



DEPARTMENT OF CHEMISTRY

ABOUT THE DEPARTMENT



PROFESSOR RADHA V. JAYARAM

M.Sc. Ph.D.

Head, Department of Chemistry

It is my pleasure to present the Annual Report (2017 – 2018) of the Department of Chemistry, Institute of Chemical Technology. The Department continues to grow and support the vision and mission of the Institute in all possible ways.

This academic year, as in the past, an overwhelming response was received for the M.Sc. Programme and 20 candidates were admitted for the programme. Fourteen research scholars successfully completed their doctoral work and awarded the Ph. D. Degree. Presently 57 doctoral candidates are enrolled in the Department. Twelve candidates were awarded degree in the annual convocation held in February 2018.

The research output of the Department continues to be creditable. The faculty members published 76 peer-reviewed research papers in reputed international journals, in addition to contributing to book chapters and patents. Both the faculty members and students made a number of oral and poster presentations in conferences and workshops at

both national and international platforms, which led to fruitful interactions and collaborations while showcasing the research outcome at ICT.

The performance of the M.Sc. and PhD students in curricular and extra-curricular activities was commendable and brought laurels to the Department. It is a matter of pride that many of the

post graduate and PhD students of the Department have been selected by reputed universities and Institutions from India and abroad for post doctoral and doctoral programmes and also for suitable employment in reputed firms of the country.

This year, two dedicated support staff of the department, Mr. Rajeev Mhatre and Mr. Vilas Hawal, superannuated after a long and dedicated service. The department bade them a warm farewell and wish them a happy, peaceful retired life.

The Department continues with the commitment in training the staff and research students of ICT with the support of the TEQIP programme and various endowment funds.

“Rasayanam”, the intercollegiate annual programme was organised in the month of January and received an overwhelming response.

An international conference - ‘Organometallic and bioorganometallic chemistry’ was organised by the department as a part of the Alexander von Humboldt foundation programme for research cooperation between Dr. Anant Kapdi and Prof. Carola Schulzke from University of Greifswald, Germany. Several speakers from India and abroad delivered talks in the workshop which was attended by a number of industry personnel. which helped to increase the outreach beyond academia.

We are thankful to all the faculty members, support staff, visiting faculty and the students of the Department for their commitment and contribution. in all the activities. With all this support, Department of Chemistry at ICT will continue to thrive to excel in teaching and research that would lead to the betterment of society and mankind.



PROFESSOR RADHA V. JAYARAM

M.Sc. Ph.D.

Professor of Physical Chemistry
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ACADEMIC COURSES TAUGHT

Undergraduate :

F.Y. B. Pharm Sem I :
Organic Chemistry Lab
F. Y. B. Tech. Sem I : Physical
and analytical chemistry lab

Postgraduate :

M. Sc. Chemistry Sem I :
Kinetic and phase equilibria
M. Sc. Chemistry III : Nano
chemistry (elective)
M. Sc. Chemistry Sem III : Solid
state chemistry
M.Sc. Chemistry Sem I :
Physical chemistry lab
M. Tech G. Tech Sem II : Green
chemistry experiments

RESEARCH INTERESTS :

Heterogeneous catalysis
Green chemistry
Photo catalysis, amorphous

alloys, functional polymers,
adsorption techniques for
removal of water pollutants,
enzyme catalysis

RESEARCH OUTPUT

[A] Current research Students

M. Tech. : 02
M.Sc. (Chemistry) : 02
Ph D : 12

[B] Research Publications :

(from 1st July 2017 to 30th June
2018) 08

[C] Sponsored Projects (from
1st July 2017 to 30th June 2018)
02

PROFESSIONAL ACTIVITIES:

- Faculty Member, NIUS Programme, HBCSE.
- Member, Board of Examiners, Indian National

Chemistry Olympiad (INChO)

- Fellow of Maharashtra Academy of Science
- Resource person, Orientation-cum-selection Camp for selecting Indian Team for International Chemistry Olympiad.

IN-HOUSE RESPONSIBILITIES

- Coordinator- Green Technology programmes
- Chairperson, Research Committee, Green Technology
- Chairperson, Research Committee, Chemistry
- Member, Examination committee
- Member secretary, Faculty Common Room



PROFESSOR BHALCHANDRA M. BHANAGE

M.Sc., PhD (Sci.)

Professor of Industrial & Engg. Chemistry &
Dean (Infrastructure and Campus Development)
Department of Chemistry
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ACADEMIC COURSES TAUGHT

Undergraduate :

S.Y. B. Tech Sem III : Green
Chemistry

Postgraduate :

M.Sc. Sem III : Organometallic
Chemistry

M. Tech Green Tech. Sem I :
Industrial Catalysis – I

RESEARCH INTERESTS

- Homogeneous catalysis,

Reaction kinetics and
mechanism

- Preparation and Characterization of organometallic complexes.
- Catalyst-product separation

techniques in homogeneous catalysis such as biphasic catalysis, supported liquid phase catalysis.

- Ultrasound assisted organic reactions and catalysis.
- C-C, C-N coupling reactions for organic synthesis.
- Microwave assisted organic reactions and catalysis.
- Preparation and application of ionic liquids for organic synthesis.
- Catalysis and reactions in supercritical carbon dioxide.
- Carbon dioxide fixation into valuable chemicals
- Carbon monoxide fixation into valuable chemicals.
- Hydroformylation for synthesis of fine chemicals.
- Polycarbonates synthesis via organometallic complexes.
- Heterogeneous catalysis.
- Bio-catalysis- Mainly study of the behavior of various enzyme in organic solvents and neoteric solvents like ionic liquids, supercritical carbon dioxide for organic

synthesis and enzyme immobilization.

- Synthesis of nano-materials & exploration of the nanomaterials synthesized as catalysts for organic synthesis.
- Green chemistry- Development of environmentally benign synthetic procedures for organic synthesis.
- Hydrogenation reactions for organic synthesis.
- Asymmetric catalysis for organic synthesis.

RESEARCH OUTPUT

[A] Current research students

M. Tech.02	
M.Sc. (Chemistry)	02
Ph. D.	11
PDF	02
RA	02
Others	01

[B] Research Publications (from 1st July 2017 to 30th June 2018): 30

[C] Conference Proceedings : 02

[D] Patents (from 1st July 2017 to 30th June 2018) : 03 (Indian)

[E] Book Chapters (from 1st July 2017 to 30th June 2018) : 03

[F] Sponsored Projects (from 1st July 2017 to 30th June 2018) : 01

PROFESSIONAL ACTIVITIES:

- Catalysis Science & Technology (Royal Society of Chemistry Journal)
- The Open Catalysis Journal (Bentham Publisher) since 2007
- The Open Acoustics Journal (Bentham Publisher) since 2008
- Science Magazine Patrika Language: Marathi (ISSN No. 0971-6912)

IN-HOUSE RESPONSIBILITIES

Dean, Infrastructure and Campus Development



PROF. SHRINIWAS D. SAMANT

M. Sc., Ph. D.

Professor of Organic Chemistry

Department of Chemistry

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ACADEMIC COURSES TAUGHT

Undergraduate :

B. Chem. Engg. Sem II : Organic Chemistry (Theory)

Postgraduate

M.Sc. (Chemistry) Sem I: Organic Reaction Mechanism (Theory)

M.Sc. (Chemistry) Sem II : Stereochemistry (Theory)
M.Sc. (Chemistry) Sem III: Advanced Spectroscopy (Theory)

M.Sc. (Chemistry) Sem I : Organic chemistry laboratory

Ph.D. : Research Methodology

RESEARCH INTERESTS

- New method of Organic synthesis
- Solution Acid Base Catalysis

RESEARCH OUTPUT

[A] Current research students

Ph. D. : 02

PROFESSIONAL**ACTIVITIES:**

- Board of Management, Institute of Chemical Technology, Matunga, Mumbai
- National Steering Committee of Science Olympiads.
- Research Board, IIS deemed University, Jaipur
- Committee to frame Statutes of B.A.Technological

University, Lonere.

- Chairman of committee to frame Ordinances for Ph.D. degree of University of Mumbai
- IQAC, Ramnarain Ruia College (autonomous)
- Academic Board, Ramnarain Ruia College (Autonomous)
- DBT Advisory committee, Ramnarain Ruia College (autonomous)

- Organizing Committee, National conference on Bioactive compounds: Challenges and opportunities for chemists

IN-HOUSE**RESPONSIBILITIES**

- Member, Board of Management, ICT, Mumbai
- Member, Research Committee, Department of Chemistry, ICT, Mumbai.

**PROF. JAYASHREE MILIND NAGARKAR**

M. Sc., Ph. D.

Professor of Chemistry

Department of Chemistry

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ACADEMIC COURSES**TAUGHT**

Undergraduate :

F.Y.B. Tech. Sem I :

Analytical chemistry practical

F.Y.B. Chem. Engg. Sem II :

Analytical chemistry practical

F. Y. B. Tech. Sem II :

Physical Chemistry II Theory

Postgraduate

M.Sc. (Chemistry) Sem I :

Kinetics and Phase Equilibrium

M.Sc. (Chemistry) Sem II :

Advance thermodynamics and electrochemistry

M.Sc. (Chemistry) Sem I :

Instrumental Methods of Analysis

RESEARCH INTERESTS

- Homogeneous catalysis
- C-C, C-N coupling reactions for organic synthesis
- Heterogeneous Catalysis
- Synthesis and Exploration of

Nanomaterials synthesized as catalysts for organic synthesis

- Green chemistry development of environmentally benign synthetic procedures for organic synthesis
- Emulsifications of Vegetable oils

RESEARCH OUTPUT**[A] Current research students**

M.Sc. (Chemistry) : 02

Ph. D. : 02

[B] Research Publications

(from 1st July 2017 to 30th June 2018) : 03

PROFESSIONAL ACTIVITIES:

- Life member, Indian Society of surface Science & Technology
- Life member, Indian

Women Scientist Association

- Life Member, Catalyst Society of India
- Life Member, Society of Advancement of Electrochemical Science & Technology
- Member, Board of Studies, University of Goa
- In-house responsibilities
- In charge, Art Club, TA
- In charge, Departmental Colloquium
- Member, PG Admissions Committee
- Member, Woman Cell
- Member, Departmental Safety Committee
- Co-ordinator Safety Workshop programme of the Institute.



Dr. ANANT R. KAPDI

M. Sc., Ph. D.

UGC-FRP Assistant Professor

Department of Chemistry

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ACADEMIC COURSES TAUGHT

Undergraduate :

F.Y. B. Chem. Engg Sem I :

Organic Chemistry

F. Y. B. Chem. Engg. Sem I :

Organic Chemistry Practical

F.Y. B.Tech. Sem II :

Organic Chemistry

F. Y. B. Tech. Sem II : Organic

Chemistry Practical

Postgraduate

M. Sc. Chemistry Sem I :

Heterocyclic Chemistry

M. Sc. Chemistry Sem III :

Analytical Practical

M. Sc. Chemistry Sem IV :

Natural Products

M.Sc. Chemistry Sem III :

Organometallic Chemistry

RESEARCH INTERESTS

- Homogeneous catalysis using palladium and nickel-based complexes.
- Heterogenization of the complexes on solid support
- C-H bond functionalization
- Green Technology approaches for synthesis

- Microwave assisted organic synthesis
- Nucleoside Modification and Applications.

RESEARCH OUTPUT

[A] Current research students

M.Sc. (Chemistry) : 02

Ph. D. : 11

RA : 02

[B] Research Publications

(from 1st July 2017 to 30th June 2018) : 11

[C] Book Chapters (from 1st July 2017 to 30th June 2018) : 04

[D] Sponsored Projects (from 1st July 2017 to 30th June 2018) : 01

PROFESSIONAL ACTIVITIES:

- Editor of Bombay Technologist Journal of the Technological Association of Institute of Chemical Technology, Mumbai 2017-18.
- Convener of Rasayanam

Event of Department of Chemistry, ICT held on 11th January 2018.

- Convener of Advances in Organometallic and Bio-Organometallic Chemistry held in K. V. Auditorium, Institute of Chemical Technology, Mumbai on 20 and 21 February 2018.

IN-HOUSE

RESPONSIBILITIES

- Convener of Freshers events for the year 2016-17
- Committee member for Purchase Committee, ICT Mumbai
- Committee member for Institutional Handbook Committee: Compilation, Designing, Detailing and Final Compilation handled.
- Committee member for safety committee for Department of Chemistry 2016-17.
- Convener of Rasayanam 2018



Dr. VIJAY KUMAR A.

Ph. D.

Assistant Professor in Organic Chemistry

Department of Chemistry

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ACADEMIC COURSES TAUGHT

Undergraduate :

FYB. Chem. Engg Sem I :

Organic Chemistry CHT 1131

FY B. Chem. Engg Sem I :

Organic Chemistry Laboratory
CHP 1132

FY B. Tech. Sem II :

Organic Chemistry CHT 1131

FY B. Tech Sem II : Organic
Chemistry Laboratory CHP
1132

Postgraduate

M. Sc. Chemistry Sem III :

Organic Synthesis CHT 2403

M. Sc. Chemistry Sem III :

Organic Chemistry Laboratory
CHP 2403

M. Sc. Chemistry Sem IV :

Bioorganic Chemistry CHT
2404

M.Sc. Chemistry Sem IV :

Supramolecular Chemistry
CHT 2612

RESEARCH INTERESTS

- New synthetic methodologies development
- Total Synthesis of Natural Products & drugs
- Catalysis for Organic Synthesis
- Biomimetic Organic Synthesis

RESEARCH OUTPUT

[A] **Current research students**

M.Sc. (Chemistry) : 02

Ph. D. : 04

[B] **Research Publications**

(from 1st July 2017 to 30th
June 2018) : 04

[C] **Patents (from 1st July 2017
to 30th June 2018) : 03**

PROFESSIONAL ACTIVITIES:

- Department TEQIP co-ordinator
- Instrumentation room in charge

IN-HOUSE RESPONSIBILITIES

- Member of Admission committee



Dr. KAUSTUBH JOSHI

M.Sc., Ph.D.

DST Ramanujan Faculty

Department of Chemistry

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ACADEMIC COURSES TAUGHT

Undergraduate :

B. Chem. Engg. Sem I : Physical
Chemistry (Theory)

Postgraduate :

M. Sc. Chemistry Sem II:

Chemical Engineering

Component (Laboratory)

M. Sc. Chemistry Sem III

Computational Chemistry
(Laboratory)

M. Sc. Chemistry Sem III :

Computational Chemistry
(Theory)

RESEARCH INTERESTS

- Cycloaddition reactions
- Organic Reaction mechanism
- Bone Health
- Python based GUI development
- NNRT based Anti-HIV drug designing
- Targets for Neurodegenerative diseases

• Silicon Chemistry

RESEARCH OUTPUT

[A] **Current research students**

Ph. D. 02

Other 01

[B] **Research Publications**

(from 1st July 2017 to 30th
June 2018) : 03

[C] **Sponsored Projects (from
1st July 2017 to 30th June
2018) : 01**



Dr. SHRAEDDHA TIWARI

M.Sc., Ph.D.

