. No.	Enrollement No	Project Title	Project Guide Name
1	190280716004	Graphene Oxide : Synthesis and It's Application	Prof. Nikita Ambegaonkar
2	190280716005	Forward osmosis: a potential way to treat wastewater	Prof. S. M. Dutta
3	190280716009	Development of novel organo Ruthenium drugs for cancer therapy	Dr. Paresh Rana
4	190280716014	Exergy analysis of bio-butanol reforming processes integrated with pemfc	Prof. Ronak R. Patel
5	190280716015	To study various reaction parameters in OBR	Prof. Rajul P. Bhatt
6	190280716016	Techno economical analysis of geothermal solar cold storage system	Dr. Sachin Parikh
7	190280716017	Hydrogen production from waste aluminium and utilization of by product	Prof. Pratik B. Patel
8	190280716019	Green solvent application and prediction of VLE data for Chemical Industries.	Dr. Satish R. Shah
9	190280716020	Modified TiO ₂ based photo catalyst for pollutant degradation in wastewater	Prof. T. S. Rajaraman
10	190280716021	Enhanced oil recovery using nanoparticles	Dr. Sachin Parikh

Here are some screenshots of the online kaizen 2021 through MS Teams.

Presentation of students:

KAIZEN 2021_Project Chemical UG Session 2

Moisture-15.8 g

Jelly -20.3 g

Drying

Pectin-4.5 g

Participants

- Type a name
- Share invite
- 1P 170280105038 HARSHIL PATA...
- 1P 170280105039 JAY PATEL
- 1R 170280105045 ARSHIA RAINA
- 1V 170280105061 DHRUTI VARS...
- 1J 180280105019 GAJENDRASL...
- 1B 180283105002 RUTVIKKUMA...
- 1D 180283105004 TEJAL DHOKIYA
- 1K 180283105005 KAJAL KANJA...
- 180283105009 ABHAY LADVA

170280105026 KANAKSINH KAGADA

170280105037 TEJASB...

170280105023 ALPESH H...

ENG 3:05 PM
US 20-Apr-21

KAIZEN 2021_Project Chemical UG Session 2

INTRODUCTION

- Date fruit contain between 6% to 18%(by weight) dates seed, and the seed contains appreciable amount of sugars, minerals, dietary fiber, and some amount of protein & fatty acids.
- The date seed is regarded as the waste from the industries processing and packing the date fruits and it is utilized as the animal feed stock or being converted to the non-caffeinated coffee by Arabs. We need a better way of utilizing the date seed and recover/use the nutrients in that seed.
- The date seed contains 5-13% of oil. Oil(Date seed oil) obtained from it contains saturated and unsaturated fatty acids with lauric and oleic a good amount of antioxidant content which is comparable to olive oil.

170280105028 RISHABH KASHYAP

180283105015 JAINIL ...

RAJUL BHATT

170280105028 RISHAL...

180283105009 ABHAY LA...

ENG 2:07 PM
US 20-Apr-21

Experiment-2

- ▶ Taken 2gm Aluminum , 5M NaOH 10ml solution for 1hr & 24Hr and size of Al <300 μ m.
- ▶ This reaction find out aluminum conversion at 1hr and 24hr.
- ▶ Most of reaction completed in 1 hour of time period at 70°C.

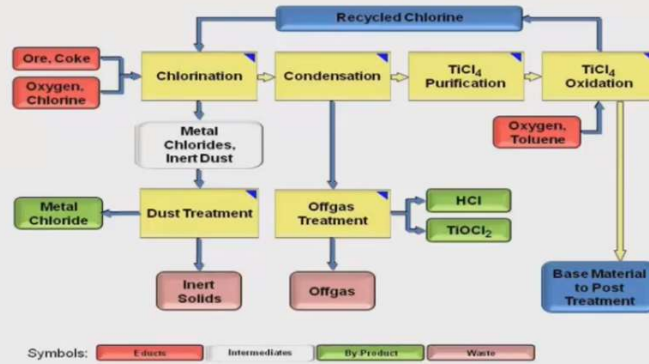
Sr.No.	NaOH Concentration (M)	Time of Reaction (hr)	Aluminum Raw Material (gm)	Aluminum Converted (gm)	Aluminum Remain (gm)	Conversion (%)
1	5M	1 hour	2	1.775403	0.225497	88.77%
2				1.794155	0.205845	89.70%
3		1 Day	2	1.824318	0.175682	91.21%
4				1.830479	0.169521	91.52%

teams.microsoft.com is sharing your screen. [Stop sharing](#) [Hide](#)

