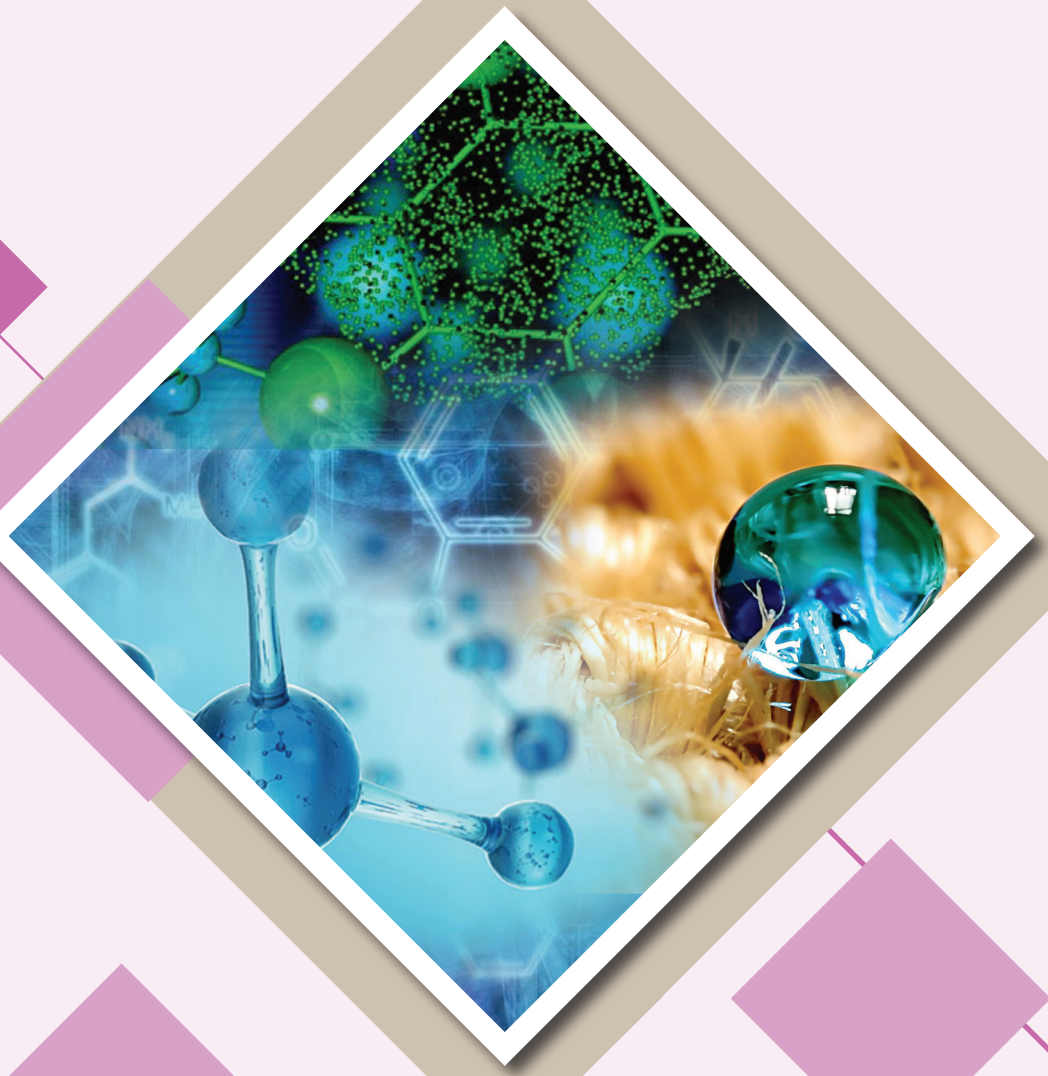

DEPARTMENT OF
POLYMER & SUFACE ENGINEERING

ABOUT THE DEPARTMENT

PROFESSOR R.N.JAGTAP
Ph.D Tech
Professor of Paint Technology
Head of the Department of Polymer & Surface Engineering

The department was established in the year 1946 and was offering a B.Sc (Tech) course for two years in Technology of Plastics and Technology of Paints, Pigments and Varnishes. In 1952, along with other divisions three years B. Sc (Tech) program was introduced. Earlier it was known as Paints, Pigments and Varnishes (PPV) Section. The B.Sc. (Tech.) courses were converted into post-B. Sc. three-year courses in 1966 and finally converted into B. Tech. programmes, which are post-HSSC (12th Grade) in 1998. M.Sc. Tech. in Chemical Technology came into existence in the year 1961. The M.Sc. (Tech.) courses were converted into post-B. Tech. four year courses in 2002. The department also offer Ph.D.Tech. and Ph.D. Sci. degrees

In the beginning of the department Dr. T. N. Mehta was the only staff member. Later on, the division progressed under stewardship of Late Professor N.R. Kamath who was a visionary. After him Professor S. P .Potnis carried the torch with great ability. From 1991 to 2005, Professor D. D. Kale was head of the Division who shared a major contribution for the developmental developments. Prof V. C. Malshe, Professor M.A. Shenoy, Professor P. A. Mahanwar are the past HODs of Polymer & Paints Departments respectively. From 1st August 2015 Professor R.N Jagtap is the Head of Department.

The intake strength was only four students per year in Polymer and surface engineering Technology branches. Later on, the strength was increased to 8 per year and now it is 16 per year in each of these two technology courses. The department received a grand donation of 1 crode from Plastindia Foundation, Mumbai in 1997 to initiate the new program – three semesters M. Sc (Tech) in Plastics Processing in addition to regular technology course. In the year 1999, the department received donation of modern equipments worth USD 100,000 from Gratag Macbeth of USA in association with Advanced Graphics Systems, India. Today, this department boosts of being the best equipped laboratory comparable with or better than laboratories in many advanced countries.

MAJOR THRUST OF RESEARCH AREAS:

Polymer Recycling, Blends, Rheology, Polymer Processing.
Synthesis of Nanomaterials and nanocomposites
Ecofriendly coatings, Hybrid coatings
Structure property relationship
Living Radical Polymerization, Synthesis of Functional monomers
Polymer Blends and alloys
Polyurethane Dispersion, Anticorrosive Coatings.
Particulate Polymer Composites, Bionanocomposites, Biodegradable Polymers and Composites, Speciality Coatings.
Electrical insulation, Water-soluble Resins Structure Property Correlations of Coatings,Electrospinning

PROFESSOR R. N. JAGTAP
B.Sc. Tech, M.Sc. Tech, Ph.D Tech
Professor of Paint Technology
Head of Department, Department of Polymer & Surface Engineering, Professor of Paint Technology

SUBJECTS TAUGHT:
Paint Tech. III
Paint Tech. II
Technology of Printing Inks
Corrosion Science and Prevention
Environment Friendly Coatings
High Performance Coatings
Advanced Paints Technology II
Advanced Surface Coating Technology II

RESEARCH INTERESTS:
Living Radical Polymerization for Tailor-made Polymers,
Nanomaterials and Nanocomposite,
Recycling of e-waste,
Antimicrobial Paints,
Heat reflective coatings,
Corrosion,
Eco friendly coating
Microencapsulation

RESEARCH STUDENTS:
Ph.D.(Tech.) - 07
Ph.D.(Sci.) - 02
M.Tech. - 18

RESEARCH PUBLICATIONS:
International - 30
Peer-reviewed - 05
Conference proceeding - 04

PATENTS:
International -2

SPONSORED PROJECTS:
Government -1
Private -3

PROFESSIONAL ACTIVITIES:
Member of UAA
Member governing council of ICPE
Member of IPI
Member of DSIR
Vice President of Color Society
Member, Society for Plastic Engineering

PROFESSOR P. A. MAHANWAR
Ph.D. (Tech)
Professor of Polymer Technology

SUBJECTS TAUGHT:
Polymer Science & Technology I
Structure property relationship
Colorants and Additives for Polymers
Advanced Polymer Science
Polymer Processing & Technology II
High Polymer Chemistry

RESEARCH INTERESTS:
Synthesis and Characterization of specialty polymers for Controlled release,
Surface coatings,
Nanocomposites,
Bionanocomposites,
Utilization of non-conventional energy for polymerization,
Super Absorbents

RESEARCH STUDENTS:
Ph.D.(Tech.) : 08
Ph.D.(Sci.) : 06
M.Tech. : 11

RESEARCH PUBLICATIONS:
International - 07
National - 03
Books - 1
Conference proceeding - 07

PATENTS:
Indian – 6

SPONSORED PROJECTS:
Government - 02
Private - 03

PROFESSIONAL ACTIVITIES:
Hon. President, Color Society, Mumbai.
Member Board of Governors, UDCT Alumni Association, Mumbai.
Member, Technical Advisory Committee Ministry of Science & Technology, Government of India, New Delhi
Course Co-ordinator DPAT, Garware Institute University of Mumbai
Permanent Invitee: Indian Small Scale Paint Association (ISSPA)
Indian Resin Manufacturers Association (IRMA)
All India Printing Ink Manufacturers Association (AIPMA)
All India Plastics Manufacturers Association
Hon. President: Indian Paint and Coating Association (Western Region)
Life Member: Indian Plastics Institute
Member Secretary: All Plastics Recycler's Association (APRA)
Life Member: Society of Polymers
Life member: Society of Plastics Engineers

DR. S. T. MHASKE
B.Sc.Tech., M.Sc. Tech., Ph.D. (Tech)
Associate Professor in Technology of Plastics & PPV

SUBJECTS TAUGHT:
Compounding and polymer processing
Nanotechnology and their applications
Evaluation and characterization of polymers
Polymer chemistry
Paint processing
Pigment synthesis
Synthesis and characterization of raw materials
Nano materials

RESEARCH INTERESTS:
Novel approaches for synthesis of nanomaterials
Sol gel techniques
Cellulose based nanoparticles and whiskers
Bio nanocomposites
Development of nano-containers by layer-by-layer (LBL) assembly
Development of thermoplastic vulcanizates and elastomers
Recycling and recovery of polymers
Rheology of polymers
Hot melt adhesives
Synthesis of resins from renewable resources for coating and adhesive applications
Waterborne coating
Insulating varnishes
Conductive coatings
Anticorrosive coatings
Flame retardant coatings
Self-healing coatings

RESEARCH STUDENTS:
Ph.D.(Tech) - 11
Masters - 15
Ph.D.(Sci.)- 02

RESEARCH PUBLICATIONS:
International -11,
National - 00,
Conference Proceedings 1
Peer-reviewed -10

PATENTS:
Nataional: 03 (Filed)

SPONSORED PROJECTS:
Government: 00
Private: 07

PROFESSIONAL ACTIVITIES:
Associate Professor, Department of Polymer and Surface Engineering, Institute of Chemical Technology (ICT), 2003- till date.
Vice Chairman, IPI, Mumbai
Head Warden, ICT Mumbai (2018)
Faculty Placement Incharge, Department of Polymer Science & Engineering, ICT
Secretary, UDCT Alumni Association (2010-14)
Secretary, The Colour Society (2014-15)

Governing Member, The Society for Polymer Science, India
Associate Member, ISSPA
Member, Solvent Extractors Association of India
Visiting Faculty at SIES School of Packaging, Garware Institute, Amaravati
University, Indian Plastics Institute
Jury Board Member, AIPMA Exhibition
Convenor, MANZAR- Annual Cultural Fest of ICT
Organizing Committee, Rangotsav, Technical Fest, DPSE, ICT
Member, JOY of GIVING, Social Drive at ICT Mumbai
Member, Organizing Committee, BioProcessing India, 2014
Jury Member, VASTRA, Tech Fest, VJTI
Organizer, 2 Days Workshop on "Polymer Identification & Characterization by IPI-ICT"
Advisory Member, Bio-Pack International Conference, 2013
19 Invited Expert Lectures delivered at Crompton Greaves, BlueStar, Garware etc.
Association with NGO "CRY"
Guiding 4 UG students under "BTUG Research Programme"

RESEARCH ACTIVITIES:

At present most of the work is being done on synthesis of nanometerials such as Titanium dioxide, zinc oxide, nanocellulose (whiskers, particles and nanofibers) etc. using conventional & cavitation approach and its applications in polymer (synthetic as well as biopolymer) composites and coatings to enhance their performance properties.
Synthesis of Polyamide hot melt adhesives and its applications.
Modification of fly ash and its applications in polymer composites and coatings to enhance their performance.
Synthesis of Nanoemulsions using conventional methods as well as acoustic cavitation like polystyrene, PMMA etc.
Discoloration and de-waxination of Shellac
Preparation of conductive coatings.