Assistant Professor in Inorganic and Physical Chemistry

Department of Chemistry

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ACADEMIC COURSES TAUGHT

Undergraduate :

F.Y. B.Tech. Sem I : Physical Chemistry – 1

F. Y. B. Tech. Sem I : Physical and Analytical Chemistry Practical

Postgraduate

M. Sc. Chemistry Sem I : Instrumental Methods of Analysis

RESEARCH INTERESTS

- Mechanistic investigation of organic reactions
- Effect of reaction media on

the selectivity and reactivity “on water” chemistry

- Space and time-resolved study of reactions in confined media
- Vibrational spectroscopy and micro spectroscopy
- Mechanistic studies of asymmetric amplification
- Interfacial reactions

RESEARCH OUTPUT

[A] Current research students

M.Sc. (Chemistry) : 02

Ph. D. : 05

Others : 01

[B] Research Publications (from 1st July 2017 to 30th June 2018) : 07

[C] Sponsored Projects (from 1st July 2017 to 30th June 2018) : 02

IN-HOUSE RESPONSIBILITIES

- Member, Student Diary Committee
- Member, Annual Report / ICT Diary/ Posters Committee
- Member, NBA / NAAC Documentation Committee



Dr. DIPANWITA DAS

M.Sc., Ph.D.

DST-INSPIRE Faculty

Department of Chemistry

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ACADEMIC COURSES TAUGHT

Undergraduate :

F. Y. B. Pharm. Sem I: Inorganic Chemistry Theory

F. Y. B. Pharm. Sem II Physical Pharmacy Lab

Postgraduate :

M. Sc. Chemistry Sem I : Inorganic Chemistry Lab

M. Sc. Chemistry Sem I Chemistry of Main Group Elements- Theory

M. Sc. Chemistry Sem II Chemistry of Transition Elements- Theory

RESEARCH INTERESTS

- Catalytic oxygen reduction reaction by metal organic frameworks
- Molecular recognition and sensing
- Photochromic complexes/ metal organic frameworks
- Inorganic photo physics and bio-sensing
- DNA binding and photocleavage.

RESEARCH OUTPUT

[A] Current research students

M.Sc. (Chemistry) : 02

Ph. D. 04

Others 01

[B] Research Publications (from 1st July 2017 to 30th June 2018) : 06

[C] Sponsored Projects (from 1st July 2017 to 30th June 2018) : 02

PROFESSIONAL ACTIVITIES:

- Member of Royal Society of chemistry
- Co-Convenor of Advances in Organometallic and Bio-Organometallic Chemistry held in K. V. Auditorium, Institute of Chemical Technology, Mumbai on 20 and 21 February 2018.



Dr. SANGHAMITRA CHATTERJEE

M.Sc., Ph.D.

DST INSPIRE Faculty

Department of Chemistry

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ACADEMIC COURSES TAUGHT

Undergraduate :

F.Y. B. Tech. Sem I :

Analytical Chemistry (Theory)

F.Y. B. Tech. Sem I : Physical/

Analytical Chemistry

(Laboratory)

F.Y. B. Chem. Engg. Sem II :

Analytical Chemistry (Theory)

F.Y. B. Chem. Engg. Sem II :

Physical/Analytical Chemistry

(Laboratory)

Postgraduate :

M.Sc. Chemistry Sem II :

Radicals, Photochemistry and

Pericyclic Reaction

RESEARCH INTERESTS

- Organic Electrochemistry
- Biomedical Applications of Nanomaterial Modified Sensors
- Materials Science and

Nanotechnology

- Electrochemical Sensing Techniques for Clinical Diagnostics and Environmental Monitoring
- Development of Sensors for Biomolecules, Drugs and Doping Agents
- Biosensors and Arrays
- Electrochemical catalysis

RESEARCH OUTPUT

[A] Current research students

M.Sc. (Chemistry) : 02

Ph. D. : 04

[B] Research Publications

(from 1st July 2017 to 30th June 2018) : 04

[C] Sponsored Projects (from 1st July 2017 to 30th June 2018) : 01

PROFESSIONAL

ACTIVITIES:

- Member, American Chemical Society
- Life Member, Indian Society for Electroanalytical Chemistry
- Co-Convener of Rasayanam Event of Department of Chemistry, ICT held on 11th January 2018.
- Co-Convener of Advances in Organometallic and Bio-Organometallic Chemistry held in K. V. Auditorium, Institute of Chemical Technology, Mumbai on 20th and 21st February 2018.

IN-HOUSE RESPONSIBILITIES

- Member of Media Publicity Committee at ICT
- Convener of Art Club at ICT



Dr. PAVAN M. MORE

M.Sc., Ph.D.

Assistant Professor

Department of Chemistry

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ACADEMIC COURSES TAUGHT

Undergraduate :

B. Tech Sem I CHT-1401:

Analytical Chemistry

B. Tech Sem I :

CHP1342: Physical and

Analytical Chemistry

laboratory

B. Chem. Engg. Sem II : CHT-

1211: Analytical Chemistry

B. Chem. Engg. Sem II:

CHP2403: Physical and

Analytical Chemistry

laboratory

Postgraduate

MSc. II CHP1342: Physical

Chemistry Lab.-III

MSc. Sem III CHP2101:

Instrumentation Lab

RESEARCH INTERESTS

- Heterogeneous Catalysis
- Synthesis of Non-noble metal catalyst for complete oxidation of pollutants like vehicle exhaust, industrial

- exhaust and other sources
- Mixed metal-based catalysts for synthesis of valuable chemicals
- Development of economically viable and green analytical procedure for industrial application

RESEARCH OUTPUT

[A] Current research students

M.Sc. (Chemistry) : 02
Ph. D. : 02

IN-HOUSE RESPONSIBILITIES

- Member of instrument purchase committee for ICT Bhuvaneshwar and Jalna Campuses
- Member of Golden Jubilee Research Fund committee (March -2018)



Dr. DAWANDE S. G.

M.Sc., Ph.D.

Assistant Professor

Department of Chemistry

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ACADEMIC COURSES TAUGHT

Undergraduate :

- F. Y. B. Pharm. Sem I : Organic Chemistry I
- F. Y. B. Pharm. Sem II : Organic Chemistry II
- F. Y. B. Pharm Sem I : Organic Chemistry Lab
- F. Y. B. Chem. Eng. Sem I : Organic Chemistry Lab
- F. Y. B. Tech. Sem II : Organic Chemistry Lab

Postgraduate

- M. Sc. Chemistry Sem I : Organic Chemistry Lab
- M. Sc. Chemistry Sem II : Radical and Photochemistry

RESEARCH INTERESTS

- Transition Metal Catalysis
- Organocatalysis
- Asymmetric Synthesis
- Heterocycle Synthesis
- Green Chemistry

RESEARCH OUTPUT

[A] Current research students

M.Sc. (Chemistry) : 03
Ph. D. : 03

IN-HOUSE RESPONSIBILITIES

- Member of Merit-Cum-Means and Trust Scholarships Committee member for safety committee for Department of Chemistry 2016-17.

SUPPORT STAFF



Mr. P. S. Gaikwad
Lab Assistant



Mr. V. R. Haval
Lab Assistant



Mr. R. M. Mhatre
Lab Assistant



Mr. A. P. Patil
Lab Assistant



Mr. A. H. Awale
Lab Attendant



Mr. S. P. Chavan
Lab Attendant



Mr. B. V. Tilve
Lab Attendant

SUPPORT STAFF - SUPER ANNUATION



Mr. Rajiv .M. Mhatre
(Laboratory Assistant)

Organic Chemistry Laboratory

Date of Retirement - 30/09/2017

Date of Farewell by Department - 29/09/2017



Mr. Vilas .R. Haval
(Laboratory Assistant)

Organic Chemistry Laboratory

Date of Retirement - 30/10/2017

Date of Farewell by Department - 30/10/2017

VISITING FACULTY

Name	Affiliation	Course	Class/ Semester
Prof. P. A. Sathe	Department of Chemistry, Ram Narayan Ruia Autonomus College, Mumbai-400019	CHT- 1342 Physical Chemistry-II	F.Y. B. Tech Semester-II
Dr. Mohmad Vasim Kasim Hanifa Sheikh	Department of Chemistry, Ram Narayan Ruia Autonomus College, Mumbai-400019	CHT-1125 Inorganic & Organometallic Chemistry	S.Y. B. Pharm Semester –II
Dr. Sameer Padhye		PHT-1103 Physical Pharmacy	F. Y. B. Pharm Semester –II
Prof. P. A. Sathe	Department of Chemistry, Ram Narayan Ruia Autonomus College, Mumbai-400019	CHT - 2403 Electrochemistry and Advance Thermodynamics	M. Sc. Chemistry Semester- II
Prof. M.A. Shenoy	Retired from Institute of Chemical Technology, Mumbai	CHT-2312 Polymer Chemistry (Elective)	M. Sc. Chemistry Semester - IV
Dr. Anirudh Shenvi	Technical Consultant and Visiting Faculty at Institute of Chemical Technology, Mumbai	CHT-2603 Project Economy	M. Sc. Chemistry Semester – IV
Dr. Vishnu Ajaonkar	Retired Department of Chemistry, University of Mumbai	CHT- 2402 Quantum Chemistry	M. Sc. Chemistry Semester – II
Ms. Aishwarya Mantravadi	M.Sc. (Specialisation in Physical Chemistry) from Ram Narayan Ruia Autonomus College, Mumbai-400019	CHP- 2402 Physical Chemistry Laboratory-II Practical	M. Sc. Chemistry Semester – II
Dr. Hemant Khanolkar	Assistant Professor, Department of Applied Chemistry Fr.Conceicao Rodrigues College of Engineering, Bandstand, Bandra (West) Mumbai-400 050	PHT-1103 Physical Pharmacy	F. Y. B. Pharm Semester –II

Name	Affiliation	Course	Class/ Semester
Dr. D. Mandal	Head, Materials Section Chemical Engineering Division Bhabha Atomic Research Centre Trombay, Mumbai, PIN: 400085	CHT 2502 Fundamentals of Fluid Flow and Heat Transfer	M. Sc. Chemistry Semester – II
Dr. D. Mandal	Head, Materials Section Chemical Engineering Division Bhabha Atomic Research Centre Trombay, Mumbai, PIN: 400085	GTT- 2006 Environment Engineering	M. Tech. Green Tech Semester –II

ENDOWMENT LECTURES

CMP Endowment			
TEQIP / Guest Lecture			
Dr. M. Sriram	Dr. S. Sriram VE, ICT	18th April 2018	Workshop on Career Choice

SEMINARS / WORKSHOPS ORGANIZED BY THE DEPARTMENT

ADVANCES IN ORGANOMETALLIC AND BIO-ORGANOMETALLIC CHEMISTRY

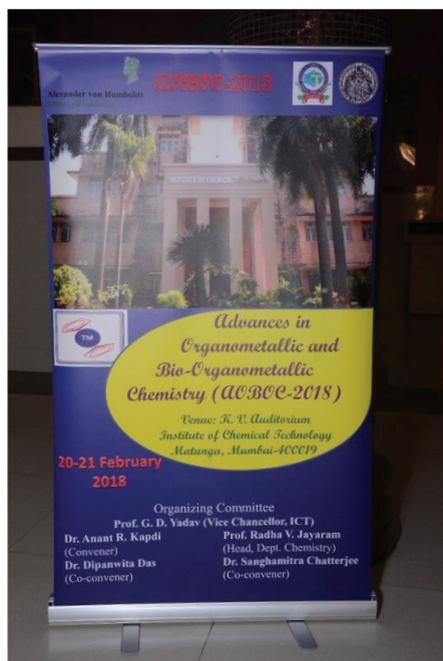
A conference held in K. V. Auditorium, Institute of Chemical Technology, Mumbai on 20th and 21st February 2018.

The conference was organized to intensify interactions amongst leading researchers from India and countries such as Germany and Spain on topics such as Organometallic and Bio-Organometallic Chemistry.

It was organized as a part of the Alexander von Humboldt foundation programme for research cooperation between Dr. Anant Kapdi and Prof. Carola Schulzke from University of Greifswald, Germany. With 11 Indian scientists from various institutes such as IIT, NCL, ICT, IISER as well as 3 international scientists from Germany and Spain the conference was able

to create a lot of excitement with regards to the quality of science that was portrayed over the 2 days of its organization. Company representation of BASF and scientific organization such as Royal Society of Chemistry also helped increase the outreach beyond academia. The programme details and photos have been attached below.





SPONSORED PROJECTS

Personal/ Departmental	Sponsor by Government / Private	Name of Sponsor	Title	Duration	Amount sanctioned (in INR)
Prof. Radha V. Jayaram					
Personal	Government	IGCAR, Kalpakkam, India	Synthesis of N, N-dialkyl-2-alkoxyacetamides extractants and N, N-dialkyl-2-alkoxyacetamides grafted resins for the separation of trivalent actinides from nitric acid medium and modelling of extractants	3 Year	27, 16, 800
Personal	Government	Department of Science and Technology post-doctoral research programme	Water bound polymers for adhesive applications	3 Year Completed (June-2018)	27, 83, 000

Personal/ Departmental	Sponsor by Government / Private	Name of Sponsor	Title	Duration	Amount sanctioned (in INR)
Prof. B. M. Bhanage					
Personal	Government	Department of Atomic Energy	Electrochemical behavior of U(III), Zr(IV) and Al(III) in room temperature ionic liquids	3 years	24,16,800
Dr. Anant R. Kapdi					
Personal	Government	Department of Science and Technology	Application of Palladacyclic Complexes in Synthesis	2012-2017	35,00,000
Personal (collaborative)	Private	Alexander von Humboldt Foundation	Multi-functional Nucleosides and Nucleotides via Palladium-Mediated Reactions Using Novel Palladacyclic Complexes with Promising Anticancer Activities	2015-18	55,000 euros (Rs. 38,00,000)
Personal (collaborative)	Government	Department of Bio- technology	'Synthesis and Cellular Evaluation of Novel Palladacyclic Complexes for Breast Cancer'	2015-18	25,00,000
Personal	Private	Encore Pvt. Ltd.	Development of efficient processes for commercially useful drugs.	2015-17	10,00,000
Personal	Government	DST	'Metal-mediated One-Pot Sequential (Telescoping) Reactions for the Synthesis of Multifunctional Nucleosides/ Nucleotides with Promising Photo- and Biophysical Properties.	2017-2020	56,00,000

Personal/ Departmental	Sponsor by Government / Private	Name of Sponsor	Title	Duration	Amount sanctioned (in INR)
Personal	Government	CSIR	'Development of Novel Approaches to Multifunctional C-Nucleosides using Palladium-Catalyzed Coupling Processes in Aqueous Media.'	2017-2020	25,00,000
Personal	Private	Tranasia	Chemoluminescent molecules for steroid detection	2018-19	7,00,000
Dr. Kaustubh A. Joshi					
Personal	Government	DST/SERB	Efficient QM/MM approach for Protein/ Ligand Binding Free Energies	5 years	33,00,000
Dr. Shraeddha Tiwari					
Personal	Govt.	DST-SERB	Investigating reactivity and selectivity of organic reactions in liposomes as microreactor assemblies	3 year (2014 – 2017)	16,98,000
Personal	Govt.	DST-INSPIRE	Investigating reactivity and selectivity of organic reactions in liposomes as model protocells	2013 – 2018	35,00,000
Dr. Dipanwita Das					
Personal	Government	DST-INSPIRE	Transition metal mediated catalytic $2e^-/2H^+$ and $4e^-/4H^+$ reduction of O_2 : synthesis, structure-reactivity correlation and mechanistic insights by trapping intermediates	November 2013 to November 2018	35,00,000