7:30 / 1:37:56

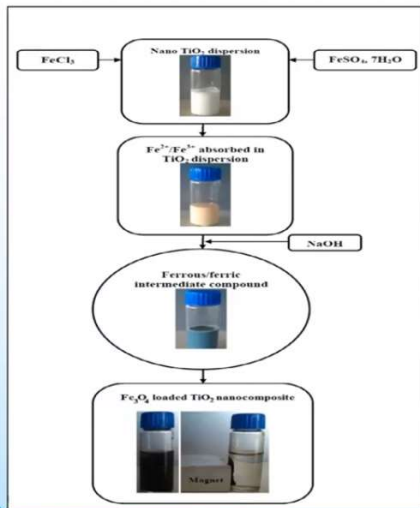
IP 1P NA DV CC

CHLORIDE PROCESS

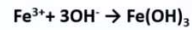
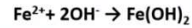


CB NA 1K NA 1C 1P 1S RB 1S

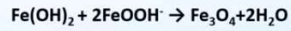
DR.DR.SS08 HE.MANTEHU CHAU... DR.DR.SS08 HARSHL PATADVA... DR.DR.SS08 Taral Solanki... RAJUL BHATT... DR.DR.SS08 AAYUSHI SOLANKI... DR.DR.SS08 HIMANSHU CHOWAN...



Fe²⁺ and Fe³⁺ are changed into hydroxide compounds after dropwise addition of NaOH.

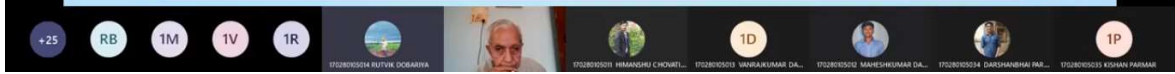


Ferric hydroxide Fe(OH)₃ can be further transformed into FeOOH, resulting in FeOOH-Fe(OH)₂ intermediate compounds formation. Magnetic nanoparticles (Fe₃O₄) can be made by conversion of FeOOH-Fe(OH)₂ compounds.

