

DEPARTMENT OF FIBRES AND TEXTILE PROCESSING TECHNOLOGY

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It is about a century ago that the Textile Industry was progressing in full swing in city like Mumbai, and Ahmedabad. Many other industries were not even born, in that pre-independence era. It was the time when Sir VitthalChandavarkar, V.C. of University of Mumbai and also the Chairman of Mill Owners' Association, along with his industrialists friends donated 200 lakhs for creation of an educational and research institute catering to the need of Textile industry and that's how this UDCT, then called as University Department of Chemical Technology, under the wings of Mumbai University, was established with two disciplines: Textile Chemistry and Chemical Engineering offering a 2 year Degree course post B.Sc. chemistry, called as B.Sc.Tech. A number of new disciplines of chemical technology, pharmacy, and biotechnology were opened up over the years as per the need of the nation and all these various technological disciplines have played a paramount role in building the respective industry in the country. Most of the Professional Bodies of the Technocrats of these disciplines, even today operate from the portals of excellence of UDCT.

Thus the Department of Fibres and Textile Processing Technology (FTPT), formerly known as Textile Chemistry section has the unique distinction of being one of the two disciplines (other being Chemical Engineering), with which this institution- ICT (formerly UDCT) started in the year 1933. The Department conducts B.Tech. course with an intake capacity of 34, which is highest among all the B.Tech. courses of ICT. The course involves study of chemistry and manufacture of Fibres, their chemical processing such as bleaching, dyeing, printing and finishing. It further encompasses the study of chemistry and application of various kinds of chemicals, dyes, thickeners, and finishing auxiliaries which are used in chemical processing of textile fabrics and garments. Textile chemistry also involves knowledge of green chemistry, biotechnology and nanotechnology with special reference to chemical processing of textiles.

The post graduate courses of M. Tech., M.Sc. in Textile Chemistry and Ph.D. (Tech.), Ph.D. (Textile Chemistry) attract a large number of students and so far more than 2500 graduates and 600 post graduates have passed out from this Department. The faculty of the Department has

good interaction with the industry. A number of industries have been benefited by the technical advice given by the faculty. There have been a number of industrial and governmental research projects in which problems of mutual interest are investigated and the students as well as the Department have been benefitting by this interaction. The department is recognized as Centre of Advanced studies in "Physicochemical aspects of Textile, Fibres, Polymers and Dyes" presently in Phase VII, since 1962. The department received a grant of Rs. 1.55 crores under DST-FIST programme which is highest so far for the department. The department has played an important role in evaluating TUFs under Ministry of Textiles, GOI. The department is engaged in high quality fundamental as well as applied research and till date have published over 1000 publications in Indian and International journals as well as fellowships to students from recognized institutions in India and abroad. In the last 5 years the department has completed project and consultancy worth Rs. 1700 Lakhs.

It gives us immense pleasure to put on record that the Ethiopian Textile Industry Development Institute (ETIDI) and Institute of Chemical Technology (ICT) had agreed on a Twinning arrangement. This arrangement was for three years period beginning from 18th Jan 2015 to 2018, primarily focussing on building capacity of ETIDI to technically transform it into institute of international standard. The prime areas were training, consulting and research to cater to the interests of the finishing technology (wet processing) sector in Ethiopian textile industry. Under this agreement 14 PG and 1 Doctoral fellow from ETIDI were admitted in ICT and awarded the respective degrees. It is matter of pride for ICT that this programme was completed successfully with one year extension and was rated as one of the best partnership programmes ever in Ethiopia by Ethiopian Government. Department also regularly conduct training programmes for Industry personnel, provides consultancy and audit services and undertake industrial research projects.

After the globalization of the markets with border less trade, textile manufacturing activities are shifted to country

like India which is fast developing economy. In textile value chain, one of the critical area is chemical processing of textile fabrics and garments which requires tremendous amount of consolidation even today in terms of well trained manpower which can keep pace with latest technological operations and demand of stringent quality parameters in shortest delivery time giving competitive edge to the Indian Textile Industry. There is a huge shortage of Textile Processing graduates in the core textile industry as well as in multinational and reputed Indian manufacturers of dyes, chemical and auxiliaries. Thus the scope for graduates and postgraduates of this department is enormous and such a demand with every passing day will only be rising given that consumption of apparels and technical textiles in India and abroad is increasing at galloping rate.



VISION

To be the world class centre of excellence in teaching and research in chemical processing of fibres, textiles, apparels and the key areas of technical textiles with ecological, social and ethical responsibility, meeting the crucial needs of trained man power and technological solutions of Indian textile industry.

MISSION

- To be the leader in offering top class human resources by training them from bachelors to doctorate level degrees in core competence i.e. in chemical processing of fibres, textiles and apparels.
- To train the industrial technicians as per the demands of the industry, upgrading their skill to meet international quality standards.
- To conduct industrially relevant research and provide technical guidance aimed at offering technology solutions and enhancing competitive edge to the industry.
- To offer technological interventions to preserve our rich heritage of the artisans in rural areas in hand looms, khadi and village industry and to strengthen the rural economy by enhancing the use of rural fibres and natural dyes.
- To create awareness of the environment protection and social and ethical commitment in pollution abatement





PROF. (DR.) RAVINDRA V. ADVAREKAR

Professor in Fibre Chemistry and Head, Dept. of Fibres and Textile Processing Technology

Profile and accomplishments so far
B.Sc., B.Sc. (Tech.), M. Sc. (Tech.), Ph. D. (Tech)

b. Fellowships/ Memberships of Professional Bodies:

- Life Member of Textile Association (India)
- Life Member of Indian Fibre Society
- Life member of Natural Fibre Society
- Editor of Journal of Textile Association
- Visiting faculty for Sophia Polytechnic, Mumbai.
- Member of selection committee, College of Home Science, Nirmala Niketan, Mumbai.
- Member of Technical/Research advisory committee of Wool Research Association
- Member of Board of studies and faculties of The Maharaja Sayajirao University of Baroda in Textile chemistry
- Member of General Advisory Committee for Research and Liason of BTRA for the period 2011-2014

- Member of 'Core Group' to function as a Sub-committee of the Council for COE in Sportech at WRA
- Member as Expert in Department Research Committee at Textile Manufacturers Department, Veermata Jijabai Technological Institute
- Member of RRC, Department of Physics, ICT
- Member of Editorial Board, IJFTR
- Member of expert committee to assess issues related to environmental pollution from textile mills identified as discharging effluent into river Ganga main stem and its tributaries
- Member of the selection committee Dr. B R Ambedkar NIT Jalandhar, India

4. Highlights of research work and its impact (maximum two single-spaced pages with figures/diagrams etc.):

a. Enzyme Manufacturing and Application

Microbial proteases are an important group of enzymes that can have application in various industries. The feasibility of the use of proteases in textile application depends on these factors. There has been an increased interest all over the world to utilize the waste for the production of value added products. This results in reduced environmental pollution and improved economics of processing. In this project sincere attempt was made to screen microorganisms from abattoir waste, poultry waste, fishery waste, etc which are rich sources of protease producing microorganisms. The

further purification of enzyme and its application in various steps involved in textile wet processing such as enzymatic treatment of wool, degumming of silk and in detergent industrv etc will be studied.

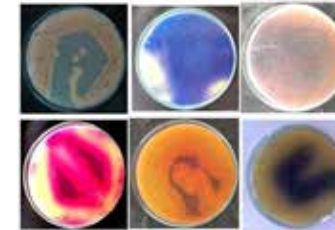


Fig.1 Enzyme manufacturing

b. Natural Dyes for Textiles and Cosmetics

The current research work focused on the modification of natural dyes with azo chromophoric system and other possible substituents (auxochromes) to modify its substantivity and tinctorial capacity to overcome inherent limitations of natural dyes. The synthesized dyes will be applied on polyester, cotton, polyester/cotton blend to yield level dyeing, good build-up, complete colour gamut.

In another work, the extraction of dye from the leaf of Artemisia afra, and its effectiveness was studied for dyeing of polyamide fibres, aroma



Fig.2 Dyeing and Printing of Textile

finish, antibacterial finish, mosquito repellence, ultraviolet protection effect as well as extraction of microcrystalline cellulose from its extractive residues.

The currently used colorants are almost exclusively made from nonrenewable resources such as fossil oils. The production of the synthetic colorants is economically efficient and technically advanced with colors covering a wide range. However synthetic colorants are facing challenges such as dependence on non renewable and environmentally friendly resources for production of natural colorants before synthetic dyes were invented, but in very low efficiency. The current research work focus on the Isolation, Extraction & characterization of new Biocolorants from natural sources like plants, animals and microorganisms, to study their unique properties like Anti-UV, Anti-Microbial, Anti-oxidant Activity etc and their application as colorant in different industries will be studied.

c. Medical textile

Studies in Blood Clotting Materials

The work is going on to develop a solution for clotting of blood in economical way comparable to

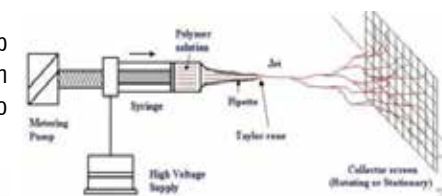
the other materials available in commercial market without leading to any side effects such as skin irritations, damage the healthy skin



Fig.3 Blood clotting material and Scaffolds

Studies in biopolymers

The work is being carried out in order to contribute to the development of novel biomaterial and their blends for the application as temporary scaffolds in health care or wound healing mechanisms. The addition of herbal products as a drug for curative purpose can also be new and imminent contribution to field of drug delivery through scaffolds. This can be achieved through imparting functional groups in the bio-materials used in scaffold engineering. It can open new prospects in this multidisciplinary field.



In view of challenges of necrotic tissue and traumatic hemorrhage in wound healing process, an attempted has been made to develop a biocompatible biopolymer based wound healing dressing with improved hemostatic and anti-

necrotic activity that promotes proliferation and absorb exudates. The research work is based on the extraction and modification of properties of biopolymers such as chitin, chitosan, carrageenan, and casein (protein) for their potential application in wound healing dressing. Electrospinning and lyophilization was employed for the fabrication of nanofibrous and porous dressing.

d. Non-conventional natural fibres for composites

Glass, carbon and aramid fibres are conventional fibres which are generally used in composite. Composite reinforced with these fibres are having high mechanical and thermal properties. But these fibres are not completely environment friendly and have very high cost. Industry is searching for alternatives to overcome the short comings of these fibres. One such alternative which has never been sought before is fibres extracted from Saccharum Munja Grass. From the experiments, it can be inferred that this fibre has good potential to r Studies in Medical Textiles place glass fibre as reinforcement in composite. Limitations of this fibre can be overcome by its modification. Some unexplored fields of application for this fibre need to be studied.



Fig.4 Composite made from natural fibre

f. Green Processing of Textiles

Selective Treatment and Recycling of Textile Effluent

Attempt is made to carry out segregation of waste streams and waste recovery, recycle and reuse for waste reduction application. A simple approach is being followed to treat the wastewater after each process itself by means of simple purification techniques, to avoid complexities on compounding of effluent for its treatment at ETP (Effluent Treatment Plant). The waste water can also be utilized in the same process flow to create a closed loop system. There are two main agenda of this research project, to save the water in textile industry and to minimize the effluent load produced in processing treatments.

In another work scouring of wool was carried out by eco-friendly process. Wool fleeces usually contain less than 50% of clean fibre, being contaminated with wool wax, skin flakes, sand, dirt and vegetable matter. To achieve satisfactory processing performance in further processing, these contaminants need to be efficiently removed by scouring with sodium carbonate and non-ionic surfactants. The pollution load from a wool-scouring mill can be equivalent to the normal discharge from a small town. Pesticide residues in wool grease are an important ecological issue. If new technologies like Ultrasound waves along with natural products like Cow urine (Gomutra) in combination of Ritha solution used for scouring, if properly devised, can work out to be a feasible method for wool scouring. Further, the scouring process can be done with limited use of water with use of fuller earth clay.

g. Eco friendly processing of textile materials

The present application is directed to a method of waterless processing of textile materials using solvents. Dyeing of textile material can be done by using solvents. The properties of the solvent are closely related to the design/operation of a solvent based separation technique that is employed to perform a specified separation task. Separation involves removal of one or more of the constituent parts from a mixture. There are two main agenda of this research project, first is to save the water in textile industry which can be solved by the solvent mechanism dyeing and second is to minimize the effluent load produced in processing treatments which can be solved by the solvent separation technique.