Personal/ Departmental	Sponsor by Government / Private	Name of Sponsor	Title	Duration	Amount sanctioned (in INR)
Personal	Government	DST-SERB	Development of Promising Photochromic Metal Organic Frameworks with Functionalized Photo-switchable Groups	November 2015 to November 2018	22,21,000
Dr. Sanghamitra Chatterjee					
Personal	Government	Department of Science and Technology (DST)	Nanomaterial Based Electrochemical Sensors for Biomedical Applications	August 2014 to August 2019	35,00,000
Dr. Dawande S. G.					
Personal	Government	DST	Design, Synthesis of 0- Thioester Substituted N-sulphonyl-1,2,3-triazoles and their applications in The Intramolecular Cyclization to Synthesize Benzo Fused Thio-heterocycles	2016-2019	24,03,000
Personal	Government	DST	Ruthenium(II) Catalysis in C-6 Functionalization of Indoles: C-C and COOBond Formation"	2017-2021	39,02,000

CONSULTANCY

PROF. B. M. BHANAGE

Industrial Consultants to several reputed chemical industries

- Technical Consultant: Chem Cleanzio, India Pvt. Ltd
- Board of Advisors: Nanocoat Chemtech Pvt. Ltd

DR. P. M. MORE

- Reaction analysis: Mangalam Organic Pvt. Ltd. At Mumbai

RESEARCH PUBLICATIONS, PATENTS AND BOOK

[A] PUBLICATIONS

Sr.	Title of the paper	Authors	Journal
Prof. R. V. Jayaram			
1	C-Se cross-coupling of arylboronic acids and diphenyldiselenides over non-precious transition metal (Fe, Cu and Ni) complexes	Sahani, A.J., Jayaram, R.V., Burange, A.S.	Molecular Catalysis, 2018 450, 14-18
2	Effect of Cerium(III) and ionic liquids on the clouding behavior of Triton X-100 micelles	Sen, I.D., Negi, C., Jayaram, R.V.	AIP Conference Proceedings, 2018, 1942,080022
3	Effect of additives on the clouding and aggregation behavior of Triton X-100	Semwal, D., Sen, I.D., Jayaram, R.V.	AIP Conference Proceedings, 2018, 1942,080044
4	Poly Ethylene Glycol Based Dicationic Acidic Ionic Liquid [PEG-DAIL][Cl] Used as Cost Effective and Recyclable Catalyst for Biginelli Reactions	Nisha D. Kadam and Radha V. Jayaram*	Current Catalysis, 2018, 7(1): 52 – 59
5	Green Oxidation Protocol for Alcohols to Carbonyls by Tertbutylhydroperoxide Over MnO ₂ Catalysts: Comparison of Bulk and Nanostructure	Anand S. Burange, Ashtami Jayakumar, Amber J. Sahani, Savita Ladage, Radha V. Jayaram*.	Current Catalysis, 2017, 6, 2, 115 – 122
6	An efficient route to 1,8-dioxo-octahydroxanthenes and -decahydroacridines using a sulfated zirconia catalyst	Sandeep S. Kahandal, Anand S. Burange, Sandip R. Kale, Pepijn Prinsen, Radha V. Jayaram	Catalysis Communications, 2017, 97, 138-145
7	PEG supported proline as a liquid-liquid biphasic catalyst in Knoevenagel condensation reactions	Nisha D. Kadam, Radha V. Jayaram	Catalysis in Green Chemistry and Engineering, 2018, 1-11
8	Amino-functionalized activated carbon materials in base-catalyzed reactions	Sonali C. Thakare, Radha V. Jayaram	Catalysis in Green Chemistry and Engineering, 2018, 113-126
Prof. B. M. Bhanage			
1	Rh-catalyzed selective synthesis of 1,5-dimethylhexahydro-1H-inden-4(2H)-one via hydroformylation of (R)-carvone	Bhagade, S.S., Bhanage, B.M.	Catalysis Communications, 112, 21-25, 2018
2	Electrodimerization of N-Alkoxyamides for Zinc(II) Catalyzed Phenolic Ester Synthesis under Mild Reaction Conditions	Subramanian, K., Yedage, S.L., Bhanage, B.M.	Advanced Synthesis and Catalysis, 360, 2511-2521, 2018

Sr.	Title of the paper	Authors	Journal
3	Reductive-hydroformylation of 1-octene to nonanol using fibrous Co ₃ O ₄ catalyst	Bhagade, S.S., Chaurasia, S.R., Bhanage, B.M.	Catalysis Today, 309, 147-152, 2018
4	Synthesis and evaluation of n-octenyl succinylated guar gum as an anti-staling agent in bread	Shah, N.N., Raut, A., Yedage, S.L., Bhanage, B.M., Singhal, R.S.	LWT, 93, 368-375, 2018
5	Ru@PsIL-Catalyzed Synthesis of N-Formamides and Benzimidazole by using Carbon Dioxide and Dimethylamine Borane	Saptal, V.B., Sasaki, T., Bhanage, B.M.*	ChemCatChem, 10, 2593-2600, 2018
6	Palladium-Catalyzed Aerobic Oxidative Carbonylation of C-H Bonds in Phenols for the Synthesis of p-Hydroxybenzoates	Gaikwad, V.V., Bhanage, B.M.	European Journal of Organic Chemistry, 2018, 2877- 2881, 2018
7	Rhodium catalyzed selective hydroaminomethylation of biorenewable eugenol under aqueous biphasic condition	Jagtap, S.A., Gowalkar, S.P., Monflier, E., Ponchel, A., Bhanage, B.M.*	Molecular Catalysis, 452, 108-116, 2018
8	Ionic Liquid Immobilized on Graphene-Oxide-Containing Palladium Metal Ions as an Efficient Catalyst for the Alkoxy, Amino, and Phenoxy Carbonylation Reactions	Gaikwad, V.V., Saptal, V.B., Harada, K., Sasaki, T., Nishio- Hamane, D., Bhanage, B.M.*	ChemNanoMat, 4, 575- 582, 2018
9	Nanoceria-Catalyzed Selective Synthesis of α -Hydroxy Amides through the Reduction of an Unusual Class of α -Keto Amides	Mishra, A.A., Bhanage, B.M.	Asian Journal of Organic Chemistry, 7, 922-931, 2018
10	Catalysis for sustainable development	Yadav, G.D., Bhanage, B.M.	Clean Technologies and Environmental Policy, 20, 681-682, 2018
11	Synthesis of Cu ₂ O/Ag nanocomposite and their catalytic application for the one pot synthesis of substituted pyrroles	Gajengi, A.L., Fernandes, C.S., Bhanage, B.M.	Molecular Catalysis, 451, 13-18, 2018
12	Molecular Iodine Catalysed Benzylic sp ³ C-H Bond Amination for the Synthesis of 2-Arylquinazolines from 2-Aminobenzaldehydes, 2-Aminobenzophenones and 2-Aminobenzyl Alcohols	Deshmukh, D.S., Bhanage, B.M.	Synlett, 29, 979-985, 2018
13	Shape-selective synthesis of gold nanoparticles and their catalytic activity towards reduction of p-nitroaniline	Gupta, S.S.R., Kantam, M.L., Bhanage, B.M.	Nano-Structures and Nano-Objects, 14, 125- 130, 2018
14	Combining Electronic and Steric Effects to Generate Hindered Propargylic Alcohols in High Enantiomeric Excess	Vyas, V.K., Knighton, R.C., Bhanage, B.M., Wills, M.	Organic Letters, 20. 975-978, 2018

Sr.	Title of the paper	Authors	Journal
15	Assessing ionicity of protic ionic liquids by far IR spectroscopy	Patil, A.B., Bhanage, B.M.*	Journal of Molecular Liquids, 252, 180-183, 2018
16	Ru–Prolinamide-Catalyzed Asymmetric Transfer Hydrogenation of Racemic β -Heterosubstituted Cycloalkanones Driven by Dynamic Kinetic Resolution	Vyas, V.K., Bhanage, B.M.	Asian Journal of Organic Chemistry, 7, 346-349, 2018
17	Ligand Assisted Rhodium Catalyzed Selective Semi-hydrogenation of Alkynes Using Syngas and Molecular Hydrogen	Jagtap, S.A., Bhanage, B.M.	ChemistrySelect, 3, 713-718, 2018
18	N-Tosylhydrazone directed annulation via C-H/N-N bond activation in Ru(ii)/PEG-400 as homogeneous recyclable catalytic system: a green synthesis of isoquinolines	Deshmukh, D.S., Bhanage, B.M.	Organic and Biomolecular Chemistry, 16, 4864-4873, 2018
19	Ligand-Assisted Pd-Catalyzed N-Dealkylative Carbonylation of Tertiary Amines with (Hetero)Aryl Halides to Tertiary Amides	Mane, R.S., Bhanage, B.M.	Asian Journal of Organic Chemistry, 7, 160-164, 2018
20	Immobilized lipase catalyzed synthesis of n-amyl acetate: Parameter optimization, heterogeneous kinetics, continuous flow operation and reactor modelling	Mathpati, A.C., Kalghatgi, S.G., Mathpati, C.S., Bhanage, B.M.	Journal of Chemical Technology and Biotechnology, 5645, 2018
21	Recent trends in organocatalyzed asymmetric reduction of prochiral ketones	Shende, V.S., Singh, P., Bhanage, B.M.	Catalysis Science and Technology, 8, 955-969, 2018
22	IEDDA Reaction of the Molecular Iodine-Catalyzed Synthesis of 1,3,5-Triazines via Functionalization of the sp ³ C-H Bond of Acetophenones with Amidines: An Experimental Investigation and DFT Study	Tiwari, A.R., Nath, S.R., Joshi, K.A., Bhanage, B.M.	Journal of Organic Chemistry, 83, 13239-13249, 2017
23	Kinetic resolution of 1,2-diols using immobilized Burkholderiacepacia lipase: A combined experimental and molecular dynamics investigation	Mathpati, A.C., Vyas, V.K., Bhanage, B.M.	Journal of Biotechnology, 262, 1-10, 2017
24	Fabrication of Amine and Zirconia on MCM-41 as Acid–Base Catalysts for the Fixation of Carbon Dioxide	Saptal, V.B., Nanda, B., Parida, K.M., Bhanage, B.M.	ChemCatChem, 9, 4105-4111, 2017
25	In situ Generation and Utilization of CO: An Efficient Route towards N-Substituted Saccharin via Carbonylative Cyclization of 2-Iodosulfonamides	Chavan, S.P., Adithyraj, K., Bhanage, B.M.	Synlett, 28, 2000-2003, 2017

Sr.	Title of the paper	Authors	Journal
26	Carbonylative Tertiary Amide Synthesis from Aryl Iodides and Tertiary Amines via Oxidant-Free C–N Bond Cleavage Catalyzed by Palladium(II) Chloride in Polyethylene Glycol/Water	Mane, R.S., Bhanage, B.M.	Advanced Synthesis and Catalysis, 359, 2621-2629, 2017
27	Chemoselective Cleavage of C(CO)–C Bond: Molecular Iodine-Catalyzed Synthesis of Quinazolines through sp ³ C–H Bond Functionalization of Aryl Methyl Ketones	Tiwari, A.R., Bhanage, B.M.	Asian Journal of Organic Chemistry, 6, 831-836, 2017
28	Pd/C in Propylene Carbonate: A Sustainable Catalyst–Solvent System for the Carbonylative Suzuki–Miyaura Cross-Coupling Using N-Formylsaccharin as a CO Surrogate	Gautam, P., Gupta, R., Bhanage, B.M.	European Journal of Organic Chemistry, 2017, 3431-3437, 2017
29	Tert-Butyl Nitrite-Mediated Synthesis of N-Nitrosoamides, Carboxylic Acids, Benzocoumarins, and Isocoumarins from Amides	Yedage, S.L., Bhanage, B.M.	Journal of Organic Chemistry, 82, 5769-5781, 2017
Prof. S. D. Samant			
1	Development of hydrogelator-based gel-entrapped base catalysts (GEB-Cs) as heterogeneous basic catalysts for the synthesis of 3-acetylcoumarins	N. N. Korgavkar, S. D. Samant	New Journal of Chemistry 41 (21), 2017, 12422-12428 (September 2017)
2	1, 3-Dipolar cycloaddition reaction of aryl nitrile oxides with alkenes using imidazole and pyridine containing reusable polymeric base catalysts	NN Korgavkar, SD Samant	Synthetic Communications, 48 (4), 2017, 387-394 (November 2017)
3	Facile One-Pot Transformation of Aromatic Aldehydes/Ketones to Amides: Fe ₂ O ₃ @SiO ₂ as an Environmentally Benign Core-Shell Catalyst,	Prateek U. Jain and Shrinivas D. Samant,	ChemistrySelect, 2018, 1, 1 –10
Dr. J. M. Nagarkar			
1	Base free palladium-Ag ₂ O catalyzed decarboxylative cross-coupling of alkynyl carboxylic acids with triarylbi-muth reagents	Balsane, K. E.; Gund, S. H.; Nagarkar, J. M.	Catal. Commun. 2018, 104, 78.
2	Facile and effective approach for oxidation of boronic acids	Wagh, R. B.; Nagarkar, J. M.	Tetrahedron Lett.2017, 58, 4572.
3	Silica chloride: An efficient promoter for oxidation of arylboronic acids to phenols	Wagh, R. B.; Nagarkar, J. M.	Tetrahedron Lett.2017, 58, 3323.

Sr.	Title of the paper	Authors	Journal
Dr. Anant Kapdi			
1	Synthesis of 2,3-disubstituted quinazolinones via intramolecular Cu-catalysed Csp ³ -H activation/cyclisation.	Gholap, A., Maity, S., Maiti, D.,*Schulzke, C., Kapdi, A. R.*	Org. Biomol. Chem., 2017, 15, 7140-7146.
2	Heterometallic Catalysis for Sustainable Organic Syntheses.	Lorion, M. M., Maindan, K., Kapdi, A. R.,* Ackermann, L.	Chem. Soc. Rev.,2017, 46, 7399-7420.
3	Crystal Structure of 5-(Dibenzofuran-4-yl)-2'-deoxyuridine.	Gayakhe, V., Kapdi, A. R.,Borozdina, Y., Schulzke, C.	Acta Crystallographica E. 2017,E73, 1493-1496.
4	Crystal Structure of 8-(4-Methylphenyl)-2'-deoxyadenosine.	Ardhapure, A. Kapdi, A. R.,Borozdina, Y., Sanghvi, Y. S., Schulzke, C	ActaCrystallographica E.2018, E74, 1-5.
5	Recent Developments of Palladium-Catalysed Non-Directed Coupling of (Hetero)arenes C-H Bond with C-Z (Z = B, Si, Sn, S, N, and H) bonds.	Wong, S. M., Choy, P. Y., Kapdi, A. R.,*Kwong, F. Y.,	Org. Chem. Front.2018, 5, 288-321.
6	Pd/PTABS: Catalyst for Room Temperature Amination of Heteroarenes.	Murthy Bandaru, S., Bhilare, S., Chrysochos, N., Gayakhe, V., Trentin. I., Schulzke, C., Kapdi, A. R.	Org. Lett. 2018, 20, 473-476.
7	Crystal structure of 4-(Pyrazin-2-yl)morpholine.	Bandaru, S. M., Kapdi, A. R. and Schulzke, C.	Acta Crystallographica E. 2018, E74, 137-140.
8	New Water-soluble N-Heterocyclic carbene palladium complexes as promising anti-tumouragents: investigating DNA and protein interactions.	Bangde, P., Prajapati, D., Dandekar-Jain, P., Kapdi, A. R.	Chem. Select, 2018, 3, 5709-5716.
9	An Active Palladium Colloidal Catalyst For the Selective Oxidative Heterocoupling of (Hetero)Aryl Boronic Acids.	Sable, V., Maindan, K., Bhilare, S., Kapdi, A. R., Chrysochos, N., Schulzke, C.	Chem. Asian J. Just Accepted
10	Pd/PTABS: An Efficient Water-Soluble Catalytic System for the Amination of 6-Chloropurine Ribonucleoside and Synthesis of Alogliptin.	Bhilare, S., Bandaru, S., Kapdi, A. R., Sanghvi, Y. S., Schulzke, C.	Current Protocols in Nucleic Acid Chemistry
11	Late stage peptide diversification by position-selective C-H activation.	Wang, W., Lorion, M., Shah, J., Kapdi, A. R., Ackermann, L.	Angew. Chem. Int. Ed. Accepted

