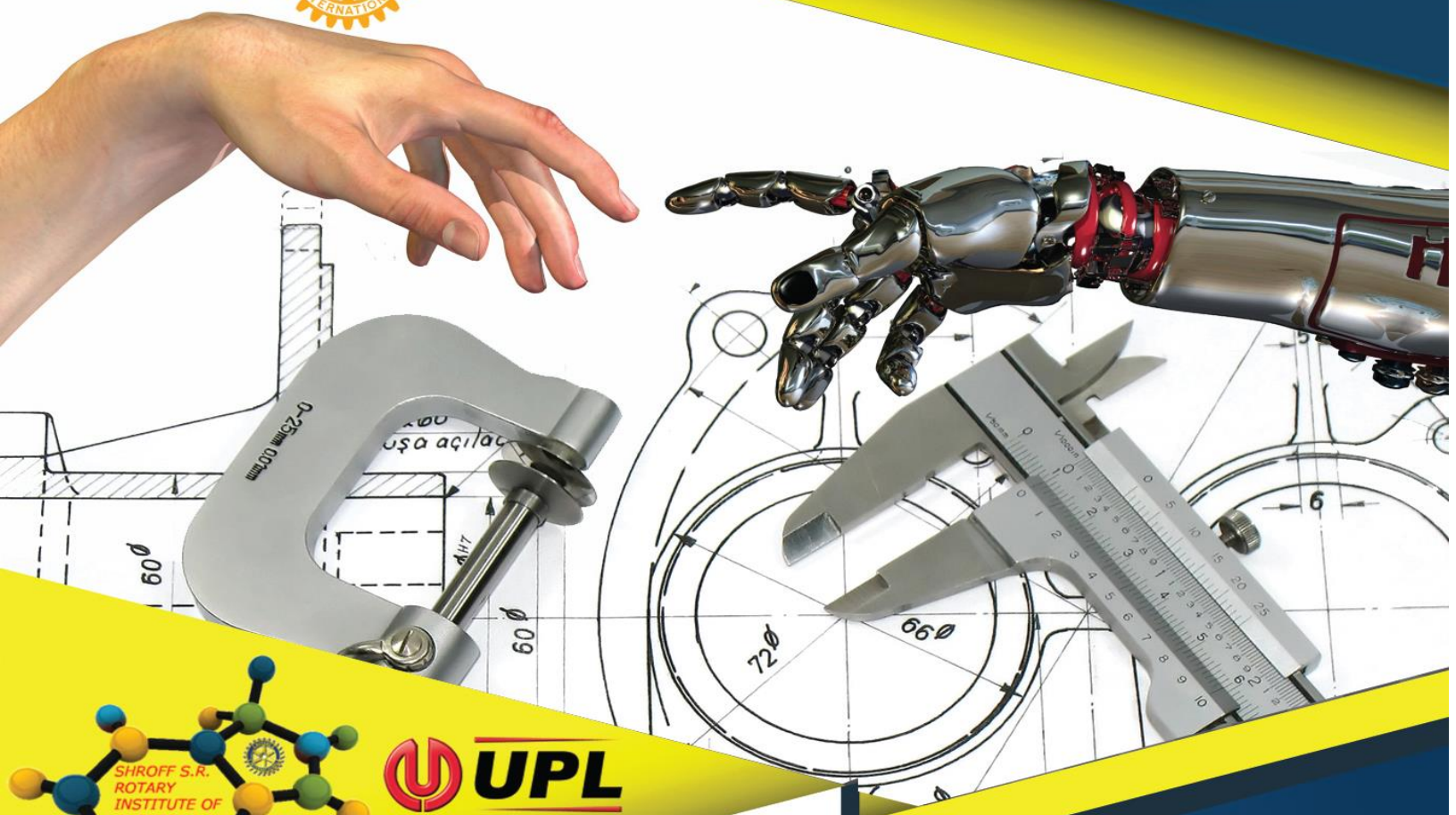
Kathan

ज्ञानम् यजामहे ।

Rotary



SHROFF S.R. ROTARY INSTITUTE OF CHEMICAL TECHNOLOGY

SRICT

UPL

KATHAN 18

October 2016

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EDITORIAL BOARD MESSAGE

Dear Readers,

It gives us a great opportunity to present the 18th issue of Kathan, the measure of developments and progress. The last quarter was full of various activities by students and faculties in academics, co-curricular, extra-curricular as well as research and developments.

Most significant developments include the GTU results where our college has successfully emerged on the top of around 102 colleges. This has been really a path breaking milestone in entire SRICT history. Our students have set such idealistic bench marks over and over again proving their persistence effects and excellence.

A magazine is like a mirror which reflects the clear picture of all sorts of activities undertaken by the institution and develops the writing skills among students in particular and teaching faculty in general. The key is simply to provide information that is likely of interest to a reasonable segment of the reader's community. It is willingness to make the efforts to share the knowledge, concerns and special insight with all at large that has made this issue possible.

This issue is at glance reflects of what has been achieved and re-discovered by us, all together as a team. We are now recognized as the sign of emerging excellence and research hub among industries and societies.

Please also keep in mind that we seek "articles" which have no peer review because the intent is to share the information, view and insight rather than a research results. It's an opportunity to assemble together and organize ideas that are of worth sharing with each other at large. It is of worth our last issues have been highly appreciated and thriving for their rich contents.

Thanks to all readers and enjoy reading to explore the unknown info….!!!

Our special thanks to **Mr.P Balagopal** for sharing his view with best of his knowledge.

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A MESSAGE FROM AN INDUSTRY PERSON:
संदेश

Mr. P BALAGOPAL

Vice President (Project)

Torrent Pharmaceuticals Limited, Dahej

PROFILE

Completed Degree in Engineering in First class with Honours.

Joined Bhabha Atomic Research Center Training School to successfully complete the course with a high grade based on the performance during the period of study.

Worked at BARC Trombay facility for nuclear related projects, handling Instrumentation and controls involving very special applications that included highly radioactive material handling. This career spanned for nearly six years.

Moved on to a different industry that was in the field of Foods & Pharmaceuticals. This was GSK Pharmaceuticals Ltd., where I spent eighteen years, transforming myself to a handle Foods and Pharmaceutical projects, gaining good knowledge of the industry and the processes. In addition I got to work in other areas of Business processes thus gaining knowledge and acumen to handle general management functions.

After GSK Pharmaceuticals, worked in the same industry segment, i.e., Pharmaceutical and Cosmetics. I was handling a bigger portfolio that included all functions associated with Technology and manufacturing operations.

Has to credit, 36 years of industry experience.

MESSAGE

The day is of Technology. In today's nomenclature Technology is akin to I.T. It has brought about a revolution in Industry in addition to all walks of life, making a difference in how we conduct business today.

Engineering is nothing but application of the fundamental principles of science. When one finds applications where the basic principles of science can be applied then you have it engineered for use by mankind to make his life easy to manage, move away from dependencies, bring about efficiency, improve accuracy, reduce time to achieve results, add safety to state a few.

The above attributes necessarily builds the need in the society, to crave for new technology, generates the necessity for technology, more and more of it to help them improve their way of life. It is this aspect that necessitates growth and innovation in technology.

Thus all of the above aspects give the required energy, and momentum, for technology upgrades, including development, aligned to meet the needs of the society, in order to make it a better place to live. Computer engineering is an example that exemplifies this fact. This science is always moving towards replacing manual jobs, otherwise carried out/conducted by mankind, using machines, which brings about flexibility, speed and accuracy in the jobs, when computers are employed.

Chemical technology that replaces natural resources to meet the need of industry, creating technology for special materials to comply the different industry needs, indeed has been a real boost to the development of technology. Examples are the special materials for space craft, plastics that is and has changed the world, evolution of new molecules that is helping manufacture of medicines in the treatment of the disorders, with added efficacy and safety.

Another industry that had transformed is in transportation, which includes automobiles, wherein improved technology has brought in features that add, comfort, safety, fuel efficiency, reduced pollution, and enhanced life style.

In their stride to implement new technologies there have been hurdles typical to technology implementation, which on identification has to be dealt with which also brings along with technology challenges. Hence current technology is working towards developing new methods in those areas such as pollution controls, use of natural energy for use for various applications, reduce generation of harmful polluting processes and materials.

There is wide spread development in the areas of Instrumentation and controls, which helps accurate measurement, control, and improve efficiency. This applies to metallurgy another field of engineering that is changing the face of things to come.

By this it is evident that innovation is the way of life, change the way we do things for effective improvement, think always for betterment. Apply the fundamentals of science to create a different world we live.

"BLOOD DONATION"

[DEEPIKA SHAH – COORDINATOR RAKTA KUNDLI – 8]

The institute had organized a mega camp of Blood Donation on 31st August 2016.

The Committee of following members was constituted to carry out the camp activities:

1. Mrs. Deepika Shah (Coordinator)
2. Mr. Pintu Prasad (Member)
3. Mr. Pankaj Patel (Member)

And 26 student volunteers (Rotaract club of SRICT) were given responsibilities to fulfill the requirement of the camp as well smooth functioning of the whole event.

Blood Donation Camp:

The Institute has decided to make an awareness drive on Blood Donation. Hence, a camp of Blood Donation was held on 31st August, 2016 for 8th consecutive time named as **"Rakta Kundali 8"**

Following of the guests were present:

On invitation of the Institute, the following dignitaries were present in the camp to appreciate the participants.

1. Mr. Angiras Shukla, Secreatary-ARES
2. Mr. Dharmesh Patel , President-RECA Green
3. Mr. Krunal Suthar – IPP-RECA Green
4. Dr. Snehal Lokhandwala-PP-RECA Green
5. Dr. J. J. Khilwani – Indian Red Cross, Bharuch

The Chief guests of the function Rtn. Angiras Shukla gave their valuable suggestions to the participants and also appreciated the responsibilities carried out by the students for the healthy society.

Participation:

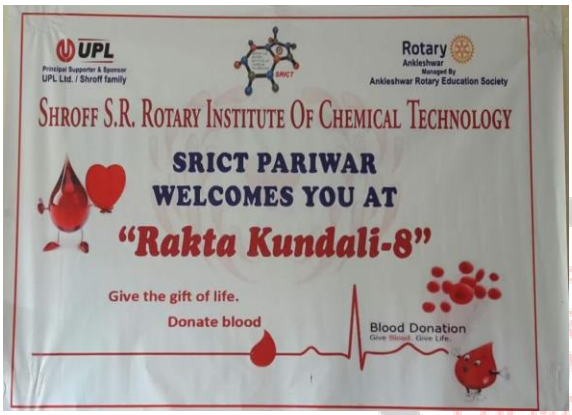
Total **160 units of blood** were given by the Students, faculty & staff members.. Due to limitation of Red Cross, we have to deny the students for Blood donation, which is remarkable for our Institute. The students, Faculty & Staff members participated very enthusiastically.

Sponsored & Supported by:

The entire event of was jointly sponsored by Rotary Club of Ankleshwar, Rotary E-club of Ankleshwar Green , Rotaract Club of SRICT, Ankleshwar. The Indian Red Cross Society, Bharuch carried out the entire camp.

Conclusion:

Shroff S R Rotary Institute of Chemical Technology, Vataria had organized a Blood Donation Camp named “Rakta Kundali 8”. The Indian Red Cross Society carried out the entire camp. A team of SRICT led & coordinated by Dr. Deepika Shah had organized the event in such a graceful way. They appreciated & motivated each of the students & made the event grand success.



INDEPENDENCE DAY CELEBRATION

[MSH DEPT]

SRICT celebrated 70th Independence Day with high spirit and pride. Honourable Rtn.

Sunil Vyas, President, Rotary Club of Ankleshwar was the Chief Guest of the Day. Mr. Sushil Kumar, President, GMS Reliance Industries Ltd was the Chief Guest of cultural program ; First Lady Mrs. Vyas; PP Rtn Narendra Bhatt, President Nominee, Rtn. Ishawar Sajja were other guests of honour on the occasion. Honourable Secretary, ARES, Rtn. Angiras Shukla, Honourable Principal, SRICT, Prof. Shrikant Wagh, Students, and faculties remained present for the programme. Tricolour was unfurled at the hands of Rtn. Sunil Vyas. This was followed by the National Anthem sung by all our SRICT family members. Mr. Sunil Vyas addressed the gathering.

After flag hoisting, we had tree plantation activity coordinated by Nature's Club. Next to tree plantation, Cultural Program was scheduled. Prof Shrikant Wagh, Principal

welcomed the gathering. Mr. Hemant Balsora, Assistant Professor, SRICT recited a patriotic poem. Mesmerizing dance performances were given by the student of SRICT. Patriotic group songs were also sung by the students. Mr. Sushil Kumar gave speech on the occasion.

Jayman Scholarship, Shrimati Prakashvati Gupta Scholarship, Shri Ram Kumar Gupta Scholarship, prize and certificate to Yoga competition winners, excellent students of English Proficiency Course were distributed among students by the hands of our distinguished guests.

TECHNOVATION 2016

Under the banner of Sustainable Technology, SRICT celebrated the fourth annual technical fest to promote technology, scientific thinking and innovation among the students, which has been creating a visual spectacle year after year, was held on 23-24 September 2016.

This year also the participation was made open for other college students. The participation of more than 1100 students comprising an outreach of more than 16 colleges participated in around 18 events like Robo-race, Aqua-thrust, Chemical synthesis, Junkyard, Chem-e-car, Insta-design, technical workshops, Treasure hunt and lot more.

The techfest was inaugurated by the hands of the Chief Guest Shree A.K. Jain, VP operation, Jubilient life science in a very unique, technical way of Contraption. The theme for the event was 'Mera Bharat, Swatchh Bharat'. TECHNOVATION hits the horizon effusing vistas of fervor, thrill and exuberance.

Dr. Shrikant Wagh, Principal delivered the welcome speech during inaugural session. Mr A. K. Jain, addressed the students by sharing his own experiences as an engineering student. He described about how important are such Techfest, also

mentioned how struggle and hard work will benefit the students irrespective to whichever branch the student is from. The

Souvenir second edition of Technovation 2016 i.e., "TECHNOPHILE" was unveiled on the inaugural session. Vice chairman Shree Ashok Panjwani addressed the gathering emphasizing the need of our theme 'Mera Bharat, Swatchh Bharat'. He also appreciated the efforts made by the team.

Events were celebrated with great zeal and enthusiasm for entire two days. Chief Guest of valedictory function Mr. Sushil Kumar from Reliance Industry spent the entire day witnessing various events of day-2 of Technovation. During valedictory function, winners were given cash prizes worth Rs. 64000 and certificates.

Overall it proved to be a good platform for students to interact, share and exchange innovative and technical ideas.

"SHAKSHATKAAR"

[DEEPIKA SHAH – COORDINATOR THALASSEMIA AWARNESS AND CHECKING CAMP – 6]

Looking forward to comply with the Hon. Vice Chancellor's Circular No. GTU/VC/Thalassemia/1848/2012, Dated 21.02.2012, Gujarat Technological University, Ahmadabad; Shroff S. R. Rotary Institute of Chemical Technology organized a camp for Thalassemia testing on 20th August, 2016, putting one more step forward in continuous efforts of fulfilling social responsibility. Seeing the increasing numbers of Thalassemia minors in Gujarat, The GTU take initiative to look in very seriously and introduce the Thalassemia as bridge course in course curriculum (Subject named SCC), Circular No. GTU/Academic/Bridge Course/2013/6961, Date: 18/7/2013. The institute took the initiative and has been organizing such camp since last four years.