Textile wet processing uses large amount of water for cleaning and value addition of textiles by colouration and finishing. Colour removal, in particular has recently become of major scientific interest, as indicated by the multitude of related research reports. Many waste treatments like physical, chemical, physico-chemical and biological treatments are used to solve this problem but only a few of these methods are being accepted in the textile industry. The lack of implementation of other processes is largely because of the low efficiency, high cost and inapplicability to a wide variety of dyes. Hence, the aim of this research will be focused on developing a low cost and low-technological process for the treatment of textile waste waters by using micro-organisms which are less unexplored, achieving various applications of microorganisms in textile industry and the use of natural products in green processing of textiles.

h. Fabric conditioners

This was a consultancy project done under industry affiliation with one of the leading Industry. It was done in two parts; Various types of actives (conditioners) supplied were applied on 100% cotton and polyester fabric by exhaust method. The samples were evaluated for whiteness/yellowness index, fabric feel (softness), water repellence, crease recovery test. Application of active (SDBS, sodium dodecyl benzene sulphonate) on 100 % cotton and polyester woven fabric was also carried out and their adsorption was measured.

i. Novel Processing Techniques

Studies in Graphite for Textiles

An approach has been made of synthesising graphene from graphite as well as its application on textile relating to its unique characteristics that can give a value addition to the field of textiles. The performance properties of textile materials is thought to be enhanced by the graphite based materials whose technology is still thought to be a wonder one in the current research of science and technology.

j. Novel flame retardancy

In present study we focus on the biodegradable and eco-friendly flame retardant. The main important factor for flame retardant property is to have element like Nitrogen and Phosphorous. In nature proteins are the main source of nitrogenous compounds. To have more effect proteins could be incorporated with phosphorous compounds. The main goal in this study to extract biodegradable material from natural origin substances and their chemical modification for better flame retardant property.

Publications (peer reviewed) so far: 141

Patents: 02

Conference proceedings/papers/poster : 70

Seminars/Lectures/Orations delivered : 24

Ph.D.s Awarded as single/ Co-Guide: 10

Integrated Ph.D.s Awarded as single/ Co-Guide : 02

Masters Awarded as single/ Co-Guide : 42

h-Index: 11

Citations : 429

Subjects taught:

Technology of Printing, Technology of Textile Colouration, Biotechnology in Textiles, Pretreatment of Textiles.

Research interests:

Textile colouration, Green Processing of Textiles, Medical Textiles, Enzyme manufacturing and application, Natural dyes for textiles and cosmetics, Textile composites, Novel Processing Techniques, Flame retardancy of textile

Research students currently working :

P.D.F.: 1

Ph.D. (Tech.) - 07

Ph.D.(Sci) – 07

Ph.D.(Biotechnology) – 02

M.Tech. – 08

M.Sc - 03

Research Publications:

International- 09

National - 05

Peer-reviewed - 02

Conference proceedings- 03

Sponsored projects:

Government- 03

Professional Activities (Membership of important Committees):

- Life Member of Textile Association (India)

- Life Member of Indian Fibre Society
- Editor of Journal of Textile Association
- Visiting faculty for Sophia Polytechnic
- Member of selection committee, College of Home Science, Nirmala Niketan
- Member of technical/Research advisory committee of Wool Research Association
- Member of Board of studies and faculties of The Maharaja Sayajirao University of Baroda in Textile chemistry
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- Member of RRC, Department of Physics, ICT
- Member of Editorial Board, IJFTR
- Life member of Natural Fibre Society
- Member of expert committee to assess issues related to environmental pollution from textile mills identified as discharging effluent into river Ganga main stem and its tributaries.
- Member of the selection committee Dr. B R Ambedkar NIT Jalandhar, India

Special Awards/Honours:

Received Best Teacher Award for Second year B.Tech for "Excellent teaching skills" during year of 2017-18.

Undergraduate students' seminars/projects/home papers :

B.Tech Seminars

No.	Name of the student	Topics
1	Dipanwita Ray	Dye-Based Ink Formulations for Inkjet Textile Printing
2	Akshay Vinayak Patkar	Quantum dots and their applications in textiles
3	Shailee Desai	Antifouling surface modifications
4	Shaiba Abdus	Denim processing and 3-D effects
5	Jimit Ashok Gandhi	Regenerated protein fibres: A preliminary review
6	Pooja Ajay Panchal	Substitutes for Sodium Alginate in Reactive Printing of Cotton

B.Tech Project

No.	Name of the Student	Department	Topics
1.	Satej Joshi	Fibres and textile processing technology	Natural fibre based oil spill cleanup
2.	Varun Tripathi	Fibres and textile processing technology	Natural fibre based oil spill cleanup
3.	Nilesh Nannaware	Fibres and textile processing technology	Low cost base material for water purifier
4.	Himanshu Dhapodkar	Fibres and textile processing technology	Low cost base material for water purifier

Post graduate students projects :

M. Tech.

Postgraduate students' M.Tech Seminar

No.	Research Scholar	Previous Institution	Project	Supervisor
1	Shani Pathak	Central Government of Textile Institute, Kanpur	Modification of Keratin	Prof. (Dr.) R.V. Adivarekar
2	Shradhha Yadav	ICT, Mumbai	Pigment dyeing of apparel fabric	Prof. (Dr.) R.V. Adivarekar
3	Radhika Patil	DKTE, Ichalkaranji	Modification of clay for textile process intensification	Prof. (Dr.) R.V. Adivarekar

Postgraduate students' M.Tech Projects

No	Research Scholar	Previous Institution	Seminar	Supervisor
1	Agmas Azmeraw	Bahir Dar University	Coloration, Multifunctional finishing and microcrystalline cellulose using Artemisia Afra leaves	Prof. (Dr.) R.V. Adivarekar
2	Miss. Biruktawit Worku	Bahir Dar University	Application of isolated catalase enzyme from microbial source as peroxide killer	Prof. (Dr.) R.V. Adivarekar
3	Temesgen Zereabruk	Bahir Dar University	Sustainable reactive dyeing of cotton using green solvent	Prof. (Dr.) R.V. Adivarekar
4	Akansha Panda	College of Engg. and Tech, Bhubaneswar	Effect of solvent on dyeability and performance property of m-aramid fabric	Prof. (Dr.) R.V. Adivarekar

5	Mahesh Mali	DKTE, Ichalkaranji	Microcrystalline Cellulose Modification using Soyabean Oil and It's Reinforcing effect on Poly(lactic acid) Films	Prof. (Dr.) R.V. Adivarekar
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M.Sc. (Chemistry) (By Research)

No	Research Scholar	Previous Institution	Project	Supervisor
1.	Rosemary Thomas	St. Stephan College, New Delhi.	Carbon based coated conductive textiles	Prof. (Dr.) R.V. Adivarekar
2.	Apurva Joshi	Dr. Babasaheb Ambedkar College, RTMU Nagpur.	Extraction of microbial pigments and its application on textile	Prof. (Dr.) R.V. Adivarekar
3.	Akash Mourya	Ramniranjan Jhunjhunwala College of Arts, Science & Commerce, Mumbai.	Printing using pectin	Prof. (Dr.) R.V. Adivarekar
4	Abhishek Patole	V. G. Vaze College of Arts, Science and Commerce, Mumbai.	Packing dyeing through phthalogen blue 3GK	Prof. (Dr.) R.V. Adivarekar

Ph.D. (Tech) students' research projects :

No.	Research Scholar	Previous institution	Project	Supervisor
1	Katode Sanjay	UICT, Mumbai.	Sustainable Approach towards Garment Processing	Prof. (Dr.) R.V. Adivarekar
3.	Madiwale Pallavi	ICT, Mumbai.	Studies in Medical Textiles	Prof. (Dr.) R.V. Adivarekar
6.	Maiti Saptarshi	ICT, Mumbai.	Studies in graphite for textiles	Prof. (Dr.) R.V. Adivarekar
7.	Mahajan Geetal	ICT, Mumbai.	Fermentation Technology in Textile Wet processing	Prof. (Dr.) R.V. Adivarekar
8	Dinesh Marewad	ICT, Mumbai.	???	Prof. (Dr.) R.V. Adivarekar
9	Akanksha Panda	ICT, Mumbai.	A promising method of natural coloration of textiles.	Prof. (Dr.) R.V. Adivarekar

Ph.D. (Textile Chemistry) students' research projects

No.	Research Scholar	Previous Institution	Project	Supervisor
1	Pawar Ashitosh	ICT, Mumbai.	Synthesis of Colourants Form Natural Sources	Prof. (Dr.) R.V. Adivarekar
2	Patil Ashwini	ICT, Mumbai.	High Performance Auxillaries for Textile Substrates	Prof. (Dr.) R.V. Adivarekar
3	Sutar Trupti	ICT, Mumbai.	Studies in Blood Clotting Materials	Prof. (Dr.) R.V. Adivarekar
4	Shinde Suvudha	ICT, Mumbai.	Application of Fluorescent Dyes on Textile and Leather Substrates	Co-guide. Prof. (Dr.) R.V. Adivarekar
5	Ramagude Supriya	ICT, Mumbai	Synthesis and application of photo stable dyes on textile	Co-guide. Prof. (Dr.) R.V. Adivarekar
6	Pawar Sushant	ICT, Mumbai.	Novel Techniques of coloration	Prof. (Dr.) R.V. Adivarekar
7	Patankar Kaustubh	Mumbai University, Kalina.	Ecofriendly Flame Retardents	Prof. (Dr.) R.V. Adivarekar

Ph.D. Sci (Biotechnology) students' research projects

No.	Research Scholar	Previous Institution	Project	Supervisor
1.	Joshi Mahesh	Mithibai College, Mumbai	Studies of Melanins and application	Prof. (Dr.) R.V. Adivarekar
2.	Priyanka Sathe	Tamil Nadu Agricultural university	Role of Biochar to retain the micronutrient content for improving the Soil fertility	Prof. (Dr.) R.V. Adivarekar

Details of sponsored projects – Government and Private

I. Government Agencies:	
Sponsor	World Bank and Gol
Duration	1.5years (2018-2020)
Total amount	6.25
Principal Investigator	Prof. R. V. Adivarekar
Title	Bicolourants: A promising source for colouration of Textiles- TEQIP Phase 3

II. Private agencies:	
Sponsor	Aditya Birla
Duration	4 months (May2018-August2018)
Total amount	10.00
Principal Investigator	Prof. R. V. Adivarekar
Title	Certificate Course in Chemistry and Technology of Fibrous Polymers

Sponsor	Hindustan Unilever Limited
Duration	1 year (2018-2019)
Total amount	12.60
Principal Investigator	Prof. R. V. Adivarekar
Title	To evaluate the efficiency of natural dye formulation as Hair dye

Details of National and International collaborations

- DyStar India Pvt. Ltd
- Veermata Jijabai Technological Institute (VJTI)
- Bombay Textile Research Association (BTRA)
- Wool Research Association (WRA)
- Central Institute for Research on Cotton Technology (CIRCOT)
- Ethiopian Textile Industry Development Institute (TIDI)
- School of Fashion and Textiles of RMIT, Australia (RMIT)
- Addis Ababa Science & Technology University (AASTU), Addis Ababa, Ethiopia
- WELSPUN INDIA LTD, India.
- University of Manchester, UK.
- Novozyme
- SASMIRA, Mumbai