Sr.	Title of the paper	Authors	Journal
Dr. Vijay Kumar A.			
1	Cobalt (II)/N-hydroxyphthalimide Catalyzed Cross-Dehydrogenative Coupling Reaction at Room Temperature Under Aerobic Condition.	Mahendra R. Patil, Noopur P. Dedhia, Anant R. Kapdi, and A. Vijay Kumar*	Mahendra R. Patil, Noopur P. Dedhia, Anant R. Kapdi, and A. Vijay Kumar*
2	Three-component one-pot synthesis of N-arylsulfonyl-2-iminocoumarins,	Prashant S.Mandal and A.Vijay Kumar*	Tetrahedron, 2018, 74 (2018) 1900 –1907.
3	A Recyclable Supramolecular - Ruthenium Catalyst for the Selective Aerobic Oxidation of Alcohols on Water: Application to Total Synthesis of Brittonin A	Mahendra R. Patil, Anant R. Kapdi, and A.Vijay Kumar*	ACS Sustainable Chem. Eng., 2018, 6 (3), 3264–3278.
4	Unprecedented Concomitant Formation of Cu ₂ O–CD Nano-Superstructures During the Aerobic Oxidation of Alcohols and Their Catalytic Use in the Propargylation Reaction: A Simultaneous Catalysis and Metal Waste Valorization (SCMWV) Method	Rani N.Patil and A.Vijay Kumar*	ACS Omega, 2017, 2, 6405–6414 (Most Viewed article from Oct 2017 in ACS Omega).
Dr. Kaustubh A. Joshi			
1	Exploring Quantum Chemical Descriptors and Molecular Docking Approach for Designing Antagonist Search Model for the Glycine/NMDA Receptor Site.	S.V. Ingle, K.A. Joshi*.	Chemistry Select2, 10476-10483 (2017)
2	iEDDA Reaction of Molecular Iodine-Catalyzed Synthesis of 1,3,5-triazines via functionalization of sp ³ C- H bond of Acetophenones with Amidines: An Experimental Investigation and DFT Study	A.R. Tiwari,S.R. Nath,K. A. Joshi*, Bhalchandra M. Bhanage*,	J. Org.Chem. 82, 13239–13249 (2017)
3	Mechanistic investigation in the [1,4] and [1,2] Wittig rearrangement reactions: A DFT study	S. R. Nath,K. A. Joshi*	Phys. Chem. Chem. Phys. (accepted)
Dr. Shraeddha Tiwari			
1	“Zero VOC” Synthetic Strategy - Aromatic Amination Reactions in Deep Eutectic Solvents	Valvi, A.; Tiwari, S.	Eur. J. Org. Chem. 2018, DOI:10.1002/ejoc.201800785
2	Ionic liquids at interfaces: general discussion	A Abbott, M Addicoat, L Aldous, RG Bhui, N Borisenko, JNC Lopes, et. al.	Faraday Discussions 2018, 206, 549
3	Structure and dynamics of ionic liquids: general discussion	M Addicoat, R Atkin, JNC Lopes, MC Gomes, M Firestone, R Gardas et. al.	Faraday Discussions 2018, 206, 291

Sr.	Title of the paper	Authors	Journal
4	Electrochemistry: general discussion	A Abbott, L Aldous, N Borisenko, S Coles, O Fontaine, JDG Garcia et. al.	Faraday Discussions 2018, 206, 405
5	Phase behaviour and thermodynamics: general discussion	A Abbott, H Abe, L Aldous, R Atkin, MBendová, M Busato, JNC Lopes, et. al.	Faraday Discussions 2018, 206, 113
6	Temperature-Dependent Empirical Parameters for Polarity in Choline Chloride Based Deep Eutectic Solvents	Valvi, A.; Dutta, J.; Tiwari, S.	J. Phys. Chem. B2017, 121, 11356
7	Nonlinear Effects at the Soft Interface of an Emulsion in the List-Lerner-BarbasAldol Reaction	Dutta, J.; Wakdikar, N.; Tiwari, S	Org. Biomol. Chem., 2017, 15, 6746
Dr. Dipanwita Das			
1	Substituent-Controlled Selective and Sensitive Potential Optical Fluoride Sensors Based on Salicylidene Schiff Base Derivatives	Patil, S. K., Das, D	Chemistry Select 2017, 2, 6178-6186
2	Conformational Control of Ultrafast Molecular Rotor Property: Tuning Viscosity Sensing Efficiency by Twist Angle Variation	Ghosh, R., Kushwaha, A., Das, D	J. Phys. Chem. B, 2017, 121, 8786-8794
3	Non-platinum Metal-Organic Framework based Electro-catalyst for Promoting Oxygen Reduction Reaction	Das, D., Raut, V., Kireeti, K. V. M. K., Jha, N.	AIP Conference Proceedings 2018,1942, 140049
4	Protonation Induced Ultrafast Torsional Dynamics in 9-anthrylbenzimidazole: A pH Activated Molecular Rotor	Nandi, A., Kushwaha, A., Das, D.; Ghosh, R.	Phys. Chem. Chem. Phys.2018, 20, 7014-7020.
5	A Pyrene-benzimidazole Composed Effective Fluoride Sensor: Potential Mimicking of a Boolean logic gate	Kushwaha, A., Patil, S. K., Das,D.	New Journal of Chemistry, 2018, 42, 9200-9208
6	Unexpected Nonresponsive Behavior of a Flexible Metal-Organic Framework under Conformational Changes of a Photoresponsive Guest Molecule	Das, D., Agarkar, H.	ACS Omega 2018, 3, 7630-7638
Dr. Sanghamitra Chatterjee			
1	Enhancement in sensitivity of non-steroidal anti-inflammatory drug mefenamic acid at carbon nanostructured sensor	Pravin Tarlekar, Sanghamitra Chatterjee	J. Electroanal. Chem. 2017, 803, 51-57.
2	Selective recognition of atropine in biological fluids and leaves of Datura stramonium employing a carbon nanotube-chitosan film-based biosensor	Suyash Mane, Rushda Narmawala, Sanghamitra Chatterjee	New J. Chem. 2018, 42, 10852-10860.

Sr.	Title of the paper	Authors	Journal
3	Nanoscale determination of antiviral drug acyclovir engaging bifunctionality of single walled carbon nanotubes – nafion film	Pravin Tarlekar, Afsan Khan, Sanghamitra Chatterjee	J. Pharm. Biomed. Anal. 2018, 151, 1-9.
4	An electrochemical comparison of single walled and multi walled carbon nanotubes utilizing paeonol as the model drug	Suyash Mane, Sanghamitra Chatterjee	Chemistry Select 2018, 3, 6406-6413.

[B] PATENTS

PROF. B. M. BHANAGE

- An efficient synthetic methodology to synthesize 2- chloro alkyl ethanoate compounds catalyzed by lipase using supercritical carbon dioxide as a greener reaction media
- A robust bio-catalytic methodology to synthesize alkyl (2-E)-but -2- enoate compounds using lipase and supercritical carbon dioxide as a greener reaction system
- Ecofriendly method for synthesis of 2, 2 di- methyl propanoate compounds catalyzed by lipase in supercritical carbon dioxide as a greener reaction system

a Sustainable Society K.C. Badgujar, B.M. Bhanage in Elsevier Publications, 2018

- Palladium-Catalyzed Carbonylative and Carboxylative CH Functionalization Reactions: Importance and Role of Regioselectivity P. Gautam, B.M. Bhanage in Elsevier Publications, 2017

DR. ANANT KAPDI

- Gayakhe, V., Bhilare, S., Yashmeen, A., Kapdi, A. R.,* Fairlamb, I. J. S. In Transition Metal-Catalysed Modifications of Nucleosides: Palladium-Catalyzed Modification of Nucleosides, Nucleotides and Oligonucleotides. Volume 2: Latest Trends in Palladium Chemistry) Eds. A. R. Kapdi, D. Maiti, Y. S. Sanghvi. Elsevier, New York, 2018 pgs 167-195.
- Ardhapure, A. V., Gholap, A., Kapdi, A. R.,* Schulzke, C. In Stille Cross-Coupling Reaction: Early years to the current state-of the art.: Palladium-

Catalyzed Modification of Nucleosides, Nucleotides and Oligonucleotides. Volume 2: Latest Trends in Palladium Chemistry) Eds. A. R. Kapdi, D. Maiti, Y. S. Sanghvi. Elsevier, New York, 2018 Pgs 19-36.

- Kapdi, A. R.,* Rajput, S., Patwardhan, A. V. Dendritic Polymers and Multifunctional Supports. "Applications of One Dimensional Nanomaterials"Ed. Chaugule, R. S. American Scientific Publishers, USA.2018.
- Sanghvi, Y. S., Kapdi, A. R. In Future of Drug Discovery: Importance of modified nucleosides, nucleotides and oligonucleotides: Palladium-Catalyzed Modification of Nucleosides, Nucleotides and Oligonucleotides. Volume 2: Latest Trends in Palladium Chemistry) Eds. A. R. Kapdi, D. Maiti, Y. S. Sanghvi. Elsevier, New York, 2018 pgs 1-18.

[C] BOOK CHAPTERS

PROF. B. M. BHANAGE

- Catalytic Reduction of Nitriles D.B. Bagal, B.M. Bhanage* in Thieme Publications,2018
- Dedicated and Waste Feedstocks for Biorefinery: An Approach to Develop

INVITED TALKS

PROF. RADHA V. JAYARAM

- ‘Catalysis by metal oxides’ at Recent Advances in Chemistry and Environment organized at Annamalai University on 20th Jan 2017.
- ‘Catalysis for the betterment of society and industry- Present status and future opportunities’ at 5th National Conference on Advanced Functional Materials and Applications (NCAFMA – 2017) organised at Kalasalingam University, Tamil Nadu on 30th March 2017
- ‘Writing skills in Research,’ a workshop organised under TEQIP III at ICT on 29th Nov – 1st Dec 2017
 - i. Writing style
 - ii. Mistakes not to be missed
- ‘Catalysis for green processes and clean environment’ organised at 54th ANNUAL CONVENTION OF CHEMISTS, 2017 at UkaTarsadia University, Bardoli, Surat, Gujarat on 23rd Dec 2017
- ‘Foundations of Basic and Applied Chemistry,’ a refresher course on 28th Dec 2017
 - i. Chemical Kinetics- Science that goes from fridge to fossil.
 - ii. Understanding the depth of surfaces.
- ‘Catalysis and Green Chemistry’ organised at NIUS camp, HBCSE, Mumbai on 28th Dec 2017.
- ‘Catalysis- A unique

- solution for green processes and clean environment’ organised by International Conference on advances and challenges in Chemical Sciences (ICACCS), 2018 in Pachaiyappa’s College, Chennai on 2nd Feb 2018.
- ‘Catalysis For Green Processes And Clean Environment’ in National Seminar on Recent Advances and Challenges in Chemistry at St.Xavier’s College, Ahmadabad on 17th Feb 2018.
 - ‘Catalysis and the Green Revolution in Chemistry’ in K. J. Somaiya Institute of Engg and Information technology on 1st March 2018
 - ‘Laboratory Safety - Self Protection and Good Practices’ in Vaze College on 8th March 2018.
 - ‘Catalysis – A unique Key to Sustainable Future’ at International Conference on Advances in Organometallic and Bio-Organometallic Chemistry (AOBOC-2018) in ICT on 20th Feb 2018.

PROF. S. D. SAMANT

- A series of lectures on Organic Reaction Mechanism at IIRBS, M.G. University, Kottayam, 22-27 Aug 2017
- Resource person, Resource Generation Camp, HBCSE, Mumbai Aug 2017
- Lecture on Green Chemistry, Jhunjhunwala College, 1st September 2017
- A series of lectures on

- Reaction mechanism, Laboratory safety, Department of Chemistry, Amravati University, 15-17 September 2017
- A lecture on Kinetic and thermodynamic control of organic reactions, UM-DAE Centre for Excellence in Basic Sciences, 18th September 2017
 - Key Note Address, UGC sponsored short term Course on Research Methodology in science, for teachers.
 - A lecture on Basics of Stereochemistry, Refresher Course for Jr College teachers, Kendriya Vidyalaya, Bhandup, Mumbai, 27th December 2017.
 - Panellist, Panel discussion, Science Academies Refresher Course on Foundations of Physical Chemistry and its applications, for College teachers, Indian Women Scientists’ Association, Vashi, 30th December 2017.
 - A lecture on “Chemistry: Domain and Transferable skills”, Mithibai College, Vileparle, Mumbai, 20th January 2018.
 - Lectures of NMR spectroscopy, R.P.Gogate College, Ratnagiri, 9th February 2018.
 - Resource person for the Orientation cum Selection camp for Chemistry Olympiad, Mumbai

PROF. J. M. NAGARKAR

- Disposal of chemical waste – Keynote lecture at Safe laboratory practices and disposal of chemical waste workshop organized by K. E. T. S. Vaze College, Mulund, Mumbai, India on 3rd March 2018.

DR. ANANT KAPDI

- Invited plenary talk on ‘Sustainable Palladium Catalysis:
- New C-C Bond Forming Technologies and Mechanistic Implications’ at Recent Trends in Chemistry and Environment 2017 organised by Dadasaheb Devidas Namdeo Bhole college, Bhusawal on 5th December 2017.
- Invited talk on “Sustainable Palladium Catalysis for the Synthesis of Multi-functional Nucleosides in Water” at the ‘Advances in Catalysis’ one day symposium in Department of Chemistry, IIT Kanpur on 12th January 2018.
- Oral presentation on “Sustainable Palladium Catalysis for the Synthesis of Multi-functional Nucleosides in Water” at the 24th ISCB International conference on Frontier Research in Chemistry and Biology interface at Manipal University, Jaipur on 11-13th January 2018.
- Invited talk on ‘Sustainable Palladium Catalysis:
- New C-C Bond Forming Technologies and Mechanistic Implications’ at Advances in Organometallic and Bio-Organometallic

- Chemistry, held in K. V. Auditorium, Institute of Chemical Technology, Mumbai on 20 and 21 February 2018.
- Invited talk on ‘Phosphatriazenes: Versatile ligands for bio-active molecules modification via sustainable palladium catalysis’ at Tokyo University of Technology, Hachioji, Tokyo, Japan on 18th May 2018.
 - Invited talk on ‘Phosphatriazenes: Versatile ligands for bio-active molecules modification via sustainable palladium catalysis’ at Nobel Prize exhibition Hall, Department of Chemistry, Nagoya University, Nagoya, Japan on 21st May 2018.
 - Invited talk on ‘Phosphatriazenes: Versatile ligands for bio-active molecules modification via sustainable palladium catalysis’ at Department of Chemistry, Osaka University, Osaka, Japan on 25th May 2018.

DR. DIPANWITA DAS

- Invited talk on ‘Spectroscopic Studies and Applications of Redox Active Metal complexes’ at Advances in Organometallic and Bio-Organometallic Chemistry, held in K. V. Auditorium, Institute of Chemical Technology, Mumbai on 20 and 21 February 2018.