SHRI. ADARSH RAO
M. Tech (pursuing Ph.D.)
Assistant Professor in Polymer Technology

SUBJECTS TAUGHT

Technology of Thermoplastics – I
Technology of Thermoplastics – II
Technology of Thermoplastics – III
Synthesis & Characterization of resins & polymers-I
Synthesis & Characterization of resins & polymers-II
Synthesis & Characterization of resins & polymers-III
Processing of Polymers-I
Processing of Polymers-II
Processing of Polymers-III
Compounding and Polymer Processing-II

RESEARCH INTERESTS :

Controlled/LivingRadical Polymerization
Polymer Nanocomposites, Nanocoatings,
Polymer blends and alloys.

RESEARCH PUBLICATIONS:

International- 1
National - 2

SPONSORED PROJECTS:

Private- 1

PROFESSIONAL ACTIVITIES:

Member of Color Society
Member of UDCT Alumni Association

DR. ANAGHA SABNIS
Ph. D. (Tech)
Associate Professor

SUBJECTS TAUGHT:

Additives for Coatings
Paint Technology – I
Analysis of Raw Materials for Polymers & Coatings
Processing of Paints – III
Processing of Paints – IV
Testing of Paints
Industrial Coatings

RESEARCH INTERESTS:

Novel approached synthesis of Nano particles,
Resin Synthesis from renewable resources
Water Borne Coatings
Conductive Coatings
Anticorrosive Coatings
Electric Insulation Coatings
Flame Retardant Coatings
Antimicrobial Coatings
Polyurea Coatings Technology
Green Route for Polymer Synthesis
Waste Recycle in Polymer Industry
Insulation Coatings

RESEARCH STUDENTS:

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

RESEARCH PUBLICATIONS:

International - 36
Conference proceedings -06

PROFESSIONAL ACTIVITIES:

Member, American Chemical Society
Member, Committee for Raw materials for Paints, Varnishes and related Products Sectional Committee, CHD 21, Bureau of Indian Standards.
Member, Color Society
Member, Alumni Association, UDCT
Member, Organization of Women in Science from Developing World (OWSD)
Regularly invited as reviewer from international peer reviewed journals such as Progress in Organic Coatings, Journal of Coating Technology & Research, Pigment & Resin Technology, Polymer Composites, Journal of Applied Polymer Science, Express Polymer Letters, RSC Advances to name a few.
Completed Faculty Development Programme on "CFD in Engineering Domain Using Computing Software" organized by VJTI, Mumbai from 8 th -12 th July, 2013
Participated in Training Programme on "Patenting System in India" Organized by Rajiv Gandhi National Institute of Intellectual Property Management, Nagpur from 1 st - 5 th February, 2016.

DR. VIKRANT SHERTUKDE
M.Sc (University of Mumbai), Ph.D. (Institute of Chemical Technology, Mumbai), DHE (University of Mumbai)
Emeritus fellow (All India Council of Technical Education),
Dept. of Polymer & Surface Engineering

SUBJECTS TAUGHT

Polymer Science & Technology II
Polymer Science & Technology III
Technology of Thermosets – I
Technology of Thermoset Polymers- III
Technology of Elastomers
Packaging & Decoration of plastics
Polymer Blends & Alloys
Smart Polymer

RESEARCH INTERESTS :

Nanocomposites,
Polymer blends & alloys,
Recycling of plastics,
Synthesis of specialty polymers,
Surface & interfacial energy studies in polymeric systems.

RESEARCH STUDENTS :

Ph.D. (Tech.) - 02
Ph.D. (Sc) - 04
M.Tech. – 08

RESEARCH PUBLICATIONS:

International - 03
Conference proceedings -08

SPONSORED PROJECTS:

Government- 01
Private - 02

PROFESSIONAL ACTIVITIES:

Life Member of UAA
Life Member Colour Society
Ex-Secretary Colour Society
Ex-Education committee
Chairman Colour Society

SUPPORT STAFF

Mr. A.K. Dicholkar
Lab assistant

Mr. S. Hasaye
Lab assistant

Mr. M.A. Ansari
Lab assistant

Mr. D.V. Karande
Lab assistant

Mr. C.S. Kumbhar
Lab assistant

Mr. B.S. Satardekar
Lab assistant

Mr. P. D. Patkare
Lab assistant

Mr. D.R. Kadam
Instrument Mechanic

STUDENTS' SEMINARS/PROJECTS/HOME PAPERS

SEMINAR (B.TECH.) POLYMER ENGINEERING & TECHNOLOGY

Sr. Nos.	Roll No	Name	Guide	Seminar Topic (Title)
1	14POL1001	Anshal Jilka	RNJ	Graphene Based Polymer Nanocomposites in Hybrid Supercapacitors
2	14POL1002	Praneeta Shetty	VVS	Use of Specialty Polymer in Aerospace and Marine Industry
3	14POL1003	Monika Lokhande	STM	Gas sensors based on polymers
4	14POL1004	Aishwarya Chandrashekar	ARR	Enzymatic Synthesis of Metal Nanoparticles
5	14POL1005	Devavrat Sathe	ASS	Bio-based reactive flame retardants
6	14POL1006	Ritesh Chogale	RNJ	Bio based polymers produced by conventional chemistry and fermentation of renewable resources.
7	14POL1007	Jennifer Miranda	VVS	Viscosity Index Modifiers and Pour Point Depressants
8	14POL1008	Aditya Natu	STM	Developments in Sol- Gel Technology
9	14POL1010	Mayuri Porwal	ARR	Biobased Additives
10	14POL1011	Rishi Jain	ASS	Recycling Of PU Waste
11	14POL1012	Shashwat Kulkarni	RNJ	Methods, Materials and Manufacture of 3D Printed Parts
12	14POL1013	Priyanka Khare	VVS	polymer composite used in automobile industry
13	14POL1015	Pratik Mantri	STM	Cellulose and it's modifications
14	14POL1016	Umang Shah	ARR	Nanomaterials for Medical Applications
15	14POL1017	Umang Khandelwal	ASS	Hydrogels In Agriculture Industry
16	13POL1015	Gargee Kotwal	RNJ	Polymers for Biosensor Application
17	13POL1017	Arhant Gimekar	VVS	Epoxy and Polyurethane Adhesives

SEMINAR (B. TECH.) SURFACE COATING TECHNOLOGY

Sr. Nos.	Roll No	Name	Guide	Seminar Topic (Title)
1	13SUR1006	Aditya Shembekar	RNJ	Non- Chlorinated Adhesion Promoters for TPO's
2	14SUR1001	Shivam Negi	VVS	Self- Cleaning Coatings: Principle, Fabrication and Application
3	14SUR1002	Aparna Agrawal	STM	Nanocomposites for Anti-corrosive Coatings
4	14SUR1003	Prachi Jha	ARR	Recent Developments in Antimicrobial Coatings
5	14SUR1004	Pratik Gotad	ASS	Polyurethane Hot Melt Adhesives

6	14SUR1005	Anirudh Venugopal	RNJ	Self-Healing Coatings for Corrosion Resistance Applications
7	14SUR1006	Varun Pande	VVS	Self- healing Polymers
8	14SUR1007	Ashlesha S. Metkari	STM	Flame Retardant Powder Coatings
9	14SUR1008	Shweta Amrutkar	ARR	A review on green corrosion inhibitors for metals
10	14SUR1009	Varun Padhye	ASS	Recent Developments in Coatings for Plastics
11	14SUR1010	Sampanna Mhatre	RNJ	Bio- based Coalescing Agents
12	14SUR1011	Prathamesh Raiter	VVS	Coatings in Marine Industry
13	14SUR1013	Aniket kamble	STM	Electrical conducting polymers
14	14SUR1016	Anurag Shah	ARR	Polyurethane dispersion using renewable resources
15	14SUR1017	Maurya Devendra Surendrakumar	ASS	Conducting Polymer for Anticorrosive Application

PROJECT (B. TECH.) POLYMER ENGINEERING & TECHNOLOGY

Sr. No.	Roll No	Name	Topic	Guide
1	13POL1015	Gargee Kotwal	Low Cost based Material for Water Filter	Prof. R.N.Jagtap
2	13POL1017	Arhant Gimekar	Tablet Detergent	Prof. R.N.Jagtap
3	14POL1001	Anshal Jilka		Dr. S.T.Mhaske
4	14POL1002	Praneeta Shetty	Synthesis and Applications of Polyamide Membrane	Prof. R.N.Jagtap
5	14POL1003	Monika Lokhande	Depolymerization of PU	Dr. A.S.Sabnis
6	14POL1004	Aishwarya Chandrashekar	LDPE/ Silver Nanoparticles Packaging	A.R.Rao
7	14POL1005	Devavrat Sathe	Synthesis of Non-Isocyanate PU	Dr. A.S.Sabnis
8	14POL1006	Ritesh Chogale	Color Removal from textile waste water using microemulsion system	Prof. R.N.Jagtap
9	14POL1007	Jennifer Miranda		Dr. S.T.Mhaske

10	14POL1008	Aditya Natu	Synthesis of Nano Zinc Oxide using Cavitation	Prof. R.N.Jagtap
11	14POL1010	Mayuri Porwal	Synthesis and Applications of Polyamide Membrane	Prof. R.N.Jagtap
12	14POL1011	Rishi Jain	Synthesis of Non-Isocyanate PU	Dr. A.S.Sabnis
13	14POL1012	Shashwat Kulkarni	Polymers from renewable resources	ARR
14	14POL1013	Priyanka Khare	Synthesis of Bio-diesel from waste cooking oil	Dr. A.S.Sabnis
15	14POL1015	Pratik Mantri	Design and Evaluation of Transdermal Formulations	Dr. S.T.Mhaske
16	14POL1016	Umang Shah	LDPE/ Silver Nanoparticles Packaging	A.R.Rao
17	14POL1017	Umang Khandelwal	Co- Crystal Engineering of Active Pharmaceutical Ingridient (API) to enhance flow and solubility using Hot Melt Extrusion (HME)	Dr. S.T.Mhaske

PROJECT (B. TECH.) SURFACE COATING TECHNOLOGY

Sr. Nos.	Roll No	Name	Topic	Guide
1	13SUR1006	Aditya Shembekar	Synthesis of Bio-diesel from waste cooking oil	Dr. A.S.Sabnis
2	14SUR1001	Shivam Negi	Preparation of EMI Shielding using Aniline	PAM
3	14SUR1002	Aparna Agrawal	Synthesis of Nano Zinc Oxide using Cavitation	Prof. R.N.Jagtap
4	14SUR1003	Prachi Jha	Depolymerization of PU	Dr. A.S.Sabnis
5	14SUR1004	Pratik Gotad	Filtration Membranes	Prof. R.N. Jagtap

6	14SUR1005	Anirudh Venugopal	Natural Fibre- based Oil spill cleanup	ASS
7	14SUR1006	Varun Pande	Synthesis of Nano Zinc Oxide using Cavitation	Prof. R.N.Jagtap
8	14SUR1007	Ashlesha S. Metkari	Co- Crystal Engineering of Active Pharmaceutical Ingridient (API) to enhance flow and solubility using Hot Melt Extrusion (HME)	Dr. S.T.Mhaske
9	14SUR1008	Shweta Amrutkar	Synthesis of Non-Isocyanate PU	Dr. A.S.Sabnis
10	14SUR1009	Varun Padhye	Filtration Membranes	Prof. R.N. Jagtap
11	14SUR1010	Sampanna Mhatre	Synthesis and Applications of Polyamide Membrane	Prof. R.N.Jagtap
12	14SUR1011	Prathamesh Raiter	Design and Evaluation of Transdermal Formulations	Dr. S.T.Mhaske
13	14SUR1013	Aniket Kamble	Advances in Textile Processing	RNJ
14	14SUR1016	Anurag Shah	Preparation of EMI Shielding using Aniline	ARR
15	14SUR1017	Maurya Devendra Surendrakumar	Wood coatings	Dr. S.T. Mhaske

RESEARCH PROJECTS PH.D. (TECH)

Sr.	Name of Student	Previous Institute	Title	Guide
1	Mundhe Chaitanya M	Institute of Chemical Technology	Synthesis and Development Polymer Composites	Dr. V. V. Shertukde
2	Nikam Pramod C.	UDCT, North Maharashtra University, Jalgaon	Thermally Stable Polymer Composites	Dr. V. V. Shertukde
3	Wazarkar Kunal Dattatray	Institute of Chemical Technology, Matunga	Utilization of biobased materials for coating applications	Dr. A. S. Sabnis
4	Fuke Chandan	Institute of Chemical Technology	Study of Electron beam and chemical crosslinked heat shrinkable sheets for Electronic application.	Prof. P. A. Mahanwar
5	Bhatnagar Manoj Praharaj	Institute of Chemical Technology	Polymer Nanofiber Synthesis and their Composites for Multitude Applications	Prof. P. A. Mahanwar
6	Karad Dnyandeep	Institute of Chemical Technology	Fiber Reinforced Composites.	Prof. P. A. Mahanwar
7	Mali Manoj	Institute of Chemical Technology	Development of Polymer Composites	S. T. Mhaske