Publications

No.	Title and authors	Journal	Pages	Year
1.	Synthesis and application of uv ray's protective mono azo acid dyes on wool, silk and nylon Smita Bait, Supriya Pandit, Suvidha Shinde , Nagaiyan Sekarand Ravindra Adivarekar	International Journal of Morden Trends in engineering and Research	7-22	July 2018
2.	Study of Decolouration Effect on Denim by Ceric Sulphate Treatment using Statistical Modeling Sanjay Katode, Saptarshi Maiti, Santosh Biranje and Ravindra V Adivarekar	Trends in Textile Engineering and Fashion Technology	1-6	Aug-2018
3.	Investigation of Thermodynamic-Kinetics of Polyester Dyeing with Liquid Disperse Dye Shyam D Phadke, Saptarshi Maiti and Ravindra V Adivarekar	Trends in Textile Engineering and Fashion Technology	1-6	Sept-2018
4.	Hemostasis and anti-necrotic activity of wound-healing dressing containing chitosan nanoparticles Santosh S. Biranje , Pallavi V. Madiwale , Kaustubh C. Patankar , Rohan Chhabra , Prajakta Dandekar, Ravindra V. Adivarekar	International Journal of Biological Macromolecules	936-946	Oct-2018
5.	Modification of casein for multifunctional finishing of cotton Kaustubh Patankar, Ashitosh Pawar, Santosh Biranje, Sandeep More, Ravindra Adivarekar	Journal of Emerging Technologies and Innovative Research	616-626	Oct- 2018
6.	Salt free Reactive Dyeing on Surface Modified Cotton Fabric Ashwini Patil, Saptarsh Maiti, Ravindra Adivarekar	Journal of Emerging Technologies and Innovative Research	628-635	Nov-2018
7.	The use of poly(amido)amine dendrimer in modification of cotton for improving dyeing properties of acid dye Ashwini A. Patil, Saptarshi Maiti and Ravindra V. Adivarekar	International Journal of Clothing Science and Technology	220-231.	Dec-2018
8.	Melanin extraction from human hair by ultrasound assisted alkaline hydrolysis Mahesh. H. Joshi, Ravindra. V. Adivarekar	International Journal of Advances in Science Engineering and Technology	9-16	March-2018
9.	A novel green approach for dyeing polyester using glycerine based eutectic solvent as a dyeing medium Sushant S. Pawar, Saptarshi Maiti, Santosh Biranje, Kedar Kulkarni, Ravindra V. Adivarekar	Heliyon	1-9	May-2019

10.	Application of natural proteins in reactive dyeing of cotton Sarweshwara Nand Pandey, Saptarshi Maiti, Ravindra V Adivarekar	Asian Dyer		47-53	Dec-2018
11.	One- bath dyeing of polyester cotton blend with vinyl sulphone reactive disperse dyes Chet Ram Meena, Saptarshi Maiti, Nagaiyan Sekar, Kedar Kulkarni, R.V. Adivarekar	Asian Dyer		26-32	Feb-2019
12.	Antibacterial and UV protective finishes on textiles using Artemisia afra leaf extract Agmas Azmeraw, Geetal Mahajan, Saptarshi Maiti, Kedar Kulkarni, R. V. Adivarekar	Asian Dyer		20-24	April-2019
13.	Microencapsulation for imparting aroma using Artenisia afra leaves on cotton Agmas Azmeraw, Saptarshi Maiti, Santosh Biranje, Kedar Kulkarni, R. V. Adivarekar	Asian Dyer		18-25	June-2019
14.	Chapter 8: GRAPHENE A WONDER MATERIAL: Nanocomposites Saptarshi Maiti, Pintu Pandit, Geetal Mahajan, R. V. Adivarekar, M.D Teli	Journal of The Textile association		30-34	June-2018
15	Chapter 9: GRAPHENE A WONDER MATERIAL: Battery Electrodes Saptarshi Maiti, Pintu Pandit, Geetal Mahajan, R. V. Adivarekar, M.D Teli	Journal of The Textile association		125-129	July-2018
16	Chapter 10: GRAPHENE A WONDER MATERIAL: Fuel Cell Catalyst Saptarshi Maiti, Pintu Pandit, Geetal Mahajan, R. V. Adivarekar, M.D Teli	Journal of The Textile association		209-213	Sept-2018
17	Chapter 11: GRAPHENE A WONDER MATERIAL: Solar Cells Saptarshi Maiti, Pintu Pandit, Geetal Mahajan, R. V. Adivarekar, M.D Teli	Journal of The Textile association	79(4)	285-289	Nov-2018
18	Chapter 12: GRAPHENE A WONDER MATERIAL: H2 Storage Saptarshi Maiti, Pintu Pandit, Geetal Mahajan, R. V. Adivarekar, M.D Teli	Journal of The Textile association	79(5)	366-369	Jan-2018
19	Chapter 13: GRAPHENE A WONDER MATERIAL: H2 Storage Saptarshi Maiti, Pintu Pandit, Geetal Mahajan, R. V. Adivarekar, M.D Teli	Journal of The Textile association	79(5)	452-455	March-2019
20	Chapter 14: GRAPHENE A WONDER MATERIAL: Grapene Quantum Dots (Part-I) Saptarshi Maiti, Pintu Pandit, Geetal Mahajan, R. V. Adivarekar, M.D Teli	Journal of The Textile association	80(1)	30-36	May-2019

General publications:

Authors	Title	Journal	Year	National/International
Adivarekar R.V	"Make in India" Innovative Products in Technical Textiles in a Sutaible Way	Journal of the textile association 79(2)	July –august 2018	National
Adivarekar R.V	Peeping trough the Warp and Whoofs of Khadi- A Spirit of True Independence	Journal of the textile association 79(3)	Aug-Sept 2018	National
Adivarekar R.V	Plethora of emotions- Welcome 2019	Journal of the textile association 79(5)	Jan-Feb 2019	National
Adivarekar R.V	Startup: Blooming flowers or seed just sown	Journal of the textile association 80(1)	May-Jun 2019	National

Membership of In-house Committees

- Looking after Students Sports Activities.
- Member of Examination committee
- Member of Academic Activities committee

Seminars/Lectures/Conferences/Symposia/Workshops/Summer or Winter Training Schools attended/Oral OR Poster Presentations

Sr. No.	Title	Symposia/Seminar	Place	Month and Year
1.	Use of Tridax procumbens in hemostatic hydrogel dressing	International Conference on Medicinal Plants and Drug Discovery, Banglore	Banglore	18-20 July 2018
2.	Potential application of vitexnegundo leaves extract for textile dyeing and functional finishing	International Conference on Medicinal Plants and Drug Discovery, Banglore	Banglore	18-20 July 2018
3	Salt Free Reactive Dyeing on Surface Modified Cotton	International Conference on Reseaches in Science and Technology (ICRST-18)		7th Oct-2018
4	Modification of casein for multifunctional finishing of cotton	International Conference on Reseaches in Science and Technology (ICRST-18)		7th Oct-2018

Paper and Poster presentations are given in following table:

Sr.	Authors	Presentation type: Paper/poster	Title	Conference name	Date (from-to)	Venue	Organized by
1.	Mahesh Joshi and R.V Adivarekar	Paper	Melanin extraction from human hair by ultrasound assisted alkaline hydrolysis	International conference on Nanoscience, Nanotechnology and Advance Materials (IC2NM)	12th – 13th Dec 2018	Muscat, Oman	Academics world
2	Trupti sutar and R. V. adivarekar	Paper	Use of Tridax Procumbens L. to prepare haemostatic hydrogel dressing with green technique	International Conference on Medicinal Plants and Herbal Discovery	July 18-20, 2018	Banglore	Sivaram Research Foundation
3	Sushant Pawar, Ashwini Pawar, Ashitosh Pawar, Sandeep More, Ravindra Adivarekar	Paper	Potential application of vitex negundo leaves extract for textile dyeing and functional finishing	International Conference on Medicinal Plants and Herbal Discovery	July 18-20, 2018	Banglore	Sivaram Research Foundation
4	Ashitosh Pawar, Ravindra Adivarekar	Paper	Dyeing of textiles with semi-synthetic azo dye made by chemical modification of natural source: Areca Nut	Young Researchers Symposium,	14-18th May 2019	Delhi	IIT Delhi
5	Kaustubh Patankar, Ashitosh Pawar, Santosh Biranje, Sandeep More, Ravindra Adivarekar	Paper	Modification of casein for multifunctional finishing of cotton	International Conference on Researches in Science and Technology	8 oct-2018	Delhi	ICRST
6	Ashwini Patil, Saptarshi Maiti, Ravindra Adivarekar	Paper	Salt free Reactive Dyeing on Surface Modified Cotton Fabric	International Conference on Researches in Science and Technology	8 oct-2018	Delhi	ICRST

Workshops, conferences and seminar attended

Sr.	Student Name	Title	Organized by	Date
1.	Pallavi Madiwale	Spectroscopic and Chromatographic Techniques for Material Characterization	ICAR- CIRCOT, Mumbai	27th - 29th November, 2018
2.	Trupti Sutar	Textile 4.0	The Textile Association (India)	9th Feb 2019
3.	Trupti Sutar	Spectroscopic and Chromatographic Techniques for Material Characterization	ICAR- CIRCOT, Mumbai	27th - 29th November, 2018
4.	Trupti Sutar	Surface Area and Porous Material Characterization	Anton Paar GmbH	15th March 2019
5.	Geetal Mahajan	Roadmap for Application of Industry 4.0 in Indian Textile Manufacturing	The Mumbai Unit of The Textile Association (India)	7th February 2019
6.	Sushant Pawar	Electrospinning Techniques and their Applications	I.C.A.R- Central Institute for Research on Cotton Technology, Mumbai.	29-31st October 2018
7.	Kaustubh Patankar	Electrospinning Techniques and their Applications	I.C.A.R- Central Institute for Research on Cotton Technology, Mumbai.	29-31st October 2018
8.	Mahesh Joshi	Advances in Application of Nanotechnology	I.C.A.R- Central Institute for Research on Cotton Technology, Mumbai.	24th - 28th Sep, 2018
9.	Dinesh Marewad	Electrospinning Techniques and their Applications	I.C.A.R- Central Institute for Research on Cotton Technology, Mumbai.	29-31st October 2018
10.	Akansha Panda	Spectroscopic and Chromatographic Techniques for Material Characterization	ICAR- CIRCOT, Mumbai	27th - 29th November, 2018
11.	Akansha Panda	Advances in application of Nanotechnology	ICAR- CIRCOT, Mumbai	24th – 28th September, 2018
12.	Akansha Panda	Roadmap for Application of Industry 4.0 in Indian Textile Manufacturing	The Mumbai Unit of The Textile Association (India)	7th February 2019
13.	Harshal Patil	Technology & Machinery Innovations For Technical Textiles	The Indian Technical Textile Association (ITTA).	19 January 2019
14.	Harshal Patil	Roadmap for Application of Industry 4.0 in Indian Textile Manufacturing	The Mumbai Unit of The Textile Association (India)	7th February 2019

Events Organized

- Texquest 2018, Annual National Level Inter collage Technical Competition
- Texpression 2018, Annual Cultural Event of the Department
- Organized Guest Lecture under Dr. N. V. Nimkar Endowment Lecture and delivered by Dr. S. Sivaram on the topic, "Sustainable Chemistry: The only way forward", on 19th June 2018.
- Organized Formal Launch Event of Book "Textile Doctor: Comprehensive Solutions for Processing", by C. N.

Sivaramkrishnan, on 19th June 2018.

Details of Post-graduate/Ph.D. students who passed out:

Name	Course	Title
Santosh Biranje	Ph.D (Tech)	Extraction of Biopolymers and their Modification for Application in Medical Textile
Girendra Pal Singh	Ph.D (Tech)	Studies in Natural Fibre Composites
Girish Kherdekar	Ph.D (Tech)	

Laboratory



RVA Lab 1



RVA Lab 2

Prof. (Dr.) Ravindra Adivarekar Research Group



Work Details of Ph.D Students

Pallavi Madiwale

Ph.D Tech

Research Title: Studies in Medical Textiles



The world of technology has become wide spread and the merger of various disciplines of technology has given astounding results for benefit of human kind. One such union is of medical field and textiles. Textiles are used since stone-age in the form of wound dressings. Since then the advancement and sophistication in the usage of textiles has only evolved for the betterment of the medical world. This is termed to be as medical-textile discipline. This advancement has enabled us to engineer the tissue, cartilages, bones, nerves, skin which are damaged or not reusable. These damages can be recovered by replacing them with artificially engineered tissues.

The work is being carried out in order to contribute to the development of novel biomaterial and their blends for the application as temporary scaffolds in health care or wound healing mechanisms. The addition of herbal products as a drug for curative purpose can also be new and imminent contribution to field of drug delivery through scaffolds. This can be achieved through imparting functional groups in the bio-materials used in scaffold engineering. It can open new prospects in this multidisciplinary field.