DR. SANGHAMITRA CHATTERJEE

- Invited talk on Biomedical Applications of Nanomaterial Modified Sensors: An Expanding Horizon at Meeting of the Society of Biological Chemists, India, Mumbai Chapter, organized by UM-DAE Centre for Excellence in Basic Sciences, in Mumbai, India on 19th August 2017.
- Invited talk on Nanomaterial Based Electrochemical Sensing for Therapeutic and Diagnostic Applications: A Promising Future at International Conference on Nanotechnology: Ideas, Innovations and Initiatives (ICN3I-2017) organized by IIT Roorkee, in Roorkee, India on 6th - 8th December 2017.
- Invited talk on The Electrochemical Performance of Carbon Nanomaterial Modified Sensors: An Analytical Perspective at Conference on Electrochemistry in Advanced Materials, Corrosion and Radiopharmaceuticals organized by Bhabha Atomic Research Centre, in Mumbai, India on 15th - 17th February 2018.

DR. P. M. MORE

- Conducted workshop arranged by Jai hind college, Mumbai on “Fundamentals of infrared spectroscopy” on 2nd Dec. 2017

DOCTORAL DEGREES AWARDED



Ravi Shankar G. Kadam

Guide: Prof. Radha V. Jayaram

Thesis title: Catalytic application of mesoporous silica supported metal oxides

Brief abstract:

Recently, worldwide over 60% of the industrially important chemical products are produced by different chemical process and the majority of these processes are accelerated by using the suitable catalysts. Catalysts play the crucial role in the manufacturing process for the synthesis of fine chemicals, pharmaceuticals, commodity chemicals, energy resources, fuels and biofuels and so on. The extraordinary advantage of heterogeneous catalysis over that of homogeneous one is the separation, recovering and recycling capability, which leads to the compliance to green synthetic pathways involving minimum environmental pollution.

Present work is focused on the preparation and characterization of porous silica materials Such as HMS, and DFNS (fibrous silica). As well preparation of catalysts by using transition metals (Cu, Ni, Co and Mn) metal oxides and noble metal as Ag such and supported on inorganic nano porous silica support or functionalized silica as catalysts and their application in various organic transformation. Series of silica supported transition metal oxide catalysts were prepared with Sol-gel and various impregnation methods. To accomplish the maximum active sites on support, catalysts were prepared with optimizing the different parameter such as metal loadings, preparation methods, calcination. It revealed that minimum loading of active metal precursor shown fine dispersion and small particle size on support and exhibited better catalytic activity as heterogeneous catalyst than unsupported one. Prepared materials and bioactive molecules were characterized with various analytical techniques such as Gas chromatography (GC), Infrared spectroscopy (FT-IR), X-ray diffraction, N₂-adsorption desorption (BET), NH₃-Temperature programme desorption (NH₃-TPD), H₂-

TPR, TPO Photoelectron spectroscopy (XPS), Scanning electron microscopy (SEM), High resolution transmission microscopy spectroscopy (HR-TEM), Thermogravimetric (TGA).



Vijay K

Guide: Prof. S.D. Samant

Thesis title: Synthetic modifications and applications of industrial aza heterocyclic intermediates

Brief abstract:

Dihydroquinolines and benzthiazoles are industrially important intermediates. 2,2,4-Trimethyldihydroquinoline is used as an antioxidant in rubber industries. Objective of the present work is to develop some novel compounds using the industrially important intermediates. Next is to find out some applications of the newly developed compounds. The interested molecules were procured from industrial sources.

The work done is summarized as follows,

1. Synthesis of dihydroquinoline and pyrazolone based merocyanines as 'naked eye' and 'fluorogenic' sensors for hydrazine hydrate in aqueous medium and hydrazine gas
2. Synthesis of dihydroquinoline and imidazopyridine based cyanine as selective and sensitive sensor for Ferric ion
3. Facile strategy for selective halogenation of 2,2,4-trimethyl-1,2-dihydro quinolines with hypohalites
4. Synthesis of dihydroquinoline and chromenone based new fluorescent compound exhibiting multiple fluorescence and solvatochromism with a wide range of responses.



Jeevan M. Bhojane

Guide: Prof J. M. Nagarkar

Thesis title: Studies of Palladium, Nickel, Copper Oxides and their Complexes in the C-C, C-N and C-S

Bond Formation Reactions Using Aryl diazonium salt

Brief abstract:

Cross-coupling reactions are an important tool for synthetic organic chemistry for the formation of carbon-carbon, carbon-nitrogen, and carbon-sulphur bonds. In recent years, these reactions are applied in a variety of synthetic venues starting from total synthesis of natural and non-natural products to pharmaceutically important molecules and functional materials. Catalytic process is the heart of the organic chemistry. The coupling reactions are usually carried out by using a homogeneous and heterogeneous catalyst of such as Pd, Cu, Ni, etc. However, the high cost, of arylating agents often restrict their utility in organic reactions. Thus, researchers have turned their attention towards the use of less expensive and environmentally benign arylating agents for the cross coupling such as C-C, C-N and C-S bond forming reactions. In this context, the present work focus on the application of aryl diazonium salts for the cost-effective N- arylation of amides and indole. This method is advantageous because of inexpensive, high yield, simple methodology and easy work up. Similarly, a cross coupling of reaction of aryl boronic acids with aryl diazonium salts using nickel glyme as catalyst in presence of glycerol as a solvent system. Various aryl diazonium salts were efficiently reacts with aryl boronic acids under optimized conditions to give respective diaryl compounds in good to excellent yield. Another way was also used for the synthesis of sulphide and disulphide is important. A simple carbon-sulphur and sulphur-sulphur bond formation reactions were achieved by using aryl diazonium salt as arylating agent and thioacetamide as sulphur surrogate. The reaction proceeds smoothly at room temperature without using any transition metal catalyst, ligand or base. In cross coupling reactions, the palladium N-heterocyclic carbene complex A catalyst, copper free cross coupling reactions such as Sonogashira was successfully achieved in the absence of external ligand under aerobic conditions. Later on, we synthesized biaryl compounds by minimize environmental hazards. Recently atom economical triaryl bismuth are good arylating

source for cross coupling reactions due stability, easy to prepare and highly reactivity. So, we perform reaction of triaryl bismuth with aryl diazonium salts in presence of palladium catalyst. The reaction carried out at room temperature with good product yield under ligand, and base-free conditions.



Vilas G. Jadhav

Guide: Prof J. M. Nagarkar

Thesis title: Catalysis Studies in C-C Bond Formation Using Palladium, Copper and Ceria for the Tandem and Cross Coupling Reaction diazonium salt

Brief abstract:

Large numbers of chemical reactions in the chemical industry are being carried out through the catalytic route. Catalytic reactions are carried out using homogeneous, heterogeneous and enzyme catalyst but the majority of the bulk chemicals involves heterogeneous catalyst. Catalyst lowers the activation energy of the system, also it reduces the number of steps in organic synthesis and subsequently leads to atom economy. Transition metal catalyst has attracted much attention in the area of catalysis in recent years. Till date numbers of catalytic methodologies have been disclosed on transitional-metal-mediated formation of C-C bond, which will be used to achieve milder condition than the conventional chemical processes in organic transformation. Both selectivity in the synthesis of complex molecules and minimization of the waste generation has been achieved through catalytic routes. Firstly Pd-MnFe₂O₄ have been synthesized an efficient and magnetically retrievable palladium catalyst-by ultrasound assisted co-precipitation method without addition of any capping reagent. The catalyst was applied for one pot synthesis of primary amides from iodobenzene. Non-toxic potassium ferrocyanide K₄[Fe(CN)₆] was used as cyanating reagent. The catalyst showed excellent activity for this transformation and can be used for five recycles without losing its activity. Next the superparamagnetic Pd-MnFe₂O₄ was applied for ligand and copper

free decarboxylative Sonogashira reaction. Arene diazonium salts were used as coupling reagent as they are easily available, highly active and cost effective. Several symmetric as well as asymmetric diaryl acetylenes were synthesized in good to excellent yields. Catalyst also can be reused up to four cycles. We further described copper ferrite catalyzed Heck-Matsuda type reaction. The catalyst (CuFe_2O_4) was prepared by co-precipitation method followed by hydrothermal treatment. Various Heck products were synthesized in good to excellent yields. Various substituents of arene diazonium salts are well tolerated. Catalyst can be reused up to five consecutive cycles. This is the first report on palladium free Heck-Matsuda type reaction. Magnetically separable catalyst and easy workup procedure are the advantages of this protocol. In further work we have described sulphated ceria catalyzed three component coupling of aldehyde, amine and alkyne (A₃ coupling). The catalyst was synthesized by precipitation followed by impregnation of sulphuric acid. The catalyst was well characterized and showed good activity for A₃ coupling. The catalyst was found active in case of aromatic aldehydes giving moderate to good yields of the desired products.



Sitaram H. Gund

Guide: Prof J. M. Nagarkar
Thesis title: Studies in C-C, C-S and C-N Bond Formation Reactions by Using Transition Metals

Brief abstract:

Catalysis plays an important role in chemical industry. Much fundamental and applied research is done by research laboratories and chemical companies to find out how catalysts can work. Catalysts are responsible for the manufacture and processing of a number of products in daily use. Many industries use catalysts (homogeneous, heterogeneous, or enzymatic type) for synthesis of chemicals employed in petrochemical, oil-refining, fuel-energetic industries and pharmaceutical companies. Transition metals have played an important role for synthesis of organic compounds. The area of homogeneous catalysis with transition metal has grown in

great scientific interest and technological promise. Various patents relating to asymmetric catalysis, C-C bond forming metathesis and cross coupling reactions are approved in this area. Many scientists are also awarded Noble Prizes who worked in the area of catalysis. In recent years transition metals such as Pd and Cu are widely used as catalyst for C-C and C-S coupling reactions such as Suzuki, Sonogashira, Kumada, Stille and Ullmann-type reactions. In the field of homogeneous catalysis transition metal have provided a lot of efficient methods for C-C, C-S and C-N bond formation reactions. These reactions are applied in academic research and chemical industry. C-C and C-S bond forming reactions are applied to synthesize biological, pharmaceutical, natural and agrochemical products. In this context, we have developed new methodologies for C-C and C-S bond formation reactions for the preparation of unsymmetrical biaryls, diaryl sulfides and diaryl sulfones in organic synthesis. The objective of the research work is the development of simple, novel and economical methodologies for coupling reactions by using sodium salt of aryl sulfinates.



Kishore E. Balsane

Guide: Prof J. M. Nagarkar
Thesis title: Studies in C-C Bond Formation Using Various Metals and Metal Nano Particles

Brief abstract:

The development of novel and more efficient methods for the synthesis of heterogeneous and homogeneous catalysts is always an important aspect of research in synthetic chemistry. The main function of catalyst is to lower the activation energy of the system and use it for organic transformation. Heterogeneous catalysts and their applications in the carbon-carbon bond formation is the main theme of the presented research work. Some methodologies for C-C bond formation using homogeneous catalytic system are also developed. Electrochemical synthesis of palladium nanoparticles on nafion/graphene support (Pd/Nf-G) and their application as catalyst for the Sonogashira and Suzuki-Miyaura cross coupling reactions is

successfully carried out. The catalyst was found to be efficient, easily recoverable and recyclable without any significant loss in the catalytic activity. The atom economic palladium catalyzed novel approach for arylation of benzothiazole and benzoxazole is also reported. Triarylbismuth reagent was used as the arylating agent for the direct C-H functionalization of benzothiazole and benzoxazole. The PdCl₂-Cu(OAc)₂ catalytic system, PPh₃ as a ligand and DMSO as a solvent were employed in above methodology. Triarylbismuth compounds are stable, less toxic and can be easily prepared from aryl Grignard or lithium reagents and BiX₃ inorganic salts. This protocol gave good yield of desired product by C-H activation. The base free, Palladium-Ag₂O catalyzed decarboxylative cross-coupling of alkynyl carboxylic acids and triarylbismuth reagents was the next scheme. The reaction was carried out at room temperature (30 °C) in DCM solvent under atmospheric pressure. Short reaction time is the highlight of this protocol. Further the Palladium catalyzed Suzuki cross coupling reaction of boronic acids and triarylbismuth reagents was described. In this report (PPh₃)₄ catalyst was used for the Suzuki cross coupling reaction. The reaction proceeds without base in DMF as a solvent at room temperature with short reaction time. Similarly, the novel, palladium catalyzed Hiyama cross coupling reaction of aryl silanes and triarylbismuth reagents was also reported. The reaction was carried out by using Pd(OAc)₂ as a catalyst and DMF as solvent at 50 °C temperature. The reaction was completed with short reaction time which gave moderate yield of the desired product.



Sachin A. Sarode

Guide: Prof J. M. Nagarkar
Thesis title: Synthesis and Application of Copper Ferrite, Palladium on Manganese Ferrite and Zinc Oxide as Nanocatalyst for Organic Transformations

Brief abstract:

Nanocatalysts and supports have drawback of separation from the reaction mixture, which

can lead to the blocking of filters and valves by the nanoparticles catalyst. Currently, a method used to address this problem is the use of magnetic nanoparticles, a route that has attracted wide research interest for its unique physical properties. In recent years applications tandem reactions or one pot sequential reaction and nanocatalyst have risen in the organic reactions due to their merits. Tandem processes have advantages of atom economic, inexpensive; it reduces many purification and separation steps during synthesis. In this context we have developed novel catalytic methodologies for organic transformation reactions using tandem reactions. Catalytic carbon-carbon and carbon-nitrogen bond-forming reactions are emerged as revolutionary reactions in chemical industry. Many complex and sensitive syntheses of pharmaceuticals and natural products have been achieved through C-C and C-N bond forming reactions using transition metals like palladium, copper, nickel, platinum, ruthenium etc. Firstly, copper ferrite nanoparticles have been synthesized co-precipitation and thermal decomposition method without addition of any capping reagent. Copper ferrite NPs then characterized by using various analytical techniques and applied to synthesis of pharmaceutical important 2-substituted benzoxazole by using 2-nitro phenol and benzyl amines. The catalyst showed excellent activity for this transformation and can be used for five recycles without losing its activity. Formation of amide bond is very important in the pharmaceutical industry by considering the green chemistry aspects. Copper ferrite NPs as catalyst under the solvent and ligand free conditions employed for the preparation of trans amides. The tandem reaction was carried out by using aldoximes and iodobenzene. Cascade type of reaction using heterogeneous copper ferrite nanocatalyst reported for synthesis of 2-aryl quinazolines from (2-aminophenyl) methanol and oxime ether under solvent free reaction conditions has been described. Various inexpensive derivatives of oxime ether were used as a starting material for this reaction protocol. Catalyst could be reused and recycled without any significant loss in catalytic activity in this protocol. Arylating agent such as triarylbismuth

utilized for Sonogashira type reaction in presence of palladium on manganese ferrite MNPs. Preparation and characterization of Pd on MnFe₂O₄ MNPs and applied for catalyzed ligand free Sonogashira type reaction. The yield of reaction product obtained is good to excellent and catalyst can be recycled for three cycles. Industrially important tetrazoles synthesised by using aldoximes which is alternative source of benzonitrile derivatives. Nanocrystalline zinc oxide was prepared by using precipitation method and it is characterised by various analytical techniques. In this work one pot tetrazoles derivatives have been obtained by using efficient heterogeneous Nano ZnO and aldoxime.