The Committee of following members was constituted to carry out the camp:

1. Mrs. Deepika Shah (Coordinator and RCC)
2. Mr. Dharmesh Patel (President RECA Green Ankleshwar)
3. Mr. Tirth (President Rotaract)
4. Mr. Rushbh Jadhav (IPP Rotaract)
5. Mr. Hamza (Secreatary Rotaract)

Thalassemia Awareness & Testing considered as a Mega Event:

The Institute has decided to make an awareness drive as mega event. Hence, a camp of Thalassemia Awareness & Testing was named as **"Rakta Kundali "**

As per the guidelines of GTU the parameters of Social Responsibility, Awareness & the Health of the students have been taken in view of priority.

Awareness Drive of Thalassemia:

The participants have seen the 30 minutes video of Thalassemia Awareness and try to understand the facts of Thalassemia.

Participation:

All students of 1st year and D_2D who registered went through Thalassemia Test & proved their commitment for future healthy society. Total 178 students had Thalassemia Tests at the Institute.

Sponsored & Supported by:

The entire event of Thalassemia Test was sponsored by Rotary Club of Ankleshwar. The Indian Red Cross Society, Ahmadabad carried out the entire camp.

Final Analysis:

Looking into the report received by the institute, total 02 students detected Thalassemia minor, 02 student detected suggestive of Sickle Cell Trait, 01 students detected Suggestive of Hb E-Trait out of 178 students.

Future Action:

The institute will organize the counseling session for students and their parents.

"SHAKSHATKAAR"

[DEEPIKA SHAH – COORDINATOR, SCHOOL VISIT.]

Since last four years, we are arranging school visits at our Institute. In continuation of the same during current Academic year 2016-17, the following schools had visited our college.

Sr. No.	Name of School	Date	Number of the students
1.	Govt. High school , Rajpipla	1/9/2016	40
2.	Jay Ambe Ankleshwar	17/9/2016	105
3.	Jay Ambe Ankleshwar	19/9/2016	55

The students of the school were informed about the facilities of the college along with various career options. The students showed their keen interest about their future. The students were very enthusiastic and overall visit was meaningful.

NEERI VISIT

20 final year students, from Shroff S R Rotary Institute of Chemical Technology (Ank-Gujarat) of Environmental Science & Technology Department: were accompanied by two in-house faculties, Lab Asst and Asst. Prof visited the National Environment Engineering Research Institute (NEERI-

Nagpur). The duration of the visit was for one day viz; 30th August 2016.

Our visit started with short introduction about NEERI, formally known as Public Health Engineering Research Institute (CPHERI) started in 1958. It was rename as NEERI by Late Prime Minister Indira Gandhi in 1974.

Post the visual Mr. Takade, took us through an introductory presentation comprising of the important departments and the novel technologies at NEERI.

We started our laboratory visit from the "Analytical Laboratory". Our next visit was to the Solid Waste Laboratory where a young Researcher Ahsootosh explained his research work about the Production of Biogas from food waste.

We also visited the "Harit Museum" which houses a number of miniatures on the commercially proven technologies invented by NEERI. Each miniature model carried a brief description about the respective technology used.

We visited "Air pollution control Department" where the chief scientist Dr. Padma Rao explained the Continuous Air Monitoring Program (CAMP). We later moved to the "waste water laboratory" in which students learned about advanced waste water technologies. On moving towards the "Waste water Laboratory" a young scientist explained his project on the removal of ammoniacal nitrogen using amonox Bacteria.

Finally we visited the "Solar Environment Park" where nationalistic scientist has developed different technologies using plasmatic materials to achieve the reduction of waste water pollutants with the help of solar energy.

The entire team of SRICT returned rich with it also gave students an understanding of the scope that they had as environmentalist.

REPORT ON SHRAMDAAN

1. Introduction of Andada village

We are living in the 21st century. Those lucky few of us who are living in city are taking advantage of the technology of the new century. For us, the biggest headache is either reaching the place we are going in time or time taken to charge our mobile phones. Amidst all the progress, there is stark reality of the villages. Our fellow brothers and sisters who are living in village are still living in the time which has stopped and there is no progress. Yes there are mobile phones, and yes there are few luxuries of city life that have reached the villages too. But the question of hygiene and cleanliness is still a big issue.

Our honorable Prime Minister, Shree Narendrabhai Modi felt the pain and decided to act for the same. To eradicate this issue, he launched Swachh Bharat Mission in 2014. The government is aiming to achieve an Open-Defecation Free (ODF) India by 2 October 2019, the 150th birth anniversary of Mahatma Gandhi, by constructing 12 crore toilets in rural India, at a projected cost of 1.96 lakh crore (US$29 billion).

As part of this mission, team comprising of Engineering Students, Faculty members and Government officials was formed and launched a campaign of 5 days in the village of Andada. The aim was to give Shramdaan and helping government to achieve the goal of defecation and creating awareness amongst villagers about the benefits of using the toilets.

Andada is the small village which is located in Ankleshwar Taluka, in Bharuch District. While few villagers do enjoy the facility of toilets, there are many who do not have toilets in their homes. The team's aim was to build the toilets for the same. The details of the work done is given in the detail as followed in the subsequent pages.

2. Team information (names)

Students - Entire 1st year batch

Staff members -

Amit Galpade, Dipen rana, Rudra Parmar, Om Prakash, Sahid Ali, Jigisha Modi, Vinita Vakkayail.

Beneficiaries -- (Not provided to us)

Support person – Government employee – Ishwarbhai

Faculty coordinators and officers – Mr.Maitreya Pandya ,Dr. Piyush Mistry, Sanjay Patel, Manish Mishra

3. Learning from Shramdaan

The team learnt many different things from Shramdaan. Generally we have sympathy for the people who suffer. But when we experience the same thing and see it ourselves how things are difficult, we feel the empathy. The students felt the empathy for the villagers. They experienced it first-hand how things are at grass root level.

Many times we take things for granted. Some things which are luxury for others are something that we come to accept at de-facto for us. But looking at the living style

of villagers, students came to understand how much they are thankful to their parents and appreciate their efforts taken for them.

Today is the age of team work. An organization cannot survive which does not have people willing to work as a team. Students learned to work as a team. More importantly, they learnt to solve the problems that were coming their way as a team.

The future of India lies with the students of today. They are the ones who will bring the solutions to today's problem. To do so, they must go and do work at grass root level. This was one big opportunity to work at grass root level and this learning will help them vastly in the future.

Last but not least, every one works for oneself. But the greatest pleasure is derived when one works for others knowing that there is going to be no return gesture while giving joy to others. This was the pleasure that the team derived while working for the villagers knowing that what they are building will never be used by them but it will make life of the villagers much better.

A REFRESHER COURSE ON "CONVENTIONAL AND ADVANCED SEPARATION PROCESSES"

The Department of Chemical Engineering has organized a refresher course on Conventional and Advanced Extraction Processes at Shroff S. R. Rotary Institute of Chemical Technology on Friday, 12th August 2016. This is the fifth refresher course organized by the Department since 2012. Previously, there have been courses on other unit operations like distillation, heat transafer, mixing and solid liquid separation. This course covered the basic concept of liquid-liquid extraction as well as solid liquid extraction with advance extraction processes.

The inaugural function was graced by Mr. Ashok Panjawani, VC ARES, chief guest Mr. Raj Arora, unit head UPL-2, Dr. Shrikant J Wagh Principal SRICT and Dr. Alok Gautam Head of Chemical Engineering and coordinator of the course. Mr. Arora appreciated in his speech the efforts taken by SRICT to interact with industries by these courses. Dr. Wagh delivered a welcome speech and Dr. Alok Gautam briefed about the course. The course was well organized by Dr. Shina Gautam, Dr. Sanjiv Dharwadkar, Mr. Yashwant Bhalerao, Mr. Hemant Balsora, Mr. Krunal Suthar, Mr. Chirag Mevada, Mr. Chintan Modia and Mr. Akshay Magodhara, Mr. Endrick Contractor and Mr. Sagar Kapadia, Mrs Nirali Tharwala and Ms. Preeti Parmar.

First session was on basics of liquid-liquid extraction and solid-liquid extraction and delivered by Mr. Rahul Chaudhari, Assistant Manager, UPL-5. Second session was on selection and scale up of extractor delivered by Mr. Rilesh Mehta, Process Engineer, Solvay Panoli. In first two sessions basic and conventional extraction processes were discussed. In next two sessions, course was moved towards advanced extraction.

The third session was delivered by Dr. Dipaly Datta, Assistant Professor, MNIT Jaipur who discussed about reactive extraction which is faster and solvent is regenerated after extraction. Fourth session was delivered by Dr. Meghal Desai from SVNIT Surat who discussed hydrotropic extraction of essential oils from lemongrass.

All the sessions were interactive and views sharing. The participants were from different industries and institutes like UPL, Atul, GNFC, Solvay, GRP, Lupin, M S University, and Pacific College of Engineering etc. Attendees at a seminar shared a common interest in the subject matter. Course helped gaining knowledge in a particular subject area. Feedback of the participants was quite positive.

PROGRESS REPORT OF THE R & D PROJECTS

1) Plastic bags pick up project

Successful live demo of plastic bags pick up equipment has been done. Set-up was designed based on previous calculations.
The equipment is ready for the roadside plastic pickup. Investigators are also considering to make it mobile to increase its viability. The team is also working on writing a patent.

2) Bio-diesel from Jatropha seeds

Bio-diesel by esterification of Jatropa seed oil has taken place in the laboratory. The detailed characterization of the bio-diesel has been done which is compatible with blending of diesel.
The team is working on to expel oil mechanically by expeller. They are designing an expeller which can expel oil effectively and efficiently.

3) Electrochemical waste management

Under guidance of Prof Guha substantial progress is going on the project. To increase the speed of the project number of set up in the lab was suggested to increase. The team is studying to find the kinetics and mechanism of the process

4) Plastic Waste to fuel

The experimental set up is ready to work on. Trial experiments have already done.
To get the more and quality oil product experiments are going on.
HAZOP study of the set up has been done and few modifications are considered according to the HAZOP study.

5) Recovery of precious metals from Electronic Waste

Experimental evaluation of the recovery of gold and silver has been done. To separate individual metals from the solution, the

team is working on synthesizing different adsorbents. The team is also working on the design of pre treatment equipments.

6) Refuse derived fuel to Syngas

HAZOP study of design of gassifier was done. Detailed flow diagram of 200 kg capacity of MSW plant with material balance was discussed. Out of 200 kg 160 kg was sellable. Ingenero design with modification by team was discussed. A small experimental set up to study the kinetics and thermodynamic equilibrium is planned to make with the help of BEIL. Lab scale reactor for the pyrolysis is present in IITB and a visit is planned in first week of May.

7) Recovery of Lead from used batteries

Modified furnace with almost closed top was discussed. Plant in operation in Ludhiana for lead recovery was visited by Dr. Alok Gautam and Mr. Anand Upadhyay. The process used there is similar to the process discovered by the project investigators.

8) Paint Sludge to Primer

Project is completed. Characterization of the product needs to be sent to Asian paints laboratory Mumbai.

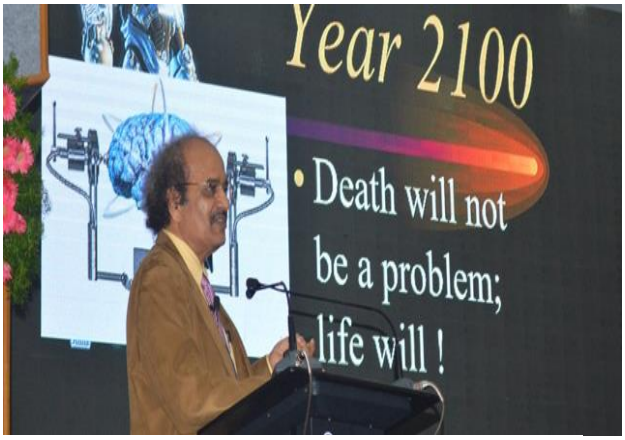
9) Recovery and recycling of used oil

Process development of the refining of oil has been done and process wise project is completed. Costing of the process per month/ year for the 20 t /month capacity needs to be done.

Report: SCHEMCON-2016 Fest in Hyderabad

SCHEMCON is a Chemical engineering student's conference organized every year by the student's chapter of Indian Institute of Chemical Engineers. SCHEMCON-2016 is the 12th edition of the mega annual event that is being organized to share the state of the art developments and achievements made in field of chemical engineering. The theme for this year's conference is chemical engineering cutting edges-towards brighter prospects. This conference is being organized by the IICHE student chapter and chemical engineering department of B.V. Raju Institute of Technology (BVRIT).

Dr.CH. Venkateshwarly, Principal BVRIT, KV Vishnu Raju, Chairman of Sri Vishnu Educational Societym Prof Satyanarana, many Chemical Engineers graced the occasion. .The SCHEMCON 2016th is the 12th annual session being organised by BV RAJU Institute of Technology in association with Indian Institute of Chemical Engineering and Osmania University Chemical Technology, National Institute of Technology Warangal, BITS, JNTU-H, CBIT, JNTU -A, CVSR & others informed KV Vishnu RAJU, Chairman of Vishnu Education Society; Prof Venkateshwarlu Chairman of Organising Committee and Prof CB Radhika, Organising Secretary.



The two day meet was held BVRIT at Narsapur, 60kms away from Hyderabad. 1000 Chemical Engineering students from prestigious institutions like Delhi University, JNTU-H, JNTU-A, CBIT, NIT Trichy, MIT Pune, Annamalaya University and Gujarat Technological University are participating in the event.
During two days, 15 students of 5thsem and 26 students of 7thsem of chemical engineering department of S.R.I.C.T. participated in Lectures, Paper, Poster Presentations, Technical quiz event and Project Exhibition.

The conference concluded with the presentation of the awards.

HOW EPC COURSE IS HELPFUL TO THE STUDENTS AT SRICT.

[RUTUL PATEL, 5TH SEM EST STUDENT]

English Proficiency Course at SRICT is aimed at proliferating the linguistic skills and overcoming the stage fear of speaking English.

As an outcome of this course we as a students can now develop the multifaceted skills like:-
(i) READING SKILL: One is able to read the paragraph or any article very smoothly and with more accurate pronunciation.

(ii) WRITING SKILL: One is able to write any text type like letter, notice, report etc. nicely.
(iii) LISTENING SKILL: One is able to understand or extract the information from the sender very properly.
(iv) SPEAKING SKILL: One is able to speak English more fluently than ever before & able to get rid of stage fear to take part in any debate or elocution competition.

With the increasing demand of English Fluency SRICT feels the need of launching English proficiency course for the students. The students awestricken with the difficulty of speaking , understanding or writing English are now find themselves capable of doing it very easily. Learned Faculties of this course are coming up with meticulously designed syllabi for all branches of Engineering. There are four stages of EPC. The SRICT management is very stringent regarding this course by making it a mandatory criterion for registration to Training & Placement Cell.