8	Lal Sumit	UDCT, NMU, Jalgaon	Modification of Biopolymer and its Potential Application for Sustainable Developments	S. T. Mhaske
9	Patil Ajit	UICT NMU, Jalgaon	Modification of Biopolymers by Atom Transfer Radical Polymerization Technique.	S. T. Mhaske
10	Phalak Ganesh	UICT NMU, Jalgaon	Modification of renewable materials as a green alternative for petrochemical based materials used in coating applications	S. T. Mhaske
11	Patil Deepak	UICT NMU, Jalgaon	Utilization of Biomaterials for Coating Applications	S. T. Mhaske
12	Tated Sumit	Institute of Chemical Technology	Modification & Application of Biopolymers	S. T. Mhaske
13	Rishabh Chaudhary	Institute of Chemical Technology	Intergated biorefinery for production of kafrin and evaluation of biopolymer application	S. T. Mhaske
14	Swapnil Kokate	Institute of Chemical Technology	Developement of sustainable technologies in polymer and chemical engineering	S. T. Mhaske
15	Arjit Gadgeel	Institute of Chemical Technology	Stimuli responsive polymers in intelligent devices	S. T. Mhaske
16	Wagh Santosh	North Maharashtra University, Jalgaon	Development Novel Multifunctional Additives	Prof. R.N.Jagtap
17	Nakula S.Bhutad	Institute of Chemical Technology	Synthesis of Micro-encapsulation and its applications	Prof. R.N.Jagtap
18	A.R.Rao	Institute of Chemical Technology	Study the synthesis, characterization and applications for copolymers by CRP technique	Prof. R.N.Jagtap

19	Amarjeet Patil	UDCT Jalgaon	Study the synthesis, characterization and applications for copolymers by living radical polymerization technique	Prof. R.N.Jagtap
20	Pratiket Bamane	Institute of Chemical Technology	Placing functionality to coating	Prof. R.N.Jagtap
21	Amadas Garje	Institute of Chemical Technology	Bio-based coating for textile application	Prof. R.N.Jagtap
22	Mustafa Kapadia	Institute of Chemical Technology	Novel resin of radiation curable coatings	Prof. R.N.Jagtap

RESEARCH PROJECTS PH.D. (SCIENCE)

Sr.	Name of Student	Previous Institute	Title	Guide
1	Bansode Savita	Institute of Chemical Technology	Biodegradable & Biocompatible polymer nanofiber for scaffold.	Prof. P. A. Mahanwar
2	Priyanka Oberoi	Mumbai University		Prof. P. A. Mahanwar
3	Singh Hitesh K	Mumbai University	Shape selective isolation and surface chemical modification of nanocellulose	Dr. S. T. Mhaske

M. TECH. SEMINARS (2017-19) POLYMER AND SURFACE COATING

Sr. No.	Students Name	Roll Number	Seminar Topic	Guide
1	R. Jeganathan	17sur208	Tackifiers	Prof. R.N. Jagtap
2	Bhagyashree Waghmare	17sur205	Hollow Particles For Antireflective Coatings	Prof. R.N. Jagtap
3	Abhijit Das	17sur201	Automotive Adhesives	Prof. R.N. Jagtap
4	Aishwariya Deshmukh	17sur202	Anti-Graffiti Coatings	Prof. R.N. Jagtap
5	Debarati Maity	17pol203	Life Cycle Analysis Of Pvc	Prof. R.N. Jagtap
6	Sabyasachi Behera	17pol215	Recent Advancements In Catalysts For Polyesterification	Prof. R.N. Jagtap
7	Vidula Ramduguwar	17pol218	Microencapsulation For Controlled Pesticide Release	Prof. R.N. Jagtap
8	Ahmad Hamza	17pol201	Negative Aspects Of Biodegradable Polymers	Prof. R.N. Jagtap
9	Sonam Pratik Khuntia	17pol217	Associative Pu Thickners	Prof. R.N. Jagtap
10	Gauri Deshmukh	17pol207	Recent Developments In Low Temperature Curing	Prof. R.N. Jagtap
11	Rusabh Ghadage	17sur211		Prof. R.N. Jagtap
12	Akshay Deshmukh	17sur204	3d Printing Technology	Prof. R.N. Jagtap

13	Dwij K Dave	17pol205	Life Cycle Analysis Of Plastic Pipes	Prof. R.N. Jagtap
14	Ajay Patil	17sur203	Auto Deposition Coatings	Prof. R.N. Jagtap
15	G S Jyotidarshan Mohanty	17pol206	Centrifugal Melt Spinning And Its Advantages	Prof. R.N. Jagtap
16	Kamalkanta Maikap	17pol209	Ceramic/Hybrid Membrane	Prof. R.N. Jagtap
17	Milind Suryawanshi	17sur209	Recent Adavancements In Intumescent Coatings	Dr. A. S. Sabnis
18	Anurag Gupta	17sur214	Recent Advances In Silicon Emulsions	Dr. A. S. Sabnis
19	Deepali Patil	17sur206	Recent Advances In Superhydrophobic Coatings	Dr. A. S. Sabnis
20	Harsh Pandya	17pol208	Advances In Non-Isocynate Polyurethanes	Dr. A. S. Sabnis
21	Rahul Singh	17pol214	Advances in bio diesel process	Dr. A. S. Sabnis
22	Shruti Parkhe	17pol216	Recycling Of Polyurethane	Dr. A. S. Sabnis
23	Shailesh More	17sur212	Advances In Antireflective Coatings	Dr. S. T. Mhaske
24	Shubham Potdar	17sur213	Recent Advances In Anti-Biofouling Coatings	Dr. S. T. Mhaske
25	Pooja Deore	17sur210	Recent development in stone wood coatings	Dr. S. T. Mhaske
26	Priyanka Mojad	17pol213	Polymer Synthesis Using Cavitation	Dr. S. T. Mhaske
27	Pratik Sanjiv Kasbe	17pol212	Dynamic Vulcanisation Of Pp/Epdm Blends Using Extrusion	Dr. S. T. Mhaske
28	Devesh Kothari	17pol204	Recent Adavancement In Sol-Gel Technique	Dr. S. T. Mhaske
29	Omkar Borde	17pol211	Cellulose Modifications	Dr. S. T. Mhaske
30	Animesh Kumar	17pol202	Conductive Polymers For Anti-Corrosive Applications	Dr. S. T. Mhaske
31	Nagarajan Iyer	17pol210	Recent Trends In Biodegradation Of Polymers	Dr. S. T. Mhaske

M. TECH. PROJECT POLYMERS

Roll Number	Name	Research Project Topics	Research Guide
17POL201	Ahmad Hamza	Study of Conducting Polymers for Anti-corrosive Applications	Dr. S.T. Mhaske
17POL202	Animesh Kumar	Biodegradation of Saturated Polyesters	Prof. Dr. R.N. Jagtap
17POL203	Debarati Maity	Development of New Monomer for Anti-microbial Activity	Dr. A.S. Sabnis
17POL204	Devesh Kothari	Recycling of PET	Prof. Dr. R.N. Jagtap

17POL205	Dwij K Dave	Synthesis of Flame Retardant Epoxy Precursor	Dr. S.T. Mhaske
17POL206	G S Jyotidarshan Mohanty	Dynamic Vulcanization of TPV using Twin Screw Extrusion	Dr. S.T. Mhaske
17POL207	Gauri Deshmukh	Studies in Controlled Release Formulations of Pendimethalin and it's Appliaction as Herbicide Agrochemicals	Prof Dr. P.A. Mahanwar
17POL208	Harsh Pandya		Prof Dr. P.A. Mahanwar
17POL209	Kamalkanta Maikap	Synthesis of Hybrid Nano Fiber Nano Filler Thermoset Composites	Prof Dr. P.A. Mahanwar
17POL210	Nagarajan Iyer	Synthesis of a Biodegradable Polymer	Prof. Dr. R.N. Jagtap
17POL211	Omkar Borde	Oxodegradable Polypropelene	Prof. Dr. R.N. Jagtap
17POL212	Pratik Kasbe	Silica Modified Natural Rubber based Adhesives	Prof. Dr. R.N. Jagtap
17POL213	Priyanka Mojad	Recycling of Polyurethanes and Optimisation of Reaction Parameters	Dr. A.S. Sabnis
17POL214	Rahul Singh		Prof Dr. P.A. Mahanwar
17POL215	Sabyasachi Behera	Aqueous PU Dispersion for Construction Applications	Prof Dr. P.A. Mahanwar
17POL216	Shruti Parkhe	Preparation of Anti-Slip Masterbatch using Recycled PET	Prof. Dr. R.N. Jagtap
17POL217	Sonam Pratik Khuntia	Hot Melt Adhesives	Dr. S.T. Mhaske
17POL218	Vidula Ramdugwar	Development of Bio-Based Non-Isocyanate Polyurethanes for Coating Applications	Dr. A.S. Sabnis

M. TECH. PROJECT SURFACE COATING

Roll No	Name	Research Project Topics	Research Guide
17SUR201	Abhijit Das	Studies in Synthesis of High Resillience Self Crosslinked Arcylic Emulsion for Coatings	Prof Dr. P.A. Mahanwar
17SUR202	Aishwariya Deshmukh	Super Hydrophobic Coatings	Dr. A.S. Sabnis
17SUR203	Ajay Patil	Self Healing Coatings	Dr. S.T. Mhaske
17SUR204	Akshay Deshmukh	Water Reducible Alkyd for Flame Retardant Coatings	Dr. S.T. Mhaske
17SUR205	Bhagyashree Waghmare	Study and Synthesis of Non-Isocyanate Polyurethane Dispersion	Prof Dr. P.A. Mahanwar
17SUR206	Deepali Patil	Microencapsulation of Super Absorbent Polymer for Intumescent Coatings	Prof. Dr. R.N. Jagtap
17SUR208	R Jegananthan	Synthesis of UV curable Polyester for Anti Fog Application	Dr. A.S. Sabnis
17SUR209	Milind Suryawanshi	Synthesis of Bio-Based Polyurethanes Coatings	Prof. Dr. R.N. Jagtap
17SUR210	Pooja Deore	Self Crosslinkable Acrylic Emulsions for Textile Coatings	Prof Dr. P.A. Mahanwar
17SUR211	Rushabh Ghadage		Dr. S.T. Mhaske
17SUR212	Shailesh More	Super Hydrophobic Coatings	Dr. A.S. Sabnis
17SUR213	Shubham Potdar	Development of a Food Spoilage Indicator	Prof. Dr. R.N. Jagtap
17SUR214	Anurag Gupta	Anti-Reflective Coatings	Prof. Dr. R.N. Jagtap

PLACEMENT AND HIGHER STUDIES B.TECH POLYMER

Sr No	Name	Roll Number	Placed At	Package	Remarks
1	Kotwal Gargee Mahendra	13POL1015	Tata Institute of Social Science	0	MBA/M.A in HRM
2	Gimekar Arhant Narayan	13POL1017			
3	Jilka Anshal Anil	14POL1001	UMass Lowell	0	MS
4	Shetty Praneeta Shantharam	14POL1002	Pidilite Industries	6,00,000	
5	Lokhande Monika Nivrutti	14POL1003	Sudarshan Chemicals Ltd.	4,00,000	
6	Aishwarya Chandrashekar	14POL1004	University of Michigan Ann Arbor	0	MS

7	Devavrat Sathe	14POL1005	University of Akron	$25,000 P.A. (plus tuition waiver)	PhD (Polymer Science)
8	Chogale Ritesh Ramesh	14POL1006	Marico	6,00,000	
9	Miranda Jennifer Roque	14POL1007	SPJIMR	0	MBA
10	Natu Aditya Shripad	14POL1008	Pidilite Industries Limited	6,00,000	
11	Porwal Mayuri Kiran	14POL1010	University of Minnesota Twin Cities	31000 per annum.	PhD Materials Science and Engineering
12	Jain Rishi Sunil	14POL1011	Indofil Industries Ltd.	5,50,000	Off- Campus
13	Kulkarni Shashwat Nishant	14POL1012	TINI, TATA Trusts	6,60,000	District Lead (Prerak)
14	Khare Priyanka Vasant	14POL1013			
15	Mantri Pratik Nandkishor	14POL1015	Marico	6,00,000	Rejected the offer, Doing Mtech
16	Shah Umang Manish	14POL1016	Virginia Tech	0	M.Eng
17	Khandelwal Umang Rajesh	14POL1017	University of Mississippi	0	MS

PLACEMENT AND HIGHER STUDIES B.TECH SURFACE COATINGS

Sr No	Name	Roll number	Placed At	Package	Remarks
1	Shembekar Aditya Prakash	13SUR1006	Sherwin Williams	3,60,000	
2	Negi Shivam	14SUR1001	Indofil	5,50,000	
3	Agrawal Aparna Arun	14SUR1002	University of Akron	25,000 dollars	PhD (Polymer Engineering)
4	Prachi Jha	14SUR1003	BASF	10,00,000	
5	Gotad Pratik Santosh	14SUR1004	Pidilite industries	6,00,000	
6	Anirudh Venugopal	14SUR1005	UpGrad Education Pvt Ltd	4,50,000	Off-campus
7	Pande Varun Anandkumar	14SUR1006			
8	Metkari Ashlesha Shivaji	14SUR1007	Aditya Birla Group	6,00,000	