Subhash Laxman Yedage

Guide: Prof. B. M. Bhanage

Thesis title: Transition Metal Catalyzed C-H and C-N bond Activation for the Synthesis of Amides and Heterocycles

Brief abstract:

The transition metal catalyzed C-H bond activation is one of the most attractive approaches for reducing the number of synthetic steps in organic synthesis leading towards the development of atom economical protocols. The methodology involving C-H activation has gained great prominence in organic synthesis. Usually, C-H bond activation has been brought about successfully by transition metal based catalytic systems. The most developed strategy is to obtain selective C-H bond activation by the use of a neighbouring directing group (DG) that pre-complexes with the metal and directs to the desired position. With the help of C-H bond activation, construction of C-C and C-N bonds have been achieved. Analogous to C-H bond activation and coupling reactions, the activation of functional groups has also been achieved. Such a combination of C-H bond activation and functional group activation has a great advantage in the form of reducing synthetic steps in pharmaceutical and drug synthesis, thus making the process cost effective. The cleavage of amide C-N bond is due to its

stability which in turn is due to the presence of the stable C-N bond. Classically, in acidic medium, the protonation of carbonyl amide is followed by nucleophilic addition to the carbonyl carbon thus resulting in its hydrolysis. Similar sequence of events takes place in transamidation and Friedel-Crafts acylation reaction. While in basic medium or in the presence of organometallic reagents, the direct nucleophilic addition to carbonyl amide results in the synthesis of acid/ketone. Moreover, enzyme/DNA catalytic system is also useful for hydrolysis of amide but requires longer reaction time. To explore the chemistry of amides, contemporary research involves metal catalyzed functionalization of amide C-N bond. Independently, Garg, Zou, Szostak, and Zeng have contributed in metal catalyzed cleavage of sterically hindered tertiary amide C-N bonds for various organic transformations. In this context, present work reports novel methodologies concerning the applications of transition metal as a catalyst cleavage of C-H and amide C-N bond to the formation of new C-C and C-heteroatom bonds. These developed protocols are important in various organic transformations like Weinreb amide, benzoyloxyl, formamide, Phenanthridinone, Isoquinolone and isocoumarin. We have developed an efficient protocol for the synthesis of Weinreb amide by oxidative amidation of alcohol using an inexpensive and easily available copper catalyst. Mild reaction conditions, economical starting materials, and an inexpensive catalytic system add additional credit to the present system. Moreover, we have used various amides and dibenzyl ethers as arylcarboxy sources for substrate-directed chemoselective- benzylation of 2-phenylpyridine in the presence of a Cu(II)/TBHP system. From the results obtained, it can be concluded that this reaction proceeds via HERON rearrangement of N-methoxyamide. The present protocol reports the cleavage of C-H, C-N and C-O bonds and synthesis of new C-O bond via C(sp²)-H bond activation. To the synthesis of transamidated product, here we have used simple and easily available MnO₂ catalytic system for the synthesis of N-substituted amides by carrying out formylation and transamidation reactions. The

present methodology involves the use of relatively inexpensive Mn catalyst as compared to other expensive transition metals reported. Also, we have shown for the first time, the synthesis of phenanthridinone from N-methoxybenzamide and aniline as novel surrogates using Pd(OAc)₂ as an efficient catalyst. The developed methodology is ligand free and proceeds via ortho C-H bond activation of N-methoxybenzamide under mild reaction conditions. The elimination of the purification step of the in situ generated diazonium salt and formation of only non-toxic byproducts such as N₂, H₂O and t-BuOH makes this protocol greener. We utilized Ru(II)/PEG-400 as a reusable catalytic system for the construction of C-C, C-O and C-N bond formations via C-H bond activations. This developed protocol is superior than previous methods due to its advantageous features such as i) cost effective, ii) recyclability of homogeneous catalyst, iii) multitasking catalyst for C-H activations, iv) mild reaction conditions, v) wide range of the substrate scope with excellent yield, vi) scalable up to gram level, and vii) simple work up process. Importantly, we have used TBN as a multitask reagent for sequential nitrosylation reactions for N-nitrosoamide, carboxylic acids, benzocoumarin and isocoumarin from N-methoxyaromatic amide using Ru(II)/PEG-400 as a recyclable catalytic system. Importantly, the developed protocol is environmentally benign due to the formation of tBuOH, MeOH, and N₂ as non hazardous side products.



Anilkumar Satapathy

Guide: Prof B. M. Bhanage
Thesis title: Transition Metal Catalyzed CO Based Polymerization and Ethylene Glycol Formation

Brief abstract:

Synthetic polymers and chemicals are of great interest in the current scenario due to their important role in the civilization and are essential material in day to day life. They manifest themselves in countless objects and find applications ranging from simple to pure high tech. engineering plastic such as polyesteramide, polyamide, polycarbonate, polyketone,

polyethylene terephthalate (PET) polyester and various valuable chemicals like monoethylene glycol, amines, alcohols, carboxylic acids etc. At present petroleum is the main raw material of the chemical industry. Roughly 7-10 % of the annual oil production is consumed by this sector. Such resources are estimated to be depleted and/or become uneconomical within the next century. Owing to the rising global demand for bulk chemicals and materials, there exists strong research interest to discover novel production processes from alternative resources. Therefore, the development of environmentally benign and efficient synthetic methods continues to be a central goal of current research in chemistry. In this regard, catalysis and organometallic chemistry are key techniques for achieving these objectives and for contributing to a “greener” chemistry in the future. Among the different catalytic reactions, the refinement of readily available feed stocks to more-functionalized products is of particular importance. The functionalization of substrates using carbon monoxide as the C1 source, carbonylation, comes in as one of the most important industrial processes for the manufacture of bulk and fine chemicals and various synthetic polymers. Recently, carbonylation reactions have gained considerable interest as they are becoming a versatile tool in the synthesis of pharmaceuticals, agrochemicals and their intermediates and polymers like polyketone. In this context, palladium catalyzed carbonylation reactions are now widely recognized as a very important tool in industrial and organic chemistry. Palladium catalyzed carbonylation chemistry allows the direct synthesis of carbonyl compounds using readily available feed stocks such as carbon monoxide (CO), which is also the simplest C-1 unit and meets the requirements of “atom economy” and “step economy”. After the pioneering work of Heck and co-workers in the 1970’s, the topic has notably developed since then. The significance of palladium catalyzed cross coupling reactions has been recognized by awarding the 2010 Nobel Prize in chemistry to Professors Heck, Negishi, and Suzuki. Use of these easily available feedstock in new transformations via C-C bond formation is essential, economical and sustainable way

is a source for innovation in material science and chemistry. Though these transformation offers a possible alternative to conventional method of preparing polymer and chemical, still commercial development of this process is a challenge. In spite of all difficulties continuous research is under progress by academic and industrial researchers to find other economic and environmental benign methods for their preparation. Nowadays, a plethora of transition metal catalysts are available for the synthesis of various functional groups like polyesteramide, polyamide, oxamates, oxamides, oxalate, etc. using carbonylation methodology. Thus, the work was focused on the on the oxidative carbonylation of aryl halides, amino alcohols, amines, for the preparation of polyamide and polyesteramide and its applications as a polymer modifier in PET for improving the dye-pickup properties. Hence provide efficient and attractive alternatives to the conventional synthetic routes. Oxidative carbonylation is an important reaction as it allows direct carbonylative C-H bond activation. The next part was involved in synthesis oxidative double carbonylation reaction provides a one-step alternative route for the synthesis of oxamide, oxamates, and oxalates etc. and further catalytic hydrogenation of these chemicals to produce ethylene glycol. Present Carbonylation methods eliminates the use of highly corrosive, thermally unstable and toxic reagents like acid chloride, oxalyl chloride and their derivatives and moisture sensitive ligands. The catalyst-product separation techniques, catalyst recoverability and catalyst reusability are the central issues to achieve an economical and environmentally friendly approach from sustainable and industrial viewpoints. The catalysts can be easily separated, reused and provide an efficient and economical way to perform carbonylative coupling reactions. The carbonylation routes using these techniques are simple, efficient, and economical, avoid the use of moisture sensitive ligands, and give the desired products in excellent yields.



Amol Baliram Patil

Guide: Prof B. M. Bhanage
Thesis title: Experimental and Computational Insights in Anisotropic Silver and Silver Sulphide Nanomaterial Electrodeposition Using

Protic Ionic Liquids

Brief abstract:

Electrodeposition of metals using ionic liquids has emerged as an active area of research since an electron is regarded as environmentally benign most reducing reagent while Room Temperature Ionic Liquids (RTILs) are being viewed as green electrolytes. Competing interactions such as electrostatic forces, dispersion forces, van der Waal's forces and hydrogen bonding in RTILs make the systems challenging. Even more intriguing is the behaviour of PILs which are characterized by extensive hydrogen bonding networks and enigmatic ionicity. These challenges are worth tackling as the same challenges and intriguing aspects provide opportunities to fine tune the process of metal electrodeposition. With this aim present work tries to investigate experimentally and quantum chemically the role played by various factors such as ionicity, ion pair binding energy and metal complexation in process of anisotropic metal nanomaterial electrodeposition using PILs.



Arvind Laxman Gajengi

Guide: Prof B. M. Bhanage
Thesis title: Studies in Nanoparticle Synthesis

Brief abstract:

Synthesis of nanoparticles has great importance in the field of nanoscience and nanotechnology. The nanomaterials show some unique properties than that of bulk materials due to their extremely small size and high surface area. The development of nanoscience and nanotechnology have wide range of applications in different fields such as information technology, energy, information storage, healthcare, environmental science, medicine, drugs & cosmetics, defence & security,

optical & bio engineering, nano fabrics, food safety, transportation and among many others. Homogeneous catalysis have the advantage of higher yield of product, higher selectivity & catalytic activity but have limitations as separation of catalyst is very difficult. In case of heterogeneous catalysis less surface area is available for reactant molecules at high catalyst loading even though separation of catalyst is easy. The limitation can be overcome by increasing in the surface to volume ratio of the catalyst by decreasing the size of the catalyst (nanocatalysis). The nanocatalyst acts as bridge between homogeneous and heterogeneous catalysis. There are various methods for the synthesis of nanoparticles, but most of the methods have certain limitations such as requirement of additives, excess reagents, higher temperature, long reaction time, multistep synthesis and tedious reaction procedure. Therefore, there is more scope for development of alternative method for the synthesis of NPs which are simple, facile, one-step, economical and additive-free, without the use of extra templates or capping agents which makes the protocol greener. In this regards, the present work focuses on the development of facile, efficient, environmentally benign method for the synthesis of nanomaterials and their catalytic application in organic synthesis. Initially, synthesis of NiO NPs and their catalytic application for three component coupling reaction of aldehyde, amine and terminal alkynes is reported. The method of preparation of NPs is facile and efficient using only two reagents i.e. Ni(OAc)₂ and benzylamine under microwave irradiation. The synthesized NPs are well characterized by XRD, TEM, EDS, BET, NH₃-TPD and XPS. Also, catalytic activity for wide variety of substrates is demonstrated with excellent catalytic recyclability without much loss of its activity. Further, we extended the catalytic application of synthesized NiO NP as a efficient catalyst for four component coupling reaction for synthesis of substituted pyrroles. Then, we describe the shape selective synthesis of copper NPs with different morphologies by change in solvent ratio of ethylene glycol and water under microwave irradiation. The synthesized NPs well characterized by FEG-SEM, TEM, XRD, XPS, NH₃-TPD and BET

surface area. The change of counter ion of copper precursor lead to selective synthesis of copper NPs has been observed (CuO, Cu₂O, Cu(OH)₂ NPs). Further, catalytic application of synthesized copper NPs for synthesis of β-enaminones and β-enamino esters from 1,3-diketones and amines was carried out with excellent yields of products and catalytic recyclability. Further, we developed a facile and efficient method of preparation for Cu₂O/Ag NPs using ethylene glycol under microwave irradiation within a short duration of time. The synthesized Cu₂O/Ag NPs well characterized by XRD, FEG-SEM, EDS and NH₃-TPD, ICP-AES techniques. Further, the catalytic application of Cu₂O/Ag NPs for the synthesis of substituted pyrroles via multicomponent reaction (MCRs) by using an aldehyde, amine, 1,3-diketone and nitromethane at room temperature. The catalytic system provides good yields of products for a wide range of substrates. Also, catalyst shows excellent catalytic recyclability without much loss of its activity. Finally, we developed an ultrasound assisted synthesis of nickel oxide NPs using benzylamine as a base and different types of cyclodextrins (CDs) as capping agents. The use of α-CD, β-CD or γ-CD leads to different morphologies of NiO NPs. The synthesized NPs were characterized by FEG-SEM, XRD, BET and EDS analysis. They showed high catalytic activity towards synthesis of different types of trisubstitutedimidazoles under solvent free conditions. In addition, NiO NPs could be recycled and reused consecutively up to four recycle runs without much loss of their catalytic activity.



Vijayesh Kanhaiyalal Vyas

Guide: Prof. B. M. Bhanage

Thesis title: Ruthenium Catalysed Asymmetric Transfer Hydrogenation of Unusual Class of Heterocyclic and Hindered Ketones by Using

Enantiopure TsDPEN and Prolinamide Ligands as a Chiral Source.

Brief abstract:

This work aims to do a particular reaction which involves the addition of two atoms of

hydrogen to an unsaturated bond, for example ketone. Such additions result in the formation of molecules with a desirable handedness if the right catalyst can be designed and used. Considering that, hydrogenation of unusual and heterocyclic substrate classes has been carried out, which have to date been little studied by other researchers in this field. This approach is based on two primary objectives in which first deals with the asymmetric transfer hydrogenation of unusual and challenging class of substrate class which have to date largely been little studied by other researchers in this field. This includes heterocyclic and hindered substrates that avoid reduction due to their bulk, and substrates which contain multiple hetero atom interfering in stereo determining transition state thereby reducing the enantiomeric excess. This involves tricyclic seven membered and acetylic ketone substrates class. By varying the substitution pattern of these substrate class, their electronic and steric properties can be altered. These effects are rationalized as resulting from a change in the steric properties of the aryl ring and the electronic properties of the alkyne which, when matched in the reduction transition state, combine within a 'window' of ideal substrate/catalyst matching, to generate products of high enantioselectivity in high yield. Moreover, other primary objective was to develop different prolinamide ligand with different substitution pattern on the ligand part which can be tested as a chiral source in ATH. The utility of these ligands in Dynamic Kinetic Resolution and One Pot Organic Transformation has been demonstrated.