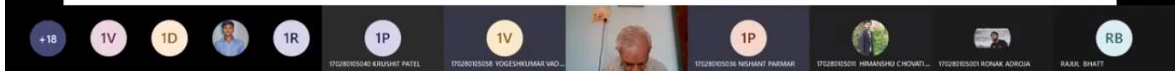


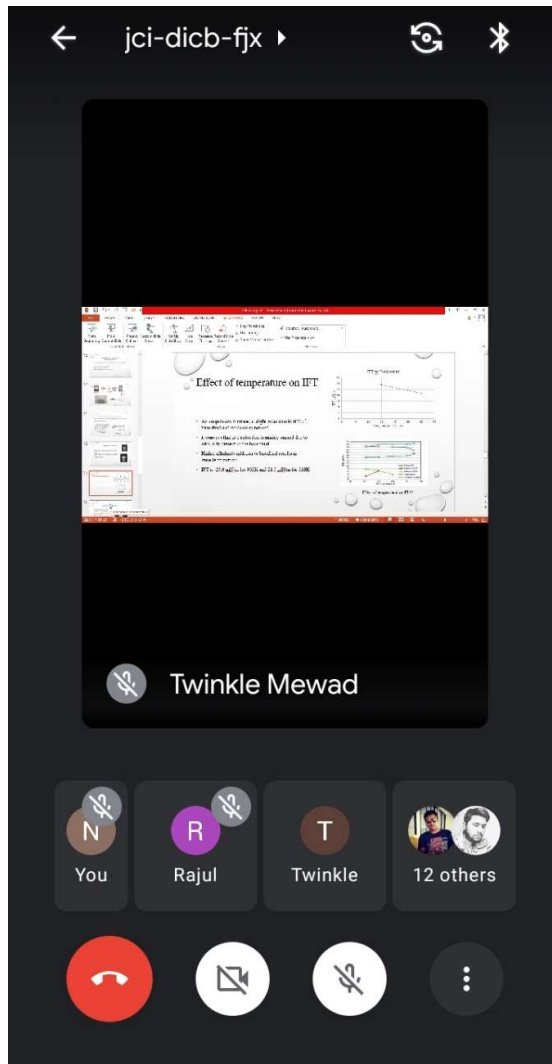
Result

By using this Fe₃O₄ doped TiO₂ for the treatment it is easy to separate these nanoparticles by using external magnetic field and reuse it again for further process. By this way, recovery of the particle is to be increased.