9	Amrutkar Shweta Yashwant	14SUR1008	Akzononbel	3,00,000	Off-campus
10	Padhye Varun Sandeep	14SUR1009	ExxonMobil	8,88,000	
11	Mhatre Sampanna Vikas	14SUR1010	Aditya Birla Group (Chemicals)	6,00,000	
12	Raiter Prathamesh Dipak	14SUR1011	Cornell University	0	MS in Materials Science and Engineering
13	Kamble Aniket Chandramani	14SUR1013	Indofil Industries	5,50,000	
14	Shah Anurag Naynesh	14SUR1016			
15	Maurya Devendra Surendrakumar	14SUR1017	University of Pennsylvania	0	MS (Chemistry)

PLACEMENT AND HIGHER STUDIES M.TECH POLYMER

Roll Number	Name	Job/PhD.	Placement	CTC
16POL201	Abhinayaa N.	PhD	Higher Studies	
16POL202	Anup Mule	Job	Kansai Nerolac Ltd	6
16POL203	Ingita Tiwari	Job	Indofil	6.5
16POL205	Karan Chugh	Job	Indokem Ltd.	5.8
16POL206	Komal Wagh	Job	Henkel Adhesives	9.87
16POL207	Kunal Wadgaonkar	PhD	Higher Studies	
16POL208	Linchon Mehta	Job	SRF Ltd.	6.6
16POL209	Megh Patel	Job	Hindustan Speciality Chemicals	5.5
16POL210	Nivedita Nandanwar	Job	Henkel Adhesives	9.87
16POL211	Parth Sheth	Job	KEC International	5.8
16POL212	Prakash Nal	Job	Saint Gobain Industries	5
16POL213	Prashil Desai	Phd	Higher Studies	
16POL214	Raj Chavda	Job	Indokem Ltd.	5.8
16POL215	Sakshi Arora	Job	Kansai Nerolac Ltd	6.5
16POL216	Siddhi Shah	Job		

PLACEMENT AND HIGHER STUDIES M.TECH SURFACE COATING

Roll No	Name	Job/Phd	Placement	CTC
16SUR201	Anand Dixit	PhD	Higher Studies	
16SUR202	Devam Ponda	Job	Kansai Nerolac	6
16SUR203	Hemant Khandagale		Higher Studies	
16SUR204	Neha Golhar	Job	Kansai Nerolac	6

16SUR205	Shubham Kharat	Job	Kansai Nerolac	6
16SUR206	Siddhant Varsheny	PhD	Higher Studies	
16SUR207	Vikram Shirsath	PhD	Higher Studies	
16SUR208	Umesh Tekale	Job	Kansai Nerolac	6
16SUR209	Sumit Parvate	PhD	Higher Studies	
16SUR210	Utkarsha Golwanshi	PhD	Higher Studies	

GOVERNMENT /PRIVATE GRANT RECIEVED:

No.	Sponsor	Title	Duration	Total Amount (Rs.)	Principal Investigator	Research Fellow
1	Ministry of Textile- BlueTex Pvt. Ltd.	Bio based coating for textile application	2 yrs	Rs. 34 lakhs	Professor R. N. Jagtap	Ambadas Garje
2	Pidilite Industries	Pickring emulsions for adhesive application	5 yrs	Rs. 20 lakhs	Professor R. N. Jagtap	Rajesh Prabhu
3	Evonik Industries	Placing Functionality to coatings	4 Year	Rs. 17 lakhs	Professor R. N. Jagtap	Pratiket Bamane
4	BRNS	High energy radiation assisted depolymerization of polyethylene terephthalate for coating applications	3 years (2012-2015)	21,00,000/-	Dr. Anagha Sabnis	Vandana Jamdar (Ph.D. Tech)
5	Indian Council of Agricultural Research (ICAR),Govt. of India	Feasibility of PTA substituting IPA to the extent possible in the manufacturing of lamination adhesive	6 months	Rs 14.00/- Lakhs	Professor R. N. Jagtap	

6	Board of Research in Nuclear sciences (BRNS), DAE, Govt. of India	Development of volatile organic compound (VOC) free radiation indicator labels along with prototype product manufacturing	3 years (March 2012 to 2015)	Rs 24.50/- Lakhs	Dr. Shashank T. Mhaske	
7	DST- TIFAC New Delhi (2011-15)	Survey of Medium, small and micro Enterprenurs in Plastics at Dharavi Cluster, Mumbai	4 Year	Rs. 21,50,000:00	Prof. P. A. Mahanwar	
8	AICTE New Delhi(2013-16)	Development of Conducting Polymer nanofibers by Electrospinnig and Polymer Nano fiber composites for Fuel Cells	3 Year	Rs. 9,90,000:00	Prof. P. A. Mahanwar	
9	BRNS(2014-17)	Development of Heat Shrinkable cable and sheets for electrical and electronic application	3 Year	Rs. 35, 00, 000	Prof. P. A. Mahanwar	
10	DST/FIST(2007-11)	Infrastructure Development at department of Polymer and Surface Engineering	3 Year	Rs. 45,00,000	Prof. P. A. Mahanwar	

11	DST/FIST(2013-15)	Infrastructure Development at department of Polymer and Surface Engineering	2 Year	Rs. 1, 25,00,000	Prof. P. A. Mahanwar	
12	RGST(2015-2018)	Development of Controlled Release formulations of Agrochemicals	3 Year	Rs. 53,00,000	Prof. P. A. Mahanwar	
13	Reliance Industries Ltd	Shortcut PET fibres in high performance Coating	6 month	11 lakhs		
14	Colors	Novel resins for uv radiation curing	4 year	20 lakh		
15	M/S Shah Petroleum Ltd.	Development of green plasticizer as replacement to phthalate base plasticizer	4 year	48 lakh		
16	DRDO	Development of Phase Change Polymers as Maitainance Free Thermal Energy Storage Material	3 year	22.22 lakh		
17	SDKDCH, Nagpur	Development of Mineral Trioxide Aggregates	3 year	19.5 lakh		
18	Unilever Industries Limited	Biopolymers for Responsible Growth	1 year	13.6 lakh		
19	Evonik India Ltd.	Responsive Polymer Based Intelligent Devices	3 year	22 lakh		

20	DBT-ICT Centre for Energy Biosciences (DBT-ICT-CEB)	Integrated biorefinery for production of sorghum seed protein	3 year	1.13 Cr		
21	Unilever Industries Limited	Shape selective isolation and surface modification of nanocellulose	3 year	36.25 Lakh		
22	Department of Science & Technology DST (MoFPI)	Synthesis and characterization of nano-cellulose and its application in biodegradable polymer composite films for food packaging	4 year	32.73 lakh		

PUBLICATIONS

No.	Title and Authors	Journal	Vol. No.	Pages	Year
1.	Design and UV-curable behaviour of boron based reactive diluent for epoxy acrylate oligomer used for flame retardant wood coating Gunawant P. Lokhande, Sachin Chambhare, R.N. Jagtap*	Designed monomers and polymers	20	125-135	2017
2.	Synthesis and properties of phosphate-based diacrylate reactive diluent applied to UV-curable flame-retardant wood coating. Gunawant P. Lokhande, Sachin Chambhare, R.N. Jagtap*	Journal of Coatings Technology and Research	14	255-266	2017
3.	Effects of incorporated imine functionality and dispersed nano zinc oxide particles on antimicrobial activity synthesized by RAFT polymerization. Sachin Chambhare, Gunawant P. Lokhande, R.N. Jagtap*	Polymer Bulletin	74	1421-1439	2017

4.	Anionic water-based polyurethane dispersions for antimicrobial coating application Sachin Chambhare, Gunawant P. Lokhande, R.N. Jagtap*	Polymer Bulletin	74	4781-4798	2017
5.	Microstructural, thermal and rheological correlations to mechanical response of polyamide-6 (glass filled)/ polyetherimide blend effect of ethylene-octene copolymer. R.N.Jagtap, LB Mehta, KK Wadgaonkar,PB Bamane, PK Ramamoorthy	Journal of Materials Science	888	11378-11392	2018
6	Ultrasound and Conventional Synthesis of Ceo2/Zno Nanocomposites and Their Application in the Photocatalytic Degradation of Rhodamine B Dye, Shah, Nidhi; Bhangaonkar, Karan; Pinjari, Dipak V; Mhaske, Shashank T;	Journal of Advances in Nanomaterials	2 (3)	133 -145	2017
7	Studies of different techniques of aminolysis of poly (ethylene terephthalate) with ethylenediamine, More, Aarti P; Kokate, Swapnil R; Rane, Pradnya C; Mhaske, Shashank T;	Polymer Bulletin	74 (8)	3269-3282	2017
8	Hot Melt Adhesives from Renewable Resources, Utekar P, Gabale H, Khandelwal A, Mhaske ST.	Progress in Adhesion and Adhesives	June 23	101-14	2017
9	Synthesis and characterization of bio-based benzoxazine oligomer from cardanol for corrosion resistance application, Patil DM, Phalak GA, Mhaske ST.	Journal of Coatings Technology and Research	14 (3)	517-30	2017

10	Synthesis of a secondary plasticizer for poly (vinyl chloride) by recycling of poly (ethylene terephthalate) bottle waste through aminolytic depolymerization, Shukla SR, Kapadi PU, Mhaske ST, Mali MN, More A.	Journal of Vinyl and Additive Technology	23 (2)	152 - 60	2017
11	Enhancement of anti-corrosive performances of cardanol based amine functional benzoxazine resin by copolymerizing with epoxy resins, Patil DM, Phalak GA, Mhaske ST.	Progress in Organic Coatings	105	18-28	2017
12	Kafirin polymer film for enteric coating on HPMC and Gelatin capsules, Lal SS, Tanna P, Kale S, Mhaske ST.	Journal of Materials Science	52 (7)	3806-20	2017
13	Synthesis and characterization of thermally curable guaiacol based poly (benzoxazine-urethane) coating for corrosion protection on mild steel, Phalak GA, Patil DM, Mhaske ST.	European Polymer Journal	88	93-108	2017
14	Synthesis of bio-based epoxy resin from gallic acid with various epoxy equivalent weights and its effects on coating properties, Patil DM, Phalak GA, Mhaske ST.	Journal of Coatings Technology and Research	14(2)	355-65	2017
15	Rheological analysis of dough prepared with lentil flour at different moistures for production of extruded products, Rathod RP, Gaikwad SB, Mhaske ST, Annapure US.	Journal of Food Measurement and Characterization	11 (1)	164- 72	2017
16	Influence of triallyl cyanurate as co- agent on gamma irradiation cured high density polyethylene/ reclaimed tire rubber blend, Mali MN, Arakh AA, Dubey KA, Mhaske ST.	Radiation Physics and Chemistry	131	66-72	2017

17	Synthesis of tetra(2,2-hydroxyethylene) terephthalamide from PET waste and its application in synthesis of polyesteramide coating, Pradnya C. Rane, Aarti P. More, Shashank T. Mhaske,	Pigment & Resin Technology	46(1)	40-47	2017
18	Design and synthesis of bio-based UV curable PU acrylate resin from itaconic acid for coating applications. Designed Monomers and Polymers, Patil DM, Phalak GA, Mhaske ST.	Designed Monomers and Polymers	20 (1)	269-82	2017
19	AgBr and AgCl nanoparticle doped TEMPO-oxidized microfiber cellulose as a starting material for antimicrobial filter, SS Lal, ST Mhaske	Carbohydrate polymers	191	266-279	2018
20	Satavalekar, S.D., Savvashe, P.B., Mhaske, S.T. Triester-amide based on thiophene and ricinoleic acid as an innovative primary plasticizer for poly(vinyl chloride)	RSC Advances	6-(116)	115101-115112	2016
21	Yeole, K.V., Agarwal, I.P., Mhaske, S.T. The effect of carbon nanotubes loaded with 2-mercaptobenzothiazole in epoxy-based coatings.	Journal of Coatings Technology Research	13-(1)	31-40	2016
22	KV Yeole, LH Mahajan, ST Mhaske	Polymer Composites	3 (2)	186-190	2015
23.	PG Nihul, ST Mhaske#, VV Shertukde	Iranian Polymer Journal, ,	23 (8)	599-608	2015
24.	KV Yeole, LH Mahajan, ST Mhaske	Polymer Composites	3 (2)	186-190	2015
25.	Aarti More, Ravindra kute, Shashank Mhaske	Pigment and Resin Technology	23(11)	869-879	2015
26.	Aarti P. More, Ravindra A. Kute & Shashank T. Mhaske	Iranian Polymer Journal	23(1)	59-67	2015