Prashant Gautam

Guide: Prof B. M. Bhanage

Brief abstract:

Abstract The development of environmentally benign and efficient synthetic methods continues to be a central goal of current research in chemistry. In this regard, catalysis and organometallic chemistry are key techniques for achieving these objectives and for contributing to a "greener" chemistry in the future. Among the different catalytic reactions, the refinement of readily

available feedstocks to more-functionalized products is of particular importance. The functionalization of substrates using carbon monoxide as the C1 source, carbonylation, comes in as one of the most important industrial processes for the manufacture of bulk and fine chemicals. For example, the conversion of olefins, the basic raw materials for the chemical industry, by carbonylation gives access to more valuable products such as aldehydes, alcohols, and carboxylic acid derivatives. Despite large-scale applications in industry, reactions with carbon monoxide are comparatively seldom used in more complex organic syntheses. This might be because of the general reluctance to use gases as reagents and the necessity to use high-pressure equipment, although a number of catalytic carbonylations proceed at ambient to low pressures (< 5 bar). However, little attention is paid to carbonylation chemistry in academic research. Arenes and heteroarenes are vital intermediates in the manufacture of agrochemicals, dyes, pharmaceuticals, and other industrial products, and thus there is continuing interest in easier and cost-efficient synthetic methods. In the past decade transition-metal-catalyzed coupling reactions of aryl halides with all types of nucleophiles have emerged as the most important tool for the production of substituted arenes. However, the palladium-catalyzed carbonylation reactions of aryl halides give carboxylic acid derivatives, aldehydes, and ketones depending on the nucleophile used. After the pioneering work of Heck and co-workers in the 1970's, the topic has notably developed since then. However, as compared to "noncarbonylative" cross-coupling reactions, "carbonylative" cross-coupling reactions are relatively difficult to execute. They also exhibit inferior catalytic turnovers as compared to their non-carbonylative counterparts. This is mainly attributed to π -acidic CO is present as compared to palladium. The fact that in carbonylative cross-coupling reactions, excess of reactivity of palladium towards oxidative addition of the aryl halide is greatly reduced due to binding of CO with palladium. Moreover, facile aggregation of palladium atoms in the presence of CO leads to the formation of non-active palladium species, thereby reducing catalytic activity. Thus,

achieving high catalytic turnovers through low palladium loadings in carbonylative cross-coupling reactions is challenging. Palladacyclic and pincer complexes have been exhaustively reported as high turnover catalysts for non-carbonylative cross-coupling reactions. They are known to catalyze reactions at extremely low palladium loadings, thus resulting in high catalytic turnovers, and in some cases, enzymatic turnovers. However, they have been seldom reported as high turnover palladium precursors for carbonylative cross-coupling reactions. Thus, the first part of the research project was involved in identifying high turnover palladacyclic complexes as homogeneous catalytic precursors for the carbonylative Suzuki-Miyaura and carbonylative Sonogashira cross-coupling. These reactions lead to the synthesis of biaryl ketones and ynones respectively, wherein, the synthesis of both the class of compounds is extremely important as they represent key structural motifs in pharmaceutical drugs, natural products, sunscreen agents and important intermediates in multi-step organic synthesis. The next part was

involved in synthesis and application of KCC-1 supported palladium nanoparticles as a recyclable and high turnover catalyst for the carbonylative Suzuki-Miyaura cross-coupling reaction. The use of CO surrogates helps in avoiding the use of gaseous CO, high pressure reactors and carbonylation reactions can be carried out using simple Schlenk tubes. However, most of the CO surrogate catalytic protocols make use of homogeneous catalysts in combination with phosphine ligands and unsustainable solvents. N-formylsaccharin was applied as an air-stable and crystalline CO surrogate in combination with Pd/C as a commercially available and recyclable palladium catalyst in propylene carbonate as a sustainable solvent for the synthesis of phenyl esters and biaryl ketones through phenoxycarbonylation and carbonylative Suzuki-Miyaura cross-coupling. 4 Keywords Carbonylation; C-C cross coupling; Ketones & esters; Homogeneous catalysis; Heterogeneous catalysis; Sustainable chemistry.

CURRENT DOCTORAL PROJECTS

Sr.	Research Scholar	Research Topic
Prof. R. V. Jayaram		
1	Tushar S. Deore	Functional surfactants in organic synthesis
2	Thomson A. Fernandes	Recovery of metals spent materials by hydrometallurgical method
3	Suyog V. Katkar	Catalysis by bimetallic nanoparticles
4	Amber J. Sahani	Homogeneous catalysis in organic transformations by non-precious metal complexes
5	Sonali C. Thakre	Synthesis and application of functionalized carbon materials
6	Nisha D. Kadam	Aqueous and non-aqueous biphasic catalytic systems
7	Bhumika P. Patil	Industrial waste treatment
8	Das Indrani Sen	Effect of ionic liquids and other chelating agents on the physicochemical properties of surfactants
9	Kavita Khiste	Enzyme catalysis
10	Datatraya V. Hase	Synthesis of novel N-based extractants for nuclear fuel reprocessing
11	Kunal N Pawar	Organic transformation in micellar media
12	Amid Sadgar	

Sr.	Research Scholar	Research Topic
Prof. B. M. Bhanage		
1	Chaurasia Shivkumar	Synthesis of hybrid nanoparticle and their application
2	Raut Amol	Synthesis and Application of nanoparticle
3	Bhagade Sachin	Studies in hydroformylation reactions for the synthesis of fine chemicals
4	Mishra Ashish	Synthesis of Nano-material oxide and its application in Organic Transformation
5	Subramaniam Kripa	Electrodeposition of metals using ionic liquids
6	Deshmukh Dewal	Dimerization and telomerization reaction
7	Gaikwad Vinayak	Studies in carbonylation reaction
8	Dhande Jawal Priyanka	Studies in enzymatic synthesis
9	Phatake Vishal	Studies in CO ₂ fixation
10	Bhujbal Akshay	Electrochemical analysis of Zr, U and Al in ionic liquid medium
11	Kolekar Yuvraaj	Studies in CO ₂ fixation
Prof. S. D. Samant		
1	Mr. Niesh N. Korgavkar	Development of polymeric and gel entrapped base catalysts for base catalysed organic reactions.
2	Mr. Prateek U. Jain	Preparation and application of modified metal oxide catalysts for organic synthesis
Dr. J. M. Nagarkar		
1	Zade Ramesh N.	Application of mixed metal oxides as catalyst in organic transformations involving C-C, C-N, C-O & C-S bond formation
2	Wagh Ravindra B.	Studies on oxidation of organic compounds with peroxides
Dr. Anant R. Kapdi		
1	Mr. Ajaykumar V. Ardhapure	Development of novel route for the synthesis of substituted Nucleosides by using transition metal-catalysed reactions
2	Mr. Dharmendra S. Prajapati	Synthesis and Application of novel metallacycles in organic synthesis.
3	Mr. Gopal L. Dhangar	Metal mediated coupling reactions under mild conditions.
4	Mr. Mahendra R. Patil	Supramolecular polyoxometalate structures synthesis and application for various catalytic organic transformation.
5	Mr. Vaibhav B. Sable	Metal-mediated Synthesis and Application of (Hetero)aromatic Aldehydes.
6	Mrs. Vidya Zende	Synthesis of novel ligands and applications in various organic reactions
7	Mr. Vijay Gayakhe	Greener approaches towards metal-mediated synthesis of important heterocycles
8	Mr. Shatrughn Bhilare	Development of efficient catalytic systems for Nucleoside modification via Sonogashira reaction

Sr.	Research Scholar	Research Topic
9	Mr. Aniket Gholap	Development of efficient C-H bond functionalisation protocols for Nucleoside modification
10	Mr. Tejpal Girase	Carbazole-based synthetically and biologically relevant molecules.
11	Mr. Yuvraj Bhujabal	Development of novel metal-mediated processes for Nucleoside modification
Dr. Vijay Kumar A.		
1	Abhishek Dubey	Transition Metal Catalyzed Synthetic Organic Transformations
2	Prashant Mandal	Synthetic Approaches For the Synthesis of Chroman Heterocycles
3	Rani Suryawanshi Patil	Development of Supramolecular based Catalysts For Organic Transformations
4	Shweta A. Pawar	Biomimetic Catalysts For Organic Transformations
Dr. Kaustubh Joshi		
1	Snehal Ingle	Exploring NMDA receptor as target for neurodegenerative diseases: a Computational approach
2	Shilpa Nath	Theoretical study in Silicon Chemistry
Dr. Shraeddha Tiwari		
1	Mangesh Potangale	Vibrational spectroscopic study of ionic liquid systems and their structures and interactions
2	Arun Valvi	Solvent effect on reactivity and selectivity of aromatic nucleophilic substitution
3	Jyoti Dutta	Study of reactivity and selectivity of chemical processes in microreactors
4	Daulat Phapale Co-guide: Dr. Dipanwita Das	Development of Photochromic Metal Complexes: Kinetics and Photophysical Study
5	Mariamammal Muthu	Synthesis and study of substituted N-confused tetraphenylporphyrin (NCTPP) and its metal complexes for potential application towards control and detection of environmental pollutants
Dr. Dipanwita Das		
1	Sagar Patil	DNA binding and molecular sensing studies of functionalized ruthenium polypyridyl complexes
2	Vrushali Raut	Heterogeneous catalytic oxygen reduction by metal organic framework
3	Daulat Phapale (As Research Co-Guide)	Development of photochromic metal complexes: Kinetics and Photophysical Study
4	Harshawardhan Agarkar (As Research Co-Guide)	Study in metal organic framework for photochromic application and catalysis
Dr. Sanghamitra Chatterjee		
1	Pravin Tarlekar	Development of Electrochemical Sensors for Investigation of Electroactive Compounds

Sr.	Research Scholar	Research Topic
2	Suyash Mane	Electrochemical Determination of Drugs Utilizing Nanomaterial Modified Sensors
3	Rutesh Savalia	Development and Application of Nanomaterial Based Sensors for Selective Determination of Pharmaceutical formulations in Biological Fluids
4	Nikita Agrawal	Fabrication with Nanocrystalline Materials for Electrochemical Sensing of Biological Analytes
Dr. P. M. More		
1	Nitin Lavande	Total Oxidation of VOC and CO using modified Mn-Ce catalyst
2	Rahul More	Complete oxidation of VOC and CO using non noble metal catalyst
Dr. Dawande S. G.		
1	Mr. Nilesh M. Kahar	Development of Novel Synthetic Methodologies using Transition Metal Carbene Metal Complexes
2	Pankaj P. Jadhav	Development of New synthetic methodologies for C-H bond functionalization of carbocycles and heterocycles
3	Kasturi U. Nabar	Design, Synthesis and applications of novel hypervalent iodinium ylides in organic synthesis

[A] AWARDS

Name of the Student	Title
Tushar S. Deore	1st Prize in "International conference on advancements and challenges in chemical sciences," (ICACCS 2018) 2nd-3rd Feb 2018, Pachaiyappa's college, Chennai-600030
K. Vijay	Synthetic modifications and applications of industrial aza heterocyclic intermediates
Jyoti Dutta	Sanctioned travel grants from CSIR and International Travel Support (ITS) scheme of DST-SERB for presenting paper in "19th Tetrahedron Symposium, Italy (26th -29th June, 2018)"
Archana Kushwaha	Best poster prize at International Conference on "Advances on Functional Materials" KTHM College, Nasik, India Title: "A pyrene-benzimidazole composed effective fluoride sensor: potential mimicking of a Boolean logic gate"
Archana Kushwaha	Best poster prize at 30th Research Scholars' Meet 2018 Organized by Indian Chemical Society in Association with Jai Hind college during 9 and 10th February 2018 Title: "A pyrene-benzimidazole composed effective fluoride sensor: potential mimicking of a Boolean logic gate"

Pravin Tarlekar	Awarded 2nd prize in Oral Presentation, International Conference on Nanotechnology: Ideas, Innovations and Initiatives (ICN31-2017), organized by IIT Roorkee on 6th – 8th December 2017 in Roorkee, India
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[B] ORAL AND POSTER PRESENTATIONS BY THE STUDENTS

Name of Student	Paper/Poster	Details of Event	Title of Paper/Poster
Thomson A Fernandes	Poster presentation	Emerging Trends in Separation Science and Technology, (SESTEC-2018) May 23-26, 2018 BITS Pilani, K.K. Birla Goa Campus, Goa	
Data V Hase	Poster presentation	Emerging Trends in Separation Science and Technology, (SESTEC-2018) May 23-26, 2018 BITS Pilani, K.K. Birla Goa Campus, Goa	Extraction and stripping studies of Am(III) by N,N-dialkyl-2-(alkoxy)acetamide
Tushar S Deore	Oral presentation	International conference on advancements and challenges in chemical sciences, (ICACCS 2018) 2nd-3rd Feb 2018, Pachaiyappa's college, Chennai-600030.	Cobaloxime metallosurfactants – Synthesis and application in catalytic selective oxidation
Amber J Sahani	Oral presentation	International conference on advancements and challenges in chemical sciences, (ICACCS 2018) 2nd-3rd Feb 2018, Pachaiyappa's college, Chennai-600030.	Non precious transition metal (Fe, Cu and Ni) complex catalysts for efficient C-Se coupling
Ravi Shankar G Kadam	Poster presentation	Conference on Advances in Catalysis for Energy and Environment (CACEE-2018) January 10-12, 2018 Tata Institute of Fundamental Research (TIFR), Mumbai	Dendritic Fibrous Nano-silica Supported Silver as Efficient Catalysts for Oxidation of Silanes
Tushar S Deore	Oral	“ National conference on emerging trends in material sciences” Mithaghar Rd, Jaihind Colony, Tata Colony, Mulund East, Mumbai, Maharashtra 400081	Cobaloxime metallosurfactants – Synthesis and application in catalytic selective oxidation
Nilesh N. Korgavkar	Paper	National Conference, New Vistas in Chemical Research (NVCR-2017) organized at IIS University, Jaipur, on 18-19 January 2017.	1, 3-dipolar cycloaddition reaction of nitrile oxides with alkenes using imidazole and pyridine containing reusable polymeric base catalysts
Prateek Jain	Paper	National Conference, New Vistas in Chemical Research (NVCR-2017) organized at IIS University, Jaipur, on 18-19 January 2017.	One pot Beckmann Rearrangement using environmentally benign modified Iron Oxide as catalyst
Nilesh N. Korgavkar	Paper	Research Scholar Meet (RSM-2017) Organized at St. Xavier's College, Mumbai on 17-18 February 2017	Development of polymeric and gel entrapped base catalysts for base catalysed organic reactions.