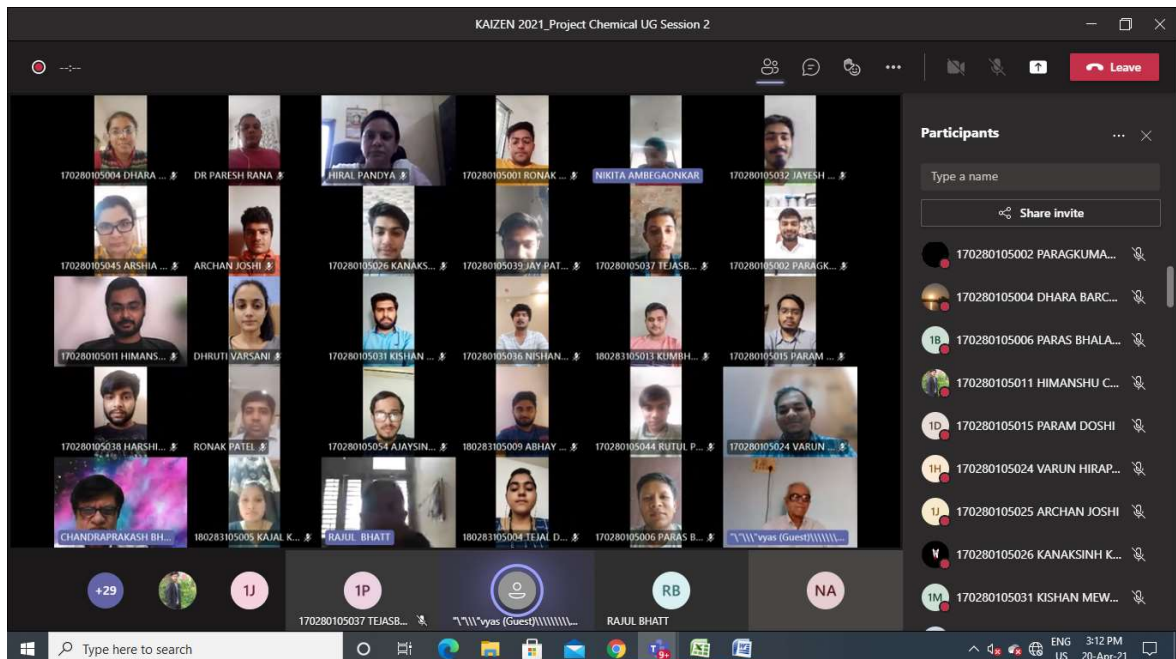


Experimental Study

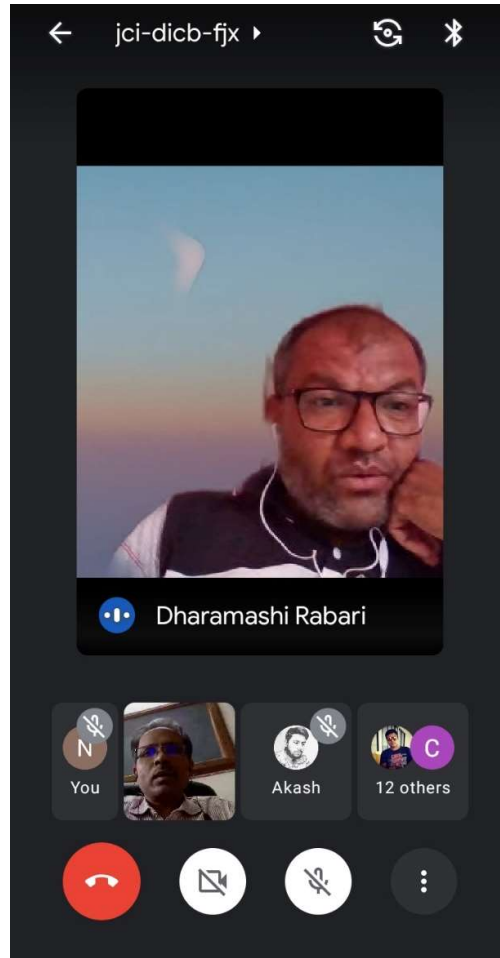
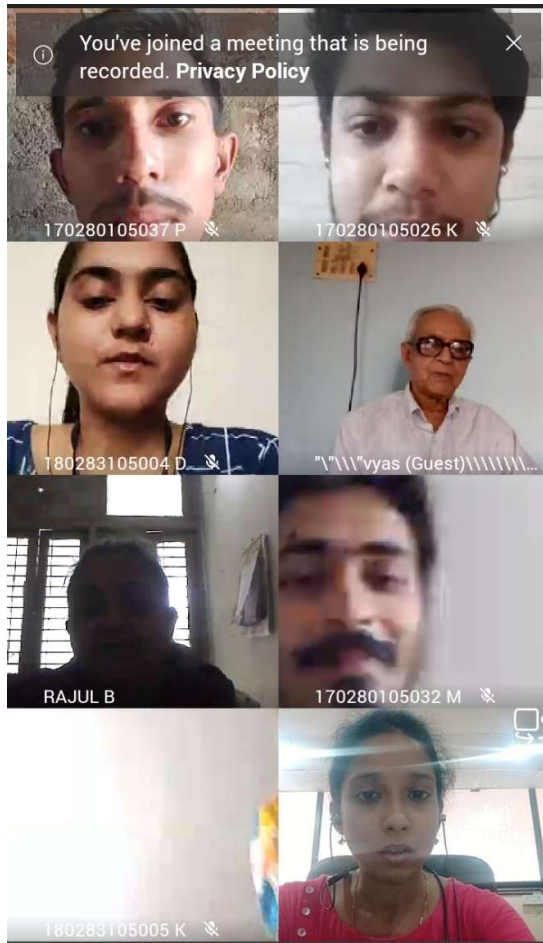




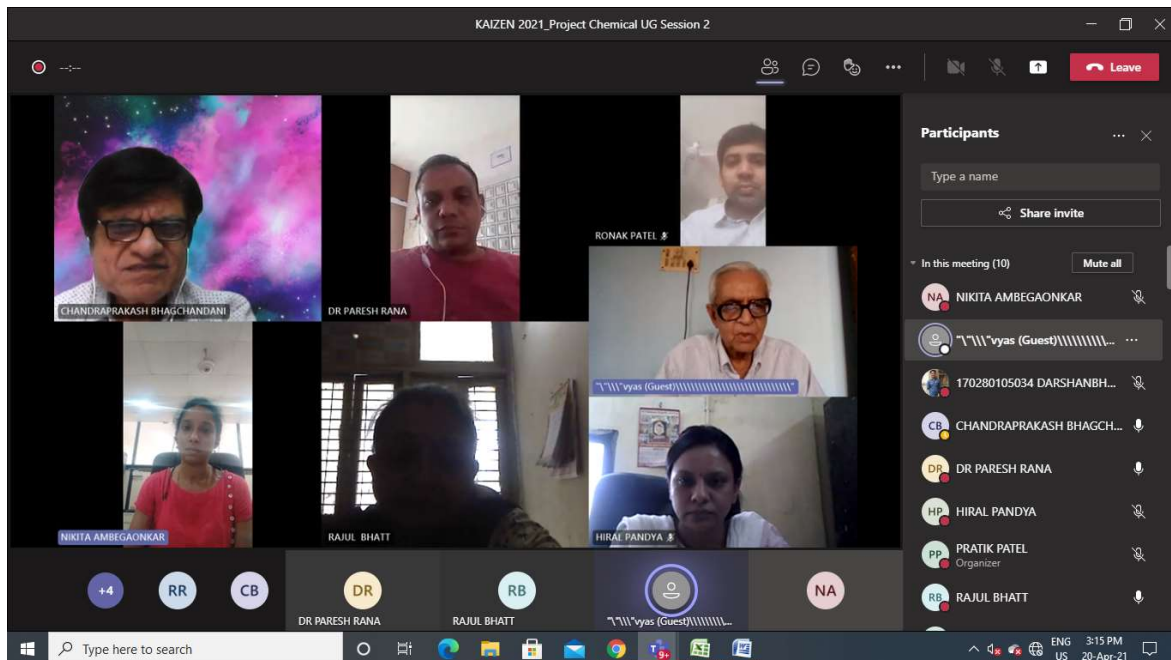
Group Photo with students, expert and faculties:



Expert- Student Interaction:



Faculty Expert Interaction:



2. Brief Detail of innovative projects having good industry/societal impact

(1) Name of project: Major Engineering Problem in Solvent Recovery in Distillation Unit(UG)

Abstract: In the agrochemical industry, solvent recovery of DEK from the mixture of DEK and NaX, by increasing the condensation rate. That will improve the economy level of that industry and that is environment friendly also.

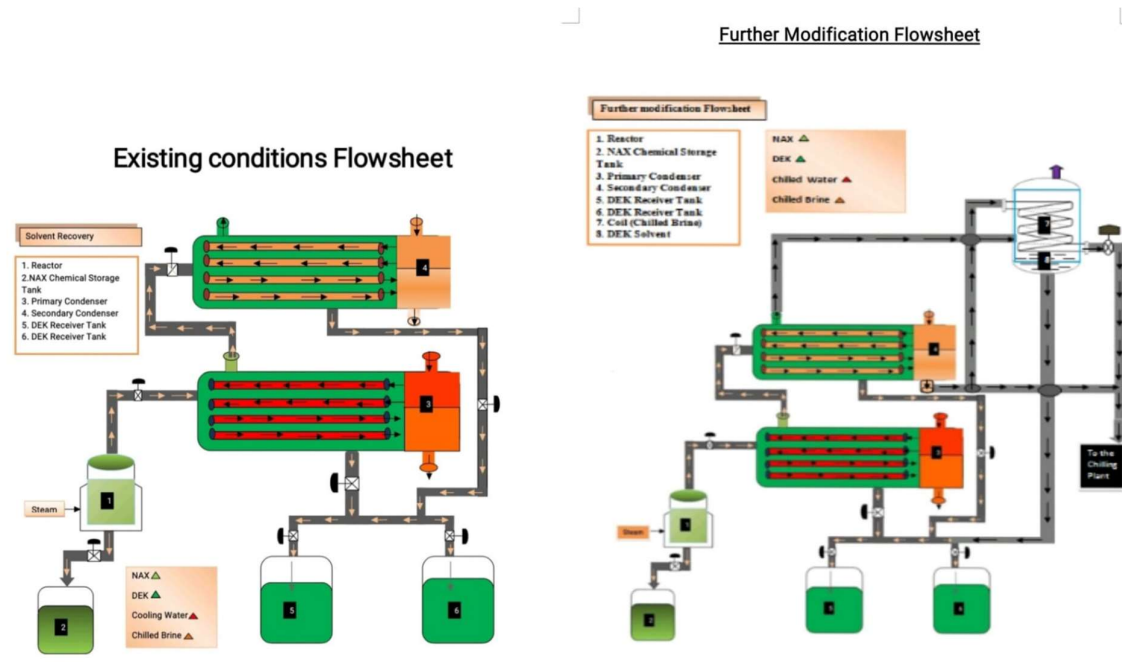
Team members:

- 1.Sonigra Nayan
- 2.Parmar Darshan
- 3 Mahaliya Rohit
- 4.Parmar Kishan
- 5.Kateshiya Vrajlal

Guided by:

Prof. S. M. Dutta
Associate Professor
Chemical Engg Dept-L.D.C.E.