Students coming from Gujarati medium are a direct beneficiary of the course. The success of the EPC course lies in the fact

that the students in elocution competition, debate, group discussion or essay writing are coming out with flying colours nowadays.

HOW EPC COURSE IS HELPFUL TO THE STUDENTS AT SRICT.

[MIRAL JALU, 5TH SEM EST STUDENT]

English Proficiency Course at SRICT has been designed with a view to blossoming a variety of linguistic skills the world is hankering after.

As an Engineering students we can now write with greater accuracy, speak more fluently and express their opinions on controversial subjects with effective communication. It helps to develop the multifarious skills like –
(i) READING SKILL: Ability to comprehend the meaning of the text and demonstrate knowledge.
(ii) WRITING SKILL : Ability to write various text types with a range of functions.
(iii) LISTENING SKILL: Ability to extract information from a text and to make out speaker's viewpoint and intension.
(iv) SPEAKING SKILL: Ability to develop verbal English fluency using a range of functions in a variety of tasks.

We realized that to enhance our employability prospects English continues to be in demand all over the world as an international language of trade and industry. There is an escalating upsurge for people who can communicate effectively in English in a variety of contexts. It helps one to employ a wide range of vocabulary including less common Lexis with fluency, precision and sophistication. The English Proficiency Course prepares students for this kind of communication.

Learned Faculties at the Institute are painstakingly working for the students with meticulously designed course material of EPC of which the students of this institute are getting benefitted directly.

ACTIVITIES IN DEPARTMENT MECHANICAL ENGINEERING

[DEPARTMENT OF MECHANICAL ENGINEERING]

Parents Meeting

Mechanical Engineering Department has successfully organized (PTM) Parents Teacher Meeting for 7th semester MED students on 10th September, 2016. In total 30 parents had attended this meeting and give positive response for the meeting. The general discussion had been carried out on their wards exam performance, attendance, training and placement activities, GATE coaching classes etc. Meeting ended with high tea and snacks at canteen.

3rd Year MED (Parents-Teacher Meeting)

Parents-Teacher meeting, "Sampark Abhiyan" for the 3rd year (5th Semester) Mechanical Engineering Students was arranged by Department of Mechanical Engineering on 1st September, 2016 at SRICT Seminar Hall No. 03. Mr. Hiren R. Mahida (HOD, Mechanical) interacted with parents about MED Faculties, Laboratory Facilities available in MED, CES Exam, Attendance Criteria, GTU Results of 4th MED, CES-I & II Results of 5th MED, T & P Eligibility Criteria, IV/EL of 5th Semester, 5s, EPC, VLNC and NBA. Parents' were requested to motivate their wards to enhance their academic performance. Feedback given by parents was found good about SRICT and MED. Parents gave suggestion regarding Bus facility from Bharuch for Students, GATE Exam Coaching Class and not receiving Attendance Message.

PARENT-TEACHER MEET (EST DEPARTMENT)

[PRATIBHA GAUTAM, ASSISTANT PROFESSOR, EST DEPARTMENT]

Department of Environmental Science & Technology organized Parent-Teacher Meet (PTM) on 10/09/2016 for 3rd semester students. A very good response was received from parents with lots of compliments for SRICT.

Around 45 Parents attended the program. The program was started with welcome note

by Mrs. Pratibha Gautam, followed by interaction session by Dr. Snehal Lokhandwala (HOD). It was a very interactive session where Dr. Snehal talked about facilities, motivation and Expectation from SRICT and Parents also came up with their concerns and doubts. All the faculty members were actively involved during the program. The session was ended with vote of thanks and tea & snacks at canteen.

ACTIVITIES IN DEPARTMENT OF ELECTRICAL ENGINEERING

[DEPARTMENT OF ELECTRICAL ENGINEERING]

Webinar on NBA

Department of Electrical Engineering, Shroff S R Rotary Institute of Chemical Technology, Vataria, Gujarat, had arranged a webinar on ***“"Virtual Academy: Course Outcome-Program Outcome Mapping Matrix & Attainment -Issues and Model Based Solutions for Tier II Confirmation”***, on 3rd August 2016 from 3:30 PM to 4:30 PM organized by GTU. The presenters are Dr. L S Admuthe, Mrs D Y Loni , Department of Electronics, D.K.T.E’s Textile and engineering Institute,Ichalkaranji.

This webinar focused mainly on CO – PO mapping matrix , attainment issues and model based solutions .One of the important element of Outcome Based Education (OBE) is establishment and attainment of Course Outcomes (COs) and Program Outcome (POs). POs are designed at program level considering knowledge and skills of the students and should demonstrate its attainment at the completion of course and program. COs are knowledge and skills that are formulated for each course. These COs are mapped to POs and attainment of each PO is

calculated by various tools considering set target levels. Depending on target level achieved, action plan is decided at course level as well as program level for improvement. The various issues in mapping and attainment are addressed.

Sampark Abhiyan (Final Year Students)

Parents meeting for fourth year students (Sem VII) were arranged at SRICT on 27th August, 2016. The percentage of student's attendance, result analysis of CET-1(Continuous Evaluation Exam) was discussed in the meeting. Mr. Sourav Choubey (Asst. Prof., DEE) interacted with parents about Rules and Regulations of SRICT, Training & Placement activities, NBA activities, Awards and scholarship Facilities, Motivational Awards, Vocational Training and planning of SRICT towards to students. Mr. Praful Chudasama(HOD, DEE) requested parents to motivate their wards for their excellent performance in academic works.

Sampark Abhiyan (5th semester Students)

Parents meeting of 5th sem EE students was arranged at SRICT on 3rd Sept, 2016. The presentation includes student's attendance, result analysis of 4th sem, bonus marks Criteria, Scholarship Criteria, Training & Placement, Pilot Action Plan for backlog students. Ms. Richa Dubey & Mr. Praful Chudasama interacted with parents about different policies, contribution and planning of SRICT towards to students. Parents asked questions regarding different policies and committed to motivate their children for more hard work in academic progress. A high tea was also arranged after the completion of meeting. Parent's feedback was very good about SRICT and they appreciated the campus discipline.

SRICT NEWS...

श्रुति एवं प्रवृत्ति।

YES, WE DID IT...

EVENTS and ACTIVITIES in EST Department

- Parent-Teacher Meeting (PTM) was organized for EST 3rd semester students on 10/09/2016.
- NATURE CLUB, SRICT organized a photography competition on the theme "Clean Ankleshwar Green Ankleshwar" in August '16 for which prizes were distributed on 15th August.

  Details of winners are as following:

Prize	Name of student	Branch	sem
1st	Akshita Kapil Shah	Env. Sc. & Technology	3
2nd	Shivam parekh	Env. Sc. & Technology	1
3rd	Aakash S Patel	Chemical Engineering	3
3rd	Abhishek. A Patil	Mechanical Engineering	1

Faculty Achievement

- **Ms Anjali Sivarajan Nair**, presented and published an international paper titled as "Removal of Hexavalent Chromium from wastewater by Adsorption: A Review" at SSASIT, Surat on 4th June 2016.
- **Dr. Purvi J Naik**, Asso.prof & HEAD MSH,5S coordinator has been invited as a judge for case study presentation competitions in allied category concept for the same event.

Students' Achievement

- 22 students from EST 3rd sem Participated in workshop "Making Yourself ready for industry" conducted by department of Chemical Engineering, Institute of Technology and organized by canter of continuing education (CCE), Nirma University on July 30-31, 2016.

- 7 students from EST Department participated in SCHEMCON on 10-11 September, 2016, organized at Dr. B.V. Raju Institute of Technology situated at Vishnupur in Telangana.

GTU BRIDGE COURSE (2016-17)

[JIGISHA MODI-COORDINATOR]

Objective of Course:

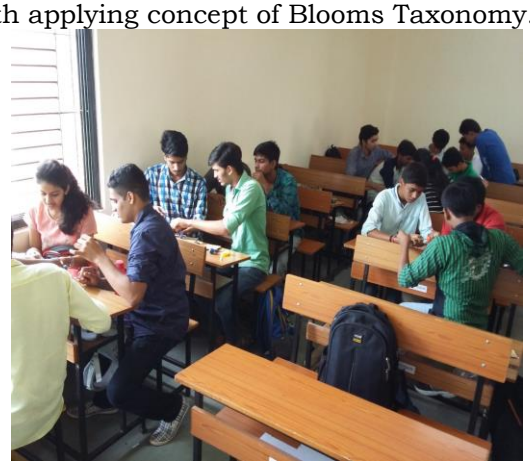
- The main objective of bridge course is to provide ample of time for the transition of students from school to the hard core engineering.
- It has also aspired to act as a buffer for the new entrants, with an objective to provide adequate time for the transition to hard-core engineering courses.
- Hence bridge course proves to be a best opportunity for the students to adapt themselves to new social and academic environment.
- During this interaction of 4 weeks with the faculty and their classmates, the students are equipped with the knowledge and the confidence needed to take on bigger challenges as future engineers of this country.

BRIDGE COURSE includes four major activities:
1. Learning Engineering
2. History of Science & Technology
3. Life Skills
4. Village Visit

All activity of different branches started from 4th Aug and ended on 20th Aug. Faculties from different department were involved in the smooth running of bridge course. My hearty thanks to all the faculties for sincere efforts and making the bridge course a great success.
Faculties from the Department of Electrical Engineering, Mechanical Engineering and Civil Engineering have successfully completed Learning Engineering activity for the first year students of engineering (All the Branches).

In this activity faculty members have conducted various activity based on the physics law like creating longest chain and

balloon car using critical thinking methods with applying concept of Blooms Taxonomy.



Students were shown working of basic instruments for better understanding and knowledge regarding the subjects.The genesis of bridge course was done with a small talk on safety precautions to be followed while working with electricity. Activities such as Resistance measurement without using any supply voltage, levelling, angular and linear measurement of land were performed by students under the guidance of faculty.

Various activities under the category of History of Science and Technology have been carried out by various faculty members. Some of selected photographs of done activities are shown here in this report.

During Life skills activity, various reasons for anger and possible solutions for depressing it or preventing it were discussed. Anger is frequently a result of frustration, or of feeling blocked or thwarted from something we feel to be important. The ideal goal of anger management is to control and regulate anger so that it does not result in problems. Students were divided into groups and were given topics for role play (eg: customer & salesman, friends meeting in the garden, at the movie theater. etc) Students were aware about the sources of happiness by developing their self-awareness and positive attitude towards life.

Along with life skills we have arranged yoga sessions for different branches. A trainer was called from outside institution. He has explained importance of yoga by saying “Yoga is not a religion; it is a practice for attaining healthy mind in a healthy body.”

On the last day of bridge course our college has arranged Thalassemia Awareness & Testing camp for all the students.

Faculties from different branch accompanied students for village visit. During their village visit following activity carried out by students:

- Students interacted cordially, observed their lifestyle, and made a

list of what they had and what they could better have.

- Students interacted more intimately for betterment of their lives .Groups formed to solve their specific problems.
- Group discussion and check for technical feasibility and availability of resources.
- Students casually played games with them to bridge closer relationship and experienced a fresh rural life.
- Students gently moved back with an impression that enabled them to communicate with them anytime whenever required.

EXPERT LECTURES

Environmental Science & Technology

- "How to face personal interviews" for the 7th semester EST Students on 20th August 2016 by Mr. Yogesh Dave, Asst. Manager HR, SPC Life science ltd.
- "How to face personal interviews" for the 5th semester EST Students on 20th August 2016 by Mr. Yogesh Dave, Asst. Manager HR, SPC Life science ltd.
- "Sustainable Industrial Water Management" for the 7th semester EST Students on 23th August 2016 by Dr. Mritunjay Chaubey, VP ENV UPL.
- "How to draft patents" for the 7th semester EST Students on 27th August 2016 by Dr. A B Oza, Executive, GNFC.
- "Disaster Management" for the 7th semester EST Students on 09th September 2016 by Mr. Kannan R, CHSE, UPL.
- "Disaster Management" for the 5th semester EST students on 09th September 2016 by Mr. Kannan R, CHSE, UPL.
- "Enviro Landfilling" for the students of 5th semester EST students on 10th September 2016 by Mr. F.T Kanpurwala, Joint Director, GICEA, Ahmedabad.
- "Environmental Microbiology" for the 3rd Semester EST students on 10th September 2016 by Dr. Maulin Shah, ETL.

ELECTRICAL ENGINEERING

- "Basics of PLC and It's Application" for the 7th semester EE Student on 09th July 2016 by Mr. Alesh Babaria, Director, Tatvamasi Automation, Surat
- "Challenges in Grid Operation" for the 5th semester EE Student on 10th August 2016 by Mr. Dilip Joshi, Rtd. Supretendent Engineer, GETCO, Vadodara
- "Renewable Energy – The need for Future" for the 3rd semester EE Student on 12th August 2016 by Mr. Prakash Pandav, Engineer (QC), Waaree Energies Ltd, Surat
- "How to face Personal Interview" for the 7th semester EE Student on 27th August 2016 by Mr. Yogesh Dave, Asst Mgr, (Business HR)
- "Application of PE converter in Grid Connected Solar Power" for the 7th semester EE Student on 27th August 2016 by Mr. Aniket Timbadiya, JE, GETCO, Savarkundla
- "Protection of Generator and Transformer in Power Station" for the 7th semester EE Student on 29th August 2016 by Mr. Vivek Patel, JE, WTPS, Wanakbori
- "Internal Construction and inspection procedure of distribution transformer" for the 3rd semester EE Student on 10th September 2016 by Mr. Nirav Patel, JE (Transformer Maintenance Squad), DGVCL, Vapi

CHEMICAL TECHNOLOGY

- "Plastic and its use" for the 7th semester CT Students on 11th July 2016 by Dr. Nitin V. Bhate, Professor, MS University, Baroda.
- "Tyre Technology" for the 7th semester CT Students on 16th July 2016 by Dr. Hardik Banker, Manager, GRPL, Mumbai.
- "Expert lecture Series On Glass & Ceramics" for the 3rd, 5th & 7th semester CT Students on 22nd and 23rd July 2016 by Dr. Saikat Maitra, Principal, GCECT, Kolkata.
- "Recent Development in Polymer & Rubber Technology and Scope of Career in this field" for the 3rd , 5th & 7th semester CT Students on 27th July 2016 by Dr. Kaushal Patel, Manager, QC & R&D Expanded Polymer System, Dahej.
- "Failures and their correlation with Goal" for the 5th semester CT Students on 27th July 2016 by Ms. Shreeji, HR, UPL, Gujarat.

CHEMICAL ENGINEERING

- "Insight of Gas- Liquid Reactions" for the 7th semester CE Student on 11th July 2016 by Dr. Nitin Bhate, Associate Professor, Chemical Engineering Department, Maharaja Sayajirao University of Baroda.
- "Pumps", for the 3rd semester CE Student on 13th July 2016 by Mr. P. M. Kapadia, Manager, Technical Service Department, GNFC Bharuch.
- "Understanding of Laboratory analysis for material balance", for the 5th semester CE Student on 13th July 2016 by Mr. I. G. Chaudhari, Chief Manager (R&D) GNFC Bharuch.
- "Vessel and Heat exchanger design", for the 7th semester CE Student on 22nd July 2016 by Mr. S. B. Umarji and Mr. G. S. Umarji, Director, New Multifab Engineers Pvt. Ltd. Mumbai.
- "Kargil Vijay Day Celebration", for the 7th semester student on 26th July 2016 by Mr. K. P. Sharma, Ex-IAF and Mr. S. P. Shastri, DSP.
- "Motivation towards Chemical Engineering", for the 7th semester CE Student on 27th July 2016 by Mr. S. K. Jindal, Unit Head, UPL-5, Jhaghadia, Bharuch.
- "Rule of Thumb for Chemical Engineers", for the 7th semester CE Student on 5th August 2016 by Mr. Kirat Nikhil Raval, Shift Manager, Covestro India Private Ltd. Ankleshwar.