Name of Student	Paper/Poster	Details of Event	Title of Paper/Poster
V. Vyas		National Conference on Chirality, Maharaja Sayajirao University of Baroda	Asymmetric Transfer Hydrogenation of Racemic β -Heterosubstituted Cycloalkanones Driven by Dynamic Kinetic Resolution
V. Shinde	Poster	National Conference on Chirality, Maharaja Sayajirao University of Baroda	Recent trends in organocatalyzed asymmetric reduction of prochiral ketones
D. Deshmukh	Poster	Indo-Japan Conference on new insights into multi-functional catalysis for biomass transformation 18-19 January 2018, CSIR-NCL, Pune, India	N-Tosylhydrazone directed annulation via C-H/N-N bond activation in Ru(ii)/PEG-400 as homogeneous recyclable catalytic system: a green synthesis of isoquinolines
S. Jagtap	Poster	Indo-Japan Conference on new insights into multi-functional catalysis for biomass transformation 18-19 January 2018, CSIR-NCL, Pune, India	Ligand Assisted Rhodium Catalyzed Selective Semi-hydrogenation of Alkynes Using Syngas and Molecular Hydrogen
A. Mishra	Poster	Indo-Japan Conference on new insights into multi-functional catalysis for biomass transformation 18-19 January 2018, CSIR-NCL, Pune, India	Nanoceria-Catalyzed Selective Synthesis of α -Hydroxy Amides through the Reduction of an Unusual Class of α -Keto Amides
S. Chaurasia	Poster	Indo-Japan Conference on new insights into multi-functional catalysis for biomass transformation 18-19 January 2018, CSIR-NCL, Pune, India	Chemoselective Cleavage of C(CO)-C Bond: Molecular Iodine-Catalyzed Synthesis of Quinazolines through sp^3 C-H Bond Functionalization of Aryl Methyl Ketones
A. Raut	Poster	Indo-Japan Conference on new insights into multi-functional catalysis for biomass transformation 18-19 January 2018, CSIR-NCL, Pune, India	Ultrasonic irradiation assisted preparation of Cu ₂ O-nanocubes and their high catalytic activity in synthesis of quinazolines
K. Subramanian	Poster	CatSymp-23, Bangalore	Electro dimerization of N-Alkoxy amides for Zinc(II) Catalyzed Phenolic Ester Synthesis under Mild Reaction Conditions
V. Shinde	Poster	CatSymp-23, Bangalore	Recent trends in organocatalyzed asymmetric reduction of prochiral ketones
Ravindra Wagh	Poster	24th ISCB International Conference in Chemistry (ISCB-2018)", Organized by Department of Chemistry, Manipal University, Jaipur on 11th -13th January 2018.	Facile and effective approach for oxidation of boronic acids

Name of Student	Paper/Poster	Details of Event	Title of Paper/Poster
Kishor Balsane	Poster	24th ISCB International Conference in Chemistry (ISCBC-2018)", Organized by Department of Chemistry, Manipal University, Jaipur on 11th -13th January 2018.	Base free palladium-Ag ₂ O catalyzed decarboxylative cross-coupling of alkynyl carboxylic acids with triaryl bismuth reagents
Mangesh Potangale	Poster	24th ISCB Frontier Research in Chemistry & Biology Interface. Manipal university, Jaipur, (11th-13th January, 2018) in Jaipur, India	Temperature Dependent Empirical Polarity Parameters of Solvate Ionic liquid"
Mangesh Potangale	Poster	24th CRSI National Symposium in Chemistry (CRSI-NSC-24), IICT, Hyderabad, 14th-16th July, 2017 in Hyderabad, in India	Molecular Interaction in Solvate Ionic liquid in the presence of Cosolvent
Arun Valvi	Poster	24th ISCB Frontier Research in Chemistry & Biology Interface. Manipal university, Jaipur, (11th-13th January, 2018) in Jaipur, India	"Zero VOC" synthetic strategy-Aromatic Amination Reactions in Deep Eutectic
Jyoti Dutta	Poster	19th Tetrahedron Symposium, organized by Elsevier, 26th - 29th June, 2018 in Riva del Garda, Lake Garda, Italy	Nonlinear Effects at Soft Interface of an Emulsion in List-Lerner-Barbas- Aldol Reaction Catalyzed by Surfactant Based Proline Catalyst
Jyoti Dutta	Oral	"International Conference on Molecular Spectroscopy (ICMS 2017)" organized by Mahatma Gandhi University, Kottayam, 8th -10th December 2017 in Kerala, India	Application of ATR-IR Spectroscopy for Investigating Biototoxicity of Ionic Liquids
Sagar Patil	Poster	8th East Asia Symposium on Functional Dyes and Advanced Materials, Organised by CSIR-National Institute for Interdisciplinary Science and Technology, Thiruvananthapuram During 20 - 22th September 2017	"Potential Anion Sensing Properties by a Redox and Substitution Series of [Ru(bpy) ₃ -n(Hdpa) _n] ²⁺ , n = 1-3; Hdpa = 2,2'-dipyridylamine: Selective Recognition and Stoichiometric Binding with Cyanide and Fluoride ions"
Sagar Patil	Oral	30th Research Scholars' Meet 2018 Organized by INDIAN CHEMICAL SOCIETY (Mumbai Branch) In Association with Jai Hind college during 9 and 10th February 2018	Potential Anion Sensing Properties by a Redox and Substitution Series of [Ru(bpy) ₃ -n(Hdpa) _n] ²⁺ , n = 1-3; Hdpa = 2,2'-dipyridylamine: Selective Recognition and Stoichiometric Binding with Cyanide and Fluoride ions

Name of Student	Paper/Poster	Details of Event	Title of Paper/Poster
Daulat Phapale	Poster	8th East Asia Symposium on Functional Dyes and Advanced Materials, Organised by CSIR-National Institute for Interdisciplinary Science and Technology, Thiruvananthapuram During 20 – 22th September 2017	Selective recognition of Cu (II) and Fe (III) using a pyrene based chemosensor
Daulat Phapale	Oral	30th Research Scholars' Meet 2018 Organized by INDIAN CHEMICAL SOCIETY (Mumbai Branch) In Association with Jai Hind college during 9 and 10th February 2018	Solvent- and DNA-Controlled Phototriggered Linkage Isomerization in a Ruthenium Sulfoxide Complex Incorporating Dipyrido[3,2 a:2',3' c] phenazine (dppz)
Vrushali Raut	Paper	62nd edition of DAE Solid State Physics Symposium (DAE SSPS 2017) will be held in DAE Convention Centre, Anushaktinagar, Mumbai during 26 – 30th December 2017	Non-platinum metal-organic framework based electro-catalyst for promoting oxygen reduction reaction
Vrushali Raut	Poster	19th Tetrahedron Symposium, Riva del Garda, Lake Garda. Italy during 26-29th June 2018	Non-platinum metal-organic framework based electro-catalyst for promoting oxygen reduction reaction
Harshawardhan Agarkar	Poster	24th ISCB International Conference (ISCB-2018), department of chemistry, Manipal University Jaipur during 11-13th January 2018	Guest dependent unusual rigidity of the flexible Metal-Organic Framework
Suyash Mane	Poster	International Conference on Nanotechnology: Ideas, Innovations and Initiatives (ICN3I-2017), organized by IIT Roorkee on 6th – 8th December 2017 in Roorkee, India	Development of Nanomaterial Modified Sensors for the Electrocatalytic Oxidation of Paeonol in Biological Fluids
Pravin Tarlekar	Oral	International Conference on Nanotechnology: Ideas, Innovations and Initiatives (ICN3I-2017), organized by IIT Roorkee on 6th – 8th December 2017 in Roorkee, India	A Novel Voltammetric Sensor for the Nano level Determination of Non-steroidal Anti-inflammatory Drug Utilizing Single Walled Carbon Nanotubes
Rutesh Savalia	Oral	International Conference on Nanotechnology: Ideas, Innovations and Initiatives (ICN3I-2017), organized by IIT Roorkee on 6th – 8th December 2017 in Roorkee, India	Effortless Devising of Biosensor for Sensitive Determination of Brucine in Human Physiology

M. Sc. SEMINAR TOPICS

M. Sc. Seminar Topics for the academic year i.e. 2017–18

Name of Student	Seminar topic	Seminar Guide
Saumyaranjan Mishra	Metallocene catalyst for olefin polymerisation	Dr. J. M. Nagarkar
Mursaleen Shaikh	Unnatural amino acids- properties, synthesis and application	Dr. Anant Kapadi
Pratiksha Desai	Total synthesis of Palau'amine	Dr. A. Vijay Kumar
Uddipana Kakati	Phil Baran's Approach for "Two-Phase" Synthesis of Natural Products: Eudesmane – A Case Study	Dr. A. Vijay Kumar
Ayushi Chand	Photochemical Applications of Porphyrins and its Derivatives	Dr. Shraeddha Tiwari
Shrutika Sonawane	IR Spectroscopy of Lipids	Dr. Shraeddha Tiwari
Pranay Wahane	Chelating Agents in Medicines	Dr. Dipanwita Das
Dhwanit Dave	Creatinine: A Retrospective Study of its Physiological Properties and Electrochemical Assay of the Biomarker	Dr. Sanghamitra Chatterjee
Abhishek Yadav	Epoxidation of Alkene using catalysis	Dr. P. M. More
Gaurav Juneja	Reactions of vinyl diazo compounds	Dr. Dawande S. G.
Anurag Chnichole	N-Heterocyclic Carbenes as Organocatalysts	Dr. Dawande S. G.
Heena Fatwani	Photoluminescence of Graphene Quantum dots and its Applications in Bioimaging	Prof. B. M. Bhanage
Anuja Sharma	An Overview of Various aspects of Diels – Alder reaction"	Dr. Kaustubh A. Joshi
Prathmesh Raghav	Enzyme- catalyzed reaction	Dr. Kaustubh A. Joshi
Jevy Correia	Applications of Contact Angle Measurement in food and Microencapsulation	Prof. R. V. Jayaram
Mr. Koushik Santra	Magnetically separable phase synthesis and its applications	Prof. R. V. Jayaram
Chinmay Pradhan	Ionic Liquids as Green catalysis and Solvents	Dr. Anant Kapadi
Nilesh Gaikwad	Construction, working and application of silicon solar cell	Dr. J. M. Nagarkar
Nerurkar Gaurav C	Sonoelectrochemical Synthesis of silver Nanoparticles and its Synthetic Applications	Prof. B. M. Bhanage

M.Sc. PROJECTS

M. Sc. Projects for the academic year i.e. 2017–18

Name of Student	Title of the research project	Research Supervisor
Saumyaranjan Mishra	Double chain cationic surfactants: synthesis and application	Prof. Radha V. Jayaram
Mursaleenshaikh	Photocatalytic degradation of anthracene-solubilisation using surfactants	Prof. Radha V. Jayaram
Gaurav Juneja	Ru@PsIL-Catalyzed Synthesis of N-Formamides and Benzimidazole by using Carbon Dioxide and Dimethylamine Borane	Prof. B.M.Bhanage
Prathmesh Raghav	Studies on Asymmetric synthesis using Ruthenium salt.	Prof. B.M.Bhanage
Anuja Sharma	Oxidative Esterification of Benzyl alcohols using Active Palladium Colloids	Dr. Anant R. Kapdi
Jevy Correia	Palladium imidate complex catalyzed modification of nucleosides	Dr. Anant R. Kapdi
Ayushi Chand	Polydopamine Catalyzed Biomimetic Synthesis of Benzimidazoles	Dr. A. Vijay Kumar
Anurag Chinchole	Recoverable Palladium based Catalyst for Organic Transformations	Dr. A. Vijay Kumar
Abhishek Yadav	Kinetic Studies of Diels Alder Reaction in Deep Eutectic Solvents	Dr. Shraeddha Tiwari
Heena Fatwani	Chirality Study of Micellar Aggregates Formed by Derivatives of Amphiphilic Proline Molecule	Dr. Shraeddha Tiwari
Dhwanit R. Dave	Photoswitching studies of a Zn(II) Complex with an Azo-functionalized Benzimidazole Ligand	Dr. Dipanwita Das
Uddipana Kakati	Design and Synthesis of Imidazole based Colorimetric Sensor for Selective Recognition of Cu(II) ion in Aqueous Medium	Dr. Dipanwita Das
Shrutika Sonawane	Electrocatalytic Oxidation and Detection of an Anti-Inflammatory Drug in Real Samples	Dr. Sanghamitra Chatterjee
Pranay Wahane	Sensitive Determination of Anti Hyperlipidemic Agent in Pharmaceutical Formulations	Dr. Sanghamitra Chatterjee
Koushik Santra	Transition metal doped as a selective catalyst for the oxidation of alcohol to aldehyde	Dr. P. M. More
Pratiksha Desai	Calcium doped cobalt catalyst for the selective oxidation of alcohol to aldehyde	Dr. P. M. More
Chinmay Pradhan	Silver (I) Catalysed Highly Regioselective Allylation of Indolizines with Allyl Alcohols	Dr. Dawande S. G.
Nilesh Gaikwad	Iodine Catalyzed Intramolecular Cyclization Reactions of N-Aryl Propargyl Amines: Synthesis of 1,2-dihydroquinoline	Dr. Dawande S. G.

Name of Student	Title of the research project	Research Supervisor
Nerurkar Gaurav C	Highly efficient and selective method for oxidation of aldehydes to carboxylic acids	Prof. J. M. Nagarkar

M. Tech. (GREEN Tech.) PROJECTS

Name of Student	Thesis topic	Seminar Guide
Vaibhavi Patil	Synthesis and application of mesoporous silica and graphene oxide for dual drug delivery system	Prof. Radha V. Jayaram
Mohini Pardeshi	Amphiphilic Self-assembly in supercooled sugar urea analog mixtures	Prof. Radha V. Jayaram
Shilpa gowalkar	Rhodium catalysed selective hydroaminomethylation of biorenewable eugenol under aqueous biphasic condition	Prof. B.M.Bhanage
Saurabh	Immobilized lipase catalyzed synthesis of n-amyl acetate: Parameter optimization, heterogeneous kinetics, continuous flow operation and reactor modeling	Prof. B.M.Bhanage

PRIZES UNDER THE CMP ENDOWMENT:

1. M.Sc. (Chemistry) Best Student Award (Batch 2017-18): Ms. Uddipanna Kakati – Rs. 5000/- cash prize and Certificate.
2. Prize for First Rank in M.Sc. (Chemistry) from batch of 2016 -17: Ms. Rashi Rakesh Gupta - Rs.5000/-Cash Prize & Certificate.
3. Prize for Second Rank in M.Sc. (Chemistry) from batch of 2016-17: Mr. Prasenjit Yatish Srivastava - Rs.3000/-Cash Prize & Certificate :
4. Prize for Third Rank in M.Sc. (Chemistry) from batch of 2016-17: Ms. Priya Nareshpal Singh - Rs.2000/-Cash Prize & Certificate

CMP Endowment Award for Best Teacher - Dr. Vijay Kumar. A

RESEARCH GROUP PHOTOS :



L to R: Dr. Anjana (PDF), Kirthana, Nisha, Bhumika, Tushar, Datta, Thomson, Ravi, Amid, Amber, Kavita, Sonali, Vishal, Swetha, Aradhana, Anuprita



From L to R:**1st Row:** Sachin Bhagade, Deepak Nale, KishorWagh, Prof.B.M.Bhanage, Nilesh Patil, Ashwini Mathpati, Kripa Subramaniam. **2nd Row:** Sujit Chavan, Subhash Yedage, Ashish Mishra, Shivkumar Chaurasia, Kirtikumar Badgujar, Anil Sathpathy. **3rd Row:** Amol Patil, Rajendra Mane, Samadhan Jagtap, Vijyesh Vyas, Arvind Gajengi, Dewal Deshmukh. **4th Row:** Clinton Fernandes, Prashad Kathe, Dilipkumar Yadav, Manohar Bhosale, Jayendra Ahire, Santosh Revankar. Amol Raut, Vitthal Saptal



From L to R: Prateek Jain, Prof. S. D. Samant, Nilesh Korgaonkar



From L to R: Ravindra Wagh, Jeevan Bhojane, Prof. (Mrs.) J. M. Nagarkar, Sitaram Gund, Vilas Jadhav, Sachin Sarode, Kishor Balsane



From L to R: Dharmendra Prajapati (Ph.D. student), Aniket Gholap (Ph.D. student), Sai Vengurlekar (Project Assistant), Ajay Ardhapure (Ph.D. student), Tejpal Girase (Ph.D. student), Dr. Anant R. Kapdi, Gopal Dhargar (Ph.D. student), Vidya Zende (Ph.D. student), Rashila Gund (Project Assistant), Safiya Rehman (Project Assistant), Vaibhav Sable (Ph.D. student), Shatrughna Bhilare (Ph.D. student).



From L to R: Ms. Ayushi, Ms. Rani Patil, Mr. Abhishek, Dr. Vijay Kumar, Mr. Prashant Mandal, Mr. Anurag, Ms. Shweta, Mr. Mahendra Patil



From L to R: Shilpa Nath, Dr. Kaustubh Joshi, Sudheer Kurup, Snehal Ingle



From L to R: :(Upper row) Mangesh Potangale, Jyoti Dutta, Arun Valvi, Daulat Phaphale
(Lower row) Mariammal Muthu, Dr. Shraeddha Tiwari, Neha Gharat



From L to R: Daulat, Archana, Vrushali, Dr. Dipanwita Das, Uddipana, Sagar, Harshawardhan



From L to R: Rutesh Savalia, Suyash Mane, Nikita Agrawal, Dr. Sanghamitra Chatterjee, Shrutika Sonawane, Pranay Wahane, Pravin Tarlekar