27.	Preparation and analysis of novel hydrogels prepared from the blend of guar gum and chitosan: cross-linked with glutaraldehyde, S. S. Rithe, P. G. Kadam and S. T. Mhaske*	Advances in Materials Science and Engineering: An International Journal (MSEJ)	1	-	2014
28.	Synthesis of a secondary plasticizer for poly(vinyl chloride) by recycling of poly(ethylene terephthalate) bottle waste through aminolyticdepolymerization, S. R. Shukla*, P. U. Kapadi, S. T. Mhaske, M. N. Maliand A. More.	Journal of Vinyl and Additive Technology	-	-	2015
29.	Ester-amide based on ricinoleic acid as a novel primary plasticizer for poly(vinyl chloride), P. B. Savvashe, P. G. Kadam, S. T. Mhaske.	Journal of Applied Polymer Science	-	1-12	2015
30	Epoxidized rice bran oil (ERBO) as a plasticizer for poly(vinyl chloride) (PVC) , Pratiksha G. Nihul, Shashank T. Mhaske, Vikrant V. Shertukde	Iranian Polymer Journal	23	599-608	2014
31	Synthesis and Characterization of Imide Containing Hybrid Epoxy Resin with Improved Mechanical and Thermal Properties, U.G.Rane, A.A.Sabnis1, and V.V.Shertukde	International Journal of Polymer Science			2014
32.	Synthesis and characterization of slip additive functioning as an intercalating agent, Prarthana U. Dhanvijay, Vaishnav D. Gharat, Vikrant V. Shertukde	International Journal of Plastics Technology	18	100-112	2014
33.	Wazarkar K., Kathalewar M., Sabnis A., Flammability behavior of unsaturted polyesters modified with novel phosphorus containing compounds	Polymer Composites	In press	-	2015

34.	Wazarkar K., Kathalewar M., Sabnis A., Improvement in flame retardancy of polyurethane dispersions by newer reactive flame retardant	Progress in Organic Coatings	In press	-	2015
35.	Wazarkar K., Kathalewar M., Sabnis A., Reactive Modification of Thermoplastic and Thermoset Polymers Using Flame Retardants: An overview	Polymer-Plastics Technology and Engineering	In press	-	2015
36.	Mehta, B., Kathalewar, M., Sabnis, A., Cyclic Carbonated Soyabean Oil as Plasticizer for PVC for Replacing Di-octyl Phthalate	Journal of Polymer Materials	31	17-29	2015
37.	Kathalewar, M., Sabnis, A., Effect of molecular weights of phenalkamines on the curing, mechanical, thermal and anticorrosive properties of epoxy based coatings	Progress in Organic Coatings	84	79-88	2015
38	RAFT copolymerization of amphiphilic poly (ethyl acrylate-b-acrylic acid) as wetting and dispersing agents for water borne coating, Saindane, P., Jagtap, R.N. Designed Monomers and Polymers	Progress in Organic Coatings	79	106-114	2015
39	Surface morphology & mechanical properties of some unique natural fibber reinforced polymer composites-a review Pai A.R., Jagtap, R.N.	Journal of Materials and Environmental Science	6	902-917	2015
40	Designing of cardanol based polyol and its curing kinetics with melamine formaldehyde resin, Balgude, D.B., Sabnis, A.S., Ghosh, S.K.	Designed Monomers and Polymers	20(1)	177 -189	2017

41	Synthesis and characterization of cardanol based reactive polyamide for epoxy coating application, Balgude, D., Sabnis, A., Ghosh, S.K.	Progress in Organic Coatings	104	250-262	2017
42	High performance polyurea coatings based on cardanol, Wazarkar, K., Kathalewar, M., Sabnis, A.	Progress in Organic Coatings	106	96-110	2017
43	Investigation of cardanol-based reactive polyamide as a crosslinker in epoxy zinc-rich primer, Balgude, D., Sabnis, A., Ghosh, S.K.	Journal of Coatings Technology Research	14 (3)	583-595	2017
44	Recycling of PET wastes using Electron beam radiations and preparation of polyurethane coatings using recycled material, Jamdar, V., Kathalewar, M., Dubey, K.A., Sabnis, A.	Progress in Organic Coatings	107	54-63	2017
45	Flammability behavior of unsaturated polyesters modified with novel phosphorous containing flame retardants, Wazarkar, K., Kathalewar, M., Sabnis, A.	Polymer Composites	38(7)	1483-1491	2017
46	Anticorrosive and insulating properties of cardanol based anhydride curing agent for epoxy coatings, Wazarkar, K., Kathalewar, M., Sabnis, A.	Reactive and Functional Polymers	122	148-157	2018
47	Glycolytic depolymerization of PET waste using MP-diol and utilization of recycled product for UV-curable wood coating, Jamdar, V., Kathalewar, M., Sabnis, A.	Journal of Coatings Technology Research	15(2)	259-270	2018

48	Effect of pendant functional groups on curing kinetics and final properties of cardanol-based benzoxazines, Wazarkar, K., Sabnis, A.	Journal of Coatings Technology Research	15(3)	555-569	2018
49	Cardanol based anhydride curing agent for epoxy coatings, Wazarkar, K., Sabnis, A.	Progress in Organic Coatings	118	9-21	2018
50	Depolymerization Study of PET Waste Using Aminoethylethanolamine and Recycled Product Application as Polyesteramide Synthesis, Jamdar, V., Kathalewar, M., Sabnis, A.	Journal of Polymers and the Environment	26(6)	2601-2618	2018
51	Synergistic effect of P–S and crosslink density on performance properties of epoxy coatings cured with cardanol based multifunctional carboxyl curing agents, Wazarkar, K., Sabnis, A.	Reactive and Functional Polymers	128	74-83	2018

PATENTS

No.	Inventors	Title	Country	Funding Agency
1.	Mhaske Shashank Tejrao Kadam Pravin Gopal Vaidya Parth Nitin Savvashe Prashant Bhairavnath	Novel poly(ester-amide) hot melt adhesive using castor oil. Patent No : 128/ MUM/2015	India	POLYFIBRE LIMITED
2..	Mhaske Shashank Tejrao, Kadam Pravin Gopal, Vaidya Parth Nitin, Savvashe Prashant Bhairavnath	Novel poly(ester-amide) hot melt adhesive using ricinoleic acid. Patent No : 127/ MUM/2015	India	POLYFIBRE LIMITED

IN-HOUSE FACULTY RESPONSIBILITIES (MEMBERSHIP OF VARIOUS IN-HOUSE COMMITTEES)

PROFESSOR R.N.JAGTAP

Arranging visiting faculties and visiting professors
Maintaining and refurbishment of the research labs
Smooth conduct of the class and practicals
Placement incharge

SHRI A.R.RAO

Timetable Committee
Factory visits coordinater
B.Tech Syllabus committee
Departmental Representative
Accreditation committee

DR. V. V. SHERTUKDE

Chairman Instrumentation committee
Inplant Training supervisor

DR. S. T. MHASKE

Instrumentation committee
TEQIP Coordinator

SEMINARS/LECTURES/CONFERENCES/SYMPOSIA/WORKSHOPS/ SUMMER OR WINTER TRAINING SCHOOLS ATTENDED/ORAL OR POSTER PRESENTATIONS

Nikesh Samarth won Young Researcher Awards at International Conference on Advances in Science and Engineering (ICASE 2017), Regent's International College, Bangkok, January 20 – 22, 2017.

Snehal Yedurkar won Best oral presentation award at International Conference on Advances in Science and Engineering (ICASE 2017), Regent's International College, Bangkok, January 20 – 22, 2017.

Sukanya Gangopadhyay, Arush Khanna, Madhumita Kulkarni and Prakash Mahanwar won Best Paper Awards at Fourth International Conference On Polymer Processing And Characterization 2016, International Unit on Macromolecular Science and Engineering (IUMSE) Mahatma Gandhi University, Kottayam, Kerala, India

Apurva Gaidhani won Best Poster Awards at Fourth International Conference On Polymer Processing And Characterization 2016, International Unit on Macromolecular Science and Engineering (IUMSE) Mahatma Gandhi University, Kottayam, Kerala, India

Sravya Nuguri Final Year Polymer

Runner-up in Kryotech-IIT Kharagpur for presenting the best design for polio vaccine storage.

- Winner in Industry Defined Problem for providing a solution to-"Develop a highly abrasion resistant and scratch resistance transparent coating for Polycarbonate Surfaces" for Crizal- Essilor Lens Company organised by VORTEX-ICT-2016.
- Runner-up at Environ, Kshitij- IIT Kharagpur-2016 for providing an effective way to reduce the carbon footprint via "Microalgal Carbon Sequestration"
- Winner in Papyrus Presentation Competition on the topic- "Depolymerisation of Brominated Epoxy and Polycarbonate using Ultrasonication technique".

Sumeet Gupta Final Year Coatings

Manifesto(Poster presentation, Vortex 2016) – 1st Prize

Dhawal Unune Final year PSE Asian Paints paper Competition- 1st Prize, OYCE Poster Presentation- 1st Prize,Rangotsav Poster-1st Prize, UMIT TPP- 1st Prize

Sainath Jadhav Final Year Polymer Industrial Defined Problem(Vortex 2016)-1st Prize

Abhinay Bhagat Final Year Polymer Duet Dance at Pratibhimb VJTI-1st Prize

Mayuri Porwal Third Year Polymer

Selected as prestigious S.N. Bose Scholar Programm, 2017

M.V.Joshi Platinum Jubilee Endowment Award (2016 for securing highest marks in SEM 1 and 2)

Professor M.A.Nabar Prize for standing first in Chemistry 2016

Pratik Mantri Third Year Polymer

Jr. Industry Defined Problem Vortex 2015 :1st Prize

EVENTS ORGANIZED

Sr. No.	Title of Workshop/Seminar/Conference	Speaker	Date of Event
1.	Advances in Polymers and coatings: Rangostav 2017	Plenary Lectures, Paper / Poster Presentations	18th March 2017
2	Saurdip Chemical industries Pvt Ltd.	Visiting Fellowship Lecture	22nd Sept 2017
3	Advanced Manufacturing Technology and New Materials	Plenary Lectures	22nd April 2016
4.	Advances in Polymers and coatings: Rangostav 2016	Plenary Lectures, Paper / Poster Presentations	6th February 2016

ADVANCES IN POLYMER & COATING – RANGOTSAV 2017

Chief Guest Dr. Shreekant Diwan

Inauguration

Technical Session I

Technical Session II

IDP Gudge Prof. M. A. Shenoy

Organizing Committee

INDUSTRIAL CONSULTANCY

Company	Area of Advice	Period	Faculty
Saint Gobain Ltd	Expert Advice	6 months	R.N. Jagtap
Neber Solutions Ltd	Expert Advice	3 months	R.N. Jagtap
Technova Imaging sys	Expert Advice	3 months	R.N. Jagtap
Krishna Chemicals and Paints	Expert Advice and Testing	1 year	R.N. Jagtap
Paulson paints	Testing	1 year	R.N. Jagtap
Hindustan org. Chem. Ltd.	Testing and Characterization	3 months	R.N. Jagtap
Vinatti organics	Testing and Characterization	2 years	R.N. Jagtap
Bhalendra Traders	Expert Advice	6 months	R.N. Jagtap
ICI	Expert Advice	6 months	R.N. Jagtap
TSIL	Expert Advice	6 months	R.N. Jagtap
Chemixil Corporation	Expert Advice	6 months	R.N. Jagtap
Enercon	Expert Advice	5 months	R.N. Jagtap
Indofil	Testing and characterization	1 year	R.N. Jagtap
Ishaan Industries	Testing and characterization	1 year	R.N. Jagtap
BASF	Expert Advice	6 months	R.N. Jagtap
SIB Associate	Expert Advice	6 months	R.N. Jagtap
Akzo Nobel	Testing	6 months	R.N. Jagtap
Sri. Vineer spot	Expert Advice	4 months	R.N. Jagtap
BASF	Expert Advice		Anagha S Sabnis
Pidilite Industries	Expert Advice		Anagha S Sabnis
Pidilite Industries	Expert Advice		Anagha S Sabnis

SHORT ABSTRACT ON SALIENT FEATURES OF RESEARCH WORK

GUIDE: PROFESSOR R. N. JAGTAP

Name of the student: Nakula Shekhar Bhutad

Title: Study of microencapsulation for various applications.

Degree: Ph. D. (Tech)

Abstract: Microencapsulation is a process in which tiny particles or droplets (solid, liquid or gases) are surrounded by a shell material to give small capsules, of many useful properties.

In this research work, microencapsulation technology was used for the following application:

To reduce the titanium dioxide in water- based paint by microencapsulated emulsion and solid powder particles having polystyrene and acrylics as wall material

Microencapsulation of photo-chromatic material for anti-counterfeit application in textile.

Microencapsulation of fragrances in different shell material for screen printing application.

Name of the student: Pratiket Bamane

Title: Placing Functionality for coating.