MSH DEPARTMENT

- "Industrial Engineering and management " for 1st semester ce,est ee branch on 3rd October 2016 by Mr Prashant Patel technical advisor, hilti India pvt lim, vadodara

MECHANICAL ENGINEERING

- "Importance of Research Skill for Industries & Further Studies" for the 5th semester ME Student on 16th JULY 2016 by Mr. Bhavesh Modi, Assistant Professor, MED, S.V.M.I.T, Bharuch
- "Importance of Research Skill for Industries & Further Studies" for the 7th semester ME Student on 16th JULY 2016 by Mr. Bhavesh Modi, Assistant Professor, MED, S.V.M.I.T, Bharuch
- "Industrial Engineering" for the 7th semester ME Student on 18th JULY 2016 by Prof. Nitin G. Phafat , Associate Professor, MED, MGM's GNEC, Aurangabad
- "Manufacturing Engineering" for the 5th semester ME Student on 18th JULY 2016 by Prof. Nitin G. Phafat

, Associate Professor, MED, MGM's GNEC, Aurangabad

- "Indian Nuclear Power Program for generation of Nuclear Energy" for the 7th semester ME Student on 21st JULY 2016 by Mr. G.C.Joshi, Scientific Officer/F, Kakrapar Atomic Power Station
- "Radiation- A fact of life" for the 7th semester ME Student on 21st JULY 2016 by Sambhaji S.Wagh, Officer In-charge, Kakrapar Atomic Power Station
- "Indian Nuclear Power Program for generation of Nuclear Energy" for the 5th semester ME Student on 21st JULY 2016 by Mr. G.C.Joshi, Scientific Officer/F, Kakrapar Atomic Power Station
- "Radiation- A fact of life" for the 5th semester ME Student on 21st JULY 2016 by Sambhaji S.Wagh, Officer In-charge, Kakrapar Atomic Power Station
- "Design of pressure vessel" for the 5th semester ME Student on 22nd JULY 2016 by Mr. S. B. Umarji , Director, New Multifab Engineers Pvt Ltd
- "Kargil Vijay Day Celebration" for the 3rd semester ME Student on 26th JULY 2016 by Mr. K.P Sharma, Retired Army officer.
- "Product design & Development with CAD Simulation Tools " for the 5th semester ME Student on 30th JULY 2016 by Mr. Krunal Patel, Research Engineer/HOD of Computational Lab, YANBU RESEARCH CENTER , Royal Commission YANBU, Saudi Arabia
- "Product design & Development with CAD Simulation Tools " for the 7th semester ME Student on 30th JULY 2016 by Mr. Krunal Patel, Research Engineer/HOD of Computational Lab, YANBU RESEARCH CENTER , Royal Commission YANBU, Saudi Arabia
- "Interactive Session on Boiler and Power Plant " for the 7th semester ME Student on 27th AUGUST 2016 by Mr. Arun Tewari, Senior Mechanical Engineer, ISGEC HEAVY Engineering LTD, Noida
- "Maintenance of Turbine" for the 5th semester ME Student on 08th September 2016 by Mr. Shanshank Jha, Dy. Manager – Mechanical maintenance dept. , CPL India Pvt. Ltd
- "General Understanding of Power Plant" for the 5th semester ME Student on 08th September 2016 by Mr. Kaushik Shah, Dy. Manager – Mechanical maintenance dept. , CPL India Pvt. Ltd

INDUSTRY VISIT

CHEMICAL ENGINEERING

- KANERIA GRANITO LIMITED on 26th July, 2016 by 5th semester CE students.
- Jayshree aromatics, Ankleshwar on 3rd July by 5th sem CE students.
- Atri pharma, Ankleshwar on 7th September, 2016 by 5th CE students.

CHEMICAL TECHNOLOGY

- Gujarat Guardian Limited, Kondh on 6th August, 2016 by 3rd, 5th & 7th semester CT students.
- BEIL, GIDC Ankleshwar on 16th August, 2016 by 5th & 7th semester CT students.

- Colourtex Pvt Ltd, Surat on 24th August, 2016 by 5th semester CT students.
- Gharda Chemicals Pvt. Ltd., Panoli on 26th August, 2016 by 3rd, 5th & 7th semester CT students.
- Gujarat Guardian Limited, Kondh on 27th August, 2016 by 3rd semester CT students.
- Amsalchem Pvt. Ltd, GIDC Ankleshwar on 27th August, 2016 by 3rd & 5th semester CT students.

ENVIRONMENTAL SCIENCE & TECHNOLOGY

- Zydus Cadila, Ankleshwar on 29th July, 2016 by 5th semester EST students.
- National Environmental Engineering Research Institute (NEERI), Nagpur on 28th -30th August, 2016 by 7th semester EST students.
- Schmitten, Kosamba on 30th August, 2016 by 7th semester EST students.
- NCTL, Panoli on 14th September, 2016 by 3rd semester EST students.

ELECTRICAL ENGINEERING

- Gujarat Borosil, Jhagadia on 3rd August, 2016 by 7th semester EE students.
- GEB 132 KV Substation, Valia on 22nd August, 2016 by 3rd semester EE students.
- Jay Khodiyar Electric panels, Ankleshwar on 2nd September, 2016 by 5th semester EE students.
- Gujarat Borosil, Jhagadia on 14th September, 2016 by 5th semester EE students.

MECHANICAL ENGINEERING

- ST Workshop, Bharuch on 20th July, 2016 by 7th semester ME students.
- NPCIL, Mandavi on 5th August, 2016 by 7th semester ME students.
- ABC Bearings, Bharuch on 13th August, 2016 by 5th semester ME students.
- Colourtex, Vilayat on 24th August, 2016 by 5th semester ME students.
- Lupin, Ankleshwar on 29th and 30th July, 2016 by 3rd semester ME students.

MSH DEPARTMENT

BEIL Ankleshwar on 27th September 2016 by 1st semester CE students.

BEIL Ankleshwar on 29th September 2016 by 1st semester EST and EE students.

ETL Ankleshwar on 08th October 2016 by 1st semester EST and EE students.

FELICITATION CEREMONY OF RANK HOLDERS

SRICT Management felicitated 130 elites who scored more than 8.5 SPI in the recently declared result of 6th, 4th and 2nd semester. The program was organised on 12th July 2016. Honourable Chairman,

ARES, Mrs. Sandra Shroff, Honourable Vice Chairman, ARES, Rtn. Ashok Panjwani, Honourable Secretary, ARES, Rtn. Angiras Shukla, Honourable Treasures, ARES, Rtn. Kishore Surti, Honourable Principal, SRICT, Prof. Shrikant Wagh, Students, and faculties remained present for the programme. Principal Sir welcomed the students. Mrs Sandra Shroff felicitated and congratulated all the students. Akshay Patel, CT and Bhavik Mahant, CE who scored 10 SPI were felicitated with Gold Medal. It was proud moment for SRICT Parivaar.

DEBATE AND ELOCUTION COMPETITION.

DAIS *(Debaters and Intelligent Speakers)* forum of SRICT created by Dr. Shrikant J. Wagh had organized an Elocution and Debate competitions on 14th Sept 2016 at 03:00 p.m. in Sem Hall -3.The organizer of event was Department of General Engineering. The competitions were judged by:

1. Dr. Anshu Tiwari , Principal Shree Gattu School
2. Dr. Snehal Lokhandwala , HOD EST
3. Dr. Sanjeev Dharwarkar , Professor Chemical Egg.

The winners of Elocution competition were:-

1. **Saumitra Wagh** – (Topic - Is better to be honest and poor dishonest and rich?)
2. **Vikas Thakur** – (Topic - The use of technological devices in education)
3. **Rushi Rawal** - (Topic - The use of technological devices in education)

Debate
Topic: The Motion of House is "On-line Education is just as good as classroom learning"
The winners of Debate Competition are:-

1. Team spoke in favor of motion of the house won :
   Saumitra Wagh (Team Leader), Vikas Thakur and Vasu Dixit.
2. Best speaker from for the motion – **Vikas Thakur**
3. Best speaker from against the motion – **Jay Mirchandani**

Congratulation Winners !!

HIGHLIGHTS OF DIRI / PGDIRI RESULT 2016

SRICT: Actvity Centre for Indian Rubber Institute, Mumbai,

Controller of final examination: Rubber Technology Centre, IIT-Kharagpur

PGDIRI Post-Graduate Diploma Course in Rubber Technology

DIRI Diploma Course in Rubber Technology

Exam dates : 22-07-2016 & 23-07-0106

PGDIRI

No. of candidates appeared : 03

No. of candidates passed : 01

No. of candidates failed : 02

DIRI

No. of candidates appeared : 04

No. of candidates passed : 04

No. of candidates failed : 00

Sr. No.	Course	Name	All India Rank
1	PG-DIRI	Vijay Patel Asst Professor	33
2	D-IRI	Ankit Mishra Student	02
3	D-IRI	Nikhil Patel Student	13

ACCQC 2016 THE 4TH ANNUAL CONVENTION ON QUALITY CONCEPT

WE ARE happy to share that SRICT has won three awards @ ACCQC 2016: The 4th Annual convention on quality concepts held at Diamond Theatre on 23-24 Sept.2016.

Our three winning teams with their case study topics in the category of allied quality concepts are:

15S at SRICT@ Mechanical Workshop Department (Gold Category Award)

BY **VIKAS THAKUR, PARTH GUPTA AND CHINTAN CHAROLA**

2. 5S at Home (Gold Category Award)

3. 5S at SRICT@ Electrical Engineering (Silver Category Award) BY **JAY MIRCHANDANI AND HIS GROUP**

One encouragement prize received in Essay competition by **Mr.Chintan Charola.**

XITIJ GTU CULTURAL FEST 2016

GTU organized cultural fest for south zone at S N Patel College, Bardoli from 29thSeptember 2016 to 1st October 2016. About 21 colleges offered their best students a chance to participate in various activities. Our college was also one of them. Total twelve students of our college represented us. Out of them, 3 students were able to acquire the required possession and got award. But remaining students acquired a great experience by competing with other college students and learned a lot in order to improve themselves at some level or the other.

It is, indeed, a milestone achievement for our college students. We look forward to having a bunch of talented students emerging with flying colors next time.

TECHNICAL ARTICLES: प्रयुक्तिलेख

Title	**Author**
REVIEW ON PRODUCTION OF HYDROGEN FROM GLYCEROL: THE MAIN BY-PRODUCT FROM BIODIESEL PRODUCTION	[MODI RUSHILB*, KRUNAL SUTHARA]
CLEAN DEVELOPMENT MECHANISM – AS A PROSPECTIVE FOR SUSTAINABLE DEVELOPMENT	[ANJALI SIVARAJAN NAIR, ASSISTANT PROFESSOR-EST DEPARTMENT]
SPECIAL EFFECT PIGMENTS	[NILESH PRAKASH BADGUJAR- ASSISTANT PROFESSOR- DYES & PIGMENTS TECHNOLOGY]
'ઇસરો'ની સફળતા : એકધારી ઉર્ધ્વગતિ	[KRUNAL SHAH, HIREN JARIWALA – ASSISTANT PROFESSOR, DEPARTMENT OF ELECTRICAL ENGINEERING]
RECYCLING OF PLASTICS	[NIKHIL PATEL 7TH SEMESTER, CHEMICAL TECHNOLOGY]
EXTRACTION OF VANADIUM FROM STONE COAL	[SAGAR VARMA, CE 5TH SEM]

REVIEW ON PRODUCTION OF HYDROGEN FROM GLYCEROL: THE MAIN BY-PRODUCT FROM BIODIESEL PRODUCTION

KRUNAL SUTHAR[A] MODI RUSHIL[B*],
[A]ASSISTANT PROFESSOR, [B]THIRD YEAR ENGINEERING STUDENT, DEPARTMENT OF CHEMICAL ENGINEERING,

Glycerol is a by-product of the transesterification reaction used to produce biodiesel. Over the past decade, production of biodiesel has greatly increased resulting in an oversupplied glycerol market and a reduction of its value. Objective of the present work is to review the possible route of hydrogen production from glycerol with merits and demerits. Production processes like steam reforming; partial oxidation and auto-thermal reforming are reviewed and compared to propose a promising solution for the production of hydrogen from glycerol which one of the main by-product of biodiesel. Efficient and effective utilization of crude glycerol in producing such value aided fueling product can economize and increase the commercialization of biodiesel production processes.

Keywords: Hydrogen, crude glycerol, transesterification.

1. INTRODUCTION

Biodiesel being a clean and promising alternative to conventional petrol-fuel, has grabbed a lot of attention during the last couple of decades. Widely acceptable route to produce biodiesel is transesterification reaction which along with biodiesel produces the by-product glycerol. Biodiesel production has increased the production of glycerol which contains plenty of impurities hindering the direct use of glycerol for many applications.

Crude glycerol has variety of value-added application like ruminant diets, feedstock for 1, 3-propanediol, lipids, citric acid and other chemicals. One of the promising applications is to use crude glycerol for hydrogen production which is expected to play a major role to overcome the energy crisis in future. Glycerol has a great potential as a raw material for the production of hydrogen due to the fact that one mole of glycerol can produce 7 moles of hydrogen depending on processing route.

Properties	Value
Flammability limits	0.1-0.7
Octane number	>120
Auto ignition temp	858 k
Adiabatic flame temperature	2480 k
Thermal conductivity at 300 K	182 mW/kg

Table 1: Properties of hydrogen [1]

Crude glycerol generated from biodiesel production is impure and of little economic value. Methanol and FFA (soaps) are 2 main impurities contained in crude glycerol. Methanol is found because of excessive use of methanol to drive transesterification to completion and not fully recovery of methanol. Soap is formed from reaction between FFA and catalyst (base).

1.1. NEW USES FOR GLYCEROL WASTE AND HYDROGEN

One of latest uses of glycerol is conversion of crude glycerol to hydrogen. In food industry, it serves as humectant, solvent and sweetener and helps to preserve foods. Hydrogen is used as hydrogenating, reducing and cracking agent; as coolant in generators. It is used in automotive, chemical, power generation, aerospace and telecommunication industries and also as authorized food additive (E 949) that allows food package leak testing. Hydrogen fuel cells can convert hydrogen and oxygen directly to electricity more efficiently than IC engine.

