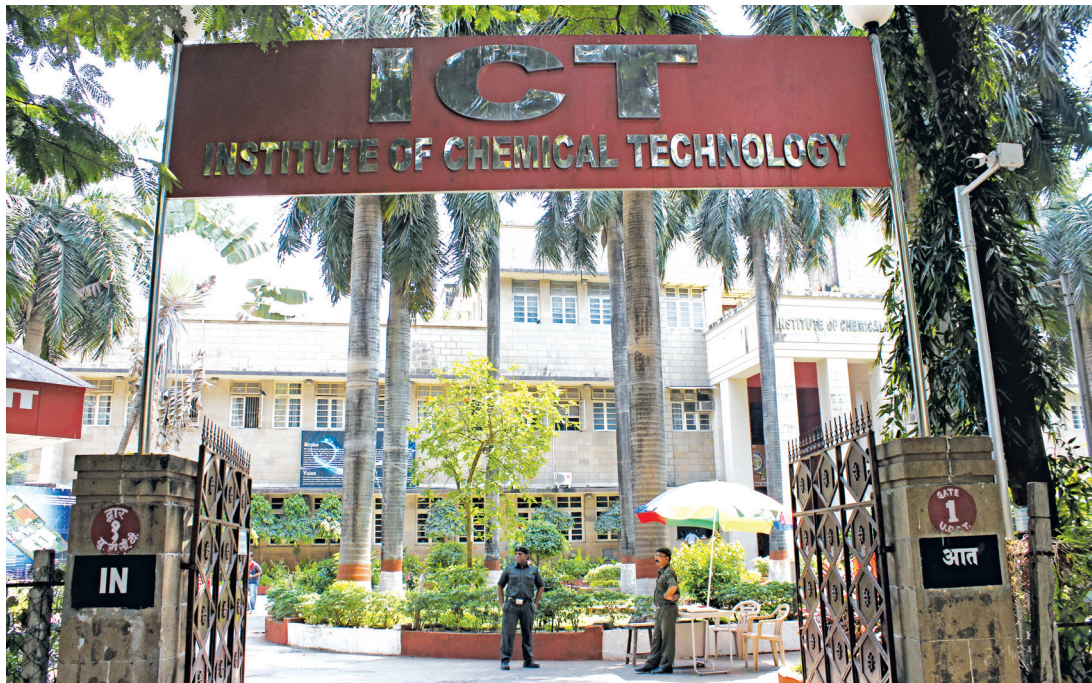




# INSTITUTE OF CHEMICAL TECHNOLOGY

Deemed to be University under Section 3 of UGC Act 1956  
Elite Status and Centre of Excellence - Govt. of Maharashtra;  
TEQIP Phase - III Funded

Nathalal Parekh Marg, Matunga, Mumbai - 400 019, INDIA  
Telephone: (91-22) 3361 1111/ 2222; Fax: (91-22) 3361 1020  
Website: [www.ictmumbai.edu.in](http://www.ictmumbai.edu.in)



## VISION

We shall perennially strive to be a vibrant institute with continuously evolving curricula to brighten the future of the chemical, biological, materials and energy industries of the nation, and rank amongst the very best in the world through active participation and scholarship of our faculty, students and alumni. We shall be creators of sprouting knowledge and design cutting-edge technologies that will have the greatest impact on society and benefit mankind at large.

## MISSION

We shall generate and sustain an atmosphere conducive to germinating new knowledge at every available opportunity. The education we shall impart will enable our students to devise new solutions to meet the needs of all segments of society with regard to material and energy, while protecting the environment and conserving the natural resources. Our endeavours, while extending well beyond the confines of the classroom, will aim to enhance public welfare and our attempts to disseminate knowledge will spread to a greater multi- and cross-disciplinary platform to conduct research, discovery, technology development, service to industry and entrepreneurship, in consonance with India's aspirations to be a welfare state. We will team scientists and engineers with professionals in other disciplines to arrive at better solutions. We will provide all our students with a strong foundation to encourage them to be our ambassadors in the professional activities that they choose to undertake in service of society at national and international levels. Through our vision, we will serve the profession and society and strive to reach the summit as a team, and ultimately serve as role models to the younger generation.

## DEEMED TO BE UNIVERSITY

The Institute of Chemical Technology (ICT), Mumbai is a unique Institute which was established on 1st October 1933 as a University Department of the Bombay University (UDCT), which has created its own brand over the years. Under the TEQIP it was granted full autonomous status in 2004 and declared as Deemed-to-be University on September 12, 2008 by the MHRD under Section 3 of the UGC Act of 1956. It was granted an Elite Status and Centre of Excellence on par with IITs, IISc and IISERs in the State Assembly on April 20, 2012 by the Maharashtra Govt. based on its stellar performance on par with institutes of national importance. Web of Science shows that ICT is number one under Category normalized citation impact of 0.98.

ICT is housed on 16 acres in Mumbai and is running 9 UG (Chemical Engineering; 7 branches of Chemical Technology; 1 Pharmacy), 18 PG (9 inter-disciplinary) and 29 Ph D programmes (11 interdisciplinary), 1 PG Diploma in Chemical Technology Management for doctoral students and 1 PG Certificate Course in Chemical Safety and Risk Management for all Masters students. ICT is governed according to special Statutes which go beyond Deemed University concept as approved by the State. In the QS ranking of Chemical Engineering only 3 from India are mentioned along with G.D. Yadav and A.B. Pandit are included.

**In November, 2017, National Assessment and Accreditation Council (NAAC) Committee visited ICT and graded with A++ CGPA of 3.77 out of 4. This the highest possible grade among all during last three cycles and ICT is the only Engineering Institute to get this A++ grade, among all Institutes all over India.**

- ICT has 11 departments and 6 centres of excellence.
- First batch of 20 students of 2-year B.Sc. (Tech.) in Textile Chemistry and Chemical Engineering (the first degree courses in Technology in Bombay University) commenced on 4th August, 1934.
- Many distinguished alumni in government, academia, industry and other walks
- 3 Padma Vibhushan, 8 Padma Bhushan, 8 Padma Shri awardees; 2 Fellows of Royal Society (among 5 engineers from India); Several Fellowships- FNA, FNASc, FNAE, FRSC, FTWAS, MUSAE.
- Over 500 first generation entrepreneurs, some owners of Fortune 500 Companies;
- Current student strength: 1100 UG; 450 PG and 730 Ph Ds
- Since last few years, Doctorates produced per year are more than 100, which is the highest in the country for such unique University.
- Publication record per faculty is the best in India. In 2015 calendar year, 468 peer reviewed papers
- Sept 2016 statistics from the Web of Science shows that ICT is number one in India under Category normalized impact citation impact of 0.98; impact relative to the world is 0.961.
- Last 10 years, 348 Patents filed/acquired, 157 granted.
- Two non-profit companies under Companies Act Section 25 for building 2G bioethanol plants of 400 TPD of BPCL and HPCL
- Student entrepreneurs; one of the Ph D student having established a company with Rs 13 Cr turn-over.
- Selected as a Lead Institution under TEQIP-1.
- TEQIP-2 provided Rs. 17.5 cr., Innovative Networking (Rs.3.01 cr.) and Centre of Excellence in Process Intensification (Rs. 5 cr.)
- Under TEQIP-3, ICT is the mentor of BIT, Mesra, Ranchi
- The External Cash Flow >2:1 over government grants.
- Majority of faculty consultants to industry with 1/3 share going to the institute without any material use.
- Except one, all faculty members are Ph D holders but the non-Ph D holder has also produced PhD.s
- Generous support by Alumni Association for welfare of students, support staff, institute and infra-structure, student interest-free loans, in-plant training.

- Some support staff have earned Ph Ds while on job.
- Vibrant syllabus. New pattern to create UG students as entrepreneurs, Masters and Ph D student fellowships from industry.
- All faculty having Ph D students including V.C., Registrar and Deans, who also teach and conduct research, and publish.
- FICCI Higher education Award in two categories viz. i) Excellence in faculty, and ii) Enabling a Research Environment(2015)
- Ranked as Number One Institute in India and in top 5 in the world in Chemical Engineering by a survey published by Professor Jude Sommerfeld of Georgia Tech., USA (January 2012)
- Rated as Number one among all Biotechnology programs in India, in2010, 2011 and 2013 by the Biospectrum magazine
- Rated as Number One Institute by NPIU among all the TEQIP funded Institutes (October 2010). Qualified for Phase II of this program from December 2011
- Awarded Ramakrishna Bajaj National Quality Award in service sector category by The Indian Merchants Chamber (IMC) in 2003
- Received the AICTE-CII sponsored Tata Chemicals Best Industry Linked Institute in Chemical Engineering thrice in a row- 2012, 2013, 2014
- Received 4 Bill and Melinda Gates Foundation awards of US \$ 1000,000/- each on global competition.
- The faculty is highly accomplished, with multi-disciplinary interests and decorated with national and international awards and honours, having live connections with industry and policy making bodies. These include Fellowship of the Royal Society- UK (2), TWAS fellowships (4) Bhatnagar Award (6), INSA Fellowships (14), Young Scientist medals (5); Indian Academy of Sciences Fellowships (15), Young Engineer Award of INAE (7), Gold Medal of the Society of Dyers & Colourists, UK, etc.
- CSIR Lab retired directors as full time faculty to work up to age of 70 under endowment positions
- 15 faculty members received special recognition by UGC for supervising more than 15 Ph.D students as single guide
- 13 UGC Faculty Recharge appointments
- Merit is the only criterion for admission; 52% students come from reserved category.
- Several merit-cum-means scholarships (350) ranging from Rs.10,000/- to Rs. 1,00,000/-
- Many endowments to cater to different activities; 21 faculty, 49 visiting faculty and 11 library, campus development; travel; support staff
- 180 MOUs in operation for academic and research collaborations with industry, Indian and foreign universities and CSIR laboratories.
- India's first 2 G bioethanol plant of 10 TPD, based on agro-wastes composed of lignocellulosics. dedicated to the nation on 22nd April 2016
- Developed technologies for cleaning of Rankala Lake in Kolhapur under CSR; more to follow.
- UG students 6 Prototype models having patents for commercialisation
- FICCI - Federation of Indian Chamber of Commerce and Industries awarded the Best Institutional Social Responsibility Award to ICT for the year 2016.
- FICCI felicitated Padmavibhushan Dr. R.A. Mashelkar, Chancellor, ICT with the Life Time Achievement Award 2016 and Padmavibhushan Professor M.M. Sharma, Former Director, ICT (then UDCT) in 2017.
- The State Government has transferred 203 acre land at Shiraswadi at Auragabad-Jalna Road to ICT for establishing satellite campus with various Centres of Excellence.
- Signed an MOU with Indian Oil Corporation Ltd., in the presence of Shri Dharmendra Pradhan, Minister of Petroleum & Natural Gas and Skill Development and Entrepreneurship to establish ICT campus in Bhubneshwar
- Professor G.D. Yadav, Vice Chancellor of the Institute has been recognized as one of the most highly prolific authors for "Industrial & Engineering Chemistry Research" on the Journal Stars website (<http://journalstars.acs.org/>) by American Chemical Society (ACS).



**Padmavibhushan  
Dr. R.A. Mashelkar,**

National Research Professor, is presently also the President of Global Research Alliance, a network of publicly funded R&D institutes from Asia-Pacific, Europe and USA with over 60,000 scientists.

**Dr.** R.A. Mashelkar, National Research Professor, is presently also the President of Global Research Alliance, a network of publicly funded R&D institutes from Asia-Pacific, Europe and USA with over 60,000 scientists.

Dr. Mashelkar served as the Director General of Council of Scientific and Industrial Research (CSIR), with thirty-eight laboratories and about 20,000 employees for over eleven years. He was also the President of Indian National Science Academy and President of Institution of Chemical Engineers (UK).

Dr. Mashelkar is only the third Indian engineer to have been elected (1998) as Fellow of Royal Society (FRS), London in the twentieth century. He was elected Foreign Associate of National Academy of Science (USA) in 2005, Associate Foreign Member, American Academy of Arts & Sciences (2011); Foreign Fellow of US National Academy of Engineering (2003); Fellow of Royal Academy of Engineering, U.K. (1996), Foreign Fellow of Australian Technological Science and Engineering Academy (2008) and Fellow of World Academy of Arts & Science, USA (2000).

Dr. Mashelkar has been on the Board of Directors of several reputed companies such as Reliance Industries Ltd., Tata Motors Ltd., Hindustan Unilever Ltd., Thermax Ltd., Piramal Enterprises Ltd., KPIT Technologies Ltd., etc. He chairs the Board of GeneMedix Life Sciences Pvt. Ltd., Vyome Biosciences Pvt.Ltd. and Invictus Oncology Pvt. Ltd.

In August 1997, Business India named Dr. Mashelkar as being among the 50 path-breakers in the post- Independent India. In 1998, Dr. Mashelkar won the JRD Tata Corporate Leadership Award, the first scientist to win it. In June, 1999, Business India did a cover story on Dr. Mashelkar as "CEO OF CSIR Inc.", a dream that he himself had articulated, when he took over as DG, CSIR in July 1995. On 16 November 2005, he received the Business Week (USA) award of 'Stars of Asia' at the hands of George Bush (Sr.), the former President of USA. He was the first Asian Scientist to receive it.

Deeply connected with the innovation movement in India, Dr. Mashelkar is currently the Chairman of India's National

Innovation Foundation, Reliance Innovation Council, Thermax Innovation Council and KPIT Technologies Innovation Council, He Chairing Marico Foundations Governing Council.

Thirty four universities have honoured him with honorary doctorates, which include Universities of London, Salford, Pretoria, Wisconsin, Swinburne and Delhi.

Dr. Mashelkar's contributions have been multifarious.

When Dr. Mashelkar took over as the Director General of CSIR, he enunciated "CSIR 2001: Vision & Strategy". This was a bold attempt to draw out a corporate like R&D and business plan for a publicly funded R&D institution. This initiative has transformed CSIR into a user focused, performance driven and accountable organization. This process of transformation has been recently heralded as one of the ten most significant achievements of Indian Science and Technology in the twentieth century.

Dr. Mashelkar has won over 50 awards and medals, which include S.S. Bhatnagar Prize (1982), Pandit Jawaharlal Nehru Technology Award (1991), G.D. Birla Scientific Research Award (1993), Material Scientist of Year Award (2000), IMC Juran Quality Medal (2002), HRD Excellence Award (2002), Lal Bahadur Shastri National Award for Excellence in Public Administration and Management Sciences (2002), World Federation of Engineering Organizations (WFEO) Medal of Engineering Excellence by WFEO, Paris (2003), Lifetime Achievement Award by Indian Science Congress (2004), the Science medal by the Academy of Science for the Developing World (2005), Ashutosh Mookherjee Memorial Award by Indian Science Congress (2005), etc.

The President of India honoured Dr. Mashelkar with Padmashri (1991), with Padmabhushan (2000) and with Padma Vibhushan (2014), which are three of the highest civilian honours in recognition of his contribution to nation building.

## PROLOGUE



### PROFESSOR G. D. YADAV

*B. Chem. Eng., Ph. D. (Tech.), FTWAS, FNA, FASc, FNASc, FNAE, FISTE, CChem, FRSC (UK), ChE, FICHEM (UK), FMASc, FIICHE, FICS,*

Vice Chancellor and R.T. Mody Distinguished Professor, Institute of Chemical Technology  
J.C. Bose National Fellow (DST-GOI)

Also Adjunct Professor RMIT University, Australia

Also Adjunct Professor University of Saskatchewan, Canada

Padmashree Awardee

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Dear Readers, I am most pleased to present to you the Annual Report for the Academic Year: July 2016- June 2017. I believe this is extra-ordinary and unparalleled. Apart from these three distinctions, our faculty, students, alumni and support staff have brought laurels to ICT.

## ICT IN NUTSHELL :

- 3 Padma Vibhushan, 8 Padma Bhushan, 8 Padma Shri awardees; 2 Fellows of Royal Society (among 5 engineers from India); Several Fellowships- FNA, FNASc, FNAE, FRSC, FTWAS, MUSAE.
- Over 500 first generation entrepreneurs, some owners of Fortune 500 Companies;
- Current student strength: 1100 UG; 450 PG and 730 Ph Ds
- Since last few years, Doctorates produced per year are more than 100, which is the highest in the country for such unique University.
- Publication record per faculty is the best in India. In 2015 calendar year, 468 peer reviewed papers
- Last 10 years, 348 Patents filed/acquired.
- Two non-profit companies under Companies Act Section 8 and two more
- Student entrepreneurs; one of the Ph D student having established a company with Rs 11 Cr turn-over.
- Selected as a Lead Institution under TEQIP-1.
- The External Cash Flow > 2:1 over government grants.
- Majority of faculty consultants to industry with 1/3 share going to the institute without any material use.
- Except one, all are Ph D holders but the non-Ph D holder has also produced Ph D.s
- FICCI Higher education Award in two categories viz. i) Excellence in faculty, and ii) Enabling a Research Environment(2015)
- Rated as Number One Institute by NPIU among all the TEQIP funded Institutes (October 2010). Qualified for Phase II of this program from December 2011
- Received 4 Bill and Melinda Gates Foundation awards of US \$ 1000,000/- each on global competition.
- The faculty is highly accomplished, with multi-disciplinary interests and decorated with national and international awards and honours, having live connections with industry and policy making bodies. These include Fellowship of the Royal Society- UK (2), TWAS fellowships (4) Bhatnagar Award (6), INSA Fellowships (14), Young Scientist medals (5); Indian Academy of Sciences Fellowships (14), Young Engineer Award of INAE (7), Gold Medal of the Society of Dyers & Colourists, UK, etc.
- CSIR Lab retired directors as full time faculty to work up to age of 70 under endowment positions
- India's first 2 G bioethanol plant of 10 TPD, based on agro-wastes composed of lignocellulosics dedicated to the nation on 22nd April 2016; three more of 250-500 TPD plants to be set up by PSUs.
- Developed technologies for cleaning of Rankala Lake in Kolhapur under CSR; more to follow.
- UG students 6 Prototype models having patents for commercialisation

**Off Campus Centres** – Under the provisions of Regulation - 12 of UGC (institution Deemed-to-be universities), Regulations – 2010, Institute is eligible for establishing the off campus centres. The proposals for establishing the same at Bhubneshwar and Aurangabad are under consideration.