Degree: Ph. D. (Tech)

Abstract: The conventional coating additives enhance e.g. the colour stability of paint, enhances colour strength and adhesion to the coated well. To increase performance and avoid undesirable impact on other coating properties, additive needs to be at the right place, at the right time. Two types of functionalities are in action:

Functionalities pertaining to the quality of the coating and functionalities pertaining to the coating itself. The second type is less explored. Functionality which are explored in this research are:

- Water based non-halogenated adhesion promoter on untreated Polypropylene/ BOPP film. This additive will work at the interface of the coatings and will help to improve coating adhesion on PP/ BOPP surface.
- A hydrophilic additive, which will work on the top surface of the coating and enhance following properties like, easy to clean, stain resistant coatings.
- An additive which improves the ultra/low-temperature resistance of main coatings. Also enhance following properties like permeability, conductivity, IR-reflectance, water repellency.

Name of the student: Junaid Parker

Title: Bio-based coatings for textile application

Degree: M.Tech

Abstract: Textiles need to pursue some of the very finest properties for some specific and desired applications.

End-users are an important part of any technology in consideration. This research takes into consideration the ease of use and at the same time aims to achieve the robust properties for the textile coatings as possible. Primarily this is aimed to develop a coating that could be used for textile applications; more specifically being applied on polyester fabrics to enhance their end-user properties, such as breathability, being the primary and wash fastness to prove that the coating is worthwhile to be introduced to the field of textiles.

High-performance properties for textiles can provide better functionality for the end-user applications. Such properties can be tailored by applying coats to the parent or base fabric. Also, an addition of this functionality along with the added advantage of lower VOCs and decreased carbon footprint makes the reliability and usage more profound. Some unique functionality to add up to the performance of textiles with an added advantage of renewable sourced raw materials makes this research more worth, reliable and relevant to the field of science and technology of coatings as well as textiles.

This research aims at providing the mentioned properties by the implication of polyurethane, for the purpose of which the use of different polyols is being considered. But the aim could be better achieved by the use of polyester polyols as they provide the best properties which are expected to be introduced into the coating by the use of polyurethane. Also, the aim of reducing the VOCs in the product being used for textile coating made us to think beyond just polyurethanes, thereby producing polyurethane dispersions.

Polyester polyols were synthesized using diacids and diols & triols which included succinic acid, adipic acid, 1,4-butanediol, 1,3-butanediol, neopentyl glycol, 1,6-hexanediol and glycerol. These were further used to produce polyurethane using diisocyanate which included Isophorone diisocyanate and 1,6-hexamethylene diisocyanate. These were further introduced to neutralization reaction between dimethylol propionic acid; reacted with polyurethane, in-situ; and triethyl amine. After the stability tests for the polyurethane dispersions, there were converted to textile coatings using the various other elements that render the polyurethane dispersion to be used as a coating, without which the viscosity and thereby the thickness of the textile coating would not have been maintained in the desired range

Name of the student: Kunal Wadgaonkar

Title: Biodegradation of unsaturated polyester resins.

Degree: M.Tech

Abstract: Polymers are the materials most widely used in almost all fields. The beauty of this material is its huge range of properties that can be altered as per the demands of engineering. polymers exhibit innumerable properties like high strength to weight ratio, special electrical properties, resistance to chemicals, amenability for quick and mass production and for fabrication into complex shapes in a wide variety of colors. However, such a high and ever

increasing demand leads to deposition of huge waste into the environment causing threat. Thermosetting materials like unsaturated polyester resin (UPR) is unrecyclable. The project deals with development of some potential material to degrade UPR. Enzyme like lipase can hydrolyse UPR to degrade. This lipase was incorporated by immobilization via microencapsulation and adsorption. Microencapsulated enzyme within polystyrene shell proves to be more efficient than enzyme adsorbed onto PVC powder. The immobilized enzyme was incorporated into UPR resin and exposed to UV radiation for degradation. UV radiation breaks polystyrene and PVC to release enzyme which then hydrolyses the ester bonds leading to random scission. Random scission thus reduces the average molecular weight which can be traced from reduction in mechanical strength of the material. The immobilized enzyme have been studied under optical microscopy and thermogravimetric analysis (TGA). Also, the effect of addition of filler into UPR matrix have been studied based on change in color coordination, change in brookfield viscosity, curing kinetics and mechanical properties like tensile strength and surface hardness. It was concluded that incorporation of immobilized enzyme via microencapsulation deteriorates the tensile strength by 22% in one month of UV exposure.

Name of the student: Lincon Mehta

Degree: M.Tech

Abstract: Melt mixed Glass filled Polyamide 6(PA6)/ Polyetherimide (PEI) blends were prepared in a co-rotating twin screw extruder over the entire composition range of 0-100 wt. % of Polyamide 6. These blends were characterized by structural, rheological, mechanical and thermal properties. Crystallization behavior and phase morphology of the blends were also investigated. The blend with the composition PA6/PEI 75/25 showed overall improved mechanical properties along with low resultant viscosity which can be processed on standard equipment. Shear viscosity along with shear stress of the blends were analyzed using shear rheometer which concluded that the blends can be processed on standard equipment due to resultant low viscosity. Scanning electron microscope micrographs revealed that the morphology of the blends showed a two phase structure in which the minor phase was dispersed as domains in the continuous phase. Polyolefin elastomer (POE) as impact modifier was added to the above composition in the range of 0-15 phr to study its effect. The thermal characteristics of PA6, PEI, and PA6/PEI blends with and without POE were investigated using DSC and TGA which revealed that the melting temperature and crystallization temperature of the blend remained unchanged while XRD results showed percent crystallinity was increased slightly. Furthermore, it can be said that the blend with composition PA6/PEI 75/25 with 10 phr impact modifier loading was suitable for high end applications because it combines the high mechanical properties of glass filled PA6 with inherent flame retardant property of PEI while POE overcomes the physical weakness of moisture absorption.

Name of the student: Nivedita Nandanwar

Degree: M.Tech

Abstract: The architectural coatings industry has great change over the last ten years. Now a day's coatings have a much different raw material base and different properties. Architectural coatings include interior or exterior paints, sealers, and specialty coatings used for stationary structures and their appurtenances building and construction applications for example walkways, pavement, floors, roofs, decks. Architectural coatings provides a protective and decorative layer on the surface.

Conventional Polyethylene terephthalate (PET) polyester synthetic fibres generally used in textile industry and also used in composites, insulation, drive belt, rubber hoses, rubber mounting, adhesives, sealants, carpets, mats, construction etc. In this study, Polyethylene terephthalate fibers used in paint industry. Surface of polyester fibers were modified with surface modifying agent at various concentrations and characteristics of polyester fibers

were investigated. Modified PET fibres exhibit superior properties such as reinforcement, flexibility, hydrophilicity, adhesion, minimize shrinkage and permeability. The major problems faced by paint industry is the use of volatile organic compound in solvent based paint. A possible solution for this problem is to use water based paint instead of solvent based paint. Water based acrylic paints are mainly used for decoration, and protection purpose from natural weathering process.

The aim of this research is to incorporate modified polyethylene terephthalate (PET) fibres in paint for enhancing the coating properties like Coverage area, Self-cleaning, Water proofing, Heat Management, Mechanical properties, Fire retardant, Anti-reflective, Pencil hardness, Adhesion, Gloss, Colour value, Stain resistance.

Name of the student: Prashil Desai

Title: Purified terephthalic acid based polyurethane resin incorporated by pet fibers for strippable coating

Degree: M.Tech

Abstract: Corrosion is the biggest issue that the world is facing today. Every year there is a step increase in the loss of billions of dollars, in order to tackle this critical issue many coating systems have been developed and used, out of which Power Coating was widely accepted in dealing with corrosion. It has been in great demand since last two decades. In this research with the aim of developing new coating system different from the conventional one used today world i.e. Powder Coating. We have derived this new anti- corrosion coating system where polyol of Terephthalic acid and Sebacic Acid were blended and polyester polyol was synthesized which was later incorporated by PET staple fibers. Fibers were well dispersed in the polyester polyol and further cured by Isocyanates (NCO) developing a new coating system. Terephthalic Acid along with PET staple fibers scale up the mechanical and chemical properties of the system where as Sebacic acid provide flexibility to the coating. Additional advantage given by the orientation of PET fibers is the development of solvent free Strip Coating. The coating can be easily zipped of from one end, which makes it more suitable for health and environment concerns.

Name of the student: Shubham Kharat

Degree: M.Tech

Abstract: Isophthalic acid based structural adhesives are prominently used for laminate joining in the industry. The adhesive is easy to manufacture, transport and application. It is a 2k system adhesive. It contains a resin for adhesive and other part is hardener. Though it has many advantages, but it is costlier than other adhesives available in market. Adding to this, since the density of isophthalic acid is high, it contains lesser volume when consumption is considered. This study is based on the removal of these barrier by introducing Purified Terephthalic acid (PTA) along with Isophthalic acid in the adhesive industry. Its effect on chemical, physical and mechanical properties on adhesive are studied. Terephthalic acid is cheaper and denser than that of Isophthalic acid.

In this case, the resin is polyester polyol (with excess free hydroxyl groups) and the hardener used is Hexamethylene Diisocyanate (HDI). On application, after curing, small craters used to develop. To remove it, Silicone oil is introduced as an additive to get uniform film. The application found to be very vast. It can be used to adhere laminates (Polyethylene Terephthalate), glass, wood, metal and paper. It is categorized under structural adhesive so application on paper is restricted. A thin coat of adhesive (40 μm) on laminate is sufficient to adhere two different surfaces, provided that the surfaces are clean.

GUIDE: DR. S. T. MHASKE

Name of the student : Manoj Mali

Degree: Ph.D (Tech)

Thesis title: Development of Polymer Composites

Abstract: Nanotechnology has been dominating in automotive industry from last many years due to their enhanced properties against conventional materials. Nanocomposites are versatile in nature they are used in automotive Industry (Thermoplastic Vulcanizate CASE). Thermoplastics vulcanizates are made by

dynamic vulcanization of Polypropylene and Ethylene propylene diene monomer (EPDM). The use of nanocomposites in vehicle parts and system is expected to reduce weight and promote recycling. The weight and energy savings are the enhanced physical properties that nanocomposites offer, such as stiffness, strength and dimensional stability, that set them apart from conventional fiber reinforced or mineral-filled materials. Property enhancement in nanocomposites occurs at very low nanoparticles loadings up to 5%.

Name of the student: Ajit Patil
Degree: Ph.D (Tech)
Thesis title:

Abstract: Polymers touch every aspect of our lives. Knowingly or unknowingly, every individual today relies on polymers to meet his needs. Though polymers are legion, sometimes they cannot fulfill the demand, depending on their properties. Improvements in polymers are tremendously important because they will widen the scope of application. There are two main approaches: construction of new molecules that are likely, from their molecular composition, to have the desired properties, and modification of properties of existing large-scale polymers. The two predominant modes of polymer modifications are grafting and crosslinking. In other words, modification is essential to meet various challenges, as it is very difficult to get new polymers. The next generation awaits polymer modification as it opens up new possibilities. Among several Controlled Radical Polymerization (CRP) technologies developed, atom transfer radical polymerization ATRP could be the promising method due to its versatility. ATRP has emerged as one of the most powerful technique in polymer science for synthesis and modification. Polymers with predetermined molecular weight, narrow molecular weight distribution as well as desired composition and molecular architecture can be prepared by using ATRP.

Name of the student : Sneha Satavalekar

Degree: Ph.D (Sci)

Thesis title: Synthesis of polymeric materials using renewable resources

Abstract: Plasticizers like di-ethyyl hexyl phthalate (DEHP), di octyl phthalate (DOP)are important additives in application of PVC. Some hazardous properties of them restrict their use in medical devices and children toys etc. Replacement of these plasticizers with heterocyclic diesters can act as alternative for these materials. Also diesters of longchain diols of oils can be treated as alternative diester system for plasticizer of PVC. Their final implementation has to be checked by mechanical and rheological studies.

Name of the student : Aarti More
Degree: Ph.D (Tech)
Thesis title: Chemical modification of silane, polyesteramide, and epoxy based resins and its application as industrial coatings

Abstract: Resin is one of the four main ingredients of paint on which various coatings properties are depend. In industrial coatings few of the popular resins are epoxy, polyurethane, silicone, acrylic etc. The modification of these conventional resins is carried out in some cases to overcome the drawbacks or in some cases to incorporate certain properties into coatings. Modification can be carried for various purposes and by various routes such as for flame retardant coating, for antimicrobial coatings, modification with hyperbranched polymer, modification with inorganic materials, Modification with specific monomers having certain groups present in it. With such modifications one or more properties can be incorporated into coating simultaneously hence coating can be used for high performance application.