Girendra Pal Singh

Ph.D Tech

Research Title: Studies in Natural Fibre Composites



As a result of a growing awareness of the global environmental factors, principles of sustainability, industrial ecology, eco-efficiency and green engineering are being integrated into the development of the next generation of materials, products, and processes. Conventional cellulosic fibres need specific land to grow as crops. To avoid the use of land for fibre production we need to explore available alternate sources for cellulosic fibres. These non-conventional fibres can be applied in various fields like fibres from Saccharum Munja grass and Pampass grass contain high amount of cellulose along with fibrous characteristics which were used to prepare nonwovens for insulation and composites applications. Mustard seed husk and pearl millet husk are the two major agro wastes in India which are not explored till date for industrial applications. Mustard seed husk contains high amount of cellulose which was utilized to produce micro cellulose. Pearl millet husk is very light weight, low density and porous structure which were successfully implemented to prepare acoustic materials.

Santosh Biranje

Ph.D Tech

Research Title: Extraction of Biopolymers and their Modification for Application in Medical Textile



In view of challenges of necrotic tissue and traumatic hemorrhage in wound healing process, we developed biopolymer based wound healing dressing materials with improved hemostatic properties that promote granulation, absorb exudates and biocompatible. Current research work is based on the extraction and development of properties of bio based material for their potential application in wound healing dressing. The functionalized biological and biochemical wound dressing materials is produced from biopolymers such as polysaccharides, protein and from synthetic biodegradable polymers. The work done also point out the acceleration of the wound healing by systematically designed dressing materials. By this direction, most efforts were made to utilize the biologically derived materials such as chitin, chitosan, casein and carrageenan which are capable of accelerating the healing processes at molecular, cellular, and systemic levels, as materials to produce wound dressings.

Ashwini A Patil*Ph.D Sci (Textile Chemistry)***Research Title:** High performance functional auxiliaries for textile substrates

In textile industry there is a vast use of specialty chemicals in each and every step of process like pre-treatment, dyeing, printing and finishing chemicals etc. There are various classes of dyes and fibres. As every fibre doesn't have affinity for each and every class of dye and many limitations are observed, e.g. polyester has affinity for disperse dye and it cannot be dyed with reactive, basic or direct etc. Similar problem is seen while finishing process. So in this project main approach is to overcome such problems. The goal of this project is to prepare an auxiliary having affinity and reactivity for textile substrate and can modify the textile substrate by getting covalently linked. This auxiliary will have reactive sites or ionic charge for further adherence of desired dye or finish to impart functionality such as colour, fragrance, flame retardancy, water repellency, antimicrobial treatment and softness properties to the textile substrates. This auxiliary will provide economical and environment friendly solution for value addition of textiles. The synthesized auxiliary may look like; S-----X-----B-----F

Where; S – Solubilising Group

X – Reactive Group to the substrate

B – Bridging Group

F – Reactive Group imparting different Finishing property

Till now three schemes are generated of above explained auxiliaries. They are used in as a functional auxiliary in two main processing treatments; i.e.

1. Dyeing of Cotton with acid dyes and salt-free reactive dyes.
2. Multifunctional finishing of textile (mainly cotton).

For auxiliary analysis spectroscopic methods were used and for auxiliary treated textiles various chemical and physical testing were done.

Ashitosh B. Pawar*Ph.D Sci (Textile Chemistry)***Project Title:** Synthesis of colorants from natural source

Synthetic colourants are used for commercial production of dyed textile materials almost exclusively. However, due to the stringent environmental standards imposed by many countries in response to the hazardous effluent generated during synthesis and toxic and allergic reactions associated with the synthetic dyes, the textile researchers have once again being enthralled by natural dyes. However, there is no natural dye containing azo group ($-N=N-$) as a chromophoric system though commercially, the azo dyes are the largest and most versatile class of organic dyestuffs.

The chemical structures of the natural dyes reveal that they are amenable for introduction of azo group as an additional chromophore which is likely to increase its tinctorial value. The possibility of introduction of other groups is also possible to take care of the substantivity part of the dye. Therefore the present study is focused on the modification of natural dye which blends the properties of azo group and natural dyes under consideration can lead to a new category of dyes "Modified Natural Dyes". These modified dyes are expected to achieve comparable performance properties vis-à-vis those of conventional established dyes.

Trupti Sutar*Ph.D Sci (Textile Chemistry)***Research Title:** Studies in Blood Clotting Materials

Blood plays an important role in regulating the body's systems and maintaining homeostasis. It is important to stop the bleeding after a vascular injury in order to prevent blood loss. Excess bleeding causes death. Some of the products burn incredibly bad. They do stop the bleeding but it takes a significant amount of effort from the Surgeons stand point to get it out and price of such products is exorbitant. Thus there is a direct need of economical and efficient product to take care of this common requirement of mankind. In this work naturally available hemostatic agent when combined properly with natural, bioresorbable materials it will fulfil the entire above requirement. Identification and evaluation of medicinal plant done to carry this Haemostatic agent in user-friendly manner.

Saptarshi Maiti*Ph.D Tech***Topic:** Studies in Graphite for Textiles

Graphene is a rapidly rising star in the perspective of materials science. The name graphene is given to a flat monolayer of carbon atoms strictly packed into a two-dimensional (2D) honeycomb lattice. It is considered to be a basic building block for graphitic materials of all other dimensionalities as it can be wrapped up into 0D fullerenes, rolled into 1D nanotubes or stacked into 3D graphite.

It is recognized to be the wonder material after two great fellows of University of Manchester received the Nobel Prize in 2010 for their special contribution to its discovery. Till now, it is the strongest and lightest material known to earth. It has very good electrical and thermal conductivity. The isolation of graphene from graphite is found to be a challenging and important zone of research in the present era of science.

An approach has been made of synthesizing graphene from graphite as well as its application on textile relating to its unique characteristics that can give a value addition to the field of textiles. The performance properties of textile materials is thought to be enhanced by such graphite based materials whose technology is still thought to be a wonder one in the current research of science and technology.

Name: Miss. Geetal Mahajan*Ph.D Tech***Research Topic:** Fermentation Technology in Textile Wet Processing

The term pollution prevention has seen a decline as supplanted by sustainability. One of the major areas for scientific activity is the control of water pollution. Textile wet processing uses large amount of water for cleaning and value addition of textiles by colouration and finishing. Colour removal, in particular has recently become of major scientific interest, as indicated by the multitude of related research reports. Many waste treatments like physical, chemical, physico-chemical and biological treatments are used to solve this problem but only a few of these methods are being accepted in the textile industry. The lack of implementation of other processes is largely because of the low efficiency, high cost and inapplicability to a wide variety of dyes. Hence, the aim of this research will be focused on developing a low cost and low-technological process for the treatment of textile waste waters by using micro-organisms which are less unexplored, achieving various applications of microorganisms in textile industry and the use of natural products in green processing of textiles.

Kaustubh C. Patankar*Ph.D Sci (Textile Chemistry)*

Fire is a devastating problem for not only mankind but also for other living organism. Many lives get disturbed or sacrificed due to fire and its post event. Flame retardants are chemicals which could inhibit the disastrous effect up to certain extent so living organism could get away from the accidental area.

In present study we focus on the biodegradable and eco-friendly flame retardant. The main important factor for flame retardant property is to have element like Nitrogen and Phosphorous. In nature proteins are the main source of nitrogenous compounds. To have more effect proteins could be incorporated with phosphorous compounds. The main goal in this study to extract biodegradable material from natural origin substances and their chemical modification for better flame retardant property.

Sushant Pawar*Ph.D Sci (Textile Chemistry)***Topic:** Novel Techniques of Coloration

Textile industry is second highest consumer of water and the most polluting industry. The present application is directed to a method of waterless processing of textile materials using solvents. Dyeing of textile material can be done by using solvents. The properties of the solvent are closely related to the design/operation of a solvent based separation technique that is employed to perform a specified separation task. Separation involves removal of one or more of the constituent parts from a mixture. There are two main agenda of this research project, first is to save the water in textile industry which can be solved by the solvent mechanism dyeing and second is to minimize the effluent load produced in processing treatments which can be solved by the solvent separation technique.

Mahesh H. Joshi*PhD (Sci) Biotechnology***Project Title:** Studies on Melanins and application

Biosynthesis of the colorants for food, cosmetics and textile application has attracted increased interests in recent years. Nature produces many bio-colorants from various resources including plants, animals, and microorganism. These are possible alternatives to synthetic colorants, dyes and pigments. The currently used colorants are almost exclusively made from nonrenewable resources such as fossil oils. The production of the synthetic colorants is economically efficient and technically advanced with colors covering a wide range. However synthetic colorants are facing challenges such as dependence on non renewable and environmentally friendly resources for production of natural colorants before synthetic dyes were invented, but in very low efficiency. The current research work focus on the Isolation, Extraction & characterization of new Biocolorants from natural sources like plants, animals and microorganisms, to study their unique properties like Anti-UV, Anti-Microbial, Anti-oxidant Activity etc and their application as colorant in different industries will be studied.

Priyanka Sathe*Ph.D (Sci) Biotechnology***Project title:** Role of biochar to retain the micronutrient content for improving the soil fertility

Biochar helps in carbon sequestration, increase water holding capacity of soil, retains nutrients in soil, attracts more beneficial microbes, alters availability of Ca, Mg, B, Mo, and improves cation exchange capacity of soil. Because of these all above properties biochar is one of the best and economical soil amendments. As it helps to increase the crop yield by increasing the water holding capacity of soil and increasing nutrients availability to the plant that are present in the soil.

The aim of present work is to study the effect of biochar from various feedstocks on the crop growth in comparison with other soil amendments and to study the changes in soil texture and fertility due to addition of biochar as it helps to retain nutrients into the soil. Agricultural waste such as coconut coir, banana peduncle, peanut shell, and maize cob

etc. can be used as feedstocks to produce biochar. Biochar produced from various feed stocks will have different effect on the growth of crop plants as each one has specific characteristics because of its varying particle size, particle density, and chemical composition.

Akanksha Panda*Ph.D (Tech) Textile Technology***Project:** Bio- coloration: A promising method of natural coloration of textiles.

Coloration of textiles is the major area in clothing industry traditionally involving higher levels of toxic and synthetic additives for effective dyeing. Textile synthetic dyes got an initiation by the accidental discovery of a dye by William Henry Perkin in 1856. The chemical colors overtook the industry era whereby affecting the ecosystem and hence led to intense research of natural colors and dyes from flora and fauna. Although these natural extracts are eco-friendly but can only supplement synthetics due to several limitations. Colored metabolites secreted by microorganisms are microbial pigments which stand to be an alternative source for textile colorants.

The research focuses on the synthesis of a novel microbial strain producing colored metabolite for application on textile substrate. The procedure involves isolation of the strain, fermentation and culture enrichment followed by extraction of the pigment. The dyed fabric is to be characterised for color strength and its performance property.



DR. USHA SAYED

BSc , BSc .tech , Msc .tech, Ph.D Tech.

Associate Professor

Fellowships/ Memberships of Professional Bodies :

DST, UGC-BSR, Teqip

Publications (peer reviewed) so far: 90

Patents : 1

Conference proceedings/papers: 20

Seminars/Lectures/Orations delivered : 20

Ph.D.s Awarded as single/ Co-Guide: 2

Masters Awarded as single/ Co-Guide : 35

Subjects taught :

- Garment Manufacturing and Processing
- Technology of Coloration
- Technology of Finishing
- Theory of Dyeing And Printing
- Advanced Textiles
- Finishing of textiles

Undergraduate students' seminars/projects/home papers :

Postgraduate students' M.Sc. - Textile Chemistry - Seminars

Sr. No.	Name of the Student	Topic Name
1	KoreMadhura	Nonwoven and its applications
2	Jimsymol	Recycling of fruit waste for textile procesings
3	Mane Nikita	Finishing with softners

Research interests :

Textile Processing, Dyeing, printing, Bleaching, Finishing, Recycling and Reuse of Dyes & Chemicals, Surfactants, Synthesis of Specialty Chemicals, Laundry Chemicals, Enzyme technology, Polymers, Fibre science, Technical textiles, natural dyes and polymers on natural fibers, leather processing, super absorbent, processing of hosiery, garment processing, technical textile, processing of non-woven, processing of wipes, shoe technology, Nano silicon finishing.