- Odisha Centre** - As suggested by Hon'ble Shri Debiprasad Mishra, Minister, Government of Odisha, Institute was exploring the idea of establishing an off campus centre of the ICT at Bhubaneswar. Accordingly, the institute is in the process of preparing the DPR for submitting to the Odisha Government. As this centre is being established outside the Maharashtra, the proposal of establishment is also being submitted for the prior permission of the Central Government. On

acceptance of DPR by the Odisha Government necessary fall of action shall be initiated and the required application shall be submitted to the related authorities of UGC.

- ii. **Aurangabad Centre** – Hon'ble Chief Minister of Maharashtra has shown willingness to offer the land at Aurangabad for establishing the Marathwada Centre of the ICT. The DPR for the same is under preparation.

The review of the bygone year shows the progress made in comparison with individuals and departments locally and nationally. The institutional h-index being 95. ICT continues to remain an exciting institute having bagged several accolades, honours and distinctions by all stake holders. It is gratifying to note that Professor A.B. Pandit crossed 10,000 citations during the years after Professor J.B. Joshi. Overall ICT's record in citations is also very remarkable. The Annual report of last year was printed in pen-drive format accompanied by a booklet of glimpses. Various departments and Centres have given in detail the relevant profiles. Many would not believe that a Deemed to be University of a State Government, situated on a tiny land of 16 acres in the middle of Mumbai, could surpass all branded institutes in terms of productivity per capita and also per rupee spent. The current report will further heighten your curiosity. We would like to set our own targets and achieve them. I believe we should try to excel our performance year after year and be in top 200 universities of the World.

This report provides detailed information of the various academic, extra-curricular and extension profile. It also demonstrates a trend as to who the most prolific faculty members are, which departments have been consistently producing high quality research within the ICT itself, and how others could learn from each other. We have to set goals. As the Vice Chancellor, I have allowed everybody to excel and set goals and compare themselves with international yardsticks. The most prolific professors are also among the best teachers, consultants and researchers. That is the only way individuals and institutes can grow. ICT has been in the news for its splendid accomplishments and stellar performance as an institute of not only of national but also of international importance, having its own distinct brand among a plethora of branded institutes for the past 83 years. Last year my new equation is  $100 = 1000!$  was presented to the alumni on the Annual Alumni Reunion Day. It seems like a binary code. Now it is revised to a higher value. US\$ 0.5Billion! Yes, you read it correctly. We are not just a Chemical Technology Institute but have been working in four different areas Chemical Sciences and Engineering, Biological Sciences and Engineering, Material Sciences and Engineering and Energy Sciences and Engineering with a thread of Green Technology, Nanotechnology and Biotechnology. Some of the faculty are working in all these area.

This is the fifth year of the new avatar of the report which has undergone an impressive change in presentation. The ICT has not only to compete nationally but also internationally to attract talented faculty, students and industry sponsored projects having an academic punch with practical relevance. Thus, it was necessary for us to collate and present the relevant information in the Annual Report and the Handbook in a different format, including the Diary which is being printed since 2011. Several photographs have been interspersed depicting the activities of the students, faculty, support staff and UDCT Alumni Association (UAA), which demonstrate the vitality of the institute.

During past seven years, several renovations, modernizations and activities for welfare of students, faculty and support staff have been carried out silently through munificent donations in cash and kind including cement, paint, medical assistance, books, etc.

During last four years, almost Rs. 30.00 Cr have been received as donation and the matching grant of Rs 50 lakhs per year totalling Rs. 1.00 Cr from the UGC has not been received for 2013-14, 2014- 15 and 2015-16. We now can boast of 340 under graduate scholarships, valued at Rs 10,000 to Rs 1.00 lakh per student, majority of them are on merit-cum-means basis, given through special endowments, trusts, individuals, industries associations, and anonymous donors. This is a record in recent times for the ICT.



## Following faculty members have joined ICT during this year:

No.	Name	Department	Position	Date of joining
1.	Prof. R.D. Kulkarni	Dept. of Oils Oleochemicals & Surfactants Tech.	Professor	4/11/2016
2.	Dr. V. Divya	Dept. of Mathematics	Assistant Professor <b>FRP</b>	12/11/2016
3.	Dr. Manju Bishan Sharma	DBT-ICT CEB	Assistant Professor	24/01/2017
4.	Dr. Hitesh S. Pawar	DBT-ICT CEB	Assistant Professor	24/01/2017
5.	Dr. Shalini Deb	DBT-ICT CEB	Research Scientist	01/02/2017
6.	Dr. Rajeshkumar N. Vadgama	DBT-ICT CEB	Research Scientist	01/02/2017
7.	Dr. Awaneesh Kumar Singh	Dept. of Physics	Assistant Professor <b>FRP</b>	01/03/2017
8.	Dr. Nitin Trivedi	DBT-ICT-CEB	DST Inspire Faculty	05/05/2017
9.	Dr. Reena Pandit	DBT-ICT-CEB	Associate Professor	04/05/2017
10.	Dr. S.M.S. Reshamwala	DBT-ICT-CEB	Assistant Professor	25/05/2017
11.	Dr. Mayur Sathe	DBT-ICT-CEB	Research Scientist	13/06/2017

## The following faculty have been relieved from the duties of the Institute:

Sr.	Name of Faculty	Department	Designation	Date of retirement/ resignation
1.	Prof. S.R. Shukla	Fiber & Textile Dept.	Professor under CAS	30/04/2017

A large number of faculty members and students have received national and international awards and honours during the year. Some of the significant accolades are given below and the others are listed under related departments and centres.

- FICCI awarded the “Best Institutional Social Responsibility Award” to ICT and “Life Time Achievement Award” to the Chancellor of ICT, Dr R A Mashelkar at the hands of Professor Arvind Panagharria, Vice Chairman, NITI Ayog in Delhi on November 10, 2016. Shri Mohandas Pai interviewed Professor G. D. Yadav and Dr. Mashelkar. Several Indian and foreign delegates were present. Professor Yadav gave a lecture on



“Make in India - A Research Hub”. Shri Pai was highly impressed and so was Prof Panagaria. They both mentioned ICT in their speeches. Both Times and QS higher education ranking representatives were present and they will include ICT in next year's international ranking. They were not aware of ICT and said ICT has excellent credentials to be counted among the top universities in Asia and the world.



### OTHER ACCOLADES RECEIVED:

- (i) Chancellor, Padmavibhushan Dr. R.A. Mashelkar has been elected for the Corresponding Membership of the Australian Academy of Science in May, 2017. He is the second Indian, after Padmavibhushan Dr. C.N.R. Rao, who is bestowed with this honorable membership.
- (ii) Professor G.D. Yadav has been appointed as Editor-in-Chief for the Catalysis Society of India's new journal 'Catalysis in Green Chemistry and Engineering' published by Begell House Inc, New York.
- (iii) The Indian National Science Academy (INSA) has bestowed its prestigious Syed Hussain Zaheer Medal for 2017 upon Professor G. D. Yadav for his contributions to Engineering.
- (iv) Professor G.D. Yadav has been recognized as one of the most highly prolific authors for “Industrial & Engineering Chemistry Research” on the Journal Stars website by American Chemical Society (ACS).
- (v) The paper “Novel Silica-Encapsulated Cu–Al Hydrotalcite Catalyst: Oxidative Decarboxylation of Vanillyl Mandelic Acid to Vanillin in Water at Atmospheric Pressure,” along with the corresponding TOC graphic, by Professor G.D. Yadav has been selected as a highlight on the cover of the most recent issue of Industrial & Engineering Chemical Research.
- (vi) Professor G.D. Yadav is elected to the Fellowship of Indian National Academy of Engineering.
- (vii) Professor G.D. Yadav has been honoured with Honorary Fellowship by Indian Society of Technical Education. The award ceremony took place in Ludhiana on 10th February, 2017.
- (viii) Sadashivrao Mandlik Sugar Factory, Kolhapur has announced “Loknete Sadashivrao Mandlik Smriti Puraskar” to Professor G.D. Yadav for his contributions towards education and society. The award will be bestowed on October 7, 2016, the 82nd birth centenary of Late Sadashivrao Mandlik, in a function organized by the Sugar Factory.
- (ix) Professor S.S. Lele, Registrar received a Woman Achiever Award by Akhil Bhartiya Chitpavan Brahman Mahasangh during Chitpavan Mahila Samelan in April, 2017.
- (x) The Citation index of Professor Rekha Singhal has crossed Ten thousand marks. This is indeed an honour achieved by faculty of ICT.
- (xi) Professor A.B. Pandit was felicitated on 14th September at the “3rd Asia Oceania Sonochemistry Conference” being held in Chennai for his achievements to the field of cavitation. Prof Pandit completed 25 years of research in this field with over 200 publications and 15000+citations. He has played a key role in transforming the basic understanding into industrial applications.

- (xii) Ms. Vaishali Mukund Kulkarni and Mr. Arjun Singh Bajwa, Ph.D. (Tech) students in Bioprocess Technology working with Prof. Anand V. Patwardhan have won the first prize including cash prize of Rs. 25 lakhs and a trophy at the Axis Moves 2017 competition sponsored by Axis Bank. The event promoted innovative solution and ideas about job creation.
- (xiii) Mr. Sagar Dhoble (Research Guide- Prof. Vandana Patravale), Ms. Vaibhavi Peshattiwar (Research Guide- Prof. Sadhana Sathaye) and Ms. Sarayu Pai (Research Guide- Prof. Archana Juvekar), from the Department of Pharmaceutical Sciences and Technology, have successfully bagged Pulmonary Hypertension Association's (PHA, USA) "Tom Lantos Innovation In Community Service Awards" for their proposal to work for the social awareness of Pulmonary Hypertension in India.
- (xiv) KG Foundation, Coimbatore has honoured "Eminent Scientist" Award to Professor A.M. Lali for his contributions in the area of bioseparations and biotransformations, and for his major contributions in the Indian biotechnology industry in the areas of microbial and enzymatic biocatalysis and bioseparations on October, 2016.
- (xv) Professor S.S. Lele, Registrar, ICT successfully inaugurated the 'Winery Project' in Kharvate – Dahivali, Tal:Chiplun, at Ratnagiri.
- (xvi) Professor S. S. Bhagwat, Department of Chemical Engineering has been selected for 'INSA Best Teacher Award' by the Indian National Science Academy.
- (xvii) Dr. Shalini S. Arya, Assistant Professor in Food Technology, Department of Food Engineering and Technology has been selected for 'Young Scientist Award 2015' by the Association of Food Scientists and Technologists (INDIA), CSIR CFTRI Campus, Mysore.
- (xviii) Professor Ashwin Patwardhan, Department of Chemical Engineering has been selected for 'Professor M.M. Sharma Science and Technology Award' by the Marathi Vidyan Parishad. The award will be bestowed in a function organized by Akhil Bhartiya Marathi Vidyan Parishad Adhiveshan on December 17, 2016.
- (xix) Professor G.D. Yadav, Vice Chancellor has been elected as Fellow of the Indian Academy of Sciences for his contributions towards education and society in January, 2017. Since 1934, the Academy plays a major role in furthering the cause of science in the country.
- (xx) A review published on "Alternative Carbon Sources for Biological Treatment of Nitrate Waste" was selected for the Sir Ganga Ram Memorial Prize by the Institution of Engineers (India). The paper is authored by Dr. P.B. Dhamole (ICTian), Dr. S.F. D'Souza (EX-BARC) and Professor Smita Lele.
- (xxi) Dr. Parag Gogate, Department of Chemical Engineering has been selected for the Maharashtra State National Award for Outstanding Research Work in Engineering & Technology of the Indian Society of Technical Education for the year 2016.
- (xxii) Dr. Prakash D. Vaidya, Department of Chemical Engineering has been selected for the prestigious Bioenergy - Awards for Cutting Edge Research (B- ACER) Fellowship Program 2017 supported by the Department of Biotechnology, Govt. of India, and the Indo-U.S. Science and Technology Forum (IUSSTF).
- (xxiii) Professor Smita Lele, Registrar received "Uncha Maza Zoka" award from Z Marathi for her research with social responsibility.
- (xxiv) Dr. D.V. Pinjari, Department of Chemical Engineering and Department of Oils, Oleochemicals and Surfactants Technology has been selected for 'INAE Young Engineer Award 2016' by the Indian National Academy of Engineering (INAE).
- (xxv) India Glycols Ltd., Kashipur and DBT-ICT Centre for Energy Biosciences has been awarded the "BIRAC Innovator Award 2016" for "Validation of Technology for production of 3000 Litre ethanol/day". The technology has been developed at the DBT-ICT Centre for Energy Biosciences.

## SOME SIGNIFICANT ACTIVITIES OF THE INSTITUTE:

### (1) Independence Day :

On the occasion of Independence Day, the Flag Hoisting Ceremony was held on August 15, 2016 in the Main Porch of the Main Building of the Institute. Dr. Vijay Khole, Former Vice-Chancellor, University of Mumbai and Vice Chancellor Amity University were the Chief Guests. The programme included national anthem and patriotic songs.

(2) A Workshop on “Public Participation in promoting integrity & eradicating corruption” was organized by Central Vigilance commission, New Delhi under ‘Vigilance Awareness Week’ on 8 November, 2016. Shri Shirish Jadhav, ACP-Anti-corruption and Shri Vinay Bahir-PI were the guest speakers. The workshop was followed by citizen pledge and elocution competition for students on the above theme. The chosen students were awarded certificates.

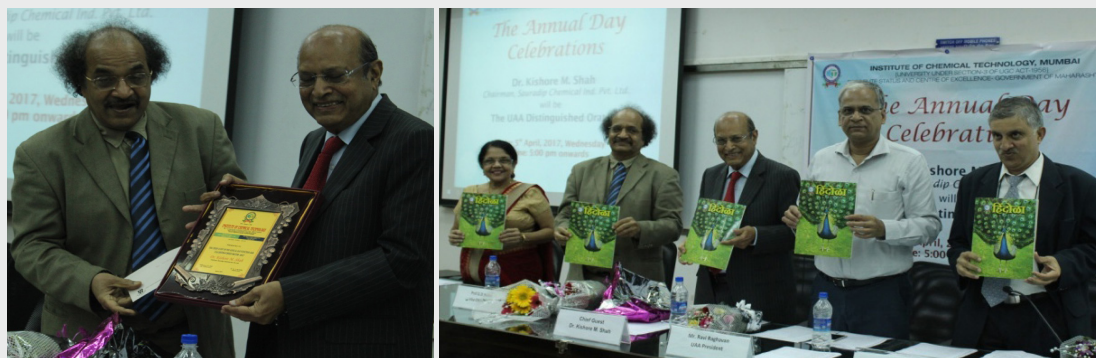
### (3) 126th Birth Anniversary of Bharatratna Dr. Babasaheb Ambedkar on 14th April and Oration on 17th April, 2017 :

The Institute paid homage to Bharatratna Dr. Babasaheb Ambedkar. In order to continue ICT tradition of arranging a special lecture in remembrance of the great contribution of Bharatratna Dr. Babasaheb Ambedkar a special lecture was organized on 17th April, 2017. Professor Hari Narke, Chairperson Mahatma Phule Chair, Savitribai Phule Pune University, Pune delivered a talk as “Bharatratna Dr. Babasaheb Ambedkar Oration 2017”.

### (4) Annual Day function :

The Annual Day of the Institute was celebrated on April 6, 2017. Dr. Kishore M. Shah, Chairman, Sauradip Chemical Ind. Pvt. Ltd. was the Chief Guest. He addressed the audience as “UDCT Alumni Association (UAA) Distinguished Orator”.

Various institutional awards including best teacher awards, Gunvant Karmachari awards and meritorious student's awards were distributed during this function.