Name of the student : Ganesh Anil Phalak
Degree: Ph.D (Tech)
Thesis title:
Abstract: Shellac is natural resin obtained from insects has been used over many centuries for wide range of applications. Earlier in nineteenth century was used in furniture application. Afterwards this resin used in electrical, food, medical, printing ink etc. Now a day because of its biodegradable property it is used in Coating application. In this research work, colour of shellac improved

by bleaching process, because it is very difficult to used dark brown colour shellac in paint. This shellac resin modified with different types of resins.

Name: Karan Chugh (M Tech Polymer)

Thesis title: Development of Dimer acid based Polyester-etheramide nhot melt adhesives from Renewable Resources

Abstract: Polyester-ether amide (PEEA) hot melt adhesive (HMA) based on dimer acid (DA), karanja oil and resorcinol were successfully designed containing a high content of renewable mass. Karanja oil was reacted with diethanolamine to prepare N-N-bis(2-hydroxyethyl) karanja oil fatty amide (HEKA). Resorcinol was reacted with dimer acid in varying concentration of resorcinol by 0%, 5%, 10% and 15% on a molar basis this is the first scheme. And, in the second scheme, polyester-etheramide (PEEA) HMA based on dimer acid (DA), ricinoleic acid, catechol, and ethylene diamine were synthesized. Ricinoleic acid was reacted with diethanolamine to prepare ricinoleic acid amide (RA amide). RA amide was reacted with dimer acid in varying concentration of RA amide by 5%, 10%, 15% and 20% on a molar basis. Catechol was further added in the above-mentioned formulations to increase hardness in PEEA HMA on the molar basis of 10%, 20%, 30%. The PEEA HMA has a high content of renewable mass with satisfactory properties. Hence, this offers a system with considerably reduce environmental impact. The effect on the properties of the hot melt, such as mechanical properties: tensile strength, shore D hardness, elongation at break; thermal properties: glass transition temperature (Tg), melting temperature (Tm), heat of crystallization (Hc), crystallization temperature (Tc); adhesion properties: lap shear strength (LSS) and T-peel strength(TPS); rheological properties and degree of crystallinity was investigated. These HMA materials could hold potential for sustainability and high adhesive performance.

Name: Sakshi Arora (M Tech Polymer)

Thesis Title- Synthesis of advanced materials for metal protection

Abstract: In the present work synthesis of novel Lanthanum Cerium Molybdate Nanoparticles was carried out using the sol-gel synthesis method. These nanoparticles were further used as the core for development of nanocontainers with polyelectrolyte shell comprising of polypyrrole and polyacrylic acid; polyethyleneimine and polystyrene sulfonate and entrapment of benzotriazole as the corrosion inhibitor using layer-by-layer deposition method. At each step of the nanocontainer formation the thickness of the layers, surface charges and the presence of the functional groups was measured by particle size distribution (PSD), zeta potential and Fourier transform infrared spectroscopy (FTIR) analysis respectively. The X-ray diffractograms (XRD) indicated the crystallinity of the nanoparticles and nanocontainers and thermogravimetric analysis (TGA) showed the thermal behavior of the nanocontainers. The morphological studies exhibited the formation of the nanocontainers containing nanoparticles as the core. The release of benzotriazole from the nanocontainers was evaluated at different pH values. The anticorrosive performance of the nanocontainers has been examined by incorporation in the epoxy coating system by electrochemical corrosion analysis. Tafel plots demonstrated the decrease in the current density with an increase in the loading percentage of the nanocontainers in the epoxy system. Bode plots confirmed that significant improvement in the corrosion protection of the mild steel by the lanthanum cerium molybdate nanoparticles and nanocontainers.

The flame-retardant polyol was synthesized by o-phenylenediamine and Phenylphosphonic dichloride, the product was further reacted with 3-chloro-1,2-propanediol to obtain cyclic phosphorous flame retardant. The polyol was used for curing of the commercial epoxy and was also, reacted with diisocyanate to obtain polyurethane flame-retardant coating.

Name: Parth Sheth (M Tech Polymer)

Thesis title: Responsible Growth of Polymers and Biopolymers

Abstract: Due to a number of

issues arising while recycling high molecular weight polymers, there is a need of replacing them with lower molecular weight polymers which are easy to recycle.

Through this project, I have tried to replace commercially important PET, with relatively simpler PE; commodity plastic in order to ease recyclability of product after its use. PE, being a simple hydrocarbon, cannot match up to property requirement, all by itself. Hence, it was blended with nanocellulose material, and hence we could end up creating a novel PE - NC nanocomposite, which showed superior properties as compared to both virgin PE and PET, as well as was very easy to recycle. We have also tried to incorporate bio-degradable polymers into packaging application, in order to facilitate faster degradation of the material, thus reducing final environmental impact of the product.I have also tried to enhance use of bio-derived monomers into synthesis. I have developed an isosorbide-based flame-retardant epoxy pre-cursor by reacting it with flame retardancy imparting compounds like boric acid and phosphorus oxychloride. In and all, my entire course work was dedicated in reducing environmental impact of polymers, in whichever way possible.

Name: Megh Patel (M Tech Polymer)

Thesis title: Synthesis, Characterization and Applications of bio-based precursors

Abstract: Synthesis of precursors from bio-based molecules derived from renewable resources is reported in this study. Depletion of petroleum sources lead to increase in demand for synthesis of bio-based polymers. Bio-based polymers for specialty applications are center of attention in current area of research. In this research, we reported synthesis of epoxy resin and crosslinking agent containing phosphorus to introduce flame retardancy property. Synthesis of flame retardant epoxy resin performed in two separate stages. Firstly, catechol reacted with phosphoryl chloride and in second stage, active hydroxyl groups reacted with epichlorohydrin to obtain epoxy resin. Characterization of a product to confirm chemical structure carried out using nuclear resonance spectroscopy (NMR), Fourier-transform infrared spectroscopy, thermogravimetric analysis (TGA), and differential scanning calorimetry (DSC). Mechanical testing like tensile strength, pencil hardness, impact strength, gloss testing has performed.

In another research work, synthesis of gallic acid based crosslinking agent carried out by three different steps. Acetylation of gallic acid performed in initial step to block active hydroxyl groups. Acetylated gallic acid further reacted with phosphoryl chloride and then hydrolysis of intermediate product performed using sodium hydroxide to unblock hydroxyl groups. Different Characterizations to confirm molecule structure have carried out using nuclear resonance spectroscopy (NMR), Fourier-transform infrared spectroscopy, thermogravimetric analysis (TGA), and differential scanning calorimetry (DSC).

Name: Prakash Nal (M Tech Polymer)

Thesis title: Synthesis and characterization of biobased precursors for various applications

Abstract: The crosslinked waterborne polyurethane-acrylic miniemulsion (WPUAG) solvent free (VOCs), emulsifier free was synthesized for pressure sensitive adhesive application (PSA) by single step miniemulsion polymerization method. Polyester polyol was synthesized from bio based, biodegradable sebacic acid and used in different NCO/OH ratios for synthesis of NCO terminated reactive prepolymer. The effect of Glycerol as crosslinker with varying amount from 0-0.2 mole% on particle size, particle size distribution index (PDI), viscosity, thermal property and shelf stability of WPUAG miniemulsions were investigated. The synthesized product was analyzed for structural confirmation and thermal property by FTIR, DSC and TGA. The single lap shear adhesion and water resistance of WPUAG was increased with increasing crosslinking. Also improvement in thermal properties, water resistance, particle size but reduction in viscosity, with increase in mole

% of glycerol are investigated. Developed WPUAG miniemulsion having high importance in pressure sensitive application to minimize human health hazards and air pollution. In second study, triaryl epoxy curing agent from bio-based vanillin and eugenol was successfully synthesized using the condensation reaction mechanism of xylenols and aldehydes. Developed VECA was efficient to use up to 75% of equivalent amount of curing agent required for epoxy curing without compromising any mechanical properties. Epoxy resin cured using 100% of VECA having high thermal stability, showing improvement in onset, 50% degradation and maximum degradation temperature. Synthesized VECA having high potential in epoxy curing application which also helpful to replace the use of highly toxic and harmful petroleum based curing agent and reduce carbon foot print.

Name: Siddhant Varshney (M Tech Surface Coating)

Thesis Title: Graphene-Polyaniline based nanocontainers for corrosion protection

Abstract: Both graphene and polyaniline have been shown to have superior anti corrosive properties due to barrier formation. As single layer graphene is porous and due to percolation, can also encourage corrosion, hence an attempt has been made to cover the graphene layers with doped conducting polyaniline to further enhance anti corrosion. Sodium zinc molybdate nanoparticle is used as the core material to get entrapped into graphene-polyaniline based nanocontainer so as to achieve superior anti corrosive property. Inexpensive methods are used to synthesize all materials so as to make this process as economic as possible. Nanocontainer synthesis has been done by two approaches, viz; layer-by-layer and coupling technique. Few layered graphene sheets (1800 S/m) and Polyaniline nanofibers (2000 S/m) has been successfully incorporated to entrap Sodium zinc molybdate nanoparticles (280 nm) and coupling APTMS in two different approaches and tested for anti-corrosion application in epoxy based system for MS panels.

Name: Devam Ponda (M Tech Surface Coating)

Thesis Title: Synthesis of polymeric resin from renewable resources.

Abstract: Most of the Polymers are derived from the Petroleum resources. Polymers and Coatings are widely used in the different industries like electrical & electronics, construction, medical, automotive and many more. As the growth of these industries increases demand for polymer industry also increases. And if the consumption of petroleum resource continues, it will deplete in near future. So the scientist and researcher are working on the renewable resources to replace petroleum based polymeric material for sustainable development.

Currently, nosocomial infections are major healthcare challenge in the world. This infections are found 4% to 10% in western industrialized country while in the developing countries, it's found more than 15%. So it's necessary to develop the coating which can prevent the microbial growth on the surfaces. Biobased epoxy resin is synthesized from Gallic Acid. In which 2- Aminobenzothiozole is added as antimicrobial agent in different proportion with partial replacement with hardner. Biobased antimicrobial agent was synthesized from cardanol for UV curable systems. Bromination reaction carried out of cardanol, and further brominated cardanol was reacted with TEA to synthesize Quaternary Ammonium Salt based brominated cardanol, which was further reacted with GMA. It was added in the UV curable systems with different dosages. E.Coli, S.Aureus, Candida Albacanis and Aspergellius Niger were used to check Antimicrobial property. Microbial and activity of yeast were analyzed by turbidity method and fungal activity was analyzed by gravemetric method. Myrcene was used in different proportion in replacement of BA to synthesize emulsion. Addition of Myrcene increases the water resistance of the coatings. Biobased emulsions are more greener approach. Desired tests and characterization has been done to evaluate the properties of all the coating systems.

GUIDE: DR. A. S. SABNIS

Name: Vikramaditya Shirsat (M Tech Surface Coating)

Thesis title: Studies in flame retardant biobased epoxy systems

Abstract: A novel phosphorus containing flame retardant was synthesized by using citric acid and successfully incorporated in epoxy backbone to obtain flame retardant epoxy resin. The reactive flame retardant compound was synthesized by using phosphorus oxychloride (1 mol), citric acid (1 mol) and epichlorohydrin (16 mol). The structure of synthesized resin was confirmed by FTIR, GPC, H1NMR and P31NMR spectroscopy. Further, the flame retardant epoxy resin was blended with conventional epoxy resin in various amounts (40, 50 and 60% on weight basis). Then the films were applied on mild steel panels. It was then characterized for coating, thermal and flame retardant properties. It was observed that all compositions exhibited good coating properties and improved thermal and flame retardant properties as compared to the conventional epoxy resin. The flame retardant property was depending on the phosphorus content and increased with increase in phosphorus content.

Name: Utkarsha Gwalwanshi (M Tech Surface Coating)

Thesis Title- Studies in Bio-Based Non-Isocyanate Polyurethane Systems.

Abstract: Polyurethane is one of the most versatile polymer used in coating and polymer industries because of its excellent mechanical, chemical and electrical properties. Conventional polyurethanes, in spite of their excellent properties and wide applications possess safety and handling issues related to isocyanate compounds while synthesis. Growing environmental concerns create the demand for synthesizing environment-friendly and sustainable materials. As amino groups are associated with its strong nucleophilicity, esters can be aminolyzed to form the corresponding amides. Thus, aminolysis of cyclic carbonates leads to carbamate linkages. In accordance with this fact, this approach has been widely studied and used to prepare polyurethanes in recent years.

In this present work, bio-based materials are used for synthesizing NIPU for coating applications. NIPU coatings were prepared using itaconic acid as a raw material, the system was cured with various amines in order to correlate the relation of carbonates contents and type of amine. Also the new catalyst system for the cyclic carbonation reaction was studied and the use of deep eutectic solvents were explored.