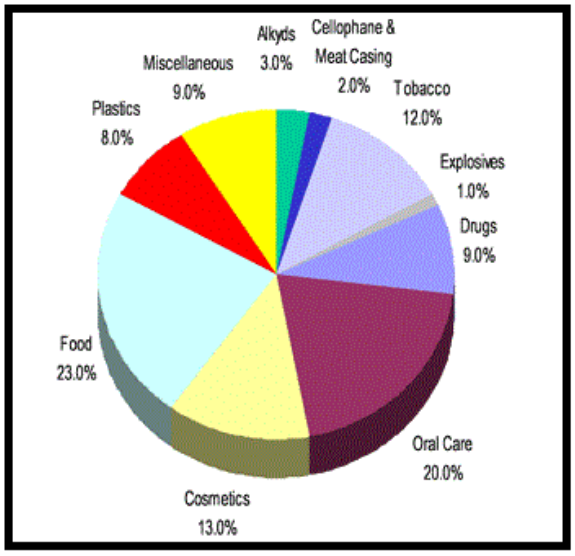


Fig. 1: Uses of Crude Glycerol [2]

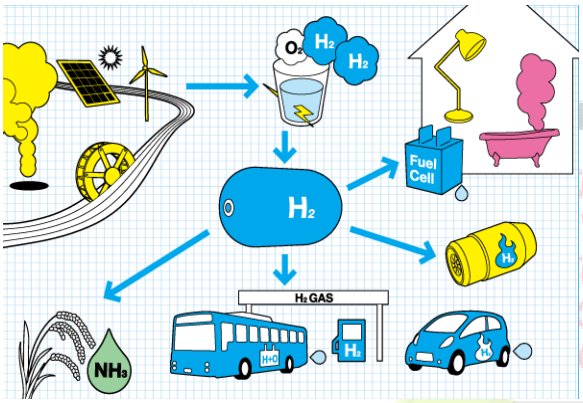


Fig. 2: Uses of Hydrogen gas

2. HYDROGEN PRODUCTION

On the Renewable resources based technologies for hydrogen production are attractive options for the future due to carbon neutral nature of these technologies with lesser effects to the environment. Most of the studies on hydrogen production are focused on thermo-chemical routes are: Steam reforming, Partial oxidation gasification, Auto-thermal reforming, Aqueous-phase reforming and Supercritical water reforming process.

3. STEAM REFORMING PROCESS

Steam reforming of hydrocarbons has been the preferred method for many decades for industrial scale hydrogen production. Reforming process mainly involves splitting of hydrocarbons in the presence of water and water–gas shift reaction as given below:

$C_nH_{2n+2}+nH_2O \rightarrow nCO+(2n+1)\ H_2$ (1)

$CO+H_2O \rightarrow CO_2+H_2;\ \Delta H=-41$ kJ/mole (2)

The first step is highly endothermic, taking more heat than it evolves from water–gas shift reaction. Therefore, overall steam reforming is an endothermic process.

3.1. FACTORS AFFECTING THE STEAM REFORMING PROCESS

The factors affecting the production of hydrogen from steam reforming process are Temperature, Pressure, Water to Glycerol Feed Ratio (WGFR), Feed reactants to inert gas ratio and Feed gas rate.

It has been observed that these factors hold a key role in order to have a high hydrogen yield and a good glycerol conversion. Thermodynamically, steam reforming process favours high temperatures and low pressures. As per various researches [3], it has been found that for optimum results the process of glycerol steam reforming requires a high temperature (800K-1000K), an atmospheric pressure, feed reactants to inert gas ratio and feed gas rate should be low. It has also been suggested that the water to glycerol ratio (WGFR) should be around 9:1, i.e. Steam to carbon ration should be around 3:1.

3.2. CHALLENGES IN THE PROCESS OF STEAM REFORMING OF GLYCEROL

- Formation of coke/ carbon.
- Effective usage and refining of crude glycerol.
- Control of high temperature.
- Less production/yield of Hydrogen by conventionally than stoichiometrically.
- Process produces 3 moles of carbon dioxide stoichiometrically and release

of carbon dioxide is an environmental concern, and hence effective utilization of carbon dioxide is required.

- Certain side reactions which hinder the production as well as the purity of hydrogen. One such side reaction is the formation of methane.

$CO_2(g)+4H_2(g)\leftrightarrow CH_4(g)+2H_2O(g)$ (3)

$CO(g)+3H_2(g)\leftrightarrow CH_4(g) + H_2O(g)$ (4)

$C_3H_8O_3(g)+2H_2(g)\leftrightarrow 2CH_4+CO(g)+2H_2O(g)$ (5)

3.3. LIMITATIONS OF STEAM REFORMING PROCESS:

- Carbon formation at low steam; carbon ratio.
- Higher hydrogen pressure limits CH_4 conversion.
- High CH_4 conversion requires high temperature.
- Excess steam production.
- Low NOx levels required in stack gas.

3.4. POSSIBLE SOLUTIONS TO THE CHALLENGES

There have been some studies which deals with the optimization of the process for increasing the productivity as well as the purity of hydrogen from the glycerol reforming [4]. Few of these methods that can be used have been mentioned here:

- **Decreasing the pressure of the system**
- **Increase of feeding steam ratio**
- **Carbon dioxide removal**
- **Hydrogen separation**

3.4.1. Decreasing the pressure of the system

It is being observed that the decrease of pressure below 1 bar could enhance the hydrogen production. However, an operating pressure below the atmospheric pressure is difficult to achieve.

Also a lower operating temperature is also critically important for industrial application which leads to the reductions of energy usage, catalyst sintering. An alternative way is use of the carrier gas, to decrease the partial pressure of reactants and the desired temperature range.

3.4.2. Increase of feeding steam ratio

If the inert gas is replaced by steam, it is observed that the hydrogen production was enhanced considerably. This option will not only decrease the partial pressure of glycerol but also, increases the reactant water. As per the equation and Le Chatelier's principle, both the two effects could enhance the forward reaction.

3.4.3. Carbon dioxide removal

As per Le Chatelier's principle, a possible way to promote the steam reforming is to remove carbon dioxide as soon as it is formed from the reaction zone. This is the so-called in-situ adsorption enhanced steam reforming for hydrogen production and has been widely accepted as an effective method to improve the reforming process for hydrogen production. Absorbent like calcium oxide (CaO) or alkali (NaOH) is used for the adsorption of CO_2 during the process.

3.4.4. Hydrogen in-situ separation

Few of the researches suggests that instead of adsorption of CO_2 the in-situ separation of hydrogen may be a better option. However, the separation of hydrogen needs to be done by using a membrane reactor. The separation of hydrogen deals with lower temperature range and lower production of methane carbon monoxide and carbon as compared to CO_2 adsorption.

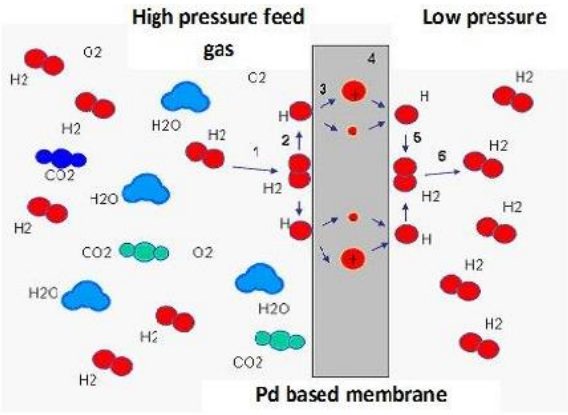


Fig. 3: Pd membrane can be used for hydrogen removal [5]

4. Summary & Discussion

It can be seen that the production of hydrogen from glycerol is a very good option, keeping in mind hydrogen as well as biodiesel to be the future fuels of the world. Also, it is being observed that the amount of hydrogen produced is comparatively less by conventional method than stoichiometrically. However, the glycerol steam reforming possesses some challenges which needs to be eradicated or avoided in order to have higher productivity as well as purity of hydrogen. There have been some studies which deals with the optimization of the process for increasing the productivity.

Fig. 4: Hydrogen concept future car

5. Conclusion

From present review work, it can be concluded that crude glycerol being by-product of biodiesel production can be utilised economically for green energy production and fulfilling energy requirements. Stoichiometrically, the moles obtained by steam reforming of natural gas and glycerol is 4 and 7 respectively. So, glycerol provides most number of moles of hydrogen and hence can be preferred over the fossil fuels.

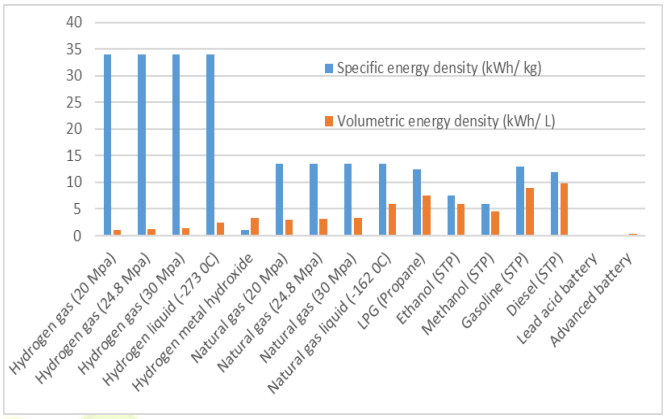


Table 2: Comparison of various fuels. Hydrogen has highest energy per unit weight but lowest per unit volume [6].

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CLEAN DEVELOPMENT MECHANISM – AS A PROSPECTIVE FOR SUSTAINABLE DEVELOPMENT

[ANJALI SIVARAJAN NAIR, ASSISTANT PROFESSOR-EST DEPARTMENT]

INTRODUCTION

Clean Development Mechanism (CDM) is one of the key components of the Kyoto Protocol. It is an offshoot of United Nations Framework Convention on climate change, Kyoto Protocol is legally binding global agreement to take action to reduce or prevent climate change through a reduction of greenhouse gas (GHG) emissions.

The Kyoto Protocol follow the fundamental UNFCCC principle of "common but differentiated responsibility" which recognizes that the burden of responsibility on countries which have historically emitted the more quantity of GHGs. The main purpose of Clean Development Mechanism is to help the developing countries to achieve sustainable development so that they can assist industrialized countries in complying with emission reduction commitments. CDM mainly fund GHG-reducing projects for developing countries by awarding these projects certified emission reductions (CERs) - also called "offset credits" - which bring in huge profits in the carbon trading market.

MECHANISMS OF KYOTO PROTOCOL

The Kyoto Protocol has established three cooperative mechanisms designed to help industrialized countries make smaller or lessen the costs of meeting their emissions targets by achieving emission reductions at lower costs in other countries than they could domestically. International Emission Trading allow countries to transfer parts of their 'allowed emissions' ("assigned amount units").So that the countries have been given an option to meet their targets through one of the following three mechanisms provided under Kyoto Protocol:-

- Joint Implementation (JI)
- International Emissions Trading (IET)
- Clean Development Mechanism (CDM)

Out of all these three mechanisms of Kyoto Protocol, CDM is only one mechanism where developing countries can participate and join in changing the climate change. With the help of CDM, developed countries can implement GHG mitigation projects in developing countries at reduced costs.

OBJECTIVES OF THE STUDY

1. To study the status of projects registered under CDM projects with UNFCCC since inception to end December, 2010.
2. To analyze the region wise distribution of the CDM registered projects.
3. To analyze the sector or technology wise distribution of CDM registered projects.
4. To find out the volume of Certified Emission Reductions (CERs) produced worldwide by the CDM registered projects and corresponding value of carbon finance Market through transactions of CERs.

STEPS INVOLVED FOR CDM PROJECT

A project has to undergo many process documentation and approval as specified under the CDM modalities and procedures. A CDM project include following steps from inception to issuance of CERs:

1) **PROJECT IDENTIFICATION:** It involves identification of a green project by the host that is project entity and the investor, a party from developed country. It also include description of the project and initial estimation of the emission reductions from the project.

2) **PREPARATION OF PROJECT DESIGN DOCUMENT (PDD):** It provides all the technical documentation of the project including a particular place or position, financial projection ascertaining technical and economic viability of the project. It also includes a more accurate estimation of the emission reductions from the project. PDD also describe in detail various additional tools that the project is valid or not.

3)**VALIDATION OF PDD BY DESIGNATED OPERATIONAL ENTITY (DOE):** It is the process of independent and making of a judgment about the amount of project activity on the basis of the PDD by a third party UN accredited auditor known as Designated Operational Entity (DOE), against the various availability of CDM particularly the eligibility.

4) **HOST COUNTRY APPROVAL:** It include clearance from host country government through its Designated National Authority (DNA) for approval purpose. Host country government refers to the government of the country in which project is being put.

5) **REGISTRATION BY THE CDM EXECUTIVE BOARD:** It is in accordance with convention and acceptance by the CDM Executive Board of a validated project as a CDM project activity. This step is a pre-requisite for the verification, certification and issuance of the CERs from that project activity.

CONCLUSION

Electricity generation by the use of wind energy is mostly practiced in developed nations, but in case of developing nations, still, it faces lack of technology so more costly in comparison with conventional fuels. Only two options can assist this type of renewable energy projects first one is the policies by respective governments to promote renewable energy and second gives focus on revenue earned by the selling of CERs. The option to get register any renewable energy project as clean development mechanism project and earn the CERs is the most feasible case for the promotion of renewable energy.

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SPECIAL EFFECT PIGMENTS

[NILESH PRAKASH BADGUJAR- ASSISTANT PROFESSOR- DYES & PIGMENTS TECHNOLOGY]

Introduction

The best-known products to the paint technologists are to give in metallic and extravagant surfaces a glitter effect pigments used. You can in two very different ways to give this effect, such as by: aluminum flake pigments; pearlescent pigments. Effect Pigments guarantee brilliant achievements in various industries, especially in the plastics processing industry, printing industry and the paint and coatings industry. They open up an infinite number of colors and effects that provide unlimited design possibilities. The earliest evidence that we have found the use of effect pigments, are the cave paintings (Ajanta).

Today, many different effect pigments come into existence in every aspect of our lives. Through the use of effect pigments you can get access to many different effects. These effects include the visual world effect with a decorative appearance, flickering lights and amazing effects. These pigments bring a new feeling and give new effect on the colors with gloss and tremulousness.

Effect of Pigments

Certain pigments are used to provide special effects, and not for the color.

• An effect pigment can:

1. Display color travel.

2. Reflect break or light.

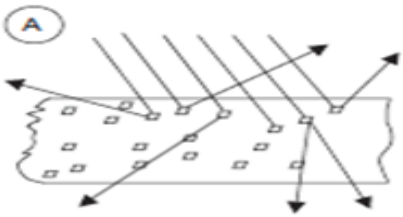
3. Act as a mirror (metal flake).

4. More color effect (iridescence)

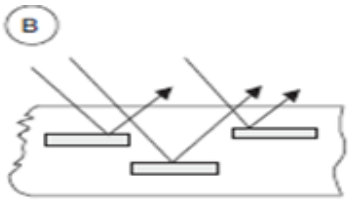
The pigment industry offers an extensive range of classic and effect pigments. Effect pigments are platelets having a diameter usually between 5 and 50 microns. They reflect incident light and cause angle-dependent brightness impressions. In addition, the incident light can be changed by absorption and / or interference effects. The high number of possible combinations of layers of different materials, and the variation of the layer thicknesses make the world of effect pigments rather complex. A classification according to color properties provides an overview. Effect pigments can be transparent, semi-transparent or opaque nature. The coloristic impression of effect pigments can be black, silver, colored or goniochromatic.