### (5) Foundation Day function :

The Foundation Day of the Institute was celebrated on October 1, 2016. Hon'ble Shri Vinod Tawde, Minister for Higher and Technical Education, School Education and Sports, Medical Education, Marathi Language and Cultural Affairs, Government of Maharashtra was the Chief Guest. He inaugurated the Classroom Recording System. During the function, the Minister delivered Colour Publications – ICT Foundation Day Lecture. On this occasion, the Alkyl Amines Young Scientist Award was bestowed on Dr. Kanishka Biswas, JNCASR, Bangalore.



**(6) Convocation Function :**

Shri C. Vidyasagar Rao, Hon'ble Governor, Government of Maharashtra was the Chief Guest for the Sixth Convocation function of our Institute held on 8th February, 2017. Padmavibhushan Professor M.M. Sharma, Former Director and Distinguished Professor of Eminence, ICT was the Guest of Honour.



During this function, Nobel Laureate Professor Jean-Marie Lehn, Professor at College de France in Paris and Nobel Laureate Professor Robert H. Grubbs, Victor and Elizabeth Atkins Professor of Chemistry, California Institute of Technology were bestowed with D.Sc. (Hon.Causa).

The sixth batch of the students under the deemed to be university status was bestowed with their respective degrees on this occasion. It included –

- **BACHELOR'S DEGREES - B.Chem.Engg., B.Tech., B.Pharm. - 238 candidates**
- (1) B.Chem.Engg. -75
- (2) B.Pharm. - 23
- (3) B.Tech in Pharma. Sci. and Tech.- 19
- (4) B.Tech in Department of Dyestuff Technology –20
- (5) B.Tech in Fibres and Textile Processing Tech. - 33
- (6) B.Tech in Food Engg. and Tech.- 17
- (7) B.Tech in Oils, Oleochemicals and Surfactant Tech. - 18
- (8) B.Tech in Polymer Engg. and Tech.- 16
- (9) B.Tech in Surface Coating Tech.- 17

• **MASTERS DEGREE - M.Chem.Engg., M.Tech., M.Pharm. M.E. (Plastic Engg.), M.Sc. - 233 candidates**

- (1) M.Chem.Engg. -26
- (2) M.Pharm. -19
- (3) M.Tech in Pharma. Sci. and Tech.- 05
- (4) M.Tech in Fibres and Textile Processing Tech. - 17
- (5) M.Sc. (Textile Chemistry) -08
- (6) M.Tech in Perfumery and Flavour Tech.- 06
- (7) M.Tech. (Dyestuff Technology) -03
- (8) M.Tech in Food Engg. and Tech.- 09
- (9) M.Tech in Food Bio Tech.- 09
- (10) M.Tech in Oils, Oleochemicals and Surfactant Tech. - 18
- (11) M.Tech in Polymer Engg. and Tech. - 16
- (12) M.Tech in Surface Coating Tech. - 06
- (13) M.Tech in Bioprocess Tech.- 29
- (14) M.Tech. in Green Tech. - 29
- (15) M.Sc. (Chemistry) -15
- (16) M.Sc. (Physics) (Material Science) -05
- (17) M.Sc.(Engineering Mathematics) -05
- (18) M.E. (Plastic Engg.) -08

• **POST GRADUATE DIPLOMA in Chemical Technology Management - 9 candidates**

• **DOCTORATE DEGREE - 92 + 3 (Ethopia) candidates**

- (1) Ph.D. (Tech.) in Chem.Engg. -11
- (2) Ph.D.(Tech.) in (Pharmaceutics / Pharmacology / Pharmaceutical Chemistry / Pharmacognosy / Medicinal Chemistry) - 28
- (3) Ph.D.(Tech.) in Fibres and Textile Processing Tech. - 04
- (4) Ph.D. (Sci.) in Textile Chemistry - 01
- (5) Ph.D. (Tech.) in Food Engg. and Technology -01
- (6) Ph.D. (Tech.) in Food Biotechnology -02
- (7) Ph.D. (Tech.) in Polymer Engg. and Tech. - 03
- (8) Ph.D.(Sci.) in Chemistry-(Inorganic/Organic/Physical) -28
- (9) Ph.D. (Sci.) in Physics -03
- (10) Ph.D.(Tech.) in Bioprocess Technology - 02
- (11) Ph.D.(Sci.) in Biotechnology -09

Dr. R.A. Mashelkar, Chancellor, Institute of Chemical Technology presided over the function. The function was graced by students alongwith their parents, alumnus and other dignitaries.





- (7) **Republic Day function** : On the occasion of the Republic Day, the Flag Hosting Ceremony was held on Thursday, January 26, 2017 at 7.45 a.m. in the Porch of the Main Building of the Institute. Dr. K. M. Shah, Chairman, Sauradip Chemical Ind. Pvt. Ltd. was the Chief Guest.
- (8) Special programme has been organized to celebrate “Women’s Day-2017”. It included – a Lecture by Mr. D.P. Mahesha, Expert in Master Mind, Bangalore on “Master Mind Workshop for Girl students”. Also, a Workshop by AVIVA India, Life Insurance Provider: AVIVA Heart Care Plan and a Lecture by Ms. Priya Bhave, Insurance Advisor & Financial Consultant on “Social Awareness among Women: Insurance, finance, investments” were also organized on 8th March, 2017.



- (9) “UDCT Alumni Association (UAA) – ICT - Dhirubhai Ambani Lifetime Achievement Award” : Professor Dame Nancy Rothwell, President & Vice-Chancellor, University of Manchester visited ICT on February 1, 2017. A programme has been organized to felicitate her with “UDCT Alumni Association (UAA) – ICT - Dhirubhai Ambani Lifetime Achievement Award” followed by her oration.



### MOUs SIGNED DURING 2016-17

Malaysian Palm Oil Board, 1st April 2017





Tel Aviv University, Technion and Hebrew University on November 17, 2016  
 Dual Degree Ph.D. programme MOU with Michigan State University January 16, 2017



MOUs with BPCL and HPCL



- MoU with BPCL (BPCL Signatory - Mr. Sanjay Bhargava, Head, BPCL R&D)
- MoU with HPCL (HPCL Signatory - Mr. Anil Pande, Executive Director)

Other MOUs signed :

- |  |              |
|--|--------------|
| 1. Harvard College, USA  | July, 2016   |
| 2. Privi Biotechnologies Pvt. Ltd.                               | August, 2016 |
| 3. Dow Chemicals Ltd.  | Sept, 2016   |
| 4. Merck Specialties Pvt. Ltd.                                   | Sept, 2016   |
| 5. Queens University of Belfast                                  | Oct 2016     |
| 6. Hebrew University of Jerusalem                                | Oct, 2016    |
| 7. Tel Aviv University   | Oct 2016     |
| 8. Technion Institute, Israel                                    | Oct 2016     |
| 9. Asian Paints Ltd.   | Oct, 2016    |
| 10. University of Manchester                                     | Nov 2016     |
| 11. Synthetic and Art Silk Mills' Research Association (SASMIRA) | Nov 2016     |
| 12. Jubilant Life Sciences Ltd.                                  | Nov 2016     |
| 13. Gencrest LLP   | Nov 2016     |
| 14. Bermaco Consulting LLP                                       | Nov 2016     |
| 15. Godavari Biorefineries Ltd                                   | Dec 2016     |
| 16. Michigan State University, USA                               | Jan 2017     |
| 17. Lactose India Pvt.Ltd.                                       | Jan 2017     |

18. ICAR-Central Institute of Fisheries Education (CIFE)	Jan 2017
19. University of Aix Marseille	Feb 2017
20. Mangalore Refinery and Petrochemicals Ltd. (MRPL)	Feb 2017
21. Equinox Environments (I) Pvt. Ltd.	May, 2017
22. Raj Petrospecialities Pvt.Ltd.	May, 2017
23. L&T Hydrocarbon Engineering Ltd.	May, 2017
24. INDO Amines Ltd.	May 2017
25. National Institute of Pharmaceutical Education and Research (NIPER), Guwahati	June, 2017

Institution of “Dr Naresh Suchak Innovation Award in Chemical Technology” by donating US\$ 25000 by Dr. Niharika Suchak on December, 2016



The institute and individual faculty and students have been receiving accolades on all fronts. We have filed a record number of patents, continued to publish in high impact factor journals, and introduced several new courses. International collaborations have been on the rise.

The ICT can boast of its proud record with regard to the number of Ph D fellowships and the UGC has been the main source. Indeed, all these departments have also got infrastructure funding from the UGC.

A lot of new infrastructure has been created and state of the art equipment added. I am personally overwhelmed by the generosity and magnanimity of all these fine individuals and industries. However, it is my cherished dream that no student be without assistance and all PG and Ph D students must get full fellowships with HRA. On that note, a record of 710 Ph D students with full fellowships, including 386 UGC Special Assistance Programme fellowships, have been in place. This is the magic of the 16- acre land located in Matunga!! As I have been professing, more so lately, please join this grand effort of institute building and be part of the list of donors, whether in cash or kind. No single individual can build any grand monument; there are many hands at work. Lend me ask for your hands, if you are reading my report as an alumnus, philanthropist or industrialist. Help the institute and some unfortunate students or support staff. However, if you are a critic, do let me know your candid opinion so that I will take steps to amend errors in administration and delivery of justice. This applies to the presentation of this Annual Report also.

We have joined with DTE admissions procedure during 2016-17 for B.Chem.Eng., B.Tech. and B.Pharm. Programmes

## UGC BSR Ph D Fellowships in ICT

Department	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	Total
Chemical Engineering	10	10	15	15	18	18	17	18	111
Food Engineering & Technology	10	10	15+1*	15	15	15	15	15+1	112
Physico Chemical Aspects of Textile, Fibres, Polymers and Pharmaceutical Science and Technology	10	10	15+1*	15	15+1*	15+*2	15+2	16+2	119
Dyes' – CAS – Phase VII	10	10	15	15	15	15	15	14+1	110
Centre for Green Technology	-	-	15	15	15	15	15	15	90
UGC Non-SAP	-	-	02	02	02	-	-	-	6
UGC-SAP Chemistry	-	-	05+1*	05	10	10	10	10+1	52
8. Polymer Engineering and Technology	-	-	-	-	05	05	05	5	20
Total	40	40	85	82	96	95	94	98	630

\***Supernumery** : Single girl child; + Other project based fellowships are not included.

The magic mantra for ICT's success is a concoction of dedicated faculty, meritorious students, admirable support staff, distinguished alumni, strong connectivity with industry, and assistance to all needy students, a grand alumni association and above all relevance of our courses in wealth creation. It is unsurprising thus that the ICT is ranked as the best chemical engineering and chemical technology teaching and research institute in India and as number 4 in the world. Different authorities have duly recognized our spectacular performance over the years.

The Technological Association deals with the students activities under the guidance of the Vice one senior faculty member as Vice President. Professor S.S. Bhagwat provided an excellent leadership to streamline all activities. A large number of students come to the ICT campus from all over the country and participate in several intercollegiate programmes such as Exergy, Young Researchers Choice Competition (YRCC), Young Researchers Conference (YRC) and Sports Saga. The hostellers celebrate different festivals and the Hostel Day is a great fun.

The UAA has been assisting several students programmes including factory visits, arrangement of seminar, competitions, scholarships, etc. term interest free loans to needy students whose fellowships have been delayed by funding agencies such as UGC, CSIR, etc. The Singapore Chapter and B Chem Eng Class of 1972 have started a scheme of Rs 1.00 lakh interest free loan for four years to two students who go abroad for further studies.

No institute can grow without the active participation and support of the non-teaching staff. The ICT has a rich tradition. The support staff organizes several programmes including Dasara Pooja, Sports competition, drama, Satyanarayana Pooja, and Haldi Kunku. The institute needs to grow and obviously getting a satellite campus of at least 200 acres in the vicinity of Mumbai will be highly desirable. The ICT certainly needs to be promoted by the State and should be treated as a special institute on par with other elite institutes in India. There is no need for me to reiterate the past performance of ICT but would

certainly like to give a glimpse of some the plans which we have made. Thus frontiers of research where we have now focused are:

- Biotechnology & biomedicine
- Nanotechnology and materials science
- Energy science and engineering
- Process systems engineering
- Green chemistry and engineering
- Environmental protection and Hazardous waste management
- Product Engineering
- Developing greener chemical processing platforms producing a much wider range of products; green technology; product engineering.
- Developing technologies for generating, storing and transporting unlimited and inexpensive energy sources; energy engineering
- Developing therapy strategies for incurable diseases; pharma and healthcare.
- Designing better materials whose properties can be predicted, tailored and tuned; materials engineering; nanotechnology

We need resources for several centres which could be established on a separate campus.

- Training and Placement Cell (in joint collaboration of UAA)
- Entrepreneurship resource centre
- Interactive student services portal
- Centre for Undergraduate Research In Engineering (CURIE)
- Centre for Process Intensification and Innovation
- Centre for Product Engineering
- Centre for Drug Discovery Engineering
- Centre for Infectious Disease Control and Prevention
- Technology Incubation Centre
- Technology Transfer Cell
- Creation of Visiting Professorships endowments
- Distinguished Adjunct Professors
- Group consultations :

Adoption of sick industries.

- Increasing international collaborations (Joint projects with leading institutes (Joint degrees, UG exchange, PG exchange)
- M.M. Sharma Library (e-Library)
- Creation of institute professorships

We have been trying to meet many deadlines and collecting information from all concerned and it is likely the something might have been inadvertently missed. I will shoulder all the shortcomings. Let the credit of making this report a grand compilation to Smt Rekha Patil and the printer Media Research & Development.

## **THE GRAND CULTURE OF ENDOWMENTS**

The ICT has a grand tradition of establishment of endowments with an objective of supporting faculty positions, foreign travel assistance, merit-cum-means scholarships, staff welfare, library, campus development, research fellowships and seed money for research by young faculty. There are 90 endowments in the Institute. All these endowments have been established through generous donations by alumni, industries, philanthropists and well wishers. Only part of the interest is used towards the purpose of the endowment and the remaining is ploughed back into the corpus allowing it to grow with time.

## FACULTY ENDOWMENTS

- R.T. Mody Distinguished Professor of Chemical Technology and Vice Chancellor (1933)
- Sir Dorabji Tata Reader in Pharmaceutical Chemistry (1943)
- Singhaneer Reader in Chemical Engineering (1936)
- Singhaneer Lecturer in Chemical Engineering (1936)
- Singhaneer Lecturer in Pharmacy (1943)
- Singhaneer Lecturer in Paint Technology (1946)
- Singhaneer Associate Lecturer in Chemical Engineering (1936)
- Singhaneer Associate Lecturer in Food Technology (1945)
- Sir Homi Mehta Reader in Oil Technology (1943)
- Sir Homi Mehta Associate Lecturer in Food Technology (1943)
- Darbari Seth Professor of Inorganic Chemical Technology (1995)
- BPCL Professor of Chemical Engineering (2001)
- V.V. Mariwala Chair in Chemical Engineering (2004)
- J.G. Kane Chair of Oil Technology (2008)
- M. M. Sharma Distinguished Professor of Chemical Engineering (2009)
- Narotam Sekhsaria Distinguished Professor of Chemical Engineering (2009)
- R.A. Mashelkar Chair of Chemical Engineering (2009)
- K.V.Mariwala - J.B. Joshi Chair of Chemical Engineering (2009)
- Dr Kapoor Chair in Pharmaceutical Technology (2009)
- RCF Chair Professor of Chemical Engineering (2012)
- Dr Burjor P. Godrej Distinguished Professor of Green Chemistry and Sustainability Engineering

## VISITING PROFESSORS/ FELLOWS/LECTURERS/ ORATIONS ENDOWMENTS

There are 46 endowments which have helped us immensely in attracting the best professionals to the Institute from all over the world who have interacted with UG and PG students, faculty and alumni. The honoraria range from Rs. 5000 to 1.25 lakhs for a period of one day to 15 days. Some eminent faculty from institutes such as MIT, Purdue, Cambridge, Monash, UC Berkeley, UCSB, Montreal have taught UG and PG courses in ICT under these endowments. These lectures will form part of audit courses for research students. Besides, public lectures are organized under each endowment. All departments have been benefitted and the list is as follows:

### 1. GENERAL

- Professor B.D. Tilak Distinguished Lectureship
- Professor B.D. Tilak Visiting Fellowships.
- Golden Jubilee Visiting Fellowships.
- Dr. Balwant S. Joshi Distinguished Visiting Professorship in Chemical Engineering Chemical Technology / Applied Chemistry
- Shri. B. S. Rajpurohit Visiting Faculty and Oration
- Shri D. M. Trivedi Lecture in Green Chemistry and Technology
- Late Professor W. B. Achwal Oration

### 2. DEPARTMENT OF CHEMICAL ENGINEERING

- Dr. G.P. Kane Visiting Professorship in Chemical Engineering.
- The Dow Professor M.M. Sharma Distinguished Visiting Professorship in Chemical Engineering.
- Shri V.V. Mariwala Visiting Professorship in Chemical Engineering
- Shri G.M. (alias Dada) Abhyankar Memorial Distinguished Fellowship in Chemical Engineering
- Professor R.A. Rajadhyaksha Memorial Lecture series.
- Shrimati Kusumben and Shri Mathradas Kothari Visiting Professorship in Chemical Engineering
- K. J. Somaiya Visiting Professor of Chemical Engineering
- Professor Arun S. Mujumdar Visiting Fellowship