Name: Hemant Khandagale (M Tech Surface Coating)

Thesis title: Studies in high temperature resistant organic coatings

Abstract: The wide spectrum of properties available with polymers makes them particularly suitable to a range of application areas but, unfortunately, some of these applications are very restricted because of the poor thermal resistance. The present work illustrates the synthesis and characterisation of novel high temperature resistant coating based on oxazine ring containing phenol derivatives namely benzoxazine and naphthoxazine. Oxazine ring is known for its distorted structure tending to undergo a ring-opening reaction under thermal conditions. Phenol derivatives being heat resistant lacks in its application due to negligible flexibility. The flexible form of benzoxazine and naphthoxazine were synthesized using polyetheramine like jeffamine D400 as its main constituent to impart flexibility. On the other hand, dimethyl carbonate and Jeffamine D230 have been reacted to produce amine terminated non-isocyanate polyurethane (NIPU). NIPU was further modified by benzoxazine to impart heat resistance. The synthesized coating were tested based on its physical and chemical properties along with characterization using fourier transfer infrared spectroscopy (FTIR), Differential Scanning Property (DSC) and thermogravimetric analysis (TGA).

Name: Anand Dixit (M Tech Surface coating)

Thesis title: Studies in Antimicrobial Coating Systems

Abstract: Objective of this research was to synthesize antimicrobial coatings. Bio based compounds such as citric acid and Itaconic acid

has antimicrobial activity and hence are the promising raw materials for synthesis of antimicrobial polymer coatings. Two Pack Polyurethane coatings were synthesized from Citric and Itaconic Acid. Also, in this research work, Citric Acid was used for synthesis of Antimicrobial UV Curable coatings. Antimicrobial Food Edible coatings were prepared from the plant extracts Asafoetida Vasica (Adulsa) and Ferula (Hing).

Name: Abhinayaa N (M Tech Polymer)

Thesis title: Studies in Depolymerization of Polyethylene Terephthalate Wastes for Coating Applications

Abstract: Polyethylene terephthalate (PET) is one of the versatile plastics used for various applications which indeed increases the quantity of waste generation. Recycling of PET by various methods has already been studied. The most widely used commercial method of chemical recycling is glycolysis. Glycolysis process is the molecular degradation of PET by glycols, in the presence of catalysts where the ester linkages are broken and replaced with hydroxyl terminals. Various catalysts such as metal acetates, acids, bases have already been used and investigated with some benefits and liabilities. The use of ionic liquids in various fields has increased due to its low cost, easy synthesis, less toxicity and are often biodegradable. Deep eutectic solvents are now acknowledged as a new class of IL analogues because they share many characteristics with ILs.

In this research work, firstly the (Choline chloride: Urea) DESs was synthesized at a molar ratio of 1:2. The glycolysis process of PET was carried out using different glycols by conventional method in the presence of 5wt% (Choline chloride: Urea) DESs as a catalyst. Hydroxyl value, molecular weights of the glycolyzed products were also determined. The glycolyzed product obtained was used for the synthesis of new polyester polyol which was further used for the coating formulation.

Name: Anup Mule (M Tech Polymer)

Thesis title: Studies in Depolymerization of Polyurethane Foam Waste for value addition

Abstract: Polyurethanes (PU) are usually formed by the reactions of liquid isocyanate components with liquid polyol resin components which lead the way for commercial quantities of more economic foams with significantly improved physical properties. The major markets for PU foams include cushioning materials in furniture, bedding, carpet underlay, automotive, and packaging applications. Various methods are available to recycle PU foam like mechanical recycling, incineration, energy recovery and chemical recycling etc. Chemical recycling has proven to be a better method since it results in generation of monomers/oligomers with suitable functional groups on the backbone which are subsequently used for synthesising suitable polymers /curing agents thus adding value to polymer waste rather than the mechanical recycling. In present study, Polyurethane foam is reacted with two different amines i.e. Diethylenetriamine (DETA) and triethylenetetramine (TETA) in presence of a catalyst and the reaction was carried out at 160°C until foam was completely dissolved. The obtained depolymerised products showed amine functionality. These amine containing recycled products were used as a hardener for epoxy coatings and in formulation of polyurea coatings. The coatings prepared by using depolymerised were then compared with commercially available coatings so as to check performance properties. Various properties such mechanical, optical, chemical and anticorrosive properties were tested as per ASTM standards. The results revealed that coatings prepared by depolymerised product have properties which are at par with commercially available coatings.

Name: Kunal Wazarkar (Phd Tech Surface Coating)

Title: Develpoment of Biobased Monomers for Coating Applications

Abstract: Nowadays, in most of the polymer and coating industries, current technologies and developments regarding the cost and performance of biobased materials have effectively reduced the dependence on petroleum resources. Therefore, synthesis of quality chemicals that are based on renewable

resources has been accepted as a strategy to contribute to sustainable development in chemical industry. Among various bio-based materials such as vegetable oils, rosin acid, lignin, sugar derivatives, terpenoids etc., cashew nut shell liquid (CNSL) and eugenol are phenolic compounds and could be modified in many ways to facilitate the use of modified product as binder, curing agent, modifier, surfactant, speciality additive etc. In the present work, cardanol was used as starting material to produce various functional monomers and oligomers which were later used for coating applications. Cardanol based phenalkamines were synthesized and used to develop high performance polyurea and epoxy coatings. Further, thiol-ene addition was performed to produce a polyol and crosslinked with isocyanates and MF resin and explored its application in industrial coatings. Along with phenalkamines, heteroatom containing multifunctional anhydride, carboxyl and amido-amine curing agents were synthesized for commercial epoxy coatings. The resultant coatings were evaluated for electrical, anticorrosive and flame retardant properties. Curing kinetics of functional benzoxazines was also studied in order to investigate the effect of pendant functional group. In addition, various UV oligomers based on cardanol was synthesized and used as components in UV composition. These coating systems were evaluated for all the performance properties and structure-property relationship was studied.

GUIDE: PROFESSOR P.A. MAHANWAR

Name of the student: Chandan Ashokrao Fuke

Degree: Ph. D. (Tech.)

Thesis title: Development of Electron Beam Crosslinked Heat Shrinkable Tubes and Sheets for Electrical and Electronical Applications

Abstract: The blending of different polymers had always found versatile application in industries because of their tailor-made properties. The properties are largely beneficial in attained the desired requirements. In recent years melt mixing of thermoplastics and elastomer had attained attention in regards to heat shrinkability. The fundamental requirement behind heat shrinkability is that the sample is thermally heated in an unstrained state, it shrinks. The shrinkage occurs because of the internal rearrangements of the structural elements within the sample. This rearrangement has been brought about by the thermal release of a stored internal strain. The strain has been stored into the polymer in the form of orientation entropy and manifests itself as molecular orientation in the sample, which in turn manifests itself as shrinkage. Heat shrinkable polymers are widely used in packaging industries and in cable industries. The main target of research work is to develop such a polymeric blends or composites which are capable to heat shrink and basic properties like mechanical as well as electrical properties. The polymer product should be able to maintain its quality and service properties at specified operational condition by exposing to high energy ionizing radiation as well as temperature up to certain period of time. The key objective is to prepare such kinds of polymer blends and composites which are able to retain their useful mechanical, thermal, thermo-mechanical, physio-chemical, and environmental properties against high energy radiation and temperature. Overall In this study, the main emphasis is given to polymeric multi-component systems.

Key words: radiation, Heat shrinkability, electron beam, blends, etc.

Name of the student: Savita Bansode

Degree: Ph.D. (Science)

Thesis title: "Development of polymer scaffolds for tissue engineering"

Abstract: Tissue engineering has emerged as a promising approach to create artificial organs and tissues, or to regenerate damaged tissues. The technique involves the culturing of the cells in temporary three-dimensional scaffolds. A wide range of materials such as metals, ceramics and polymers have been extensively used for synthesis of scaffolds. Among the available materials, polymers offer numerous advantages over other. These materials are attractive due to their

fabrication into various shapes. There are several methods for the synthesis of polymer nanofibers. Electrospinning is a simple, cost-effective and can be employed to use various materials. In the present research work we are proposing the development of biocompatible and biodegradable polymer nanofibers using electrospinning and their application for the preparation of scaffolds used for tissue engineering application.

Keywords: Biodegradable Polymer, Biocompatible Polymer, Electrospining

Name: Rohit S. Tarade

Degree: Ph.D. (Tech)

Thesis title: STUDIES AND DEVELOPMENT OF POLYMER BLENDS AND COMPOSITES FOR LUGGAGE APPLICATIONS

Abstract: Polymer and its based materials are finding an ever-increasing usage for numerous industrial applications like electronic appliance, aeronautics and astronautics, mechanical and automobile industries due to its high Physical, mechanical and weathering resistance. The present work deals with the studies of High Impact resistant polymeric multi-component systems i.e. binary blends. Various thermoplastic-elastomer blends have been studied for their mechanical, thermal and Morphological property with varying concentrations of elastomers In order to increase the Impact properties also the radiation cross-linked polymer blend studied. Polymer that have been selected in present research work are Polycarbonate (PC), Acrylonitrile butadiene styrene (ABS), Polypropylene Random Copolymer (PP-R), poly (ethylene terephthalate) (PET), ethylene-propylene diene elastomer (EPDM), ethylene butene block copolymer (EBC), Ethylene Methyl Acrylate (EMA), Poly(styrene-b-(ethylene-co-butylene)-b-styrene) (SEBS) and styrene Butadiene copolymer (SBC).

Keywords: Polymer Blend, Toughening of Plastic, Thermoplastic and Elastomer

Name of the student: Manoj Praharaj Bhatnagar

Degree: Ph.D (Tech.)

Thesis title: Synthesis of Polymeric Nanofibers and their Hybrid Composites for Rodent Proof Cable Insulations

Abstract The highpoint of my main project is designing and fabrication of novel equipment for Electrocentrifugal Spinning and the patents filed on this. This innovative design developed by me will help in scale up generation of nanofibers, which is most crucial in the making of nanofiber composites to be used for multitude of applications. Solvent Electrospinning being the most common method so far for preparation of nanofibers suffer from drawbacks like low throughput and difficulty in finding appropriate solvent system. Also the novel equipment for Melt Electrospinning will be used to synthesize nanofibers from various engineering, biocompatible & biodegradable polymers which can be used for various other important applications like engineering composites, membranes, filters, packaging, tissue scaffolds, charge storage devices etc.

Rodents have been known to cause extensive damage to wire and cable system installations. They have habit of gnawing on objects while making their burrows & runways, which lead to damaging of communication & power cables. My other project work to develop rodent proof cable insulation has a two pronged approach, firstly to reinforce blends of elastomers & HDPE with nanofibers made by the Electrocentrifugal spinning process already described above, and also incorporating various others inorganic fillers to increase the surface hardness of the cable insulation without increasing the stiffness and letting the cable crack. The second approach is to add non-toxic rodent repellents in an encapsulated or free form that will be controlled release from the cable insulation to ensure long life span of the cables. After preparing the hybrid nanofiber composite cable insulation, extensive testing will be carried out for Rodent Resistance along with Mechanical Testing, Environmental Weathering, Chemical Weathering, and so on, which are important properties for a cable insulation.

Name of the student: Vinayak Mahadeo Kamble

Degree: Ph.D. (Tech)

Thesis title: Study of Effect of High Energy Irradiation (Gamma & Electron Beam)

on catalytic Pyrolysis of waste plastics into Fuel.

Abstract: The consumption of the plastic materials is growing due to their versatile properties (relatively low cost, light weight and durability) in various applications (packaging, electrical and electronics, agriculture and health care). Therefore, plastic waste amount continuously increases in municipal and industrial waste, creates a large burden on environment because of both contamination and area required to land-filling the waste. The recycling of waste plastics has attracted much interest as an alternative method for their disposal and management over the last few decades. As plastic comprise the calorific value to that of fuel, so the recovery of the fuel like product is an effective method of recycling. Basically pyrolysis is used for production of fuel but the amount of energy require to cracking is high enough. Considering radiation technology, had ability to alter the structure of polymeric materials (cross-linking, Grafting and degradation) can be efficiently applicable for recycling of plastic waste. So the combination of both radiation technology and pyrolysis become an alternative method for conversion of fuel from plastic waste. This research work gives an idea about the alternate method for recovery valuable product from the plastic waste at low energy consumption by using radiation processing.

GUIDE: PROFESSOR V.V.SHERTUKDE

Name of the student: Akash A. Dongre

Degree: M.Tech

Thesis title: Synthesis and study of acrylate copolymers used as viscosity index improvers and pour point depressant for different base stocks.

Abstract:

MAJOR ACCOMPLISHMENTS:

Department Selected for getting DST-FIST Development Grant

Pioneered Technology of interfolic compatibilization in polymers.

Published 42 International peer-reviewed research papers in the journal of international repute and attended three international conferences at abroad.

PHOTO GALLERY

PROFESSOR R.N.JAGTAP RESEARCH GROUP

From Left to Right: 1st Row – Nivedita Nandanwar, Ruchita Mapuskar, Prof. R.N. Jagtap, Stuti Shukla, Neha Golhar;
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