Photos of the projects :



(2) Name of project: Synthesis of black TiO₂ for visible light photo catalysis

Abstract: Photo catalysis has been considered a potentially promising approach for renewable energy and environmental remediation with abundant solar light. We hereby propose to utilize the synthesized black TiO₂ for various applications in context with environmental remediation via photocatalytic degradation. So, self-cleaning occurs in visible light also and maximum UV radiation absorption occurs in synthesized TiO₂.

Sunlight also have source of UV light in 5-6%, so by using a sunlight this model is also work on that way

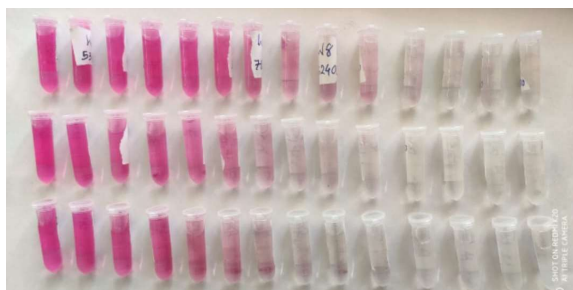
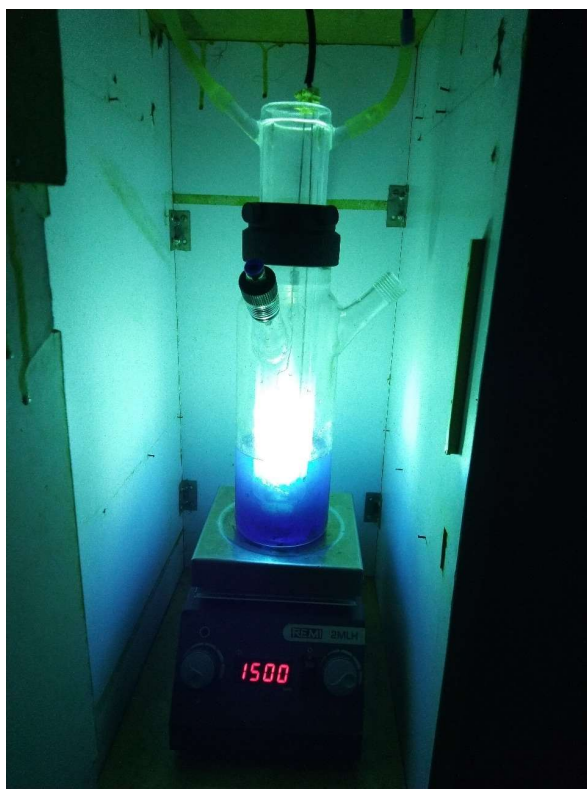
Team members:

- 1.Dobariya Rutvik
- 2.Chovatiya Himanshu
- 3.Dabhi Mahesh
- 4.Damor Vanraj

Guided by:

- . Pro.T.S.Rajaraman
Assistant professor
Chemical Engg Dept-L.D.C.E.

Photos of the project:



(3) Name of project: Evaluating Performance of Inorganic Fertilizers as Draw Solute in Fertilizer Driven Forward Osmosis for Wastewater concentration(UG)

Abstract: Forward osmosis (FO) is a novel and emerging low energy technology applied for the desalination of saline water and concentration of wastewater. FO process utilizes the osmotic pressure difference induced by the solute concentration difference between the feed and draw solution separated by a selectively permeable membrane. This work focus on performance of inorganic fertilizer such as Ammonium Sulphate, Magnesium Sulphate, Potassium Chloride as draw solutions for drawing pure water from waste water by using a thin film composite (TFC) membrane. The dilute draw solution generated can be used as a fertilizer solution and can be applied for drip irrigation (fertigation). Performance parameters like water flux, reverse permeation and a suitable draw solute recovery process is studied for possible commercial application.

Team members:

1. Rutvikumar Bhatiya
2. Bhavsar Yash V.
3. Pandya Jatin G
4. Pankhaniya Kumbhan N.
5. Patil Mitesh P.

Guided by:

Prof. S.M. Dutta
Associate professor
Chemical Engg Dept
L.D. College of. Engineering.