3. DEPARTMENT OF DYESTUFF TECHNOLOGY
  - K.H. Kabbur Memorial Silver Jubilee Lectureship.
  - Professor K. Venkatraman Lectureship.
  - Pidilite Industries Ltd. Visiting fellow in Dyestuff Science & Technology.
  - Dr. KKG Menon Memorial Lecture
4. DEPARTMENT OF FIBRES AND TEXTILE PROCESSING TECHNOLOGY
  - Professor G.M. Nabar Endowment Lectureship.
  - L.N. Chemicals ICT Diamond Jubilee Visiting Fellow
  - Class of 1966 Visiting Fellowship.
5. DEPARTMENT OF FOOD ENGINEERING AND TECHNOLOGY
  - Professor A. Sreenivasan Felicitation Lectureship.
  - Marico Industries Visiting Fellowship
  - ICT - Lupin Visiting Fellowship for Bioprocess Technology
6. DEPARTMENT OF OILS, OLEOCHEMICALS AND SURFACTANTS TECHNOLOGY.
  - Professor J.G. Kane Visiting Professorship in Chemical Technology
  - Professor J.G. Kane Memorial Lectureship
7. DEPARTMENT OF PHARMACEUTICAL SCIENCES AND TECHNOLOGY
  - CIPLA Distinguished Visiting Fellowship in Pharmaceutical Sciences
  - Themis Medicare - ICT Diamond Jubilee Distinguished Fellowship in Pharmaceutical Sciences
  - Professor (Mrs.) Malati R. Baichwal Visiting Fellowship in Pharmaceutical Science and Technology
  - AAIPS- Dr. R. S. Baichwal Pharmaceutical Seminar
  - Dr. S.K. Pradhan Endowment
  - Professor V.M. Kulkarni Endowment Fund in Pharmaceutical Science and Technology
8. DEPARTMENT OF POLYMER ENGINEERING AND TECHNOLOGY AND DEPARTMENT OF SURFACE COATING TECHNOLOGY
  - Shri K. S. S. Raghavan - Chemical Weekly Visiting Professorship in Polymer Science and Technology
  - Indian Plastics Institute (IPI)-ICT Diamond Jubilee Visiting Fellowship in Polymer Processing
  - Chemimpex Rastogi-ICT Diamond Jubilee Visiting Fellowship in Surface Coatings.
  - Synpol-ICT Diamond Jubilee Distinguished Visiting Fellow in Science & Technology of Pigment
  - Tipco-ICT Diamond Jubilee Distinguished Visiting Fellow in Thermosets
  - Jayvee Organics & Polymers(P)Ltd. Visiting Fellowship in Polymer Additives and Compounding
  - Shri. Parmanand F. Parikh Endowment
  - Shri B.S. Rajpurohit Visiting Professorship in Polymer Science and Technology
  - Sauradip Chemical Industries Pvt. Ltd. Visiting Fellowship
9. DEPARTMENT OF CHEMISTRY
  - Dai-Ichi Karkaria Ltd. Visiting Fellowship
  - The Dharamsi Morarji Chemical Co. Visiting Fellowship in Chemistry
  - The (Late) Shri. G.D.Gokhale Endowment Lectureship
  - Spinco-Biotech - Ramanathan Lectureship
10. DEPARTMENT OF PHYSICS
  - Dr. Mooljibhai Shivabhai Patel Trust Visiting Fellowship in Polymer Physics

## SCHOLARSHIPS FOR UG STUDENTS

The ICT supports 340 students under merit-cum-means scholarships range is Rs. 10,000/- to Rs. 1,00,000/- per annum per person through several endowments, private trust and annual commitments by alumni. All economically deprived students are given assistance in the form of tuition fees, hostel fees, mess bills and travel assistance to present papers in national conferences. During 2009-10, two endowments were established for supporting UG students

–Dr Kangle Endowment (Rs. 5.00 lakhs) and Swati Bhagwat Endowment (Rs. 1.25 lakhs); whereas M/s Borogue have started 12 UG scholarship of US\$ 500 per student, for students of Polymer Engineering (10) and Technology and Chemical Engineering (2). An endowment of Rs 10.00 lakh was created by Dr Dhiren and Dr Mrs Kailas Thakker. Dr B.S. Joshi donated US\$ 50,000 to create a loan scholarship for the needy students.

## Ph.D. FELLOWSHIPS ENDOWMENTS

- Prof. M.M.Sharma Endowment (2 Ph.D. Fellows)
- Dow-ICT Woman Chemical Engineers Ph.D. Fellowship
- Narotam Sekhsaria Foundation (2 Ph.D. Fellows)
- Pidilite Professor M.M. Sharma Distinguished Doctoral Fellowship in Chemical Engineering (4 fellowships at a time).
- Dr Dhiren and Dr Mrs Kailas Thakker Fellowship
- Dr. Ramesh Y. Mantri Distinguished Masters Fellowship

## LIBRARY ENDOWMENTS

We have been assiduously working on creating a 'library culture' and took pains to generate endowments to support journals subscriptions and acquisition of books to some extent. Perhaps, ours is one of the rare universities in India where such type of endowments exist.

- Indian Oil Corporation Endowment (Rs 5 lakhs)
- Dr Mooljibhai Shivabhai Patel Trust (Rs 5 lakhs)
- Colour Chem Ltd (Rs 5 lakhs)
- Professor M.M. Sharma Library Endowment (Rs 75 lakhs)
- UDCT Golden Jubilee Library Endowment (Rs 10 lakhs)
- Polyolefins Industries Ltd. (Rs 5 lakhs)
- BLA industries (Rs 5 lakhs)
- Hindustan Organics Chemicals Ltd. (Rs 5 lakhs)
- Tata Electric Companies (Rs 10 lakhs)
- Gharda Chemicals Ltd. (Rs 5 lakhs)
- Associated Cement Companies Ltd. (Rs 20 lakhs)
- Tata Chemicals Ltd. (Rs 5 lakhs)

Only 50% interest accrued on these endowments is utilized for the Library.

## VICE CHANCELLOR'S ANNUAL REPORT



### PROFESSOR G. D. YADAV

*B. Chem. Eng., Ph. D. (Tech.), FTWAS, FNA, FASc, FNASc, FNAE, FISTE, CChem, FRSC (UK), Ch E, FICHEM (UK), FMASc, FIChE, FICS*

Vice Chancellor and R.T. Mody Distinguished Professor, Institute of Chemical Technology

J.C. Bose National Fellow (DST-GOI)

(Also Adjunct Professor RMIT University, Australia)

Also Adjunct Professor University of Saskatchewan, Canada

### SUBJECTS TAUGHT:

- Fundamentals of Green Chemistry and Technology (M.Tech. Green Tech.),
- Nanotechnology in Green Technology (M. Tech. Green Tech.)

### RESEARCH INTERESTS:

- Green Chemistry and Technology,
- Catalytic Science and Engineering,
- Multi-phase Reaction Engineering,
- Nanomaterials and nanocatalysis,
- Biotechnology
- Energy Engineering

### RESEARCH PRODUCTIVITY

Ph. D.: 91, Masters: 101, PDF: 31, Research Staff: 9 Papers: 316, Patents: 73, Books: 3, h index: 47; i10 index 174, Citations: 7600+

### CURRENT RESEARCH STUDENT:

Ph D ( Tech): 14 , Ph D (Sc): 8

M. Chem. Eng. : 4, M. Tech. (BPT): 4, M. Tech. (Green Tech.): 5; M. Tech. (Perfume & Flavour Tech.): 1

### PROFESSIONAL RECOGNITIONS, AWARDS AND ACCOLADES

- Syed Husain Zaheer Medal For Engineering, Indian National Science Academy
- Member, Expert Committee for Review of Deemed University Status of Jamia Hamdard University
- Mentor, UPE programme of UGC, Anna University, Chennai,TN

### INTERNATIONAL RECOGNITIONS

#### International Fellowships and Honours

- Elected Chair, APCAT-7, 7th Asia Pacific Congress on Catalysis in Mumbai, January 17-21 , 2017
- Chair (Founder), ACS India International Chemical Sciences Chapter
- Member, International Advisory Board (IAB), The State Key Laboratory for Catalysis, Dalian Institute of Chemical Physics, The Chinese Academy of Sciences, Dalian, China (<http://sklc.dicp.ac.cn/homepagee.htm>),



## **International Distinguished Faculty Positions and Chairs**

### **Membership of Editorial Boards of Prestigious International Journals**

- Editor-in-Chief, Catalysis in Green Chemistry and Engineering, Begell House, New York
- Member, Editorial Board, Green Chemistry (RSC, UK)
- Associate Editor, Current Catalysis, Bentham Science Publishers
- Member, Editorial Board, ACS Journal of Sustainable Chemistry and Engineering, USA
- Member, Editorial Board, Advanced Porous Materials (<http://www.aspbs.com/apm.htm>)

### **Fellowships**

- Fellow, Royal Society of Chemistry, UK
- Fellow, Institution of Chemical Engineers, UK
- Fellow, TWAS-Academy of Sciences of the Developing World
- J. C. Bose National Fellow (DST-Govt. of India)
- Fellow and Chartered Chemical Engineer, Institution of Chemical Engineers, UK
- President, Maharashtra Academy of Sciences
- Fellow, Indian National Science Academy (INSA)
- Fellow, National Academy of Sciences India (NASI)
- Fellow, Maharashtra Academy of Sciences
- Fellow, Indian Chemical Society and Chartered Chemist
- Fellow, Indian Institute of Chemical Engineers.
- Fellow, Indian Society for Technical Education

### **Membership of Prestigious National Committees**

- Chairman, NAAC Committee
- Member, Advisory Committee, Gujarat Chem Ahmedabad January 2016
- Member, Steering Committee, Universities with Potential for Excellence, UGC
- Member, Chemical Industry Committee, CII
- Member, Maharashtra Innovation Council

## **PROFESSIONAL SERVICES**

### **University Grants Commission (UGC)**

- Member, Peers Committee, Universities with Potential for Excellence (UPE) programme
- Member, Peers Committee, Centres for Excellence in Particular Areas programme
- Chairman, Expert University of UGC for Inspection,

### **Indian Chemical Council (ICC)**

- Member, Awards Committee, Indian Chemical Council

### **Indian Standards Bureau**

- Member, Chemicals Committee

### **Indian Institute of Chemical Engineers**

- Chairman, National Organizing Committee, CHEMCON-2016, Annual Session of Indian Institute of Chemical Engineers, Chennai, Dec. 27-30
- Chairman, Dhirubhai Ambani Commemoration Day Celebration, Dec. 28
- Member, International Affairs Committee
- Member, Awards Committee
- Member, Chemcon Distinguished Speaker Awards

### **Catalysis Society of India**

- Chairman, Catalysis Workshop, ICT, Hyderabad, June 24-26 2016
- Member, Editorial Board, Bulletin of Catalysis Society of India

### **Government of Maharashtra**

- Member, Maharashtra Innovation Council
- Member, Peers Group, Rajiv Gandhi Science and Technology Commission
- NAAC
- Member, Skill Development Committee

### **Govt. of Karnataka**

- Member, Advisory Council, Department of IT, BT and S&T

### **Confederation of Indian Industries (CII) and Other Industrial Organizations**

- Member, Chemical Industry Committee, CII
- Member, FICCI Committee on Chemicals

### **Maharashtra Academy of Sciences**

- President, M.A. Sc.

### **Membership of Board of Directors of Companies**

- Director (Hon.), Clean Science and Technology, Pune
- Independent Director, Aarti Industries Ltd., Mumbai

### **Ph. D. DEGREES AWARDED**

1.	Shivaji L. Bhanawase	Valorization of biomass into chemicals using heterogeneous catalysis
2.	Jeetendra Y. Salunkhe	Waste minimisation through development of novel catalytic processes
3.	Anil B. Gawade	Valorization of 5-hydroxymethylfurfural by green processes

### **MASTERS DEGREES AWARDED**

#### **M. Chem. Engg.**

1.	Ajinkya Kotkar	Insight into lithium recovery from dead batteries
2.	Pramod Pawar	Cascade engineered synthesis of acid by using a multifunctional catalyst 3-methyltetrahydrofuran from itaconic

#### **M. Tech. (Bioprocess Tech.)**

1.	Surbhi Gupta	Resolution (R,S)-flurbiprofen using immobilized lipase under the influence of microwave irradiation
2.	Pralhad N. Jadhav	Laccase mediator system in destruction of water pollutant

#### **M. Tech. (Green Tech.)**

1.	Shubhra Verma	Biocatalysis by fungal enzymes: Purification and Characterization of Laccase from <i>Trametes hirsuta</i> and its application in oxidation reactions
2.	Amita G. Dhadphale	Multiphase transfer Transfer catalysis Catalysis for Selective Synthesis of Furfuryl Glycidyl Ether
3.	Manali Dhawan	Insight into a catalytic process for simultaneous production of biodiesel and glycerol carbonate

## CURRENT RESEARCH FELLOWS UNDER SUPERVISION

### Ph. D. (Tech.) and Ph.D. (Sci) Research Fellows

(all supported under various research schemes, projects and programmes)

#	Name	Mon	Year	Title of thesis
1.	Gunjan P. Deshmukh	Mar	2011	Green Synthesis of Agrochemicals
2.	Dhiraj Katole	Mar	2011	Carbon Dioxide Based Catalytic Reactions
3.	Jayaram Molleti	Oct	2011	Design and Synthesis of Safer Chemicals by Benign Green Routes
4.	Pooja R.Tambe	Feb	2012	Carbon Dioxide Valorization
5.	Amarsinh L. Jadhav	Feb	2012	Selectivity Engineering in Synthesis of Valuable Chemicals
6.	Kalidas Rasal	Feb	2012	Insight into Catalysis in Utilization of Carbon Dioxide into Chemicals and Solvents
7.	Manoj Kamble	Mar	2012	Selectivity Engineering in Synthesis of Biotechnological Products and Pharmaceutical Intermediates
8.	Shivani S. Vedula	Nov	2012	Novelties of Catalytic Membrane Reactors and Microreactors for Development of Green Processes
9.	Kalpesh Bhavsar	Nov	2012	White Biotechnology and Green Chemistry for Applications in Environmental and Fine Chemical Industries
10.	Pravin D. Patil	Nov	2012	Enzyme Engineered Green Reactions
11.	Deepali B.Magadam	Dec	2012	Selectivity Engineering of Enzymes in Synthesis of Industrially Relevant Chemicals
12.	Nikhil H. Margi	Sep	2013	Selective Engineering of Heterogeneously Catalysed Reactions using Multiphase Reactors and Microreactors
13.	Apoorva M. Ranjekar	Sep	2013	Design and Development of Advanced Materials and Processes for Energy Storage
14.	Ashish D. Shejale	Sep	2013	Membrane Assisted Catalytic Hydrogen Production and Storage
15.	Radhika Malkar	Mar	2015	Fundamental and Experimental Analysis of Cascade Engineered Catalytic Reactions of Industrial Utility
16.	Harshada Salvi	Mar	2015	Multi-phasic Green Reactions
17.	Devendra Pisal	Mar	2015	Design and Development of Novel Catalysts and Their Applications
18.	Shrirang Sabde	Mar	2015	Converting Liabilities into Assets
19.	Deepti Wagh	May	2015	Insight into Development of Green Processes for Fine Chemical and Pharmaceutical Industries

### Masters Research Scholars

1.	Ajinkya Kotkar	M. Chem. Eng.	Aug	2015	Insight into lithium recovery from dead batteries
2.	Pramod Pawar	M. Chem. Eng.	Aug	2015	Cascade engineered synthesis of 3-methyltetrahydrofuran from itaconic acid by using a multifunctional catalyst
3.	Shalaka Mohire	M. Tech. (Green Tech)	Aug	2015	Green Route for Synthesis of Fine Chemicals: Multimetallic Catalysts in Hydrogenation of Cinnamaldehyde
4.	Parag P. Sarode	M. Tech. (Green Tech)	Aug	2015	Functionalisation of inorganic supports and membranes
5.	Sania Karanjkar	M. Tech. (Perfume & Flavour Tech.)	Aug	2015	Selectivity Engineering of Synthesis of –Cresyl Methyl Ether: Comparison of Batch Vs Vapour Phase Processes
6.	Nikhil V. Sood	M. Tech. (Bioprocess Tech.)	Aug	2015	Microwave Assisted Synthesis of Ferulyl Oelins using Immobilized Lipase in Solvent and Solvent-free Conditions
7.	Apurwa A. Lad	M. Tech. (Bioprocess Tech.)	Aug	2015	Microwave Assisted Process Intensification of Lipase Catalysed Esterification of Benzyl Alcohol and Levulinic Acid for the Green Synthesis of Benzyl Levulinate: Kinetic Study

### Post - Doctoral Fellows

1.	Dr. Godfree Fernandes	Hindustan Insecticides Ltd	Alternatives to DDT
2.	Dr. Ashwini B. Nirukhe	ONGC Energy Centre	ICT-OEC Technology of Hydrogen production
3.	Dr. Prakash Parhad	ONGC Energy Centre	ICT-OEC Technology of Hydrogen production