Research students :

Ph.D.(Sc) - 3

M.Tech. - 6

M.Sc - 3

Research publications:

International - 8

Sponsored projects :

Private- 1

Professional Activities:

- Referee for Journal of polymer and Environment
- Member of Editorial Advisory Board of International Journal of Advanced Science and Engineering
- Chairperson of Adhoc Committee of Textile Technology (MU)
- Best Ph.D. Tech Thesis Committee,
- Referee- for NirmalaNiketan college for M. Sc. (Home Science).
- Referee- for SNDT.
- Examiner for NirmalaNiketanCollege for M. Sc. (Home Science).
- Student counselling,
- Trained and Lectured students of National Institute of Fashion Technology [NIFT]

Postgraduate students' M.Sc. -Textile Chemistry – Projects

Sr. No.	Name of the Student	Topic Name
1	KoreMadhura	Wet Processing of Nonwovens
2	Jimsymol	Factors for efficient RFT dyeing of cotton yarns using bifunctional Reactive dyes
3	Mane Nikita	Finishing with Softners on Textile substrates

Postgraduate students' M.Tech Seminars

No.	Name of the Student	Previous Institute	Topic
1	Joshi Rushikesh	DKTE, Kolhapur	Hollow fibres
2	PatilKanchan	Shri Guru Gobindsingh institute of engineering and technology, Nanded	Mosquito Repellent for tents
3	Joseph Basil	Sree Buddha College of Engineering, Kerala	Biomimicking on Textiles

Postgraduate students' M. Tech Critical review

No.	Name of the Student	Topic
1	Joshi Rushikesh	Non aqueous dyeing process of reactive dye on cotton
2	PatilKanchan	Wrinkle free plaited knitted fabrics without preheat settings
3	Joseph Basil	Microbial Production of textile grade pigments

Research Projects

Postgraduate students' M. Tech.

No.	Research Scholar	Previous Institution	PROJECT	Supervisor
1	ChaurasiaRaveena	UPTTI, KANPUR	Synthesis, Formulation and Application of Agro Waste(Cocoon Waste)	Dr. Usha Sayed
2	YadavSarvajeet	DKTE,Kolhapur	Studies In Nano Emulsion of Essential Oils And Its Applications in Textile Processing	Dr. Usha Sayed

Publications

Sr.	Author	Title of the paper	Name of Journal	Issue	Page no	Imp. Fac	Citation Index	Year
1	Prof (Dr .) Ushasayed1, Raveena Chaurasia2, Swati Korgaonkar3, Sneha Parte4	Synthesis and functional properties of waste cocoon for value added finishing	Under publication					
2	Ravikant Sharma, Usha Sayed	Binary surfactant system for preparation of nano emulsion of herbal oil mixtures	International Journal of Advances in Science Engineering and Technology		1003-1008			2019

3	Ravikant Sharma, UshaSayed	Novel antimicrobial protein fabrics using pharmaceutical waste	International Journal of Advances in Science Engineering and Technology		1226-1232		2019
4	UshaSayed, Sneha Parte	Hygienic and Fragrant Autotextiles	International Journal of Advances in Science Engineering and Technology		1021-1026		2019

Major accomplishments :

First person to attend the International brokerage event organized by Uludag textile exporters association (UTIB) and Bursa textile and clothing R&D center (BUTEKOM) at Turkey representing our institute.

Had eventful interaction with textile institute, government agencies, and researcher from the all over the world (well represented) including Russia, Japan, Poland and Vietnam.

The final outcome was "BUTEKOM is ready for cooperation with your institutes for research activities in Turkey. BUTEKOM can sign a MOU at the beginning in order to carry the relationship for upper levels."

Signed MOU with Bursa technical university, Turkey representing our institute.

Dr. Usha Sayed Research Group



From left to right: Sarvajeet Yadav, Basil Joseph, Chaitanya Kumbhar, Ravikant Sharma, Rushikesh Joshi, Kanchan Patil, Raveena Chaurasia Swati Korgaonkar, Sneha Parte.



PROF (DR). RAVINDRA D. KALE

B. Sc., B.Sc. (Tech.), M.Tech., Ph.D. Tech.

Professor in Textile Chemistry

Fellowships/ Memberships of Professional Bodies :

- Life Member of Indian Fibre Society
- Life Member of Indian Natural Fibre Society
- UDCT Alumni Association

Highlights of research work done and its impart:

Application of nanoparticles for Effluent treatment

The effluent discharged from textile process houses consist highly concentrated dyes wastewater. Most of the colorants are complex aromatic structures, which are difficult to dispose off by natural methods. Azo dyes in particular are resistant to biodegradation. Reactive dyes are the most popular dyes used for dyeing cellulosic fibres and consequently their removal from wastewater is difficult due to their high solubility. At present different physical, chemical and biological methods are tried for dye removal or their decolorization but most of these methods have their own limitations. In our research work, we are investigating the efficacy of nanoparticles to decolorize coloured effluent obtained from textile wastewater.

Use of Nano emulsions in dyeing of synthetic fibres and its blends

In this study three types of

nanodisperse dyes were prepared using oil in water nanoemulsions and applied on polyester and its blend. Nanoemulsions were prepared by three methods: ultrasonication, phase inversion composition and spontaneous emulsification process. Nano scale emulsion was obtained by all the three methods as evidenced by Dynamic Light Scattering method. Dyeing characteristics of fabric dyed with crude disperse dyes using these nanoemulsions and that dyed with commercial form of same disperse dyes was compared. Dyeing of very high color depth was thus eliminating the requirement of milling of the crude disperse dye with the dispersing agent resulting in cost, time and energy savings.

Novel Technique to Develop Mosquito Repellent Fabric using Essential Oils

Mosquitoes are not only a nuisance as biting insects, but are also involved in transmitting disease to humans and animals. To ensure our security and safety from the future hazards, we need to develop the mosquito repellent finished textiles which is a part of protective textiles [2]. Mosquito repellent textile will protect the human beings from the bite of mosquitoes thereby protecting from mosquito – borne diseases such as malaria, dengue fever and yellow fever. This study focused on developing mosquito repellent nylon

net fabric using essential oils. Fabrics were treated with oil nanoemulsion using a novel technology which is a room temperature finishing technique. The oil nano emulsion was synthesized using high speed homogeniser. The particle size was analysed using dynamic laser diffraction particle size analyser. The finished fabrics were analyzed for their mosquito repellent activity using modified WHO excito repellency test and mosquito mortality using WHO cone test. The treated fabrics showed 95% mosquito repellent efficiency and 90% mortality rate and retained their activity until 25 washes. SEM analysis of the treated and washed samples was also done. These types of textiles can protect the human beings from the bite of mosquitoes there by promising safety from the mosquito borne diseases.

Surface Modification of Synthetic Fabrics for enhancing its hydrophilicity using Natural Polymers

Different kinds of fibres are available now-a-days. These fibres are mainly divided into two categories natural and synthetic. Synthetic fibres being cheap and possessing all the desirable physical as well as chemical properties lack the hydrophilicity that is present in the natural fibres. The use of micro denier fabrics and hollow fibres in sports textile makes the products

very costly and the production cycle longer. We are working on surface modification of synthetic fabrics using natural polymers to enhance its hydrophilicity. The durability of this natural polymer onto synthetic fibres like polyester and polypropylene will be achieved through the use of coupling agent. The concentration of coupling agent will be kept to minimum level and that of cellulose polymer would be maximum so as to achieve the desirable effect at lower cost. The process will be very much easier and cheaper as compared to the available techniques. This hydrophilic modified synthetic fabric will find use in sports textile, diapers, sleeping bags and the products will be available at lower costs making it within the reach of the common man. This process can be carried out in conventional machines therefore all these products can be produced in India as presently companies producing goods of this kind are all foreign MNCs.

Synthesis of Biodegradable Polymeric Films

Plastics have become the inseparable part of human life since its evolution to its vast expansion in day to day life. Irrespective of its good durability, light weight and low cost, plastics have become problematic considering its disposal problem. Biodegradable polymer is an alternative to plastic materials but problem still arises regarding its cost and dependence on food crops for raw material. So, the problem has been addressed in the research work using non-food source material natural polymer for developing low cost bio-composite film for packaging application.

The strength of these films is more due the addition of reinforcement material which is very cheap and readily available.

The Bio-composite films have low moisture regain less WVTR (Water Vapour Transmission Rate), enough tensile strength (TS), low Water solubility (WS) and Swelling ratio (SR). Then optimised bio-composite films have good rot resistance and biodegradability.

These films have promising potential to serve as Packaging material in various fields such as agriculture, day to day life and storage of goods. It can serve the purpose of an emerging and sustainable option for replacement of conventional non eco-friendly plastic based packaging materials.

Use of Natural Polymers in Green Composites

Various commercially available petroleum based plastics and composites pose a serious environment threat due to their extremely slow degradation characteristics. While a small fraction of these products are incinerated, most others end up in landfills at the end of their useful life and pose serious ecological concerns. Environment friendly "green" composites are increasingly being explored as alternative to the conventional plastics to improve the environmental sustainability. As a result natural biopolymers are fast becoming viable alternative to petroleum based polymers. Hence there has been a growing trend in utilizing the vegetable oils extensively as a raw material in making bio-composite by reinforcing them with nonconventional fibres in various applications due to their inherent biodegradability, low cost, societal favourably advantage and availability. Thus utilization of these green composites will help reduce the consumption of petroleum based composites. Green composites cannot cope with rapid rise in global

demand for industrial purposes. However, realizing the long term problem of petroleum based composites, the potential for green composites is required to be exploited as they are likely to play a key role in emerging "green" economy. Producing green composites on a large scale will help in fulfilling the industrial sectors like automotive, constructions, furniture's etc. on a large scale. Pursuing this quest the current research work is aimed at manufacturing green composites. Both the matrix and reinforcement materials that are being used are of natural origin. The current work carried in this direction will give a better understanding of their behaviour during its test performance which itself will decide its end applications.

Biodegradable foams

In this work, the conventional polystyrene foam products have been attempted to be replaced with promising biodegradable polymer based on carbohydrate compounds. The tensile strengths are almost comparable with the polystyrene foam. Also these sheets are completely biodegradable in soil. From the BOD tests, it was evident that it can be degraded by microbial action. Moreover by addition of hydrophobic formulation its water sensitivity is found to be reduced giving it requisite durability.

Hence such foams find promising applications in packaging; the water sensitive ones could be used in medical fields for application in bandages with drug delivery actions. The packaging fields could be electronic packaging; food packaging etc. These foams can also be made stiff and used in geological applications as superabsorbent by introducing this property.

Nanotechnology using LBL Technique

Polyelectrolytes have been utilized in the formation of new types of functional materials through film formation of nanometric scale on the fibre surface. These thin films are constructed using layer-by-layer (LbL) technique. Polyelectrolytes, either cationic or anionic are adsorbed on the surface of the fibre and the surface charge is reversed, allowing the gradual and controlled build-up of electrostatic films of polycation-polyanion layers. The polyelectrolyte multilayer (PEM) film thus built by this method can be subjected to further modification to impart new functional properties to the fabrics onto which it is applied such as antimicrobial, super hydrophobic surface, mosquito repellent, optical anti-reflective coatings etc. In our research lab, we have been successful to incorporate ZnO nanoparticles on Nylon fabric by this method. The resultant fabric found to have antimicrobial properties. We are currently attempting to impart mosquito repellent properties to the fabrics by this technique using naturally occurring oils.

New Synthetic Fibre Processing technique through solvent crazing

Synthetic fibres can be modified at room temperature using solvent crazing technique. Solvent crazing permits us to add any additive into the yarn of synthetic fibres using so called active absorption media (AAM). The advantage of this method is, it combines the best of finishing method and the melt additive method which is normally used to incorporate any compound in the fiber without having any demerits of the above two methods. Process modifications are being carried out to dye and incorporate additives into the synthetic fibres at room temperature on continuous

production line without having to modify the process sequence or addition of any new machinery. This will avoid the processing of these fibres being done at higher temperature which require higher temperature and energy.

Selfreinforced composites

Composites are composed of two chemically foreign components, so there should be an interface between the fibre and the matrix. The interface often brings serious problems such as poor adhesion and water uptake by the composites. Nowadays we can see that these composite material are used everywhere in our daily purpose hence create a lot of environment pollution and other related problems. Single-polymer composites are particularly important in biomaterials applications, since any additives composed of different chemicals could affect biocompatibility and biodegradation. In this study, self-reinforced cellulose films were prepared by incomplete dissolution of commercial microcrystalline cellulose in LiCl/DMAc solvent and subsequent coagulation of regenerated cellulose in the presence of undissolved microcrystalline cellulose. This self-reinforcement composite were further investigated by using Fourier transform infrared spectroscopy (FTIR), thermo gravimetric analysis (TGA), Tensile strength, X-ray diffraction (XRD), visual assessment and scanning electron microscope (SEM).