Photos of the project:



(4) Name of project: Development of novel organo ruthenium drugs for cancer (PG)

Abstract:

The quest for an anticancer agent that is less toxic and is highly selective continues. It turns out that ruthenium compounds offer the advantages of not being very toxic and being very selective for cancer cells. As cancer cells overexpress transferrin receptors to satisfy their increased demand for iron, ruthenium-based drugs (containing the iron homologue ruthenium) may be delivered more efficiently to cancer cells. In this paper two novel ligands naming: 6- phenyl-2,3- bis((4-(pyridin-2-yl)-1H-1,2,3-triazol-1-yl)methyl)quinoxaline and 6-(4-fluorophenyl)-2,3-bis((4-(pyridin-2-yl)-1H-1,2,3-triazol-1-yl)methyl)quinoxaline with their ruthenium complexes naming: 6-phenyl-2,3-bis((4-(pyridin-2-yl)-1H-1,2,3-triazol-1-yl)methyl)quinoxalineRu(II)-p-cymene complex and 6-(4-fluorophenyl)-2,3-bis((4-(pyridin-2-yl)-1H-1,2,3-triazol-1-yl)methyl)quinoxalineRu(II)-p-cymene complex respectively, have been synthesized and characterized by ¹H NMR and IR spectroscopy.

Team members:

1. Nisha Devi

Guided by:

Prof. P.H.Rana
Professor & Head
Chemical Engg Dept
L.D. College of Engineering.

Photos of the project:



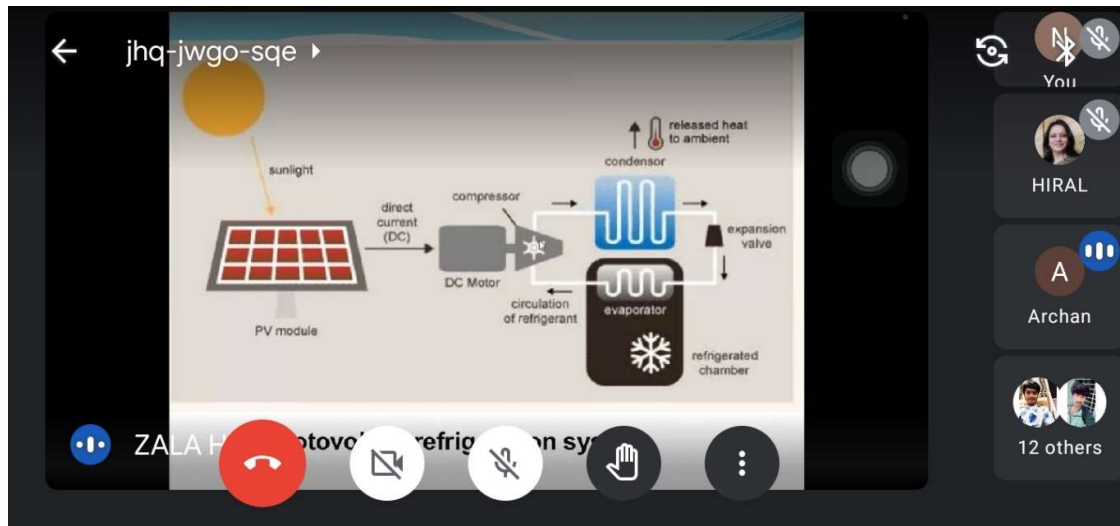
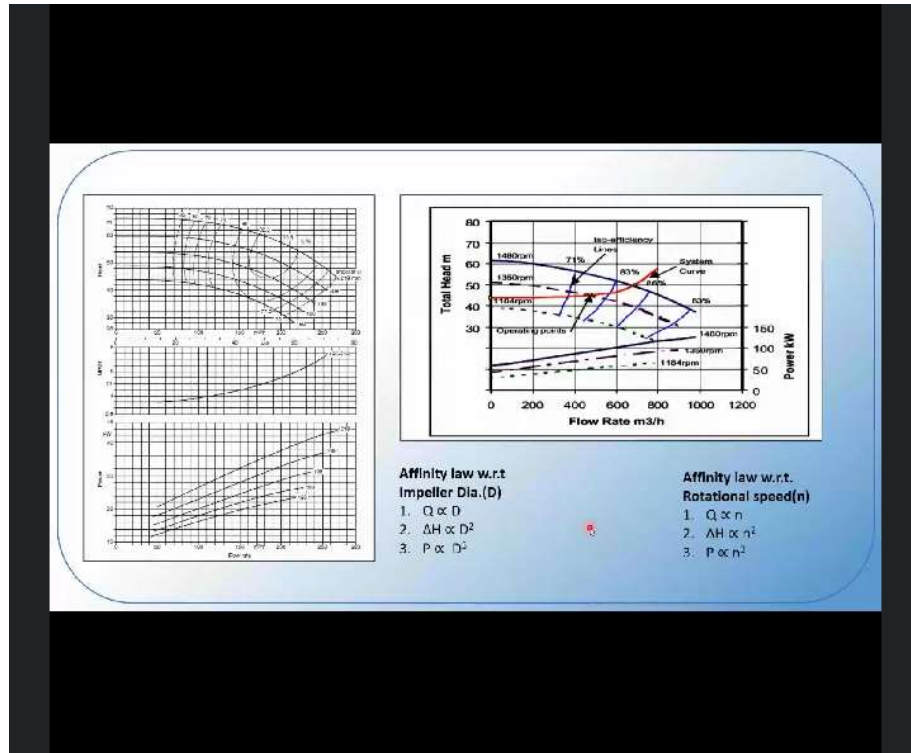