Classification of Effect Pigments

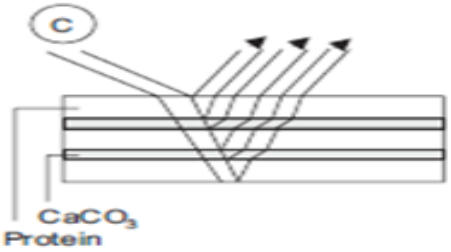
In a simple picture, the existing pigments can be arranged according to these properties (Figure 1).



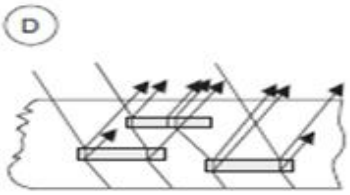
Absorption Pigment



Metal Effect Pigment



Natural Pearl



Pearl Luster Pigment

Along the horizontal axis, the effect pigment world is classified according to Transparency: opaque groups are 1, 2, 5 and 8; semitransparent pigments are in groups 3, 6 and 9; and transparent pigments are in groups 4, 7 and 10. FIG.

Along the vertical axis the classification criterion is the visual impression of the effect pigments. For example, the second row silver pigments based on opaque (2), semi-transparent (3) or transparent (4) flakes. Aluminum flakes, the examples of opaque silver pigments (2), titanium dioxide-coated mica pigments are transparent silver represent (4), while mica coated with gray black oxides are semitransparent (3).

Goniochromatic effect pigments show different colors at different viewing angles. Again opaque types (8), semi-transparent (9) or transparent grades (10) exist.

Illustration shows the different optical principles of conventional pigments (A) (absorption pigments), metallic effect pigments (B) and beads (C) and pearlescent pigments (D), the most important group of the effect pigments.

Absorption:

All conventional organic or inorganic color pigments fall into this category. In the case of absorption pigments, the interaction with light based on absorption and / or diffuse scattering of the particular wavelength of the incident light. These pigments produce any luster, due to their irregular shapes.

A completely different optical behavior can be observed with the group of effect pigments with pearlescent and metallic effect pigments.

Metallic effect:

Metal pigments consist of very small flakes of aluminum, copper, zinc, titanium, which work like tiny mirrors and almost completely reflect the incident light. The formation and differentiation of opaque pigments are based on the surface gloss due to these metallic pigments.

Pearl Luster:

Pearlescent simulate the luster of natural pearls. They consist of alternating transparent layers with different refractive indices. The layers consist of CaCO3 (high refractive index) and proteins (low refractive index).

Pearlescent pigments are suitable to be used in almost all of the printing inks. They are semi-transparent. These pigments are based on guanine or bismuth oxychloride, mica minerals. In these pigments, the light between the various layers of pigments reflected. This phenomenon makes these pigments extremely glossy.

The effect pigments can bring a Metallic in plastic materials. These are lamellar flakes. The very thin plates of special effect pigments can be obtained by their forms readily. On the basis of transparent and opaque effects of the active pigments, they can be divided into two groups:

Transparent pigment:

The platelets of transparent pigments can partly translucent and for these phenomena, these pigments can produce a special kind of shimmering gloss. The refractive index of these platelets is low. The figure describes the light mechanism of transparent pigments. Transparent effect pigments have an affinity with almost all thermoplastics.

Opaque pigments:

The platelets of opaque pigments transmit no light. These platelets reflect only the light and the reflection they also absorb light partially.

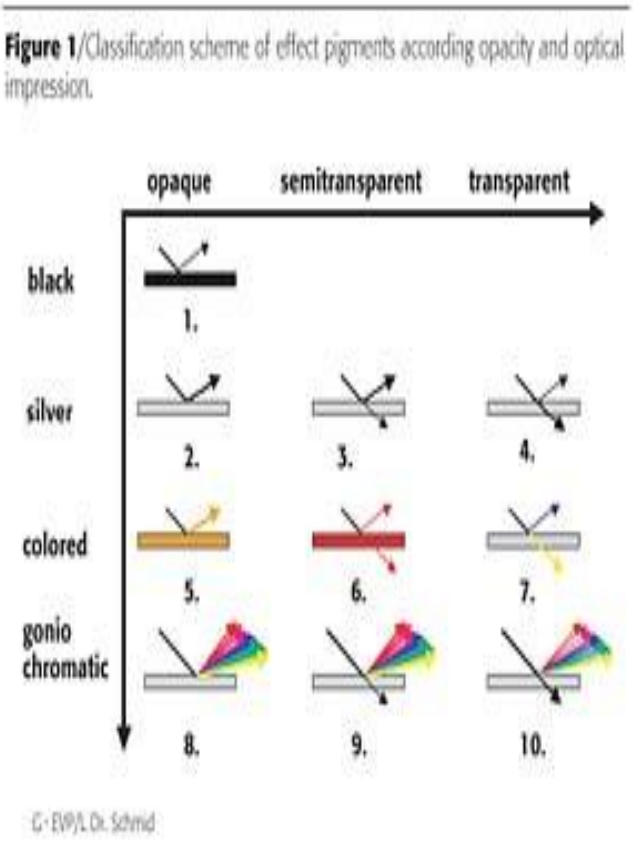


Figure 1/Classification scheme of effect pigments according opacity and optical impression.

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‘ઇસરો’ની સફળતા : એકધારી ઉર્ધ્વગતિ

[KRUNAL SHAH, HIREN JARIWALA – ASSISTANT PROFESSOR, DEPARTMENT OF ELECTRICAL ENGINEERING]

ભારતીય અવકાશ સંશોધન સંસ્થા- ‘ઇસરો’એ એક જ લૉન્ચ વેહીકલની મદદથી એક ભ્રમણકક્ષામાં ૨૦ ઉપગ્રહો મૂક્યા. તેમાં ભારતની બે યુનિવર્સિટીના પ્રાયોગિક ઉપગ્રહોથી માંડીને અમેરિકા, જર્મની, કૅનેડા, ઇન્ડોનેશિયા જેવા દેશોના ઉપગ્રહોનો સમાવેશ થાય છે. પોલર સેટેલાઇટ લૉન્ચ વેહીકલ (PSLV C-34)ની એક જ ઉડાનમાં ધ્રુવીય ભ્રમણકક્ષામાં વીસ ઉપગ્રહો મૂકવાની સિદ્ધિ ‘ઇસરો’ માટે પહેલી વારની અને મહત્ત્વપૂર્ણ છે. અગાઉ ૨૦૦૮માં લૉન્ચ વેહીકલની એક ઉડાનમાં ‘ઇસરો’એ એક સાથે દસ ઉપગ્રહ તરતા મૂક્યા હતા.

અવકાશ ક્ષેત્રે સંશોધન અને કામગીરીના મામલે આંતરરાષ્ટ્રિય બજારમાં ‘ઇસરો’ પ્રતિષ્ઠિત સંસ્થા ગણાય છે. બીજા દેશોની સરખામણીએ સસ્તા ભાવમાં અને ચોક્સાઇપૂર્વક કામગીરી માટે ‘ઇસરો’એ નામ કાઢ્યું છે. તેને પણ નિષ્ફળતાઓનો સામનો કરવો પડ્યો છે. છતાં, સ્વદેશી ટૅકનોલોજી વિકસાવીને એક પછી એક નવાં શીખર સર કરવામાં ‘ઇસરો’ની ગતિ પ્રશંસનીય છે. એક સાથે વીસ ઉપગ્રહો ભ્રમણકક્ષામાં મૂકી શકવાની તાજી સિદ્ધિથી તેની યશકલગીમાં વધુ એક પીંછું ઉમેરાયું છે.

આ વખતે PSLV સાથેના પે-લોડ(સંપેતરા)માં મુખ્ય ઉપગ્રહ ભારતનો ‘કાર્ટોસૅટ-૨’ છે, જેનું વજન ૭૨૫.૫ કિલો છે. ભારતમાં જમીનના અભ્યાસ, વિસ્તૃત નકશા બનાવવા, જીઓગ્રોફિકલ ઇન્ફર્મેશન સીસ્ટમ જેવાં અનેકવિધ કામ માટે આ ઉપગ્રહનો ઉપયોગ થવાનો છે. ચેન્નઇની સત્યભામા યુનિવર્સિટીએ મોકલેલો ‘સત્યભામાસૅટ’ ગ્રીનહાઉસ ઇફૅક્ટ સર્જતા વાયુઓનું પ્રમાણ માપશે, જ્યારે પૂણેની કૉલેજ ઑફ એન્જિનિયરિંગનો ઉપગ્રહ ‘સ્વયમ્’ હૅમ રેડિયો વાપરતા લોકો વચ્ચે સંદેશા વ્યવહાર માટે વપરાવાનો છે.

RECYCLING OF PLASTICS

[NIKHIL PATEL, 7TH SEMESTER, CHEMICAL TECHNOLOGY]

Plastic materials are widely used in different sectors for their good mechanical properties, low density, low cost, and also ease of processing. Due to these properties, they are replacing many materials like metal, wood, glass etc. The total production of plastics is more than 230 million tons per year which, according to a paper published by Yasser Zare in 2013, will reach up to 400 million tons in 2020 based on a yearly conservatively annual growth rate of about 5%. The increased usage of the plastic has accelerated the waste disposal which results in environment problems as most of plastics are not biodegradable. So the plastic waste disposal is one of the important issues in this modern world. The traditional methods such as combustion or landfill show a negative impact on the environment like formation of dust, fumes and toxic gases in the air, and the pollution of underground water and other resources. The recycling process is the best way to manage the plastic waste. There are various techniques for recycling of plastic waste which are as below.

Primary Recycling

It is also known as Re-Extrusion. It means recycling of waste plastics into a product with same characteristics similar to those of original product. In this method, clean waste plastics are subjected to extrusion process with the aim of producing the new product of similar plastics. It is simple and low cost method and remains the most popular process, which is mainly applicable in in-plant.

Mechanical Recycling

Mechanical recycling involves processing of waste plastics into new product that have different characteristics from the original ones. The process generally reduces the size of scrap to a more desirable shape and form,

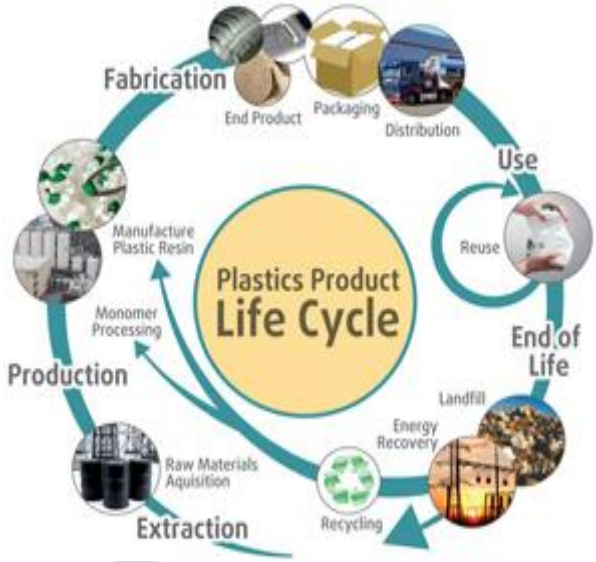

FIGURE 1: RECYCLING OF PLASTICS

such as pellets, flakes, or powders, depending on the source, shape, and usability via mechanical processes such as grinding, washing, separating, drying, re-granulating, and compounding. Only thermoplastic materials can be recycled via mechanical recycling as it involves re-melting and reprocessing. It is widely used for Municipal Plastic Wastes.

Chemical & Feedstock Recycling

It is the process which converts plastic materials into smaller molecules, generally liquids or gases, which are suitable for use as a feedstock for the production of new petrochemicals and plastics. The decomposition of waste polymer is done by means of chemical substances or heat. And the decomposition products are monomers or mixture of compounds as result of depolymerisation. Recycling chemical processes are pyrolysis, gasification, liquid-gas hydrogenation, viscosity breaking, steam or catalytic cracking.

Energy Recovery

It involves production of energy in the form of heat, steam and electricity. This is the most effective way to reduce the volume of organic materials. This method used only when material recovery processes mentioned above fail. Plastic materials

possess a very high calorific value, in particular when they are derived from crude oil. The method has been charged as ecologically unacceptable owing to the health risk from air born toxic substances such as dioxins, nitrogen oxides, and sulphur oxides.

In summary, recycling is suitable approach for post-consumer waste management of plastics. Recycling can accordingly decrease energy and material usage per unit of output and yield superior eco-efficiency. It is an effective way to improve the environmental performance of the polymer in the substitution of virgin plastic.

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Extraction of Vanadium from Stone Coal

[SAGAR VARMA, CE 5TH SEM]

Abstract

Vanadium, as one of the important rare elements, is used mainly to produce certain alloys. Stone coal is an important vanadium-bearing resource. The gross reserves of vanadium in stone coal accounts for more than 87% of the domestic reserves of vanadium. Hence, much attention has been paid to research on extracting vanadium from stone coal. The high salt roasting-water leaching technique is the earliest technique applied in vanadium extraction from stone coal, but much caustic gasses and ultra-high salinity wastewater are generated and the total vanadium recovery is low in production. There are various other techniques for the extraction of Vanadium which are environmentally friendly in the roasting step compared to high salt roasting for example; the blank roasting-acid leaching technique, the calcified roasting-carbonate leaching technique and the direct acid leaching technique. The technique of modern era is the low salt roasting-cyclic oxidation technique, which is characterized by high vanadium recovery, low pollution and strong adaptability to raw ore and has good prospect of applications.

Introduction

Vanadium, the 23rd element in Mendeleev's periodic table, was first discovered in 1831 within converter slag from certain iron ore by Swedish chemist Nils Gabriel Sefström, who named it vanadium after the Scandinavian goddess of beauty and fertility, Vanadis (Freya).

Vanadium compounds of which the vanadium pentoxide is of the most important are mainly used in steel industry at present. About 85% of vanadium consumption arises from the production of high-strength and low-alloy steels (HSLA) together with tool and die steels due to its physical properties such as tensile strength, hardness and fatigue resistance, another 10% is employed in aerospace industry for the manufacture of titanium–aluminum alloys, while the remainder are used in oxidation catalysts for the production of sulfuric acids and the cracking of petroleum products in chemical industry. In addition, there are significant potential applications of vanadium in vanadium redox battery.

Vanadium is never found in its pure state and is one of rare earth elements. It occurs in combination with over 50 different minerals such as carnotite, roscoelite, vanadinite, mottramite and patronite. The world reserve base of vanadium is about 38 million tons of metal. China, South Africa and Russia are the world leading vanadium-producing countries currently, and their primary resources come fromores, concentrates and vanadiferous slag.

Materials & Methods

Stone coal is one carbonaceous shale with average calorific value by the bomb calorimetric method of 4.18 MJ/kg. There are many debates on the origin of stone coal, but these points are commonly

accepted as follows: I) the low organisms in the ocean, such as algae, Fungi, plankton and so on are the main raw materials of stone coal; ii) Stone coal forms in reducing environment; iii) deposition plays an important role in the formation of stone coal. In summary, stone coal is a type of shallow marine sediment that is formed by lower Organisms and colloidal silica or clay in a reducing environment after long time of metamorphism and digenesis.