Highlights of research work done and its impact:

Publications (peer reviewed) so far: 57

Patents : 03

Conference proceedings/papers: 02

Seminars/Lectures/Orations delivered : 60

Masters Awarded as single/ Co-Guide : 17

h-Index : 08

Citations : 174

Subjects taught :

- Technology of Textile Polymers
- Polymer Chemistry
- Testing & Analysis of Fibres
- Testing of Textile Materials
- High tech & Industrial Fibres, Technology of non-wovens
- Dyeing of Natural and Synthetic fibres
- Lab Testing of Textiles and Garments
- Fastness Lab

Research interests :

- Effluent treatment using nano particles and natural materials
- Application of nano emulsions in Textiles
- Green synthesis and application of nano particles
- Use of Polyelectrolytes Multilayers for imparting Novel Properties to Textile Polymers
- Green Composites
- Self-Reinforced Composites
- Biodegradable packaging films and foams
- Functional Finishes for Natural & Synthetic Fibres
- Processing of Polyester fibres at room temperature
- Modification of Synthetic Fibres by Melt Spinning,
- Hydrophilic polyester using natural biopolymers

Research students :

Ph.D.(Sc) -04

M.Tech. - 11

Research publications:

International- 6

National - 13

Conference proceeding: 02

Books: 01

Patents :

Indian - 01

Sponsored projects :

Government - 01

Professional Activities:

- TEQIP coordinator of the dept
- Part of the Chief Conductor cum Senior Examiner for all the examinations conducted for UG and PG students
- Committee member of the MIS system of the Institute
- Placement coordinator the dept
- IPT in charge for T Y B Tech and M Sc Textile Chemistry students
- Coordinator of the dept for UGC-SAP programme
- Divisional Representative of the dept for IPC
- Member of the Cultural Activity Cell of the Institute

- Member of the Admission Committee of the Institute
- Member of the “Shri G.M. Abhyankar Students’ Travel Assistance” of the Institute
- Examiner for M Tech. Thesis in VJTI, Matunga
- External Examiner for M Sc. Home Science students of Nirmala Niketan, Mumbai
- Examiner for Practical Exam in SASMIRA, Worli
- Paper setter for NMIMS (Deemed to be University), Shirpur
- Assisting NMIMS (Deemed to be University), Shirpur for designing the DTT course syllabus
- Expert on the committee formed by Dept of Health Sciences, Maharashtra State that is tasked with preparing specification for different garments/items that is used in Govt. mental hospitals

Special Awards/Honours:

MsLatika Bhatt, Ph.D Science student awarded Newton PhD UK - India Placement scholarship where she spent three months in the Liverpool School of Tropical Medicine, UK from June to September 2018

Best paper award received for the paper “Biogenic synthesis of Silver Nanoparticles using Citrus Limon leaves and its structural investigation” at International Conference on Advances in the field of Health, Safety, Fire, Environment, Allied Sciences and Engineering (HSFEA-2016) held on 18-19 November, 2016 at University of Petroleum and Energy Studies, Dehradun

Best paper award received for the paper “Dyeing of polyester and its blend using nano emulsion” by The Centre of Excellence (CoE), College of Technology, GB Pant University of Agriculture & Technology, Uttarakhand on 6-8 October, 2016

Undergraduate students’ seminars/projects/home papers :

Seminars

No.	Name of the Student	Topic
B.Tech		
1.	Junaid Mohammad Khan	Graphene Derivatives/ Chemically Modified Graphene
2.	Pooja Sunil Talele	Modification of Kapok fibres and its applications
3.	Siddhesh Chaudhari	Challenges in viscose rayon manufacturing

Project / Home paper

No.	Name of the Student	Topics
1.	Sharma Kartikeya	Utilisation of Polyester Fibre Waste
2.	Khilari Vishal	Utilisation of Polyester Fibre Waste
3.	Prasad Komal	Synthesis and Application of Graphene Derivatives on Tex
4.	Patil Utkarsh	Synthesis and Application of Graphene Derivatives on Tex

Post graduate students’ seminars/projects :

Seminars

No.	Name of the Student	Topic
1.	Annure Yogesh	Metal Deposition on Textile Fabric Using PEDOT
2.	Todakar Sandeep Narayan	Modification of Microcrystalline cellulose by using Neem Oil

Research Projects

Ph.D. (Science)

No.	Research Scholar	Previous Institution	Project	Supervisor
1.	Chaudhary Babita		Application of Bio polymer in Textiles	RDK

M. Tech. / M.Chem. Eng.

No.	Research Scholar	Previous Institution	Project	Supervisor
1.	Annure Yogesh		Development of Insect Repellent Formulation using Natural Essential Oils	RDK
2.	Todakar Sandeep		Color removal from textile effluent using emulsion	RDK
3.	Pawar Nilesh		Synthesis of Novel BODIPy and its application in textile dyeing	RDK

M.Sc. (Chemistry) (By Research)

No.	Research Scholar	Previous Institution	Project	Supervisor
1.	Aditya Nayar	S.I.E.S COLLEGE, SION	APPLICATION OF CHOLRINATED WAX TO IMPART WATER REPELLENCY AND FLAME RETARDANCY TO TEXTILE FABRICS	RDK
2.	Chaitalee Gongale	Ferguson college, Pune	Finishing of Polyester using Nanoclay	RDK
3.	Gajanan Jayade	G.N. Khalsa college, Matunga	Application of Microcrystalline Cellulose on Polyester Fabric	RDK
4.	Shweta Lingayat	G.N. Khalsa college, Matunga	Bio-Degradable films using Agricultural Waste	RDK

Postdoctoral/Ph.D. students’ research projects :

No.	Research Scholar	Previous Institution	Project	Supervisor
1.	Chaudhary Babita		Application of Bio polymer in Textiles	RDK

Details of sponsored projects – Government and Private

Government Agencies:

Sponsor	Ministry of Textiles, Govt. of India
Title	Development of New Generation High Performance Auto Responsive Green Textile through Renewable Energy Resources
Duration	2017-2019 (2 Years)
Total amount	Rs. 35,23,500/-
Co- Investigator	Prof. R.D. Kale
Research Fellows	AmabadasGarje and Junaid

Sponsor	Centre of Excellence-Process Intensification-TEQIP-III (World Bank Sponsored)
Title	Colour removal from textile effluent using emulsions
Duration	October 2018-March 2020
Total amount	Rs. 5.85 Lakhs
Principal Investigator	Prof. R.D. Kale
Research Fellows	Ms. Babita Chaudhary

Sponsor	Rajiv Gandhi Science and Technology Commission, (Assistance for Science & Technology Applications)
Title	Capacity building of weaker section of the society by developing eco-friendly and low cost packaging films
Duration	2018-2021 (3 Years)
Total amount	50,00,000
Principal Investigator	Prof. R.D. Kale
Research Fellows	NA

Sponsor	Empowerment and Equity Opportunities for Excellence in Science (EMEQ) , SERB
Title	Surface modification of synthetic fabrics for enhancing its hydrophilicity using natural polymers
Duration	2018-2021 (3 Years)
Total amount	30,16,800
Principal Investigator	Prof. R.D. Kale
Research Fellows	NA

Publications

No.	Title and authors	Journal	Vol. No.	Pages	Year
1.	Extraction and characterization of microcrystalline cellulose from delignified fiber wastes MisganaTaye a, Babita U. Chaudhary b, Vikrant Gorade b, Ravindra D. Kale b, *	Journal of Natural Fibers (Taylor & Francis Group)	Accepted		2019
2.	Application of atmospheric pressure plasma for adhesion improvement of polyurethane coating on polypropylene fabrics Shital S. Palasakar, Ravindra D. Kale, Rajendra R. Deshmukh*	Journal of Coatings Technology and Research (Springer)	Accepted		2019
3.	Adhesion properties of DBD plasma treated nylon 66 fabric- Optimisation of plasma process parameters Shital S. Palasakar, Ravindra D. Kale, Rajendra R. Deshmukh*	International Journal of Adhesion and Adhesives (Elsevier)	Accepted		2019
4.	Water proof coating of polyester R D Kale and Akshay Vade*	ASIAN DYER	16(4)	31-35	AUG-SEPT 2019
5.	Utilization of waste leather for the fabrication of composites and to study its mechanical and thermal properties Ravindra D. Kale , *, Nilesh C. Jadhav	Springer Nature Applied Sciences(Springer)	(2019) 1:1231		2019
6.	Microbial synthesis of CuNPs using Brevundimonasdiminuta strain and its antibacterial activity. Mahesh H. Joshi a, Ashwini A. Patil b, Smita Chaudhary a, and Ravindra D. Kale*a	Advances in Natural Sciences: Nanoscience and Nanotechnology (ANSN)	Accepted		2019
7.	Adhesion properties of DBD plasma treated nylon 66 fabric- Optimisation of plasma process parameters R RDeshmukh, ShitalPalaskar, Ravindra D. Kale	International Journal of Adhesion and Adhesives	Accepted		2019
8.	Antibacterial and Conductive Polyester Developed using Nano Copper Oxide and Polypyrrole Coating Ravindra D. Kale*, Akshay Vade &Prerana B. Kane	Journal of the Textile Association		340-346	January - February 2019
9.	A facile method for honey mediated bio-synthesis of nickel nanoparticles and its characterization Ravindra D Kale*a, Prerana B Kanea, PriyankaJagtapa, Adarsh R Raob	Advances in Natural Sciences: Nanoscience and Nanotechnology (ANSN)			2019

10.	CymbopogonFlexuosus Treated Textile: A Control Measure against Vector Borne Diseases Ravindra D Kale*, and Latika Bhatt	Heliyon (Elsevier)	Accepted		2019
11	Fabrication of green composite based on rice bran oil and anhydride crosslinkers Ravindra D. Kale , *, Nilesh C. Jadhav Sanchayan Pal	Iranian Polymer Journal (Springer)	28(6)	471-482	2019
12.	Citrus Limon Leaves Mediated Synthesis Method for Copper Nanoparticles and its Structural StudyRavindra D. Kale*, PriyankaJagtap, Prerana Kane	European Journal of Sciences (EJS)	Accepted		2019
13.	Surface modification of microcrystalline cellulose using rice bran oil: A bio-based approach to achieve water repellency Ravindra D. Kale1,*, Vikrant G. Gorade&AalokaKotwal	Journal of Polymer Research (Springer)	Accepted		2019
14.	Extraction and characterization ofcellulosesingle fiber from native Ethiopian serte (Dracaena SteudneriEgler) plant leafRavindra D. Kale *,1, MisganaTaye2, Babita Chaudhary3, Vikrant Gorade	Journal of Macromolecular Science, Part A: Pure and Applied Chemistry(Taylor& Francis Group)	Accepted		2019
15.	A flame retardant, antimicrobial and UV protective polyester fabric by solvent crazing routeRavindra D. Kale*, MohitSoni, TejasviPotdar	Journal of Polymer Research (Springer)	26(189)		2019
16.	Waste medical cotton reinforced chitosan biocomposite film using tannic acid as the crosslinking agent Ravindra D. Kale1,*, Vikrant G. Gorade&OmkarParmaj	Journal of Natural Fibers (Taylor& Francis Group)	Accepted	1-8	2018
17.	Potential application of medical cotton waste for self-reinforced composite Ravindra D. Kale1,* Vikrant G. Gorade	International Journal of Biological Macromolecules (Elsevier)	124	25-33	November 2018
	Extraction and characterization of lignocellulosic fibres from Girardiniabullosa (Steudel) wedd. (Ethiopian kusha plant) Ravindra D. Kale1,*, Vikrant G. Gorade	Journal of Natural Fibers (Taylor& Francis Group)	Accepted		2018
18.	Colour removal of phthalocyanine based reactive dye by nanoparticles Ravindra D. Kale1,*Prerana Kane	Groundwater for Sustainable Development (Elsevier)	8	309-318	2019
19.	Synthesis of PVP stabilized bimetallic nanoparticles for removal of Azo based Reactive dye from aqueous solution Ravindra D. Kale1,*Prerana Kane	Sustainable Chemistry and Pharmacy (Elsevier)	10	153-162	November 2018