3. Continuous evaluation:

Chemical engineering department has organized mid sem internal review for BE Final projects for expert review on their work progress. Main aim of this was to give proper directions to the students in their project work. This evaluation helped the students to overcome their difficulties, to build up confidence, to improve presentation and communication skills. This can prepare students for their final presentation. Newer ideas or modifications suggested by the internal reviewers can provide them a new path of working and all the suggestions can be incorporated in the final presentations.

Four panel of faculty members and students was created and their online presentation was arranged. A presentation was scheduled in the month of April and their project works were presented by the students. Important suggestions, modifications, presenting skill related tips, presentation making tips, confidence building tips etc were given to the students. This has helped students in many ways.

Screenshots of the presentation:



4. Feedback:

(A) Feedback from the faculty members:

All the faculty members shared their valuable feedback regarding the Online kaizen event 2021. According to all the faculties, efforts given by students were commendable in this tough situation. Students have tried their best to come up with newer idea in this situation as

well and their hard work has paid them well. Presentation skills and communication skills can be improved through this event which boost the confidence in students, as agreed by all the teaching members.

As commented by senior faculty, Prof C G Bhagchandani, Innovative approach for the existing practise/ technology was the most important insight of the event and he really appreciated the young minds exploring the newer and innovative techniques for the existing practise/ processes which can be implemented in industries as well. According to him, cost analysis was area for improvement as cost estimation helps to implement the innovative idea into reality.

Another faculty from the department, Dr S M Dutta, counted this event as an excellent event where students can showcase their innovative ideas through their project work in front of the expert and they can get an idea, where they are standing and improve themselves. He really considered the panel discussion and question- answer session as important one as in this session only important comments from experts can benefit the students and a new path can be observed for advanced work.

(B) Feedback from the experts:

Both the experts Shree M N Vyas and Dr Dharamshi Rabari found this Kaizen event very good and technically sound event. It has provided a good platform the students to display their ideas through their project work. They both agreed on the point that, projects were innovative and few were having really good potential to work upon in future and can be implemented in real life.

(C) Feedback from the students:

All the final year and prefinal year students enjoyed the presentations and they came across many recent advances in the field of chemical engineering. They enjoyed presentation of all students and highly rated this event. They really liked the question-and-answer session and through this session they came to know about many new things.

Kashyap Rishabh, final year student, admired the important points suggested by the expert. He said that, expert highlighted the exact point where being students, we faced problems. He also considered the points suggested by expert as very relevant and important. Kashyap also suggested that the presentation of their project work should be accessible to other

people also. Another student named Dhruti Varsani said that the expert was very much involved in all the projects and helped them to unfold new aspects of the projects and helped learning new things. She would recommend this event to others as well.

All the prefinal year students were also exposed to the project work and they valued all the projects. They enjoyed this online event but preferred this to be as offline one for better and deeper understanding of the work.