### Research Staff On Industrial Projects

1.	Swanand Patange (SRF)	ONGC Energy Centre	2014-16	Investigation of Properties of Molten Salt as a Heat Storage Medium
2.	Atul Tripathi (SRF)	ONGC Energy Centre	2015-16	Investigation of Properties of Molten Salt as a Heat Storage Medium
3.	Juthika Sane (SRF)	ONGC Energy Centre	2014-16	Continuation of Close loop experimental studies on ICT-OEC Process for Copper-Chlorine (Cu-Cl) Thermochemical Hydrogen Production

4.	Praveen Kumar (JRF)	ONGC Energy Centre	2014-16	Continuation of Close loop experimental studies on ICT-OEC Process for Copper-Chlorine (Cu-Cl) Thermochemical Hydrogen Production
5.	Mr. Mayur Sagar- Technical Assistant (Science)	ONGC Energy Centre	2014-16	Continuation of Close loop experimental studies on ICT-OEC Process for Copper-Chlorine (Cu-Cl) Thermochemical Hydrogen Production
6.	Mr. Sagar Patil- Technical Assistant (Mech.)	ONGC Energy Centre	2014-16	Continuation of Close loop experimental studies on ICT-OEC Process for Copper-Chlorine (Cu-Cl) Thermochemical Hydrogen Production
7.	Mr. Amol Sonar- Technical Assistant (Electrical)	ONGC Energy Centre	2014-16	Continuation of Close loop experimental studies on ICT-OEC Process for Copper-Chlorine (Cu-Cl) Thermochemical Hydrogen Production

### INDUSTRIAL CONSULTATIONS

1.	ONGC Energy Centre	Molten salts for energy storage
2.	ONGC Energy Centre	Continuation of Closed Loop Experimental Studies on ICT-OEC Process for Copper-Chlorine (Cu-Cl) Thermochemical Hydrogen Production
3.	ONGC Energy Centre, New Delhi	Development of materials alternative to Platinum as electrode materials in Cu-Cl cycle
4.	Malladi Drugs & Pharmaceuticals, Chennai	Dynamic Kinetic Resolution of D-Ephedrine to L-Ephedrine
5.	Malladi Drugs & Pharmaceuticals	Process intensification of existing catalytic process for synthesis of phenylpropanolamine and development of novel catalyst for higher yield
6.	Resonance Specialities Ltd., Mumbai	Green process development for important lutidines and collidines

### SPONSORED RESEARCH PROJECTS (FUNDS IN RS. LAKHS)

1.	2015-on	ONGC Energy Centre	Continuation of Closed Loop Experimental Studies on ICT-OEC Process for Copper-Chlorine (Cu-Cl) Thermochemical Hydrogen Production	339.50
2.	2015-on	ONGC Energy Centre, New Delhi	Development of materials alternative to Platinum as electrode materials in Cu-Cl cycle	150.00

3.	2015-on	Malladi Drugs & Pharmaceuticals, Chennai	Dynamic Kinetic Resolution of D-Ephedrine to L-Ephedrine	38.00
4.	2015-16	Malladi Drugs & Pharmaceuticals	Process intensification of existing catalytic process for synthesis of phenylpropanolamine and development of novel catalyst for higher yield	11.89

### DETAILS OF NATIONAL AND INTERNATIONAL COLLABORATIONS

- Professor Ritta Kieski, University of Oulu, Finland
- Professor Suresh Bhargava, RMIT University, Australia
- Professor Ajay Dalai, University of Saskatchewan, Canada
- Professor Takehiko Sasaki, University of Tokyo (with Prof B.M. Bhanage, JSPS programme)

### INTERNATIONAL PATENTS FILED & PUBLISHED

1.	Yadav Ganapati D Bhadra Kalpesh H	201621004346	Process of methylation of phenol with increased anisole selectivity
2.	Yadav Ganapati D Bhadra Kalpesh H	201621004347	Tunable catalyst for vapor phase methylation and preparation thereof
3.	Yadav Ganapati D Bhadra Kalpesh H	201621004348	Process of methylation of phenol with increased cresol selectivity
4.	Yadav Ganapati D Gawade Anil B Tiwari Manishkumar S	201621041576	Heterogenous catalyst for selective hydrogenolysis and method of preparation thereof
5.	Yadav Ganapati D Gawade Anil B Tiwari Manishkumar S	201621041577	A process for synthesis of to 2,5-dimethylfuran by selective hydrogenolysis of 5-hydroxymethylfurfural at mild condition
6.	Yadav Ganapati D	201721006702	Dual function multiphase microreactor
7.	Yadav Ganapati D	201721005814	An improved continuous flow stirred multiphase reactor
8.	Yadav Ganapati D Gawade Anil B Talapade Abhijit D	201721006714	Efficient synthesis of 5-hydroxymethylfurfural catalyzed in heterogeneous acidic ionic liquid
9.	Yadav Ganapati D Bhadra Kalpesh H	PCT/IN2017/000028	Tunable catalyst for vapor phase methylation and preparation thereof
10.	Yadav Ganapati D Bhadra Kalpesh H	PCT/IN2017/000027	Process of methylation of phenol with increased cresol and anisole selectivity

## INTERNATIONAL PEER REVIEWED PUBLICATIONS

1.	Akhil V. Nakhate and G.D. Yadav,* Palladium nanoparticles supported carbon based graphene oxide monolith as catalyst for sonogashira coupling and hydrogenation of nitrobenzene and alkenes,	Chem. Select 1 (2016) 3954–3965; DOI:10.1002/slct.201600819
2.	Suresh M. Doke and G.D. Yadav, Synthesis of novel titania membrane support via combustion synthesis route and its application in decolorization of aqueous effluent using microfiltration,	Clean Tech. Environ. Policy 18 (2016)139–149
3.	Akhil V. Nakhate and G.D. Yadav, Synthesis and characterization of sulfonated carbon-based graphene oxide monolith by solvothermal carbonization for esterification and unsymmetrical ether formation,	ACS Sustainable Chem. Eng., 4 (2016) 1963–1973; DOI:10.1021/acssuschemeng.5b01205
4.	Akhil V. Nakhate, Suresh M. Doke, and G.D. Yadav, Template assisted synthesis of nanocrystalline sulfated titania: active and robust catalyst for regioselective ring opening of epoxide with aniline and kinetic modeling,	Ind. Eng. Chem. Res. 55 (2016) 10829–10838; DOI:10.1021/acs.iecr.6b02619
5.	Gajanan B. Kunde and G.D. Yadav, Green approach in the sol–gel synthesis of defect free unsupported mesoporous alumina films	Micro. Meso. Mater. 224 (2016) 43-50 DOI:https://doi.org/10.1016/j.micromeso.2015.10.045
6.	Gajanan B. Kunde and G.D. Yadav, Sol–gel synthesis and characterization of defect-free alumina films and its application in the preparation of supported ultrafiltration membranes,	J. Sol-Gel Sci. Tech. 77 (2016) 266–277; DOI:https://doi.org/10.1007/s10971-015-3852-8
7.	Kalidas B. Rasal and G.D. Yadav, La–Mg mixed oxide as a highly basic water resistant catalyst for utilization of CO <sub>2</sub> in the synthesis of quinazoline-2,4(1H,3H)-dione,	RSC Adv. 6(2016)111079-111089; DOI:10.1039/C6RA15802A
8.	Kalidas B. Rasal and G.D. Yadav, Carbon dioxide mediated novel synthesis of quinazoline-2,4(1H,3H)-dione in water,	Org. Process Res. Dev. 20 (2016) 2067–2073; DOI: 10.1021/acs.oprd.6b00244
9.	Manishkumar S. Tiwari and G.D. Yadav, Novel aluminium exchanged dodecatungstophosphoric acid supported on K-10 clay as catalyst: benzylation of diphenyloxide with benzoic anhydride,	RSC Adv. 6 (2016) 49091-49100: DOI:https://doi.org/10.1039/C6RA05379C
10.	Manoj P. Kamble, Somnath D. Shinde, and G.D. Yadav,* Kinetic resolution of (R,S)- $\alpha$ -tetralol catalyzed by crosslinked <i>Candida antarctica</i> lipase B enzyme supported on mesocellular foam: A nanoscale enzyme reactor approach,	J Mol. Catal. B: Enz. 132(2016) 61-66; DOI:https://doi.org/10.1016/j.molcatb.2016.06.013

11.	Mitesh Shah, R. Anantharaj, Tamal Banerjee and G.D. Yadav, Corrigendum to quaternary (liquid + liquid) equilibria for systems of imidazolium based ionic liquid + thiophene + pyridine + cyclohexane at 298.15 K: Experiments and quantum chemical predictions (J. Chem. Thermodyn. 62 (2013) 142-),	J. Chem. Thermodyn. 99(2016) 96; DOI:10.1016/j.jct.2016.03.041
12.	Moreshwar P. Hude, Janusz Kozinski, Ajay K. Dalai, and G.D. Yadav, Novelty of penicillium camembertii lipase supported on glutaraldehyde activated-SBA-15 mesoporous silica for mono-esterification of bioglycerol in non-aqueous media,	Internat. J. Chem. Reactor Eng., 14 (4) (2016) Published Online: 2016-05-13 DOI:https://doi.org/10.1515/ijcre-2014-0058
13.	Satish K. Kabra, Esa Turpeinen, Riitta L. Keiski and G.D. Yadav, Direct synthesis of dimethyl carbonate from methanol and carbon dioxide: A thermodynamic and experimental study,	J. Supercritical Fluids 117 (2016) 98-107; DOI:https://doi.org/10.1016/j.supflu.2016.05.039
14.	Satish K. Kabra, Mika Huuhtanen, Riitta L. Keiski, and G.D. Yadav, Selectivity engineering of O-methylation of hydroxybenzenes with dimethyl carbonate using ionic liquid as catalyst,	React. Chem. Eng. 1(2016) 330-339; DOI:10.1039/C6RE00016A
15.	Satish K.Kabra, Esa Turpeinen, Mika Huuhtanen, Riitta L.Keiski, and G.D. Yadav, Direct synthesis of formic acid from carbon dioxide and hydrogen: A thermodynamic and experimental study using poly-urea encapsulated catalysts,	Chem. Eng. J. 285 (2016) 625-634; DOI:https://doi.org/10.1016/j.cej.2015.09.101
16.	G.D. Yadav and Mandar G. Kulkarni, Selective synthesis of 1-(1-naphthoxy)-2,3-epoxypropane from 1-naphthol and epichlorohydrin under solid-liquid phase transfer catalysis: a waste minimization strategy,	Clean Tech. Environ. Policy19 (2017) 1223–1230;DOI: https://doi.org/10.1007/s10098-016-1307-8
17.	G.D. Yadav, M.Lakshmi Kantam, B.M. Bhanage and B. Subramaniam, Advances in Catalysis for Sustainable Development Special Issue	ACS Sustainable Chem. Eng. 5(2017)3597–3597; DOI:10.1021/acssuschemeng.7b01129
18.	Gunjan P. Deshmukh and G.D. Yadav, Facile synthesis of dicamba ester over heterogeneous magnesium oxide and kinetic modelling,	Chem. Eng. J. 309 (2017) 663-673; DOI: https://doi.org/10.1016/j.cej.2016.10.037
19.	Gunjan P. Deshmukh and G.D. Yadav, Insight into regioselective hydrogenation of methyl phenyl glyoxalate to methyl mandelate over Pt/ $\alpha$ -MnO <sub>2</sub> nanorods,	Mol. Catal. 433 (2017) 250-264;DOI: https://doi.org/10.1016/j.mCatal.2017.02.002



20.	Jayaram Molleti and G.D. Yadav, Green Synthesis of Veratraldehyde Using Potassium Promoted Lanthanum–Magnesium Mixed Oxide Catalyst,	Org. Process Res. Dev. 21(2017)1012–1020; DOI:10.1021/acs.oprd.7b00127
21.	Jayaram Molleti and G.D. Yadav, Potassium modified La-Mg mixed oxide as active and selective catalyst for mono-methylation of phenylacetonitrile with dimethyl carbonate,	Mol. Catal. 438(2017)66-75; DOI: <a href="https://doi.org/10.1016/j.mCatal.2017.05.006">https://doi.org/10.1016/j.mCatal.2017.05.006</a>
22.	Jayaram Molleti and G.D. Yadav, Selectivity engineering in hydroxyalkoxylation of phenol by ethylene carbonate using calcined hydrocalcite,	Clean Tech. Environ. Policy 19 (2017) 413–1422; DOI: <a href="https://doi.org/10.1007/s10098-017-1339-8">https://doi.org/10.1007/s10098-017-1339-8</a>
23.	Jayaram Molleti and G.D. Yadav, Potassium modified La-Mg mixed oxide: selective mono-methylation of phenylacetonitrile with dimethyl carbonate	Mol. Catal. 438 (2017) 66-75; DOI: <a href="https://doi.org/10.1016/j.mCatal.2017.05.006">https://doi.org/10.1016/j.mCatal.2017.05.006</a>
24.	Manishkumar S. Tiwari, Anil B. Gawade and G. D. Yadav,* Magnetically separable sulfated zirconia as highly active acidic catalysts for selective synthesis of ethyl levulinate from furfuryl alcohol,	Green Chem. 19(2017)963-976; DOI: <a href="https://doi.org/10.1039/C6GC02466A">https://doi.org/10.1039/C6GC02466A</a>
25.	A.B. Gawade, M.S. Tiwari, and G.D. Yadav Biobased Green Process: Selective Hydrogenation of 5-Hydroxymethylfurfural to 2,5-Dimethyl Furan under Mild Conditions Using Pd-Cs <sub>2</sub> H <sub>0</sub> .5PW <sub>12</sub> O <sub>40</sub> /K-10 Clay	ACS Sustainable Chem. Eng. 4 (2016)4113–4123; DOI:10.1021/acssuschemeng.6b00426
26.	Manoj P. Kamble and G.D. Yadav, Kinetic resolution of (R,S) phenyl glycidyl ether by red mung beans ( <i>Vigna angularis</i> ) epoxide hydrolases Author links open overlay panel,	BioCatal. Agri. Biotech. 12 (2017)260-265; DOI: <a href="https://doi.org/10.1016/j.bcab.2017.09.013">https://doi.org/10.1016/j.bcab.2017.09.013</a>
27.	Manoj P. Kamble and G.D. Yadav, Kinetic resolution of (R,S)- $\alpha$ -tetralol by immobilized candida antarctica lipase b: comparison of packed-bed over stirred-tank batch bioreactor,	Ind. Eng. Chem. Res. 56(2017) 1750–1757;DOI:10.1021/acs.iecr.6b03401
28.	Manoj P. Kamble, Sandeep A. Chaudhari, Rekha S. Singhal, and G.D. Yadav, Synergism of microwave irradiation and enzyme catalysis in kinetic resolution of (R,S)-1-phenylethanol by cutinase from novel isolate <i>Fusarium ICT SAC1</i> ,	Biochem. Eng. J. 117 (2017) 121-128; DOI: <a href="https://doi.org/10.1016/j.bej.2016.09.007">https://doi.org/10.1016/j.bej.2016.09.007</a>

29.	Paula Saavalainen, Esa Turpeinen, Linda Omodara, Satish Kabra, Kati Oravisjärvi, G. D.Yadav, Riitta L. Keiski and EvaPongrácz, Developing and testing a tool for sustainability assessment in an early process design phase – Case study of formic acid production by conventional and carbon dioxide-based routes,	J. Cleaner Prod. 168 (2017) 1636-1651; DOI: <a href="https://doi.org/10.1016/j.jclepro.2016.11.145">https://doi.org/10.1016/j.jclepro.2016.11.145</a>
30.	Pooja R. Tambe and G.D. Yadav, Selective carbonylation of o-phenylene diamine using carbon dioxide as feedstock for synthesis of 1, 3-dihydro-benzimidazol-2-one over La-Zr mixed oxide,	J. Cleaner Prod. 166 (2017) 285-298; DOI: <a href="https://doi.org/10.1016/j.jclepro.2017.08.025">https://doi.org/10.1016/j.jclepro.2017.08.025</a>
31.	Prasad Mandade, Bhavik R. Bakshi, and G.D. Yadav, Ethanol from indian agro-industrial lignocellulosic biomass: an emergy evaluation,	Clean Tech. Environ. Policy 18(2016)2625–2634; DOI: <a href="https://doi.org/10.1007/s10098-016-1179-y">https://doi.org/10.1007/s10098-016-1179-y</a>
32.	Radhika S. Malkar and G.D. Yadav, Selectivity engineering in synthesis of thymol using sulfated ZrO <sub>2</sub> -TiO <sub>2</sub> ,	Ind. Eng. Chem. Res. 56 (2017) 8437–8447; DOI:10.1021/acs.iecr.7b01454
33.	Sachin V. Jadhav, Piia Häyrynen, Kumudini V. Marathe, Virendra K. Rathod, Riitta L. Keiski, and G.D. Yadav, Experimental and modeling assessment of sulfate and arsenic removal from mining wastewater by nanofiltration,	Internat. J. Chem. Reactor Eng. Published Online: 2017-04-07 DOI: <a href="https://doi.org/10.1515/ijcre-2016-0103">https://doi.org/10.1515/ijcre-2016-0103</a>
34.	Sandip V. Pawar, Joe C. H. Ho, , G.D. Yadav, Vikramaditya G. Yadav, The impending renaissance in discovery & development of natural products,	Curr. Top. Med. Chem. 17 (2017) 251-267; DOI:10.2174/1568026616666160530154649
35.	Saurabh C. Patankar and G.D. Yadav, Cascade engineered synthesis of 2-ethyl-1-hexanol from n-butanal and 2-methyl-1-pentanol from n-propanal using combustion synthesized Cu/Mg/Al mixed metal oxide trifunctional catalyst,	Catal. Today 291 (2017) 223-233; DOI: <a href="https://doi.org/10.1016/j.cattod.2017.01.008">https://doi.org/10.1016/j.cattod.2017.01.008</a>
36.	Shivaji L. Bhanawase and G.D. Yadav, Hydrotalcite as active and selective catalyst for synthesis of dehydrozingerone from vanillin and acetone: effect of catalyst composition and calcination temperature on activity and selectivity,	Curr. Catal. 6 (2) (2017) 105-114; DOI: <a href="https://doi.org/10.2174/2211544705666161123122411">https://doi.org/10.2174/2211544705666161123122411</a>