Vanadium in Stone Coal

Vanadium exists as V(II) (bivalent vanadium), V(III) (trivalent vanadium), V(IV) (quadrivalent vanadium), and V(V) (pentavalent vanadium) in nature as a rule, however, it generally is found as V(III), V(IV) and little V(V) in stone coal. V (III) and V (IV) readily replace Al (III) from structure as an isomorphism in mica group minerals, such as illite, muscovite, and biotite and so on, since they have similar ionic radius and electro negativity and same coordination number to Al (III). This type of vanadium is the most representative and prevalent in stone coal but it is difficult to be extracted as the vanadium is embedded in the crystal lattice of the aluminosilicate minerals. The second type of vanadium in stone coal is vanadium combined with organic compounds with abundant oxygen, nitrogen and sulfur. Finally, vanadium also can exist as independent minerals, for instance, the goldmanite, roscoelite, colusite, pascoite, vanadium bearing germinate etc. but these are rare in stone coal. Overall thus, vanadium in stone coal, for the most part, exists in the crystal lattice of the aluminosilicate minerals as isomorphism, and a small amount of it combines with organic compounds and/or adsorbs on the surface of clay and pyrite, only rare vanadium forms independent vanadium-bearing minerals in stone coal.

Method: Traditional high salt roasting-water leaching (HSRWL) technique

The traditional HSRWL technique can be traced back to the first salt-roast patent for vanadium extraction from vanadium minerals published by Bleecker in 1912 (Bleecker, 1912). The principles of vanadium extraction are not changed but only minor modifications are conducted in the traditional HSRWL technique. The pre-decarburized stone coal is ground with sodium chloride and pelletized under appropriate moisture. Next, the pellets are roasted in horizontal kiln at 800 °C–850 °C for about 2 h. The aim of roasting is to oxidize V (III) and V (IV) to V (V) and then V (V) combines with sodium to form water-soluble sodium vanadate. Pure sodium chloride is stable and not easy to decompose at high temperature, but it can decompose to
Release Cl2 and/or HCl only above 500 °C in contact with metal oxides in stone coal. The chemical reactions are as follows:

$4NaCl + O_2 = 2Na_2O + 2Cl_2\uparrow$

Or

$2NaCl + H_2O\ (g)\ Na_2O + 2HCl\ (g) \uparrow$ (at high moisture)

The released Cl2 can catalyze the oxidation of vanadium although the essential mechanism is still in debate.

$2V_2O_3 + O_2 = 2V_2O_4$
$3Cl_2 + 3V_2O_4 = 2VOCl_3 + 2V_2O_5$
$4VOCl_3 + 3O_2 = 2V_2O_5 + 6Cl_2\uparrow$
$xNa_2O + yV_2O_5 = xNa_2O{\cdot}yV_2O_5$

The ratio of x to y in Equation is closely related to the roasting conditions, and when x=y the roasting product is sodium metavanadate (NaVO3) which is soluble in water. In the roasting process, the roasting efficiency is defined as

η = (soluble vanadium/total vanadium) × 100%

Where the soluble vanadium indicates that that be converted from insoluble vanadium to water soluble vanadium during roasting. Subsequently, the roasted ore is leached by water and pH of the water leaching solution is adjusted to about 2 where V (V) exists as $H_2V_{10}O_{28}$.

$6Na_4H_2V_{10}O_{28} + {}_7H_2SO_4 + (n+13)\ H_2O = 5Na_2V_{12}O_{31}{\cdot}nH_2O\downarrow + 7Na_2SO_4 + 13H_2O$

The precipitated product, sodium polyvanadate (SPV), is generally brick-red and also called “red cake”. This product contains many impurities and the content of V_2O_5 is only about 85% commonly. The

"red cake" needs refining by being redissolved in NaOH solution and precipitated as AMV by adding NH4Cl at weak alkali condition as:

$NaVO_3 + NH_4Cl = NH_4VO_3\downarrow + NaCl$

Finally, the AMV is calcined and turned into the final product with more than 98.5% of V_2O_5 at about 550 °C.

$2NH_4VO_3 = V_2O_5 + H_2O\ (g)\uparrow + 2NH_3\uparrow$

In this technique, the roasting efficiency is about 45%–55%, the vanadium recoveries in water leaching, precipitating SPV and AMV are about 88%–93%, 92%–96% and 90%–93%, respectively. Hence, the total vanadium recovery is not more than 45%, which causes serious waste of the resource. Moreover, a large quantity of caustic gasses generated during oxidation process also causes acute environmental problems.

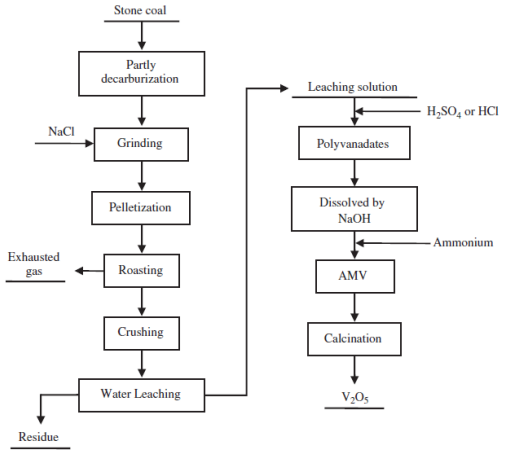

Figure 2: Flowchart of traditional HSRWL technique.

Discussion

Industrial vanadium extraction from stone coal was commenced from the 1970s in the Southern provinces of China. Production fluctuated widely with variations of the vanadium price on the world market. There are hundreds of small-scale vanadium extraction factories in the Hunan,
Hubei and Zhejiang provinces in the 1970s due to the high vanadium price at that time. Nearly all of these factories adopted the traditional HSRWL technique to extract vanadium from stone coal because this technique is characterized by simple flow, low investment, requirement for less equipment, and quick revenue, although the total vanadium recovery is not satisfactory. Because the roasting efficiency of horizontal kiln is low and a large footprint is needed for horizontal kiln, the production scale is restricted and the output of most small-scale factories are not more than 100 t V2O5 per year. In addition, a large amount of salt above 20% of the weight of raw ore is required in the roasting process due to the low roasting efficiency. Moreover, the wastewater with exceedingly high salinity also causes serious pollution to rivers and lakes. With the correction of vanadium price as well as the strengthening of environmental awareness and government's control in recent years, most of these small-scale factories have been closed down or were outlawed, and thus the traditional HSRWL technique has become obsolete.

For the purpose of ensuring the rational exploitation of stone coal at the large scale, these following aspects which should be strengthened and paid more attention to are listed below.

1. The studies on the mechanisms of the oxidation roasting and the leaching process. Although many studies focused on the oxidation roasting and leaching process of stone coal, the mechanisms of roasting additives in oxidation roasting process and the influence factors on the leaching of vanadium from vanadium-bearing minerals have not been completely understood until now. The development of innovative roasting additives and the improvement in the leaching process depend on breakthroughs of studies on their mechanisms.
2. The development of specialized equipments for the industry of extracting vanadium from stone coal. The suitable equipments which are designed for vanadium extraction form stone coal are the precondition for enlarging production scale, reducing specific energy consumption and costs, realizing auto control in vanadium extraction process and relieving environmental stress.

3. The application of bio hydrometallurgy in extracting vanadium from stone coal. Bio hydrometallurgy is a promising technology which is mainly used to recover certain metals, such as copper, gold, lead, nickel and zinc, from sulfide ores at present Bio hydrometallurgy lends itself economically and technically to the processing of low-grade and complex ores, and in some cases, it may be more environmentally friendly than other traditional technologies. The success in cultivation and naturalization for vanadium resistant bacteria makes bio hydrometallurgy a promising technology for vanadium extraction from stone coal, but there are technical challenges that need to be addressed.

4. The comprehensive utilization of tailings of vanadium extraction from stone coal. It is estimated that about 120,000–150,000 tons' tailings are generated for each 1000 tons V2O5 extracted from stone coal. The vast amounts of tailings not only occupy land but potentially

Pollute the environment. The essential chemical properties of the tailings with relatively high content of Al and active Si compounds make it appropriate to act as the raw material for production of new building materials, such as geopolymer or aerated concrete. It can potentially obtain extra economic benefits by utilizing tailings of stone coal.

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LITERARY ARTICLES: साहित्यिक प्रबन्ध

TITLE **AUTHORS**

BOOK REVIEW [AMIT GALPHADE, ME DEPARTMENT]

"જીંદગી જીવી જાણો" [SAGAR BHATT, LAB ASSISTANT, EST DEPARTMENT]

काव्य संकलन- नर हो, न निराश करो मन को
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BOOK REVIEW ON THE CONQUEROR SERIES BY CONN IGGULDEN

[AMIT GALPHADE, ME DEPARTMENT]

Imagine one fine morning when you wake up, you find your hair stuck to ground in ice which has formed over the night. There is numbing cold everywhere you go. Add to this that you are outcast, shunned out of the community, having to look after 3 older siblings. You are nine years old and your father was murdered. You have one positive though that your mother is not some weakling but woman of very strong character. But this doesn't help in finding the food which is scarce and scattered over the large area covered with snow and you have to get it, distribute it as you have to survive. Already two attempts have been made to kill you by this time.

Given this background, what future would one hold for the person experiencing above mentioned situation?

History is made by many individuals. But sometimes, some individuals are born who alter the history such that it sets completely different path. The Conqueror series is based on bunch of individuals coming from same family who altered the history in such a way that the subsequent history of mankind is still not completely out of their shadows even today.

The character whose life was as described by in the opening paragraph was Temujin, the second son of Yesugai who was *Khan* of the Mongolian tribe. But the world knows him today as *Gengis Khan*.

Conn Iggulden travels us back in the time when there was no nation called Mongolia but there were bunch of tribes living across vast area which was covered with ice and had scarce resources necessary to survive.

The series starts with the birth of Temujin who is named so by his father after the young warrior whom he had killed during the battle in the morning. Soon we learn about the family background. *Khan* was the title given to the tribe leader. Soon the story unwinds as we see the glimpse of *Genghis* in young Temujin throughout the narrative of his childhood just before the death of his father. The murder of his father sets things in motion and family finds themselves in the hardship. As the story unfolds further, we learn how Temujin becomes the leader and slowly unites all the tribes and thus gives birth to the nation of Mongolia. This is where first novel of the series *The Birth of the Nation* stops. This is followed by *Lord of the Bows*. In this, we read about the exploits of Mongols taking on the kingdom of Xi Xia. Also we are introduced to Tsubodai, one of the greatest Generals of all time in the history of mankind. Genghis's story ends in the third novel of the series, *Bones of Hills*. By this time, Mongolia had become the force to reckon with and the Mongol army the deadliest that had ever walked over the earth.

The fourth novel *Empire of Silver*, deals with the rule of Ogedai, second son of Gengis Khan. In this we also learn about the building of Karakorum and learn about the strife building amongst the successors of Genghis khan. This book ends with the death of Ogedai. The fifth and the last book *Conqueror* follows the rules by Guyuk Khan followed by Mongke Khan and finally by Kublai Khan. This part majorly focuses on how Kublai Khan came into possession of Mongol Kingdom.

Genghis Khan and Kublai Khan are two of the greatest known names from the Mongolia. Genghis's achievement is in the fact he brought together the different tribes and converted them into army which was one of the deadliest to walk on the earth. His impact on our history is enormous. The fact that *Khan* word has become today as the alternative of king shows how much this single man born 800 years back impacted our history.

Genghis Khan is usually the seen as dark character of the history. To many people, he is epitome of cruelty who was mass

murderer and enjoyed the suffering. Conn Iggulden actually gives alternative version of this. It is said that to understand a person you need to understand his background. Once you start learning about the formative years of Genghis or rather Temujin, you start to wonder that how did he even survive this. Today it might be hard to imagine the life without the modern comforts. And here is this young boy who did not even have the luxury of *ger* (Mongolian house, tent). He not only survived these harsh times, but went on to become one of the mightiest leaders that the world has ever known.

On the other side of the spectrum is his own grandson. Kublai Khan is considered to be one of the greatest four leaders of all time alongside Julius Caesar, Alexander the Great, and Napoleon Bonaparte. He, in contrast to his grandfather, had considerably comfortable childhood. But his youth was by no means less eventful. He had to survive his own brothers- first cousins and then siblings.

The problem was that there was no fixed rule for succession established by Genghis Khan. So there were continuous issues and till Kublai took over, the times were tumultuous for the entire kingdom. The fifth book is more focused on this aspect of the family. In fact, some of the darkest episodes are noted in this book. The transfer of power from Guyuk to Mongke and from Mongke to Kublai was by no means smooth. Lots of blood was shed and sometimes it was their own blood. This was passed on to their future generations and one will not be surprised that one of the lines of Genghis went on to be known as Mughals.

The strong point of the series is to show the inner thinking of Genghis Khan and likes of Tsubodai. Genghis was by no means the person who would be hell bent on destruction. In fact, he was someone who was surprised by the kind of luxury the other kingdoms enjoyed. His luxury was to have tent on his head. Also he was a person who would always reward the loyalty. He had the great knack of picking people. He rewarded the talent rather than bloodline which was something new. The rise of Tsubodia is proof of this.

Another great highlight of the series is description of the wars. Mongol soldiers were different from their contemporaries. Mongol soldiers were extremely good horse riders. They were able to march 200 miles in a day. This figure may seem too small in today's day of modern transportation, but they were the fastest in their times. Another striking aspect is that Mongols always valued strategy over valor. That is the reason that despite being always outnumbered, they always were able to overcome their enemies.

While being historically accurate, Conn Iggulden has taken some liberty in writing the novels. These are very few instances and as such don't affect the history much. He has in fact given the explanation for each at the end of each book. That also is very interesting read.

In retrospect, the impact of Genghis Khan was not just on Mongolia. It was hammer blow to the existing system of that time. It not only altered the history and geography of Asia but also altered the history of middle ages of Europe.

In nutshell, this series is not just for those who love to read something regularly, but also for those who want to take something away after reading. Combine this series with the history of middle ages and one can find many roots of today's modern one.

Conn Iggulden is master story teller. Even though the books are historical, one would not be bored but would be rather enthralled to keep reading as if he or she is reading the thriller. He has tried to show Genghis as he was. It is left to reader to decide how to look at Genghis- whether as a cruel dictator or as Conqueror.

"જીંદગી જીવી જાણો"

[SAGAR BHATT, LAB ASSISTANT, EST DEPARTMENT]

લાંબી આ સફરમાં જીંદગીના ઘણા રૂપ જોયા છે,

તમે એકલા શા માટે રડો છો, સાથી અમે પણ ખોયા છે.

આપ કહો છો આમને શું દુઃખ છે, આ તો હંમેશા હસે છે,

આપ શું જાણો આ સ્મિતમા કેટલા દુઃખ વસે છે.

મંજિલ સુધી નહિ પહોંચ્યા, તમે એ વાત થી દુઃખી છો,

ચાલવા તો મળ્યો રસ્તો તમને, એટલા તો તમે સુખી છો.

જે થયું નથી એનો અફસોસ શા માટે કરો છો,

આ જીંદગી જીવવા માટે છે,આમ રોજ રોજ શાને મરો છો.

આ દુનિયામા સંપુર્ણ સુખી તો કોઈ જ નથી,

એક આંખ તો બતાવો મને જેને ક્યારેય આંસુ સાર્યા નથી.