20.	CymbopogonFlexuosus Oil Nanoemulsion: A Natural, Safe and Effective Mosquito Larvicidal and Antibacterial Ravindra D Kale, and Latika Bhatt	Journal of Advanced Research in Dynamical and Control Systems (Elsevier)	10, 09-Special Issue	517-529	2018
21.	Nanocomposite polyester fabric based on graphene/titanium dioxide for conducting and UV protection functionality Ravindra D. Kale1,*TejasviPotdar, Prerana Kane and Rahul Singh	Graphene Technology (Springer)	3(2-4)	35-46	December 2018
22.	Decolourization by PVP stabilized Fe-Ni nanoparticles of Reactive Black 5 Dye Ravindra D. Kale1,*Prerana Kane	Journal of Environmental Chemical Engineering (Elsevier)	6	5961–5969	2018
23.	Preparation and characterization of biocomposite packaging film from poly(lactic acid) and acylated microcrystalline cellulose using rice bran oil Ravindra D. Kale, Vikrant G. Gorade, Namita Madye, Babita Chaudhary, Prachi S. Bangde, Prajakta P. Dandekar	International Journal of Biological Macromolecules (Elsevier)	118	1090–1102	June 2018
24.	Treatment of C.I. Reactive Blue-21 effluent by microcrystalline cellulose grafted with APTES: kinetics, isotherm and thermodynamic study. Ravindra D. Kale*, Tejasvi Potdar	Sustainable Environment Research (Elsevier)	29:7		April 2019
25.	Comparative Study of Wool Descaling Using Various Techniques Ravindra Kale*, Prerana Kane, Jidnyasa Patil & Arjunsing Girase	Journal of the Textile Association	78(6)	384-389	March-April 2018
26	D Novel sericin/viscose rayon based biocomposite: Preparation and characterizationRavindra D. Kale, Vikrant G. Gorade&OmkarParmaj	Journal of Natural Fibers (Taylor& Francis Group)	Accepted		August 2018
27.	Green Synthesis of Magnetite Nanoparticles using Banana Leaves Ravindra D. Kale*, SangeetaBarwar, Prerana Kane, Latika Bhatt	European Journal of Sciences (EJS)	1(1)	26-34	2018
28.	Graphene Coated Conducting Polyester Using Sodium Hydrosulphite as Reducing Agent Ravindra D. Kale, TejasviPotdar, Prerana Kane, Sandeep More and Rahul Singh	Current Graphene Science	Accepted		April 2018

29.	D Development and characterization study of silk filament reinforced chitosan biocomposite Ravindra D. Kale, Vikrant G. Gorade & Omkar Parmaj	Journal of Natural Fibers (Taylor & Francis Group)	Accepted		April 2018
30.	Green Synthesis Of Copper Nanoparticles Using Betel Leaves: Synthesis And Characterization Ravindra D. Kale, Sangeeta Barwar, Prerana Kane	IJSART - Volume 4 Issue 11 –	4(11)	918-923	January 2018
31.	Green Synthesis of Silver Nanoparticles Using Papaya Seed and Its Characterization Ravindra Kale, Sangeeta Barwar, Prerana Kane, Sandeep More	International Journal for Research in Applied Science & Engineering Technology (IJRASET)	6 (II)	168-174	February 2018
32.	Preparation of acylated microcrystalline cellulose using olive oil and its reinforcing effect on poly(lactic acid) films for packaging application Ravindra D. Kale ^{1, *} , Vikrant G. Gorade	Journal of Polymer Research (Springer)	Accepted		2018
33.	Synthesis and characterization of magnetite nanoparticles using betel leaves Ravindra D. Kale, Sangeeta Barwar, Prerana Kane, Sandeep More	International Journal of Green and Herbal Chemistry	7(1)	143-152	February 2018
34.	Improvement of Light Fastness of Dyed Meta-Aramid Fabric using Nano TiO ₂ Ravindra D. Kale [*] , Yashlok Maurya, Satyapriya Dash, Tejasvi Potdar	Coloration Technology (Wiley)	0	1-6	June 2018

Book and book chapters :

No.	Author(s)	Title	Publisher	Place	Year
1.	Ravindra D. Kale and Priyanka Jagtap	Biogenic Synthesis of Silver Nanoparticle Using Citrus Limon Leaves	Springer Transactions in Civil and Environmental Engineering, Advances in Health and Environment Safety	India	2018

Membership of In-house Committees :

- Life Member of Indian Fibre Society, India
- Life Member of Indian Natural Fibre Society, India

Seminars/ Lectures/ Conferences/ Symposia/ Workshops/ Summer or Winter Training Schools attended/Oral OR Poster Presentations :

- Attended Professor W. B. Achwal Oration lecture "An Odyssey with Technical Textiles" by Professor Seshadri Ram Kumar of Texas Tech University, USA on 20th February 2018 in KV Auditorium, ICT, Mumbai
- Attended TEQIP-III sponsored "Woolmark Wool Education Course" lecture by Mr RAJESH BAHL of SEAM CONSULTING GROUP on 12th arch 2018 in KV Auditorium, ICT, Mumba
- Attended International conference on "textile 4.0 Global and Indian Perspective" organized by The Textile Association

(India) on 22nd and 23rd March 2018 in Hotel The Lalit, Andheri (E), Mumbai

- Attended AICTE sponsored one week short term course on "Research Methodology for Engineering Management Research" held from 9th to 14th July, 2018 at VJTI, Matunga,
- Events Organized :
- Organized Industry visit to AYM Ltd., Silvasa and Raymonds, Vapi in March 2018 for M Sc Textile Chemistry-Second Year students.
- Aditya birla course
- Organized Dr M V Nimkar

Industrial Consultancy :

Sr. No.	Title	Amount	Duration
1	Up gradation, Expansion and Accreditation of Dadar Laboratory Sewerage Operations Department of MCGM	Rs. 19.10 lacs	One and half year 2013-18

Details of Post-graduate/Ph.D. students who passed out :

Name	Course	Title
Vikrant Gorade	Ph.D (Sci)	Application of micro/Nano cellulose in Textile

Laboratory



Prof (Dr). Ravindra Dhondiba Kale Research Group





DR. SANDEEP P MORE

B. Sc., M.Sc., Ph.D.

DST-INSPIRE Faculty

Fellowships/Memberships of Professional Bodies :

DST INSPIRE Faculty Fellowship

Highlights of research work done and its impact:

A. Molecular Machines

The molecular machines in nature are result of evolution of billions of years which made it irresistible for scientists to imitate at different levels and applications. The selectivity, precision and accuracy of the biological process and the ensembles formed at cellular and sub cellular level was the motivation behind the creation of molecular machines. We are dealing with synthesis of self assembled Molecular Machines and its fabrication on textile surface.

B. Singlet Fission

The limited maximum efficiency of solar cells may be dramatically enhanced by multi-exciton generation (MEG). This process creates multiple charge carrier pairs from single photons, where as conventional solar cells produce on exciton per photon. In molecular systems we are dealing with, produces two triplet pairs by a process known as singlet

fission and these molecules shows around 180% of internal conversion efficiency.

C. Organic Electronics

The Organic Electronic devices such as OPVs, OLEDs, etc. have proved their performance in market as well as in the scientific world. Taking in to consideration the scope of these devices and future needs, we are engaged in the synthesis of various types of molecules as potential material for Organic Electronic devices

Publications (peer reviewed) so far : 14

Conference proceedings/papers: 11

Seminars/Lectures/Orations delivered : 04

Masters Awarded as single/ Co-Guide : 07

h-Index : 08

Citations : 324

Subjects taught :

- Chemistry and Applications of Textile Auxiliaries
- Chemistry and Applications of Colorants

- Chemistry of Speciality Chemicals
- Chemistry of Materials
- Environmental Aspects and Advances
- Advanced Characterization Techniques
- Smart Materials
- Green Chemistry for Textile Processing

Research interests :

- Molecular Machines
- Singlet Fission
- Organic Electronics
- Smart Textile Novel Auxiliaries
- Functional dyes

Research students:

Ph.D.(Sci.) - 04

M.Tech. - 02

M.Sc - 03

Research Publications :

International - 14

Book Chapters-02

Conferenceproceeding- 03

Sponsored projects :

Government - 04

Post graduate student's seminars/projects:

M. Tech. Seminars

Sr. No	Name of the Student	Topic
1	Jasani Akhil	Synthesis of Novel Functional Dyes and its Application in Smart textile
2	Meshram Pallavi	Synthesis of BODIPy Dyes and Its Application on Textile
3	Agrawal Ram	Natural colorants for Dye Sensitized Solar Cells

M. Tech. Research Projects

Sr. No.	Research Scholar	Previous Institution	Project	Supervisor
1	Akhil Jasani	NMIMS, Shirpur	Synthesis of Novel Functional Dyes and its Application in Smart textile	Dr. Sandeep More
2	Pallavi Meshram	SGGS, Nanded	Synthesis of BODIPy Dyes and Its Application on Textile	Dr. Sandeep More
3	Agrawal Ram	DKTE, Ichalkarnji	Effect of metal oxide doping on fibre formation and properties.	Dr. Sandeep More

M.Sc. (Textile Chemistry) Seminars

Sr. No.	Research Scholar	Previous Institution	Project	Supervisor
1	RevankarSaisha	Khalsa College, Matunga	Anthraquinone Based Reactive Dyes	Dr. Sandeep More
2	Shetty Sanjana	Thakur College of Science and Commerce, Kandivali (E)	Synthesis and properties of novel Azo Dyes	Dr. Sandeep More
3	Shaimah Khan	Thakur College of Science and Commerce, Kandivali (E)	Synthesis and properties of novel Thiazole Based Dyes	Dr. Sandeep More

M.Sc. (Textile Chemistry) (Research Projects)

Sr. No.	Research Scholar	Previous Institution	Project	Supervisor
01.	RevankarSaisha	Khalsa College, Matunga	Anthraquinone Based Reactive Dyes	Dr. Sandeep More
02.	Shetty Sanjana	Thakur College of Science and Commerce, Kandivali (E)	Synthesis and properties of novel Azo Dyes	Dr. Sandeep More
03.	Shaimah Khan	Thakur College of Science and Commerce, Kandivali (E)	Synthesis and properties of novel Thiazole Based Dyes	Dr. Sandeep More

Postdoctoral/Ph.D. students' research projects:

Ph. D. (Sci.)

Sr. No	Research Scholar	Previous Institution	Project	Supervisor
01.	Bhadke Anil	Dr. BAMU, Aurangabad	Singlet Fission via Extended Aromaticity	Dr. Sandeep More
02.	LambudSushil	Dr. BAMU, Aurangabad	Design, Synthesis and Properties of Dimeric Molecule for Organic Electronics	Dr. Sandeep More

03.	PranaySatardekar	ICT, Mumbai	Functional Dyes: Way to bypass finishing stage in textile processing	Dr. Sandeep More
04.	Zahir Ali Siddiqui	Delhi University	Phenanthroline-ly coupled Tetracene Dimers: Novel Materials for Organic Electronics	Dr. Sandeep More (Co-Supervisor)

Details of sponsored projects – Government and Private

I. Government Agencies:

Sponsor	DST INSPIRE
Title	Design, Synthesis and Properties of Dimeric Molecule of Organic Electronics
Duration	2015 – 2020
Total amount	Rs. 3500000
Principal Investigator	Dr. Sandeep More
Research Fellows	Mr. SushilLambud

Sponsor	DST SERB (Extra Mural Grants)
Title	Phenanthroline-ly coupled Tetracene Dimers: Novel Materials for Organic Electronics
Duration	2017 – 2020
Total amount	Rs. 3758480
Principal Investigator	Dr. Sandeep More (Co-PI)
Research Fellows	Mr. Zahir Ali Siddiqui

Sponsor	DST SERB (Early Career Research Award)
Title	Singlet fission via Extended Aromaticity of Azacenes: (SFEAA) Novel Material for Potential Solar cell Applications
Duration	2018 – 2021
Total amount	Rs. 2475000
Principal Investigator	Dr. Sandeep More
Research Fellows	Mr. Anil Bhadke

Publications :

Sr.	Title and authors	Journal	Vol. No.	Pages	Year	Impact Factor
01.	“Dispersant-free disperse dyes for polyester an eco-friendly approach” C. R. Meena, SaptarshiMaiti, N. Sekar, Sandeep More, R. V. Adivarekar,	The Journal of The Textile Institute	108	1144-1149	2016	1.12