37.	Shivaji L. Bhanawase and G.D. Yadav, Novel alkali-promoted hydrotalcite for selective synthesis of 2-methoxy phenyl benzoate from guaiacol and benzoic anhydride,	Clean Tech. Environ. Policy 19 (2017) 1169–1180; DOI: <a href="https://doi.org/10.1007/s10098-016-1316-7">https://doi.org/10.1007/s10098-016-1316-7</a>
38.	Shivaji L. Bhanawase and G.D. Yadav, Novel silica-encapsulated Cu–Al hydrotalcite catalyst: oxidative decarboxylation of vanillyl mandelic acid to vanillin in water at atmospheric pressure,	Ind. Eng. Chem. Res. 56(2017)12899–12908; DOI:10.1021/acs.iecr.6b04982
39.	Shivaji L. Bhanawase and G.D. Yadav, Activity and selectivity of different base catalysts in synthesis of guaifenesin from guaiacol and glycidol of biomass origin,	Catal. Today 291(2017)213-222; DOI: <a href="https://doi.org/10.1016/j.cattod.2016.12.008">https://doi.org/10.1016/j.cattod.2016.12.008</a>
40.	Shivaji L. Bhanawase and G.D. Yadav, Novel alkali-promoted hydrotalcite for selective synthesis of 2-methoxy phenyl benzoate from guaiacol and benzoic anhydride	Clean Tech. Environ. Policy 19 (2017)1169–1180; DOI: 10.1007/s10098-016-1316-7
41.	Surbhi M. Gupta, Manoj P. Kamble and G.D. Yadav, Insight into microwave assisted enzyme catalysis in process intensification of reaction and selectivity: Kinetic resolution of (R,S)-flurbiprofen with alcohols,	Mol. Catal. 440 (2017)50-56; DOI: <a href="https://doi.org/10.1016/j.mCatal.2017.06.020">https://doi.org/10.1016/j.mCatal.2017.06.020</a>
42.	Suresh M. Doke and G.D. Yadav, Novelties in synthesis of unsupported and crack-free titania membranes from metal alkoxides using two-way controllable sol–gel method,	Adv. Porous Mater. 5 (2017) 36-43 DOI: <a href="https://doi.org/10.1166/apm.2017.1129">https://doi.org/10.1166/apm.2017.1129</a>

## SEMINARS/LECTURES/CONFERENCES/SYMPOSIA

Invited Lecture (IL), Keynote Address (KA), Plenary Lecture (P), Orations/Award Lecture (O), Chief Guest Addresses (CG) & Seminars (S)

11.	How to Build and Nurture Academic Entrepreneurship in India ?	IL	Conference on 'Indo-Israel Collaboration in Innovation, Entrepreneurship, medial & communications and role of academia, University of Mumbai, Kalina Campus, March 28, 2017
12.	The Energy Perspective: Challenges and Opportunities	CG & KL	National Workshop on "Solar Energy Utilization (SUN) for Sustainable Development, CSIR-NEERI, Nagpur, March 23, 2017
13.	Green Chemistry and Engineering in Service of Society: Sustainable and Green Production of Chemicals, Fuels and Energy from Waste Biomass, Water and CO <sub>2</sub>	CG & KL	National Seminar on Recent Trends in Chemistry. Kisan Veer College, Wai, Satara; March 18, 2017
14.	Sustainable and Green Production of Chemicals, Fuels and Energy from Waste Biomass and CO <sub>2</sub>	CG & PL	National Conference: Green Chemical Process and Sustainable Technologies, Shiv S. Nadar College of Engineering, Kalavakkam, Chennai-603110; March 17, 2017
15.	How to build and nurture academic entrepreneurship in India?	IL	National Academy of Sciences India (NASI) Workshop on Entrepreneurial Skill Development in Chemistry, Madurai Kamaraj University, Madurai, March 11, 2017
16.	Catalytic selectivity engineering in sustainable production of chemicals, fuels and energy from biomass	IL	Hokkaido University, Japan, Seminar in Honour of Professor M. Arai, March 3, 2017
17.	Catalytic selectivity engineering in sustainable production of chemicals, fuels and energy from biomass	S	AIST, Tsukuba, Japan; Feb. 28, 2017
18.	Selectivity engineering, catalysis, green chemistry & energy engineering	S	Tokyo University, Japan; Feb. 27, 2017
19.	Catalytic selectivity engineering in sustainable production of chemicals, fuels and energy from biomass		The University of Electro-Communications, Chofu, Tokyo; Feb. 24, 2017
20.	Leveraging Information Technology for Inter-sectoral Research	CG	ICAIM 2017, International Conference on Advances in Information Management, Thakur Institute of Management Studies, Kandivali, Mumbai, Feb. 17, 2017
21.	Importance of nutraceuticals	CG	Prof D.V. Rege Seminar, AFSTI and Dept of Food Engineering & Technology, ICT, Mumbai; Feb. 15, 2017

22.	Converting biowaste into energy and protection of environment	GH	Society of Friends of the Trees, Annual Exhibition of Vegetables, Flowers and Fruits, Ruparel College, Mumbai, Feb. 12, 2017
23.	Building excellence in higher education in digitally networked world	PL	46th Annual Convention and Conference, ISTE, Gulzar Group of Institutes, Ludhiana, Feb. 10, 2017
24.	Innovations in engineering and technology education	GH	Conference Chair, 46th Annual Convention and Conference, ISTE, Gulzar Group of Institutes, Ludhiana, Feb. 10, 2017
25.	Industry-institute interaction for mutual benefit	CG	Thane Manufacturers Association, Thane, Feb. 4, 2017
26.	Relevance of biological sciences and engineering in energy production	CG	International Conference on Biotechnology, Modern College, Pune
27.	Sustainable and green production of chemicals, fuels and energy from waste biomass and CO <sub>2</sub>	IL	Dr. H.S. Gaur Sagar University, M.P., Jan. 24, 2017
28.	Catalytic selectivity engineering in sustainable production of chemicals, fuels and energy from biomass	PL	APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, January 17-21, 2017
29.	How Institute of Chemical Technology Mumbai has Created and Sustained Excellence and Brand Value in Digitally Connected World	IL	Conference, Saturday Club, Mumbai. Jan. 14, 2017
30.	Green Chemistry & Engineering in Biotransformations and Bioprocessing	GH	Vaze College Biotechnology Dept. Silver Jubilee Celebration, Jan. 14, 2017
31.	How Institute of Chemical Technology Mumbai has created and sustained excellence and brand value in digitally connected world	CG	Nirmala Niketan Bhavan College, Mumbai, Jan. 10, 2017
32.	Waste to Wealth: Cleaner and greener production of value added chemicals, fuels materials and energy from biomass	O	Hetero Drugs Prof G.S. Laddha Chemcon Distinguished Speaker Award Medal Oration, CHEMCON-2016, Anna University, Chennai, Dec. 28, 2016
33.	Dhirubhai Ambani Commemoration Day Celebration		Preamble, CHEMCON-2016, Anna University, Chennai, Dec. 28, 2016
34.	Chemcon 2016 and Chemical Engineering Profession	A	NOC Chairman's address, Inaugural Function, CHEMCON-2016, Anna University, Chennai, Dec. 28, 2016
35.	संशोधन आणि उच्च शिक्षण यांची परस्परपूरकता (Complementarity of Research and Higher Education)	IL	Marathi Vidyan Parishad Annual Conference, Gadkari Rangayatan, Thane, December 18, 2016

36.	Waste to Wealth from Energy Production, Utilisation and Conservation	CG	Energy Conservation Week, RCF, Mumbai, Dec. 17, 2016
37.	Synthesis and Applications of Novel Catalytic & Allied Materials for Development of Green Processes	PL	Materials Symposium, B.A.R.C. Dec. 6, 2016
38.	How Institute of Chemical Technology Mumbai has Created and Sustained Excellence and Brand Value in Digitally Connected World	GH	Texsummit, Mumbai, Dec. 5, 2016
39.	Creating Ecosystem for Academic Excellence : Institute of Chemical Technology as a Model	IL	Workshop for University Administrators, Tata Institute of Social Sciences, Mumbai, November 12, 2017
40.	Role of Chemistry in Peace and Prosperity	PL	ACS Industry Symposium, ACS India International Chapter, Dr Reddy's Laboratory, Hyderabad, November 11, 2016
41.	Bioeconomy, Sustainability and Catalysis	KA	UK-India Newton Researchers Link Workshop, IIT Madras, Nov. 1, 2016
42.	Cascaded engineered catalysis for cleaner and greener production of value added chemicals from biomass	PL	ICOSSE-5, 5th International Conference on Sustainability Science and Engineering, Suzhou, China, Oct 26, 2016
43.	Technology Development and IPR Management: How to Achieve and Sustain Excellence and Brand Value in Digitally Connected World	IL	Sustainable Growth through Innovations in Management and Technology, 1st International Conference, Sanjay Ghodawat Group and ISTE, Dubai, Oct. 19, 2016
44.	Make In India And Make For The World: Creating Intellectual Property Ecosystem for Developing Technologies for Tomorrow's World	IL	Education for Tomorrow: Learn in India for The World; 12th FICCI Higher Education Summit 2016: Global Conference & Exhibition, Oct. 10, 2016
45.	Science and Engineering of Pores, Particles & Interfaces in the Development of Green Chemical and Biological Processes	CG	CSIR Foundation Day Lecture, CSIR-CECRI, Karaikudi, Oct. 3, 2016
46.	The Beauty And Charm At The Interface Of Chemical and Biological Sciences & Engineering	PL	TEQIP Workshop, Heritage Institute of Technology, Kolkata, Sept. 28, 2016
47.	Role of Stake holders in Improving Quality of Higher Education	PD	British Council, Ahmedabad, Sept. 23, 2016
48.	Creating Academic Excellence and Brand Value in Digitally Connected & Competitive World	PL	TEQIP Workshop for Vice Chancellors in UP, UP Higher Education Dept., Sept. 22, 2016

49.	Plasma Processing: Perspectives and Scope	CG	Plasma Processing Seminar, Dept. of Physics, ICT, Mumbai, Sept. 21, 2016
50.	How Universities Can Create and Sustain Excellence and Brand Value in Digitally Connected World	IL	Global Conference on Quality Higher Education, NAAC, Bangaluru, Sept. 17, 2016
51.	Creating Intellectual Property Ecosystem for Building A Brand: A Case Study of Institute of Chemical Technology, Mumbai	IL	Seminar on Environment, Central University Gujarat, Ahmedabad, Sept. 16, 2016
52.	Green Chemistry and Engineering in Development of Innovative Dyestuff and Textile Industry	CG	Seminar by Dyestuff Technology Dept., ICT, Mumbai, Sept. 14, 2016
53.	Relevance of Mathematics in Engineering Education	CG	Seminar by Dept of Mathematics, ICT, Mumbai, Sept. 13, 2016
54.	Chemical Engineering As Vibrant and Versatile Profession in the Service of Society	CG	Valedictory Address, Students Chemcon, SCHEMCON-16, Dr. B.V. Raju Institute of Technology, Hyderabad, Sept. 11, 2016
55.	Creating Intellectual Property Ecosystem for Building A Brand: A Case Study of Institute of Chemical Technology, Mumbai, India	PD	Panel Discussion: Developing the Intellectual Property Ecosystem; Science and Technology for Society Forum Sri Lanka, Colombo, Sept. 9, 2016
56.	Green Chemistry and Engineering in Development of Innovative Textile Industry	PL	ETIDI Seminar, Ethiopia, Adis Ababa, Aug. 17, 2016
57.	Waste to Wealth: Valorization of Waste from Sugar and Associated Industries	O	Gundu Rao Memorial Lecture, Deccan Sugar Technologists Association, 62nd Annual Meeting, Pune, August 13, 2016
58.	No Life Without Chemistry !!	CG	Acharya P.C. Ray 155th Birth Anniversary Celebration, Vijnan Bharati and Sathay College, Mumbai, Aug. 3, 2016
59.	Building Excellence in Technical Institutes: How to Beat the System in the Digital World	IL	MCEP, IIM Trichy, Chennai Campus, July 26, 2016

### CONFERENCE PRESENTATIONS

1. J. Molleti and G.D. Yadav, Novel synthesis of Ru supported on OMS prepared by solvent free method as a catalyst : Selective hydrogenation of Levulinic acid to GVL in aqueous medium, APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017
2. G.P. Fernandes and G.D. Yadav, Selective glycerolysis of urea to glycerol carbonate using combustion synthesized nano magnesium oxide, APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017
3. K. B. Rasal and G.D. Yadav, One-pot synthesis of benzimidazole from o-nitroaniline using DMF as multitasking reagent in presence of CuFe<sub>2</sub>O<sub>4</sub>, APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017

4. A.B. Gawade and G.D. Yadav, Sustainable and selective synthesis of 2,5-FDCA by oxidation of 5-HMF over MnFe<sub>2</sub>O<sub>4</sub> catalyst using H<sub>2</sub>O<sub>2</sub> as oxidant and water as solvent, APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017
5. R.S. Malkar and G.D. Yadav, Selectivity engineering in thymol synthesis using heterogeneous sulfated ZrO<sub>2</sub>-TiO<sub>2</sub> catalyst, APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017
6. M.P. Kamble and G.D. Yadav, Biocatalytic resolution of (R, S)- styrene oxide using a novel epoxide hydrolase from red moong beans, APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017
7. D.B. Magadum and G.D. Yadav, Development of kinetic model for the synthesis of (R)-1-pyridin-4-ylethyl acetate using palladium lipase tandem catalyst supported on mesocellular foam, APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017
8. D. Pisal and G.D. Yadav, Hydrogenolysis of furfural to 1,2 pentanediol on OMS<sub>2</sub> supported catalyst APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017
9. S. Gupta and G.D. Yadav, Insights into microwave and enzyme catalysis in process intensification of reactions and selectivities: Kinetic resolution of (R,S)-flurbiprofen with alcohols, APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017
10. A.V. Nakhate and G.D. Yadav, One pot synthesis of CuFe<sub>2</sub>O<sub>4</sub>@rGO by solvothermal process: efficient and green catalyst for synthesis of c-o cross coupling and N-arylation reaction, APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017
11. P.R. Tambe and G.D. Yadav, Heterogeneous green route for cycloaddition of styrene oxide with carbon dioxide for synthesis of styrene carbonate using reusable lanthanum zirconium mixed oxide APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017
12. S. Sabde and G.D. Yadav, Hydrolytic depolymerization of polyethylene terephthalate (PET) to Terephthalic acid (TPA) monomer using metal salt and phase transfer catalyst, APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017
13. A. D. Shejale and G.D. Yadav, Cu promoted Ni-Co/hydrotalcite bi-metallic catalyst for improved hydrogen production in comparison with several modified Ni-based catalysts via steam reforming of Ethanol, APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017
14. G.P. Deshmukh and G.D. Yadav, Novelty of solid-liquid phase transfer catalysis using K<sub>2</sub>CO<sub>3</sub> in synthesis of mecoprop ester, APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017
15. M, Dhawan and G.D. Yadav, Insight into a catalytic process for simultaneous production of biodiesel and glycerol carbonate, APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017
16. H. Salvi and G.D. Yadav, Insight into continuous flow packed bed reactor of immobilized candida antarctica lipase B for synthesis of geraniol esters: Optimization and kinetic modeling, APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017
17. P. D. Patil and G.D. Yadav, A novel process for the purification of laccase from *Trametes hirsuta* using microwave assisted three phase partitioning, APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017
18. S.C. Patankar, A. G. Sharma and G.D. Yadav, Selective synthesis of  $\gamma$ -butyrolactone from succinic acid using supported palladium-copper on alumina xerogel catalyst and isopropyl alcohol as solvent, APCAT-7, Asia Pacific Congress on Catalysis, Mumbai, Jan. 17-21, 2017



## CAREER PROFILE

Professor Ganapati D. Yadav is the first Vice Chancellor and R.T. Mody Distinguished Professor of the Institute of Chemical Technology (ICT), Mumbai (formerly UDCT), which is a Deemed-to-be-University having Elite Status and Centre of Excellence given by State Assembly on par with IITs/IISc/IISERs. He is J.C. Bose National Fellow and Adjunct Professor at RMIT University, Melbourne, Australia and University of Saskatchewan, Canada. He was conferred Padma Shri by the President of India on March 28, 2016 for his outstanding contributions to Science and Engineering. He is internationally recognized by many prestigious and rare awards, fellowships and honours for his seminal contributions to education, research and innovation in green chemistry and engineering, catalysis, chemical engineering, biotechnology, nanotechnology, energy engineering and development of clean and green technologies. He has provided inspiring leadership to the Institute of Chemical Technology (ICT), the Indian Institute of Chemical Engineers (IChE), Catalysis Society of India, and Maharashtra Academy of Sciences. His passion for Sanskrit, Vedas, Etymology, Philosophy, Poetry and literature stands him apart in academic community. He has earned his B. Chem. Eng. (1974), and Ph.D. (Tech.) in Chemical Engineering (1980) from the University of Bombay Department of Chemical Technology (famously known as UDCT then; now ICT). The D.Y. Patil University, Kolhapur conferred upon him D. Sc. (Hon. Causa) in 2016. He has won over 100 national and international honours, awards, fellowships, editorships, etc. He is an elected Fellow of all National Science and Engineering Academies in India: Indian National Science Academy (INSA), National Academy of Sciences, India (NASI), Indian Academy of Sciences (IASc), Indian National Academy of Engineering (INAE) and The World Academy of Sciences (TWAS).