બસ એટલું જ કહેવું છે જીંદગીની દરેક ક્ષણ દિલથી માણો,

નસીબ થી મળી છે જીંદગી તો એને જીવી જાણો.

Taken from other source

काव्य संकलन- नर हो, न निराश करो मन को

[PRATIBHA GAUTAM, ASSISTANT PROFESSOR, EST DEPARTMENT]

राष्ट्रकवि **मैथिलीशरण गुप्त** (३ अगस्त १८८६ - १२ दिसम्बर १९६४) हिन्दी के कवि थे। महावीर प्रसाद द्विवेदी जी की प्रेरणा से आपने खड़ी बोली को अपनी रचनाओं का माध्यम बनाया और अपनी कविता के द्वारा खड़ी बोली को एक काव्य-भाषा के रूप में निर्मित करने में अथक प्रयास किया। पवित्रता, नैतिकता और परंपरागत मानवीय सम्बन्धों की रक्षा गुप्त जी के काव्य के प्रथम गुण हैं, जो पंचवटी से लेकर जयद्रथ वध, यशोधरा और साकेत तक में प्रतिष्ठित एवं प्रतिफलित हुए हैं। साकेत उनकी रचना का सर्वोच्च शिखर है।

गांधी जी ने उन्हें "राष्टकवि" की संज्ञा प्रदान की। सन् १९५३ ई. में भारत सरकार ने उन्हें "पद्म विभूषण' से सम्मानित किया। तत्कालीन राष्ट्रपति डॉ॰ राजेन्द्र प्रसाद ने सन् १९६२ ई. में "अभिनन्दन ग्रन्थ' भेंट किया तथा हिन्दू विश्वविद्यालय के द्वारा डी.लिट. से सम्मानित किये गये। मैथिलीशरण गुप्त को साहित्य एवं शिक्षा क्षेत्र में पद्म भूषण से १९५४ में सम्मानित किया गया।

<u>प्रकाशित कृतियाँ</u>

महाकाव्य- साकेत

खंड काव्य - जयद्रथ वध, भारत-भारती, पंचवटी, यशोधरा, द्वापर, सिद्धराज, नहुष, अंजलि और अर्घ्य, अजित, अर्जन और विसर्जन, काबा और कर्बला, किसान, कुणाल गीत, गुरु तेग बहादुर, गुरुकुल, जय भारत, झंकार, पृथ्वीपुत्र, मेघनाद वध,

नाटक - रंग में भंग, राजा-प्रजा, वन वैभव, विकट भट, विरहिणी व्रजांगना, वैतालिक, शक्ति, सैरन्ध्री, स्वदेश संगीत, हिडिम्बा, हिन्दू

अनूदित- मेघनाथ वध, वीरांगना, स्वप्न वासवदत्ता, रत्नावली, रूबाइयात उमर खय्याम

नर हो, न निराश करो मन को

नर हो, न निराश करो मन को

कुछ काम करो, कुछ काम करो
जग में रह कर कुछ नाम करो
यह जन्म हुआ किस अर्थ अहो
समझो जिसमें यह व्यर्थ न हो
कुछ तो उपयुक्त करो तन को
नर हो, न निराश करो मन को।

संभलो कि सुयोग न जाय चला
कब व्यर्थ हुआ सदुपाय भला
समझो जग को न निरा सपना
पथ आप प्रशस्त करो अपना
अखिलेश्वर है अवलंबन को

नर हो, न निराश करो मन को।

जब प्राप्त तुम्हें सब तत्त्व यहाँ
फिर जा सकता वह सत्त्व कहाँ
तुम स्वत्त्व सुधा रस पान करो
उठके अमरत्व विधान करो
दवरूप रहो भव कानन को
नर हो न निराश करो मन को।

निज गौरव का नित ज्ञान रहे
हम भी कुछ हैं यह ध्यान रहे
मरणोंत्तर गुंजित गान रहे
सब जाय अभी पर मान रहे
कुछ हो न तज़ो निज साधन को
नर हो, न निराश करो मन को।

प्रभु ने तुमको कर दान किए
सब वांछित वस्तु विधान किए
तुम प्राप्त करो उनको न अहो
फिर है यह किसका दोष कहो
समझो न अलभ्य किसी धन को
नर हो, न निराश करो मन को।

किस गौरव के तुम योग्य नहीं
कब कौन तुम्हें सुख भोग्य नहीं
जान हो तुम भी जगदीश्वर के
सब है जिसके अपने घर के
फिर दुर्लभ क्या उसके जन को
नर हो, न निराश करो मन को।

करके विधि वाद न खेद करो
निज लक्ष्य निरन्तर भेद करो
बनता बस उद्यम ही विधि है
मिलती जिससे सुख की निधि है
समझो धिक् निष्क्रिय जीवन को
नर हो, न निराश करो मन को
कुछ काम करो, कुछ काम करो

- मैथिलीशरण गुप्त

MY COLLEGE LIFE

[RIDDHI D. CHANDEGARA
5th semester, Chemical Engineering]

My heart peevish for some time,
so beautiful were college life,
No one can ignore to discuss,
That how was his college life,
At the time of admission we said,
so long is our college life,
The first step was to admit at college,
The second was to retired from college life
Then to sat in class first year,
We take start for college life,
But after very little period of time,
First year were ignored from college life,
Then on promoting of next class,
I felt the beauty of college life,
But the time has to go on and so on!
And never wait to enjoy college life,
Now before ending the session,
To shares activities of college life.

KNOW THE ULTIMATE GOAL OF YOUR LIFE

[EKTA JASROTIA, EST 7TH SEM]

When we speak of the goal of life, most of us think of some worldly ambition. We say, "I want to be an engineer', 'I want to be rich', and so on and so forth. We are so pre-occupied in achieving our respective ambitions that we hardly explore what we really want in life .After working day and night, and struggling very hard, a person may become an engineer or doctor, may amass wealth, and have a good family too. But do these guarantee happiness and peace that is eternal? Is this all that is there to life? What is the purpose of our existence? Most of us remain unaware about the ultimate goal of the human life.

Within each of us is a natural urge to struggle for a better state of life than the present one. With regular practice of introspection we sense incompleteness in the current state of life. This makes us crave unalloyed happiness, uninterrupted peace, and immorality. This is the inner quest and ultimate goal of every human heart. We are all trying hard to attain it in our own way, irrespective of whether we are aware of our efforts in this direction and whether or not we succeed in our efforts during our life time.

We therefore work towards gaining a sense of completeness that we find missing in our lives. Generally we want to achieve something that we think is within our reach, expect for some courageous men and women who like to make a sort of pole-vault to attain what is apparently beyond an individual's capacity. They are able to reject the alluring and prolific material goals, and focus only on the ultimate goal. Such people are very rare. Most of us are unmindful of the ultimate goal of life and set out to seek the desired completeness in life by pursuing material and tangible goals such an academic qualifications, a respectable career, marriage, progeny, creation of wealth, and so on-though necessarily in the given order. This we do ignorantly and unintentionally, flowing social conventions or a kind of herd mentality, with the underlying believe that by working hard and achieving same position of importance in social life, we will be able to achieve a state that is different from the present one; a happier, freer, more peaceful, more powerful and less miserable state.

Hope those who are reading this might be thinking the ultimate goal of their life and starts working upon it and achieving happiness soon.

MAY-BRITT MOSER

Born: 4 January 1963, Fosnavåg, Norway

Affiliation at the time of the award: Norwegian University of Science and Technology (NTNU), Trondheim, Norway

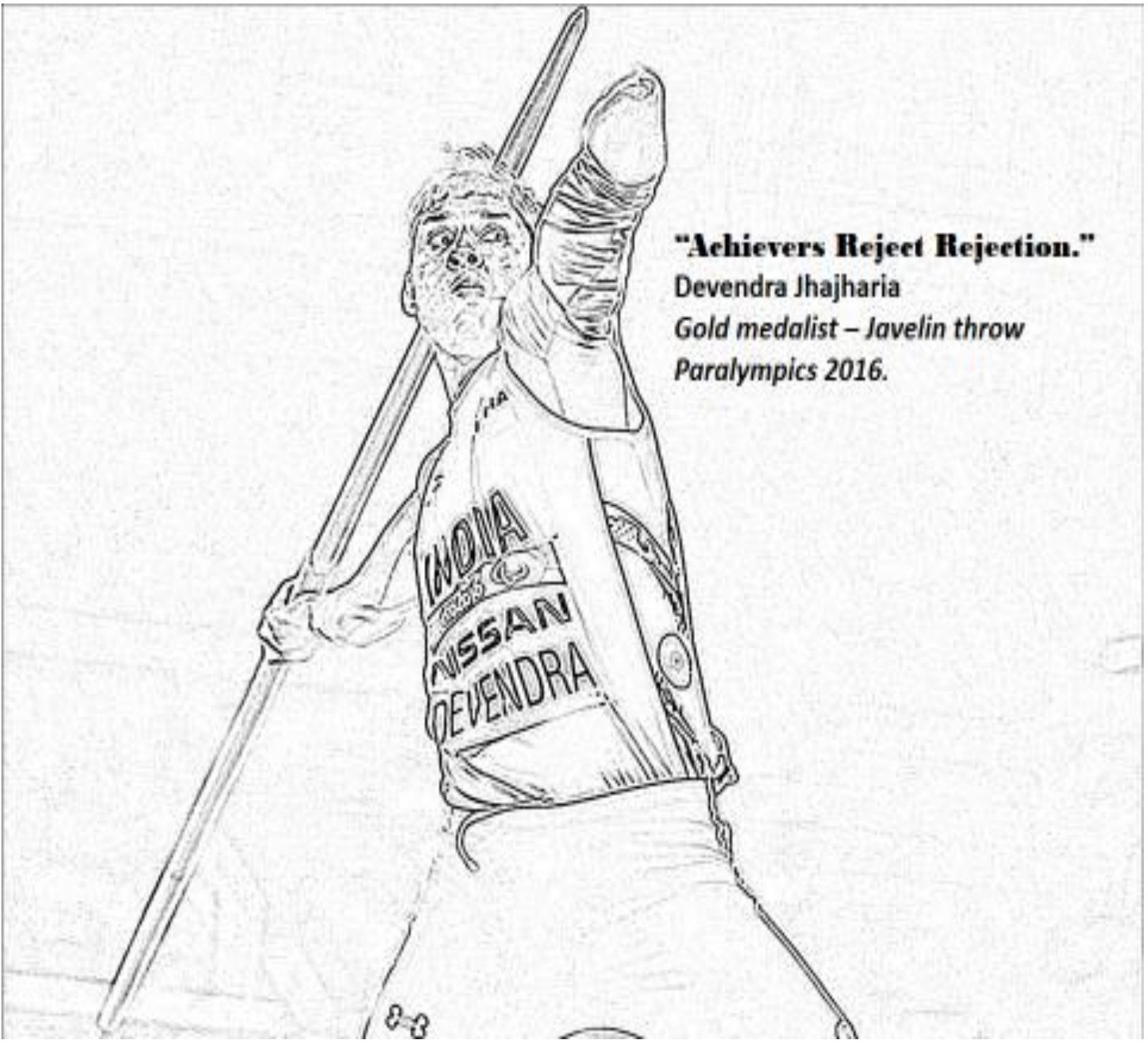
Prize motivation: "for their discoveries of cells that constitute a positioning system in the brain"

Field: physiology, spatial behavior

Work

The awareness of one's location and how to find the way to other places is crucial for both humans and animals. In 2005 May-Britt Moser and Edvard I. Moser discovered a type of cell that is important for determining position close to the hippocampus, an area located in the center of the brain. They found that when a rat passed certain points arranged in a hexagonal grid in space, nerve cells that form a kind of coordinate system for navigation were activated. They then went on to demonstrate how these different cell types cooperate.

ART CORNER: चित्र-लेख



KNOW OUR FACULTY MEMBERS:

गुरुं -विजानियात्

NAME: URVIJ B DAVE

DESIGNATION: Assistant Professor

DEPARTMENT:
Environmental Science & Technology

EDUCATIONAL QUALIFICATIONS:
B.E(Chem. Engg)., M.E. (Environmental Engg)

RESEARCH INTEREST:
Environmental management, environmental modelling and green technologies.

ACADEMIC INTERESTS;
Environmental Engineering, Climate Change, Solid Waste Management, Air Pollution, Engineering, Plant Design and Project Engineering, Process Safety Management.

PUBLICATIONS:
National Journals: 1
International Conference: 2
National Conference: 5

NAME- TARIKAHMED A. SHAIKH

DESIGNATION- Assistant professor

DEPARTMENT- Mechanical Engineering

EDUCATIONAL QUALIFICATION-
B.E.(Government Engineering College, Surat,Gujarat, India)
M.E.(Energy Engineering)(Government Engineering College, Valsad,Gujarat, India)

EXPERIENCE- 4 years 8 Months

RESEARCH INTEREST- Thermal and Energy Audit

PUBLICATION- 2 International Journal

KNOW OUR STAFFS':

सहकार्यकर्तामज्जानियात

NAME: MAYUR H NAI

DESIGNATION: Assistant of Administration

DEPARTMENT: Administration

EDUCATIONAL QUALIFICATION: Master of Commerce

RESEARCH INTEREST: Astronomy (Theory of Big Bang)

HOBBIES: Reading & Learning

PERSONAL QUOTE

- Learn from Every One Follow No One.
- I may not the Best. But I definitely I dislike the Rest.
- Come What May Never Give Up.

NAME: MISS RUCHI A. PATEL

EDUCATION QUALIFICATION: Bachelor of Engineering (B .E) in Environmental Science and Technology

DESIGNATION: Junior Research Assistant (R & D cell)

PROJECT WORK: Electrochemical-oxidation of Wastewater, Biodiesel from Jatropha , Acetochem Wastewater Sample test , Plastic waste to fuel

ACHIEVEMENTS: Secured First rank in GTU in Final Semester

HOBBIES: Reading, Travelling, Crafts, Drawing

"PUZZLE"

[SHUBHAM TIWARI, VII SEMESTER, DEPARTMENT OF ELECTRICAL ENGINEERING]

- 14 students in a class failed in both QT and accounts.20 failed in QT, but 32 failed in accounts. How many students were there in total ?
- S is as much older than K as he is younger than P. N is as old as K. Which of the following is wrong?

OPTIONS:

1) K is younger than P

2) N is younger than P.

3) S is older than N.

4) P is not the oldest.

5) K is younger than S.

"TOP NATIONAL NEWS OF LAST 3 MONTHS"

- Army Chief Dalbir Singh visits Northern Command after cross-LoC strike.
- Most candidates in local body polls in rural Maharashtra have political background: Study
- Narendra Modi only working for top class industrialists: Rahul Gandhi
- KVIC to launch portal for registration of institutions.
- Need for air connectivity with Nigeria very obvious: Hamid Ansari

"TOP INTERNATIONAL NEWS OF YEAR-2016"

- Clinton edges ahead of Trump in post-debate poll bump.
- Afghan military kill 6 security forces in air strike mistake.
- Boston Marathon bombing makes way to TV and movie screens.
- Hurricane Matthew strengthens into Category 5 storm.
- UN chief Ban Ki-moon offers to mediate between India and Pakistan

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