02.	“Synthesis of pyrene fused pyrazaacenes on metal surface: towards one-dimensional conjugated nanostructures” L. Jiang, A. Papageorgiou. S. Oh, J. Reichert, D. A. Duncan, Y. Zhang, F. Klappenberger, Sandeep More, Rajesh Bhosale, Aurelio Mateo-Alonso, Johannes V. Barth,	ACS NANO	10	1033-1041	2016	13.33
03.	“11,11,12,12-Tetracyano-4,5-pyrenoquinodimethanes (4,5-TCNP): Isolable Push-Pull or thio-Quinodimethanes with S2 Fluorescence” R. Garcia, Sandeep More, Manuel Melle-Franco, Aurelio Mateo-Alonso	Organic Letters	16	6096-6099	2014	6.73
04.	“Low LUMO Pyrene-fused Azaacenes” Sandeep More, Rajesh Bhosale, Aurelio Mateo Alonso	Chemistry An European Journal	20	10626-10631	2014	5.77
05.	“Twisted Pyrene-fused Azaacenes” Sandeep More, Sunil Choudhary, Alexander Higelin, Ingo Krossing, Manuel Melle-Franco, Aurelio Mateo-Alonso	Chemical Communications	50	1976-1979	2014	6.56
06.	“Versatile 2,7-substituted pyrenesynthons for the synthesis of pyrene-fused azaacenes”, Sandeep More, Rajesh Bhosale, Sunil Choudhary, Aurelio Mateo-Alonso	Organic Letters	12	4170-4173	2014	6.73
07.	“A tetraalkylatedpyrene building block for the synthesis of pyrene fused azaacenes with enhanced solubility”, NiksaKulicic, Sandeep More, Aurelio Mateo-Alonso	Chemical Communications	47	514-517	2011	6.56
08.	“Ionic Liquid promoted synthesis of β -Enamino Ketones at room temperature”, Rajesh Bhosale, Sandeep Mane, P. Suryawanshi, Sandeep More, M. Lokhande, R. Pawar	Synlett	06	933-935	2006	2.42
09.	“Microwave-Assisted facile synthesis of 2-substituted 2-Imidazolines”, MohsinPathan, VijaikumarPaik, PandurangPachmase, Sandeep More, RajendraPawar	ARKIVOC	XV	205-210	2006	1.16
10.	“Synthesis and characterization of magnetite nanoparticles using betel leaves” Ravindra Kale, SangeetaBarwar, Prerana Kane, Sandeep More	International Journal of Green & Herbal Chemistry	07	143-152	2018	1.83
11.	“Green Synthesis of Silver Nanoparticles Using Papaya Seed and Its Characterization” Ravindra Kale, SangeetaBarwar, Prerana Kane, Sandeep More	International Journal for Research in Applied Science & Engineering Technology	06	168-174	2018	6.88

12.	“One-bath Dyeing of Polyester/Cotton blend with Vinyl sulphone Reactive Disperse Dyes” SaptarshiMaiti, Sandeep More, R. V. Adivarekar	Fibers and Polymers		Accepted	2018	1.11
13.	“Dyeing of polyester and Nylon with semi-synthetic Azo Dye by chemical modification of natural source Areca Nut” Pawar, A.B., Sandeep More. &Adivarekar, R.V.	Natural Products and Bioprospecting	08	23	2018	
14.	“Dispersant-free disperse dyes for polyester an eco-friendly approach” R. V. Adivarekar C. R. Meena, SaptarshiMaiti, N. Sekar, Sandeep More	The Journal of The Textile Institute	108	1144-1149	2017	1.1

Book and book chapters :

Book chapters: 02

Sr.	Author(s)	Title of the chapter	Publisher	Place	Year	Page
01	VijaykumarPaike, Padmakar A. Suryavanshi, Sandeep More, Sandeep B. Mane, Rajendra P. Pawar and K. L. Ameta	“Recent Progress on One-Pot, Multicomponent Reaction for Pyridine Synthesis”	CRC Press, Taylor &Fransis Group	USA	2017	281-298
02	Padmakar A. Suryavanshi, VijaykumarPaike, Sandeep More, Sandeep B. Mane, Rajendra P. Pawar and K. L. Ameta	“Synthesis of Functionalized Piperidine Derivatives Based on Multi-Component Reaction”	CRC Press, Taylor &Fransis Group	USA	2017	299-330

Seminars/Lectures/Conferences/Symposia/Workshops/Summer or Winter Training Schools attended/Oral OR Poster Presentations :

Sr.	Title	Conference Name	Place	Month & Year
01.	“Advances in Chemical and Material Sciences”	International Conference	Mangalore ,Karnataka	Oct-2019
02.	“Exploring New Horizons in Chemical Sciences (ENHCS)-2019”	International Symposium	Aurangabad (MH)	Jan-2019
03.	Synthesis of Materials for Organic Electronics and Smart Textile Dr. Sandeep More	DST-DBT Joint-Conclave meet	Jaipur	June-2018
04.	Recent Advances In Chemistry (Rac-2018)	State Conference	Lonavala, Pune	Jan-2018
05.	“Transition metal doped Azaacenes for Organic Electronics” Vijaykumar More, Sandeep More	National Conference on Recent Trends and Advances in Chemical Science	Parbhani	2016
06.	“A route to linear AzaacenesMetalComplexes”Vijaykumar More, Sandeep More,	Recent Challenges in Advanced Material and Green Chemistry.	BAMU, Campus, Osmanabad	February, 2015

07.	“Break Incorporated Multicomponent Self-Assembly Nanorotors” Sandeep More, Jan Bats, SoumenSamanta, Michael Schmittel.	RTG Münster-Nagoya Abschluss-symposium, University of Munster - University of Nagoya.	Castle of Munster, Germany	November 2014
08.	“Synthesis of pyrene-fused azaacenes with enhanced solubility” Sandeep More, Aurelio Mateo-Alonso	Regio Symposium-2011	Sornetan, Switzerland.	September 2011.

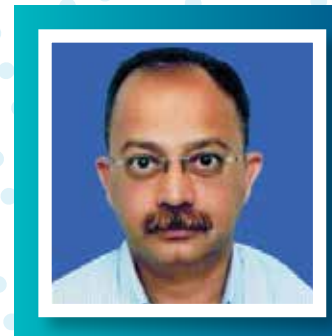
Details of Post-graduate/Ph.D. students who passed out :

Name	Course	Title
SupriyaPandit	M.Sc.	Synthesis of Pyrene Based Molecular Sockets
AjitRaut	M.Sc.	Sulfonation Of Pyrene And Its Applications On Textile
AshwiniPawar	M.Sc.	Combine Dyeing and Multi functional Finishing of Textiles with Natural Sources
PoojaGhodke	M.Sc.	Effluent Treatment of Textiles
KaustubhGawade	M.Tech	Pyrene Fused Acenes&Azaacenes for OLEDs
Shrutibal	M.Tech	Organic Molecules in Electronics
Takbhate Nikhil	M.Tech	Integration of OLED in Textile

Laboratory



Research Student Names: (Left to Right) Anil Bhadke (PhD Sci), Pranay Satardekar (PhD Sci), Akhil Jasani (M.tech), Zahir Ali Siddiqui (PhD Sci), SushilLambud (PhD Sci)



KEDAR S. KULKARNI

B. Sc., B.Sc. (Tech.), M.Tech., Ph.D. Tech.

Adjunct Professor

Subjects taught :

Technology of Pretreatment, continuous processing, Computer colour matching in shade matching, wet processing machinery

Research interests:

Natural dyeing, effluent treatment, polymer recycling, textile auxiliaries, Research students: M.Sc - 3

Research publications:

National- 1

Sponsored projects:

Private- 1

Undergraduate students' seminars/projects/home papers :

Seminars

No.	Name of the Student	Topic
1	Ms. Mishra Sheetal	Sustainability in textiles
2	Ms. Joshi Shruti	Treatment of textile effluents
3	Ms. Menon Shritu	Medical and healthcare textile

Project / Home paper

No.	Name of the Student	Topics
1	Ms. Mishra Sheetal	Dyeing of polyester using natural indigo
2	Ms. Joshi Shruti	Use of weeds for effluent treatment
3	Ms. Menon Shritu	Use of organic alkali for pre-treatment of cellulose

Details of sponsored projects – Government and Private

Private agencies:

Sponsor	Welspun (India) Ltd.
Title	ICT – Welspun hand holding program
Duration	1 year
Total amount	10,00,000/-
Principal Investigator	Kedar Kulkarni
Research Fellows	

Publications

No.	Title and authors	Journal	Vol. No.	Pages	Year
1	Kalamkari revamping: Assessment of pretreatment processes & fastness properties; R. V. Adivarekar, K. S. Kulkarni et.al.	Asian dyer	16(5)	24	2019



ARANYA SOUMYANATH MALLICK

Ph.D. *Fibres and Textile Processing Technology*

Adjunct Professor

Publications (peer reviewed) so far: 15

Conference proceedings/papers: 2

Seminars/Lectures/Orations delivered : Many

Masters Awarded as single/ Co-Guide : 3 ongoing

h-Index : 2

Citations : 15

Subjects taught:

Yarn and Fabric Formation Technology, Testing of Textile Materials, Analysis of Textile Chemicals

Research interests :

Fibre Modification, Functional Colouration, Effluent Treatment,

Research students :

M.Sc - 3

Research publications:

International - 4

National - 11

Books- 7

Professional Activities:

Member - Elsevier Advisory Panel, SN Applied Science - Reviewer

Undergraduate students' seminars/projects/home papers : 5

Seminars

No.	Name of the Student	Topic
1	T Amritha	Electrospinning for Filtration
2	Drushti Konde	Self Cleaning
3	Ronak Sirsath	Application of Chitin and Chitosan
4	Prachi Patade	Synthesis of Chitin and Chitosan
5	Pratiksha N.	Herbal Finishing on Textiles

Post graduate students' seminars/projects :

Seminars

No.	Name of the Student	Topic
1	Deshpande Shamika	Multifunctional Natural Colours
2	Kashik Sujaan	Sports Textiles
3	Sarkar Supriya	Medical Composites

Research Projects

M.Sc. (Chemistry)(By Research)

No.	Research Scholar	Previous Institution	Project	Supervisor
1	Deshpande Shamika	NA	Extraction of Natural Colour and Application	
2	Kashik Sujaan	NA	Treatment of Effluent using Fruit Waste	
3	Sarkar Supriya	NA	Utilization of Wash Bath of Denim Colouration of Alternative Fabrics	

Book chapter:

No.	Author(s)	Title of the chapter	Editor	Publisher	Place	Year	Page
1	A. Mallick	Interconnection between Biotechnology and Textile: A New Horizon of Sustainable Technology”		Scrivener-Wiley Publishing	Handbook of renewable materials for coloration and finishing	2018	
2	P. Pandit, A. Mallick, S. Maiti	Applications of Textile Materials Using Emerging Sources and Technology: A New Perspective		Scrivener Publishing LLC	Green and Sustainable Advanced Materials	2018	
3	B. Regubalan, A. Mallick, S. Maiti	Potential Bio-Based Edible Films, Foams, and Hydrogels for Food Packaging		Springer Nature Singapore Pte Ltd	Bio-based Materials for Food Packaging	2018	
4	A. Panda, A. Mallick, R.V. Adivarekar	Microbial Colorants – Future of Sustainable Colouration of Textiles		Woodhead Publishing	Sustainable Textile Colouration of Textiles	2019	
5	A. Patil, A. Mallick, R.V. Adivarekar	Cationization as Tool for Functionalization of Cotton		Springer Nature Publishing	Advances in Functional Finishing of Textiles	2019	
6	A. Mallick, Md Shahid, R.V. Adivarekar	Challenges and Opportunities in Functional Finishing		Springer Nature Publishing	Advances in Functional Finishing of Textiles	2019	
7	A. Mallick, S. Khedkar	Aromatic Textiles		Elsevier Publishing	Advances in Functional and Protective Textiles	2019	

Events Organized :

Texquest - Texpression - 18

Profile:

I am a dedicated teacher, a passionate researcher, a curious learner and an enthusiastic manager for organizing technical programmes, industrial visits or other study tours. Equipped with experience of industry and academia, I possess well balanced knowledge in entire part of Textiles and am associated with researches which address the problems of environment, economy and underprivileged society. I am a strong promoter of building bridge between industry and academia and interdisciplinary researches.