He was Leverhulme Overseas Visiting Fellow at Loughborough University (1980-81), PDF/NSERC Fellow, University of Waterloo, Canada (1982-84), Johansen Crosby Visiting Chair Professor of Chemical Engineering, Michigan State University (2001-02) and Distinguished Visiting Scholar, Asian Initiative of Purdue University President (2007), Distinguished Visiting Professor Lunghwa University of Science and Technology, Taiwan.

His research productivity is phenomenal: supervision of 84 doctoral and 92 masters theses, 321 original research papers, 83 national and PCT patents; 3 books; h-index of 51, i10 index of 201; 9700+ citations. He is one of the topmost engineering scientists and academicians in India, who despite being an administrator, is still actively involved in guiding Ph.D., patenting, publishing, consulting and transferring technologies to industry. He has given more than 575 talks including prestigious orations, plenary lectures, keynote addresses and seminars across the world in his chequered career. He has been an active consultant to industry. He is a Fellow of Royal Society of Chemistry, UK, Institution of Chemical Engineers, UK, Indian Institute of Chemical Engineers, Indian Chemical Society, Indian Society for Technical Education (Hon.) among others.

Deepak Groups Prof L.K. Doraiswamy Chemcon Distinguished Speaker Award and Medal, IChE (2017), Hetero Drugs Prof G.S. Laddha Chemcon Distinguished Speaker Award and Medal, IChE (2016) Asian Paints Dr R.A. Mashelkar Chemcon Distinguished Speaker Award and Medal, IChE (2015). He was bestowed with the first Loknete Sadashivrao Mandlik Memorial Award for his contribution to Education and Research in 2016. D. M. Trivedi Lifetime Achievement Award by Indian Chemical Council (2013) and Dr. B. P. Godrej Lifetime Achievement Award of IChE (2013). The Indian Chemical Council conferred upon him Life Time Achievement Award and gold medal (2014). The Indian Speciality Chemicals Manufacturers Association bestowed upon him the Best Researcher award in 2014.

The American Chemical Society (ACS) published a Festschrift (special issue) of Industrial and Engineering Chemistry Research (2014) in his honour with 65 original research papers from scientists from all over the world. He is the Founder President ACS India International Chapter. He is on editorial boards of prestigious journals like: ACS Sustainable Chemistry & Engineering, Green Chemistry, Applied Catalysis A: Gen, Journal of Molecular Catalysis A: Chem., Catalysis Communications, International Journal of Chemical Reactor Engineering, Clean Technologies and Environmental Policy, Current Catalysis, etc. He is the Founding Editor-in-Chief of Catalysis in Green Chemistry & Engineering (2017, Begell House, USA).

Other noteworthy recognitions include: Chairman, APCAT-7, Asia Pacific Congress on Catalysis, Jan. 17-21, 2017 Mumbai; Fellow Royal Society of Chemistry, UK and Institute Chemical Engineers UK; Canadian Catalysis Foundation's Cross-Canada Lectureship; John van Geuns Lectureship, Amsterdam University; Park Reilly Distinguished Speakership, Waterloo University; Visiting Professorship, Lunghwa University of Science and Technology, Taiwan; He is elected Chairman of Asia Pacific Conference on Catalysis, and is on governing council of APCAT, the confederation of catalysis societies from Asia Pacific region. He is a member, International Advisory Board, The State Key Laboratory for Catalysis, Dalian Institute of Chemical Physics, The Chinese Academy of Sciences. He served as Director, Asia-Pacific Confederation of Chemicals Engineering Institutes.

He is recipient of honours such as IIT-Roorkee's Khosla National Award; H.L. Roy Memorial Lecture; RPG Life Sciences' Padma Vibhushan MM Sharma Medal; Institution of Engineer's Eminent Engineer Award; Ashland Padma Vibhushan CNR Rao Medal; Dr. Anji Reddy Innovator of the Year Award; Dhirubhai Ambani Oration Award- IICHe-Reliance Industries; Anna University's National Award for the Most Outstanding Academician; VASVIK Foundation Award for Excellence in Research, Best Teacher Award, Maharashtra Govt.

His contributions to development of the Chemical Engineering profession in India are incomparable. As President of the IICHe (2001), he established 51 national awards through endowments. He has been a member or chaired several national and international committees of MHRD, DST, DBT, UGC, AICTE, CSIR, the PSA's on Green Chemistry, the Planning Commission's Pan India S&T Committee, and the Government of Maharashtra's Rajiv Gandhi S&T Commission Peers Group. He is Chairman, Research Council, CSIR-CSMCRI, member of RC of IICT Hyderabad and NIIST Trivandrum. He has served as a Chairman/member of Selection Committees of directors of many CSIR labs. He is Chairman, Advisory of DST-National Centre for Catalysis Research, IIT-Madras and international PAC in Chemical Sciences of DST. He is a member of Maharashtra Innovation Council. He is Chairman, Waste Management Expert Committee, DST-Govt of India, and serves on Boards of two companies as independent Director. He has been actively involved as Chairman/member of many committees of UGC, AICTE, NAAC, DST, DBT, CSIR, CII, FICCI, ICC, IICHe, ACS, among others, and is one of the most active scientists and administrators in the World.

**A documentary on his life's story is available in English and Marathi on YouTube:**

<https://www.youtube.com/watch?v=allxaDFBefE&feature=youtu.be> (English)

[https://youtu.be/eKZo\\_cvuJ50](https://youtu.be/eKZo_cvuJ50) (Marathi)

<https://www.youtube.com/watch?v=6vyZHJ7Jqfs> (Interview in Marathi programme Desh Yatra IBN Lokmat channel)

His views on Chemical Engineering profession are given in a TEDxICTMumbai:

[http://www.youtube.com/watch?v=viG Tk\\_2Q-L4](http://www.youtube.com/watch?v=viG Tk_2Q-L4)

The University song written by him: [https://www.youtube.com/watch?v=fnHJ\\_1uTKHU](https://www.youtube.com/watch?v=fnHJ_1uTKHU)

### RESEARCH GROUP PHOTO



A professional microphone is positioned on a podium, with a smartphone and a pen visible in the background. The image is framed by decorative blue and yellow geometric lines at the top and bottom. The word "SPEECHES" is written in a bold, dark blue, sans-serif font across the top right.

# SPEECHES

## PROCEEDINGS OF THE FIFTH CONVOCATION

3rd March 2016



**Professor Dr. Ganapati D. Yadav**

Vice Chancellor, ICT

**H**onourable Chief Minister Shri. Devendraji Fadanavis, Hon. Chancellor Padmavibhushan Dr. R. A. Mashelkar, members of the Board of Management, Dean (Academic Programmes), Registrar, Controller of Examinations, members of Academic Councils, Fellow Deans, former Directors, Padmavibhushan Prof. M. M. Sharma, Padmabhushan Prof. J. B. Joshi, Padmabhushan Dr. A. V. Ramarao, Padmashri Dr. K. H. Garda, and my colleague, Prof. V. G. Gaikar, the newly appointed Vice Chancellor of Dr. Babasaheb Ambedkar Technological University, current and past Presidents of the UDCT Alumni Association, fellow colleagues, graduated students, their parents, alumni and support staff, visiting faculty, invited guests, ladies and gentlemen...

At the outset, let me congratulate the graduating students. Well done girls and boys! Now, set a new goal for achieving zenith in your chosen careers and be our proud alumni. In keeping with the grand tradition of the ICT, we have decided to confer honorary doctorates on two Nobel Laureates : Professor Jean Marie Lehn; Distinguished Professor of Chemistry at the College De France In Paris, winner of the Nobel Prize in Chemistry in 1987 and Professor Robert H. Grubbs, Victor and Elizabeth Atkins, Professor of Chemistry at Caltech, USA, who is the recipient of 2005 Nobel Prize in Chemistry, for which a separate Convocation will be organised in June 2016.

**“Set A New Goal For Achieving  
Zenith In Your Chosen Careers...”**

In this Convocation, 568 degrees are being awarded in which 83 are Ph. D. students, of which 80 are students of this Institute, who will receive the degree here and 3 are from Mumbai University. During the year, we published 417 Research Papers in top notch journals, got 63 patents, presented 290 conference papers, and the faculty members received 69 major national & international awards.

We also established Dr. B. P. Godrej, Distinguished Professor Of Green Chemistry and Sustainability Engineering for an annual donation of Rs. 40 lakh by the House of Godrej. The Chair is currently occupied by Dr. Laxmikantam, former Director of CSR IICT, Hyderabad. K. V. Mariwala - J. B. Joshi Distinguished Professor of Chemical Engineering is occupied by Dr. D. K. Ghosh, former Director of CSIR, CSMCRI, Bhavnagar. Prof. W. B. Achwal's two children have donated Rs. 20 lakh for establishing an endowment in his name, and Mrs. Pushpal Mantri donated Rs. 1.25 crore in her husband's name, Dr. R. Y. Mantri to create M. Tech. Perfumery and Flavour Technology fellowships. Last year, this stadium was built with generous donation of Rs. 1.2 Crore under the CSR activities by Pidilite industries and the Rankala lake cleaning was done through CSR funds of Rs. 25 lakhs through Arti Industries.

Ladies and gentlemen, with unbound delight and affection, we welcome you all for the Fifth Convocation. Our performance has been on the rise over the years and several accolades and

honours have been bestowed on the faculties, students and support staff, and the Institute at last. As an engineer scientist and academic leader, I have seen how institutions and individuals can contribute to the growth of the nation. The ICT is a unique Institute with achievements which has changed the destiny of India. 83 years of glorious past history and incredible achievements! Several new dimensions have been added and the ICT is now recognized for its excellent education, training, and research in Chemical Engineering, Chemical Technology, Applied Chemistry, Pharmacy, Biotechnology, Material Science, Energy Engineering and Bioprocessing. It has been cited as a role model for industry-institute-government relationship. Many of our alumni have distinguished themselves in all walks of life, be it industry, academia, Government or public service and brought glory to the alma mater. Some of the rare national and international scholars have been bestowed. 17 Padma Awards, in which 3 Padmavibhushans, 7 Padmabhushans, and 7 Padmashris have been bestowed on our graduates and faculties. Civil felicitations, fellowships of prestigious international academies, have been bestowed. Over 500 first generation entrepreneurs have been generated from this Institute and some of them have hailed from poor families or having without a family business. Also fortune-500 company owners are our graduates. This year, our alumni and faculty have received rare honours. 3 Padma Awards, Padmavibhushan to Dr. A. V. Ramarao, Padmashri to Dr. K. H. Garda, and Padmashri to yours truly. Shri Mukesh Ambani, our 1979 bachelor of Chemical Engineering graduate, and Chairman and Managing Director of Reliance Industries, was bestowed with the Membership of US' National Academy of Engineering. Shri. Ashwin Dani, Vice Chairman of Asian Paints, is bestowed as the businessman of the year, and now my young colleague Professor V. G. Gaikar as the first Vice Chancellor of the State University, Dr. Babasaheb Ambedkar Technological University.

Ladies and gentlemen, today amongst us, we have a dynamic Chief Minister, who is trying to bring investments of not just funds, technology and talent in the State but also shaking the

bureaucracy to be efficient, fast with goal based delivery. The recent event of Make in India, arranged in Mumbai was a testimony to his vision and the Government's resolve to serve the nation at large. What are today's buzz words? Energy, environment, water, food, affordable healthcare, carbon foot print infrastructure, sustainable development and GDP. Contrast these with the Prime Minister's mission. Swaccha Bharat, Swastha Bharat, Make in India, Water Mission, Climate Change, Skill Development Programmes, Smart Cities, Namami Gange, Digital India, Startup India, Stand Up India... The issues of energy, environment, healthcare, food, water, housing, and above all, educating millions of young Indians can not be solved without the participation of all stakeholders, and the institutes like ours will have a great role to play. We are not just a chemical Institute, but we have been dealing with Pharmaceuticals, Polymers, Textiles, Paints, Foods, Biomass Conversion, Energy, Material, Biotechnology and Energy Engineering. The ICT would like to contribute to the prime minister's grand missions. Hon'ble Chief Minister, the Chancellor Dr. Mashelkar and I are the members of the State Innovation Council and on behalf of the Institute, we assure you that we will help the State and the nation in all their endeavours related to development of technology. I believe Maharashtra should be at the hub of industrial activities with zero pollution and it is high time the steps are taken to revive the eco friendly chemical industry. Never before, we have faced so many technological challenges. The ICT is now doing many wonderful things. We have a much greater role in participating in national missions and delivering cutting edge technologies. India needs to grow with 9.5% GDP for the next 2 decades to be a powerful nation. We have to be worshippers of Laxmi, and Saraswati both. Creators of wealth through new knowledge in service of society. We have 52% students coming from poor strata and so far, we have created 340 undergraduate scholarships ranging from Rs. 10,000 to 1 lakh per student, and we have all the philanthropists helping us. If you look at the interesting aspect, it was a proud moment for us last year, when Hon'ble

Narendra Modi alongwith Hon'ble Mr. Tony Abott, the Australian premier discussed 3 Indo Australian grand challenge technologies, in which one of the technologies on biofuels was headed by our Institute under the leadership of Prof. Arvind Lali. Another international recognition is at Bill and Melinda Gates Foundation now supported 4 projects of US \$ 1 lakh each in last 2 years. The CII AICTE Tata chemicals best industry linked Institute In Chemical Engineering Award has been continuously bagged by us for the last 3 years. Another thing the ICT has earned the maximum number of collaborative projects with Department of Atomic Energy establishment. Currently we run 32 projects by them.

Ladies and gentlemen, I will also present to you the concept of Ekalavya. E means e-based, K is knowledge intensified, A is accessible to all, L is learner friendly, A is affordable, V is vibrant content, Y is youthful and yearlong 24x7 and A for anytime. We will use Ekalavya as a model for going beyond our boundaries, literally and figuratively to Odisha and other campuses. We need to have additional campus in the vicinity of Mumbai about 100 acres so that our engineering and technology base is augmented with faculties strength of something like 400, student strength of 4,000 in next 2 decades. We'd like to establish 29 Research and Innovation centres and we need the Government's blessings. We have been approached by Odisha Government to open a campus of ICT in Bhuvaneshwar near the IIT and IISER. In this regard, our government is required to give us

permission to go there. Odisha Government has promised us to give a land of 100 acres and support there, because they are going to have many mega projects in the Paradip sector. Sir, kindly permit us to have a campus in Odisha which can play on par with institute of national importance like IITs.

We need resources for such a massive expansion on par with the other national institutes. A foundation of Rs. 1,000 crore should be created. We need one time grant upto 200 crore from the State and the Centre. The MHRD should recommend us an allied institute for the special grant and I am sure they will do it.

Ladies and gentlemen, there is a Marathi saying "देणाऱ्याने देत जावे, घेणाऱ्याने घेत जावे, घेता घेता एक दिवस... देणाऱ्याचे हातही घ्यावेत..." We can give Income Tax benefits under section 80 G and CSR and I am sure you would like my equation  $100 = 1,000$ ; meaning; give me a satellite campus of 100 acres and I will go after creating 1,000 crore endowment. I am optimistic that such a day is not far away. If our alumni, Government, industry and philanthropists decide to open their purses, I am sure this will happen. So let me quote Rigveda at the end. "चक्षुर्नो धेहि चक्षुषे चक्षुर्विख्ये तनूच्यः । संचेदं विच पश्येम।" Give sight to our eyes, sight to our bodies, so they can see.

May we see the whole world. May we see in detail. Ladies and gentlemen, thank you very much. Dhanyawad!

## PROCEEDINGS OF THE FIFTH CONVOCATION



“Education disseminates old knowledge, research creates new knowledge, and innovation converts knowledge into wealth...”

**Padma Vibhushan, Dr. R. A. Mashelkar**  
Chancellor, ICT

**H**on'ble Chief Minister Shri. Devendra Fadnavis ji, Prof. G. D. Yadav, our beloved and most popular Vice Chancellor, my Guru and everybody's Guru, Prof. M. M. Sharma, Prof. J. B. Joshi, Dr. A. V. Ramarao, Dr. Gharda, functionaries of ICT on the dias, faculty, proud graduates of the day, equally proud parents, ladies and gentlemen...

It's a very special day in your life. You are the graduates of the day and my mind goes back exactly 50 years ago- 1966 when I myself received the degree of this august Institute. Exactly 50 years ago becoming bachelor's degree in Chemical Engineering holder. I know exactly how I felt and I know exactly how you must be feeling. So preserve this day as you move along! This moment will never come again. I want to thank our Hon'ble Chief Minister for being our Chief Guest. He is an iconic figure as far as we are concerned. His dynamism, his vision, and (recently I was witnessed to) his speed of action. It is as fast as the speed of thought. He is absolutely incredible and we are really blessed by your presence, Sir! Thank you!!

Professor Yadav has already given an extensive account of the achievements of our Institute. My Institute is gathering new heights of excellences you heard; but the most proud moment among

many others is the national honour that has been received by the Padma awardees. Must I have a special word for them?

Today, we talk about the startup India, standup India and these were the leaders who started the startup India. Prof. Gharda, for example, almost 4 decades ago started Gharda Chemicals. Dr. A. V. Ramarao, couple of decades ago showed how to convert knowledge into wealth. So they are icons for us.

The responsibility that we have is that of both - excellence and relevance. Excellence - great academic heights, but at the same time being relevant to the country and the society. Our visionary Prime Minister has set us moving on a vision Make in India, Swaccha Bharat, Startup India, and we have to align as our institution to all these national dreams. I will take just one of them and speak a couple of minutes on, and that is make in India. We always talk in terms of education, research, and innovation. Education disseminates old knowledge, research creates new knowledge, and innovation converts knowledge into wealth. We use to give education here and the students after their education, go abroad and do research there. Automatically, the benefits will be received by those countries. They will do innovation there. As I used to say, the Indian genius express in

silicon valley, not here, because there are better opportunities there. But those great opportunities are being created. You heard the Finance Minister creating these new opportunities for startup India. So India too is becoming a land of opportunities.

One important thing I was mentioning to the Chief Minister is the following- Make in India but it has to be science led, innovation led Make in India. And it has to be Indian science, Indian innovation led Make in India. Let me illustrate... You know iphone is made in China? And for every iphone, Apple takes away 350\$. What the manufacturing Chinese company gets? 10\$. And of course, 4.5 million jobs are created. So jobs are created in China. They take away 10\$ and 35 times more is taken by the industry which created that knowledge, monetisable knowledge. That is innovation.

In India, we can't just be satisfied with that 10 \$ or 4.5 million. It has to be the Indian science led, Indian innovation, led Make in India so that that 350 \$ will be here, 10 \$ will also be here and 4.5 million jobs will be here as well. And that is what ICT has been doing for long and will move forward with. The last point is the fact that these young people, their ambitions are changing. We say Satyam Shivam Sundaram, Satya Nadella became the CEO of Microsoft, Sundar Pichai became

the CEO of Google, and one day some Shiv will become CEO of Apple. That is wonderful! I was talking to some people on the other day and one of them said that his ambition was just to go to US some or the other day... and one fellow said, my ambition was just to go to US on some or the other day. In 1967, I was happy just to go to USA. Now today they say, "I will get a Microsoft job or I am happy with a job in Google, and my ambition is to become a CEO". Interrupting in this talking when somebody gets up and say that my ambition is not to become the CEO of Microsoft or Google in the US, but to create my own Microsoft, my own Google, here in India. What an immense pleasure it creates! So, Hon'ble Chief Minister, that is the Yuvashakti that we have with that sort of aspiration. I want to finally thank you for giving importance to innovation. You have created Maharashtra State Innovation Council. We are the first State in the country to have registered it as a Society because you want us to give full freedom, full autonomy so that knowledge, innovation, wealth creation, and social good, excellence and relevance will all be brought together. Let me end by again wishing you great luck, great future, and great rise on this limitless ladder of excellence and limitless ladder of achievement.

Thank you!



## PROCEEDINGS OF THE FIFTH CONVOCATION



**Shri. Devendraji Fadanavis**  
Chief Minister, Government of Maharashtra

*(Tutari is played before the CM's speech)*

lthough we need innovation, we want some things to remain like they are. So this 'tutari' should remain

**A** like this only, no innovation is needed. Chancellor of the ICT, Padmavibhushan Dr. R. A. Mashelkar, Vice Chancellor Padmashri Prof. G.D. Yadav, Registrar Prof. Smita Lele, Dean (Academic Programme) Professor P. R. Vavia, Professor Rekha Singhal, Dean (Research Consultancy and Resource Mobilization) Dr. R. R. Deshmukh, Controller of Examination, all the professors on the dias, Padma awardees present at this function, parents, and dear students...

It gives me immense pleasure to be part of this Convocation ceremony of ICT. In fact, I was to remain present at the last Convocation programme but due to some mishap I couldn't come. But, I am happy that I could come today and I tell myself "der aaye... durust aaye," because this is the right Institution, an Institution of which we take pride... the Institution which has evolved in decades and which has alumni who have been Padma awardees for such a long time. So many people from various walks of life... the academic leaders, the business leaders, the leaders into technology, the leaders into innovation, all type of leadership has been provided by this Institution, and I feel that the students who have been awarded degrees are really privileged that they are part of this Institution. It is real pride of our nation. At this juncture, I would like to congratulate all the students who have been

"The degree is important, but this education of a feeling that "Yes, I've given back something." is more important..."

conferred a degree and I am sure that from today a new life for you starts. As a student, you had a responsibility to complete your graduation, post graduation, your academics. But as a graduate, you have a duty towards society. You have a duty towards nation. You have graduated, you have acquired knowledge, and after acquiring knowledge, if it's not put to the use of society, of nation, of mankind, the knowledge is of no use. And I feel that our country is passing through such a phase that every single day in the life of our country is very important. As we all know that we are passing through an era of demographic dividend, where 50% of our population is below 25 years of age, we are one of the youngest nations or youthful nations in the entire world. And we will remain so; for the next 20 to 40 years. I think if this demography is leveraged upon, we can actually develop into a great nation.

As we all know, that all developed economies are aging. By 2020, the average age of Japan will be 48 years, of Eastern Europe will be 44 years, Western Europe - 41 years, China 37 years, America 39 years, the average age of India would be 29 years. So, by 2020, the entire developed world would be aging and it would require human resource to run their economies, to fuel their economies. And if we create this human resource in our country, if our population is transformed into human resource, we will be able to provide the human resource to

the entire world. And if the entire world economy is enriched and fueled by the Indian minds, brains, hands, I think our dream to be one of the developed countries in the world can be accomplished. We have a lot of opportunities. But when we look at the opportunities, at the same time we need to look at the challenges. When I look at our State of Maharashtra, we could see that 50% of our population is dependent on agriculture. They get employment from agriculture. The share of the agriculture into the GSDP is just 11%. This means 50% of the people are living on 11% of wealth which is created and rest 50% are living on 89% wealth which is created. You can imagine when 50% of people are contributing 11% of the GSDP, what share they must be getting out of that 11% and here comes the challenge! I think that this challenge is also an opportunity- opportunity for young minds like you. In agriculture, we need sustainability, we need to create market, we need food processing industry to be developed. We need entire supply chain to be developed. At every juncture, your role is prominent. On one hand, the agriculture sector needs a lot of innovation, it needs a lot of capital, it needs lot of efforts, initiatives. On the other hand, even when we look at our cities, we need a lot of technologies to be infused, so that the lives of our people living in cities can be scaled up.

If we look at our cities, the environment which we provide in our cities, the amount of pollution, the amount of solid and liquid wastes we generate, and we keep it untreated. This pollutes the entire environment. I think it's not only a challenge but an opportunity to provide sustainable technologies so that this menace of polluting solid and liquid wastes can be transformed into wealth and sustainability can be provided to those who are living in the cities at the same time to have sustainable environment can also be achieved. I think this is immense opportunity for each one of you to work and when we say that we want to become a developed country and the growth trajectory of 10 years is projected... I feel with so much of youthful population with such young brains... we can actually fasttrack the trajectory and can have impact in just 5 years if all of us focus together and work together towards some common goals. I am sure that these young minds who are entering into a new life would also focus their way to creating new technologies, innovation. Ultimately, I think that if you want to defeat an idea, it is said that you have to come out with the bigger idea. If you really want to work on the challenges,

then the disruptive technologies is a solution where one single technology changes the life of people. And I am sure that in your course of next few years you will not only work on the path which is created by the people in the past but you will be able to create new paths as well. These new paths would be recognised after you. This institute can produce so many alumni of which we can take pride of. I think you can be one of them in future and there can be a time when in the list of the Padma awardees you will be there and some Chief Minister at that time would be felicitating you on this dias. Aiming at a career is good. But you should look beyond as well. Aiming at a career is something everybody does, but there is something beyond the career. If the ICT would not have been created, we could not have got the capacity to do what we are doing in our career. We owe a lot to the society because it gives us so much. Like, somebody from the society created ICT, which gave you knowledge. So, there must be in our mind the knowledge we got is from the society and there is always a time to give something back.

So, in our every action, though we must think of ourselves, at the same time, we must also think what we are going to give back to the society. The society has given me so much, am I giving something back? If in your life, at some point of time you feel that you could give back to the society what you got from it, that is the time when you really graduate into your life. The degree is important, but this graduation of a feeling that, 'Yes, I've given back something,' is more important and I think you will go on that part and do something for the society.

I would also like to request the Honourable Chancellor and Vice Chancellor that they should also look at creating such institutions elsewhere in Maharashtra. I would propose if they can think of Marathwada, creating such an institute there, the Government would come forward and support you in creating such an institute of world repute. I am sure we need more such institutes in our State and country which would actually serve the goal of making this country a better place.

I would like to congratulate all the Professors who have taken pains to impart the knowledge to make the students able to be conferred with a degree, and I wish all students, all the very best in their life... Go ahead and you will succeed.

Thank you, Jai Hind!!

## EMERITUS PROFESSOR OF EMINENCE, INSTITUTE OF CHEMICAL TECHNOLOGY



### PROFESSOR M. M. SHARMA

B. Chem. Eng., M.Sc. (Tech) (Bombay), Ph. D. (Cambridge), D.Sc. (I.I.T., Bombay) (I.I.T., Delhi) (B.H.U. (Calcutta) (Kanpur) (Bundelkhand) (Lucknow) (h.c.), D. Eng. (Roorkee) (h.c.), LL.D. (Mumbai) (h.c.), FEng, FRS, FNA, FASc, FNASc, FTWAS, C Chem, FRIC (U.K.), C. Eng., FICHe (U.K.), FIICHe, FICS, FBRS

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Institute of Chemical Technology, Mumbai (Deemed University) (2003-)

Scientific Advisory Council to the Prime Minister (2006-2009; 2009- )

Chairman, Board of Governors, IIT, Madras (June, 2011-May, 2014)

Member, Advisory Board, IIT, Bombay (2003- )

Director, Central Board of Directors, Reserve Bank of India (2006- )

Director, Board of Directors, AERAS Global TB Vaccine Foundation, MD, US (2005-2008) (Non Profit Foundation).

[Former Professor of Chemical Engineering (1964-97) and Director (1989-97), Institute of Chemical Technology (Autonomous), Now Institute of Chemical Technology (ICT)-A Deemed University, Matunga, Mumbai- 400 019]

Adjunct Professor of Chemical Engineering, Monash University, Australia (1995-2002, Four weeks in a year).

Chairman, Empowered Committee for rejuvenation of Universities, UGC/MHRD, Government of India, (2006-)

Visiting Professor, Department of Chemical Engineering, University of Delaware, US, Spring Semester 1982, (Also consultant of DuPont, Wilmington, during a part of this period).

Consultant of Dow Chemicals and Dow Corning, 2000-2003, Midland, Michigan.

Three Festschrift (special issue) in my honour, Two in Chemical Engineering Science (Pergamon and Elsevier) (1997, 2007) and Industrial Engineering Chemistry Research (2007) (American Chemical Society)

### AWARDS / HONOURS:

S. S. Bhatnagar Prize in Engineering Sciences (1973)

Fellow, Indian National Science Academy (INSA) (1976), (VP: 1987-88; President: 1989-90); Vishwakarma Medal (1985); Meghnad Saha Medal (1994); Sir J. C. Bose Memorial Lecture (1994); Medal for Promotion and Service to Science (2008)

Fellow, The Royal Society, London (1990); Leverhulme Medal (1996) (First engineer from India to be elected in the 20th Century).

International Fellow, The Royal Academy of Engineering

(2005)

Foreign Associate, U.S. National Academy of Engineering (2006)

PADMA BHUSHAN (1987); PADMA VIBHUSHAN (2001), Second highest Civilian Honour by President of India

Moulton Medal of Institution of Chemical Engineers, UK (1971, 1977)

SIES Sri Chandrasekarendra Saraswati National Eminence Award, Science & Technology (2008)

Fellow, Indian Academy of Sciences (1974)

FICCI Award in Science and Technology, Engineering and Technology (1981)

Best Teacher Award, Government of Maharashtra (1984); Om Prakash Bhasin Award, Engineering (1985)

Danckwerts Memorial Lecture, Chemical Engineering Science/ Institute of Chemical Engineers, U. K. (1987)

Honorary Fellow, National Academy of Sciences (1988); Prof. N. R. Dhar Memorial Lecture Award (1999)

P.C. Ray Lecture (1998); Hon. Member (1997); Honoured as an Individual Technologist 1990, Indian Chemical Manufacturers Association (now Indian Chemical Council),

Shreve Distinguished Visiting Professor, Purdue University, USA (1989)

Jawaharlal Nehru Lecture, (1989); P.C. Ray Memorial Award (1995); Platinum Jubilee lecture, Chemistry (1995); Shatabdi Puraskar, Engineering and Technology (1999); Millennium Award (2003); Indian Science Congress Association

Fellow, Third World Academy of Sciences (1990); TWAS medal Lecture in Engineering Sciences and Technologies (1997)

H.K. Firodia Award for Excellence in Science and Technology (1999)

G.M. Modi Science Award, Modi Foundation (1991)

Life Time Contribution Award in Engineering, India National Academy of Engineering (2001)

Life Time Achievements Award, Dr. B.P. Godrej-I.I.Ch.E. (2002); Dhirubhai Ambani Oration; I.I.Ch.E. (2004); Diamond Jubilee Award (2007)

Life Time Achievement Gold Medal, Chemical Research Society of India (2003)

Life Time Achievement Award, Indian Chemical

Society (2004); Mid Day (2005)

Honorary Member, Perfumery and Flavours Association of India (1995) and Indian Speciality Chemicals Manufacturers Association (1994); Honorary Fellow, Indian Chemical Society (1997); Honorary Fellow, Indian Plastics Institute (2003); Honorary Fellow, Indian Association for Cultivation of Sciences, Kolkatta (2005); Honorary Fellow, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore (2004)

University of Calcutta, P. C. Ray Medal (2010)

UDCT Golden Jubilee Distinguished Fellow (1984), UDCT Diamond (1994); UDCT Alumni Association Distinguished Alumna Award (1990); Institute of Chemical Technology (Deemed Uni.) Platinum Award (2009)

Rajasthan Science Congress Award (2016)

Editor, Chemical Engineering Science, UK (1975-1986); Associate Editor, Chemical Engineering Research and Design, UK (1974-1986); Member, International Advisory Board, Canadian J. of Chemical Engineering (1989-1993); Member, International Advisory Board, Reactive and Functional Polymers (1995-2006), Editorial Board, Separation and Purification Technology (1997-1999); Editorial Board, Green Chemistry (1999-2000), Member, Editorial Board, Clean Technologies and Environmental Policy (2002-2004)

Published 250 research papers in Chemical Engineering Science; Industrial and Engineering Chemistry Research; Chemical Engineering Research and Design; Canadian Journal of Chemical Engineering; Reactive and Functional Polymers, etc.

Supervised 71 Doctoral Thesis and 35 M. Chem. Eng. / M. Sc. (Tech.); Thesis Active Consultant to Industry since 1964

### Book Published:

“Heterogeneous Reactions: Analysis, Examples and Reactor Design”, Volumes I and II, Wiley-Interscience, USA, 1984 (with L. K. Doraiswamy)

Fine Chemicals: Technology and Engineering, Elsevier, The Netherlands, Dec. 2001 (with J. A. Moulijn, A. Cybuluski and R. A. Sheldon)

Also contributed several chapters in renowned books

(April, 2017).