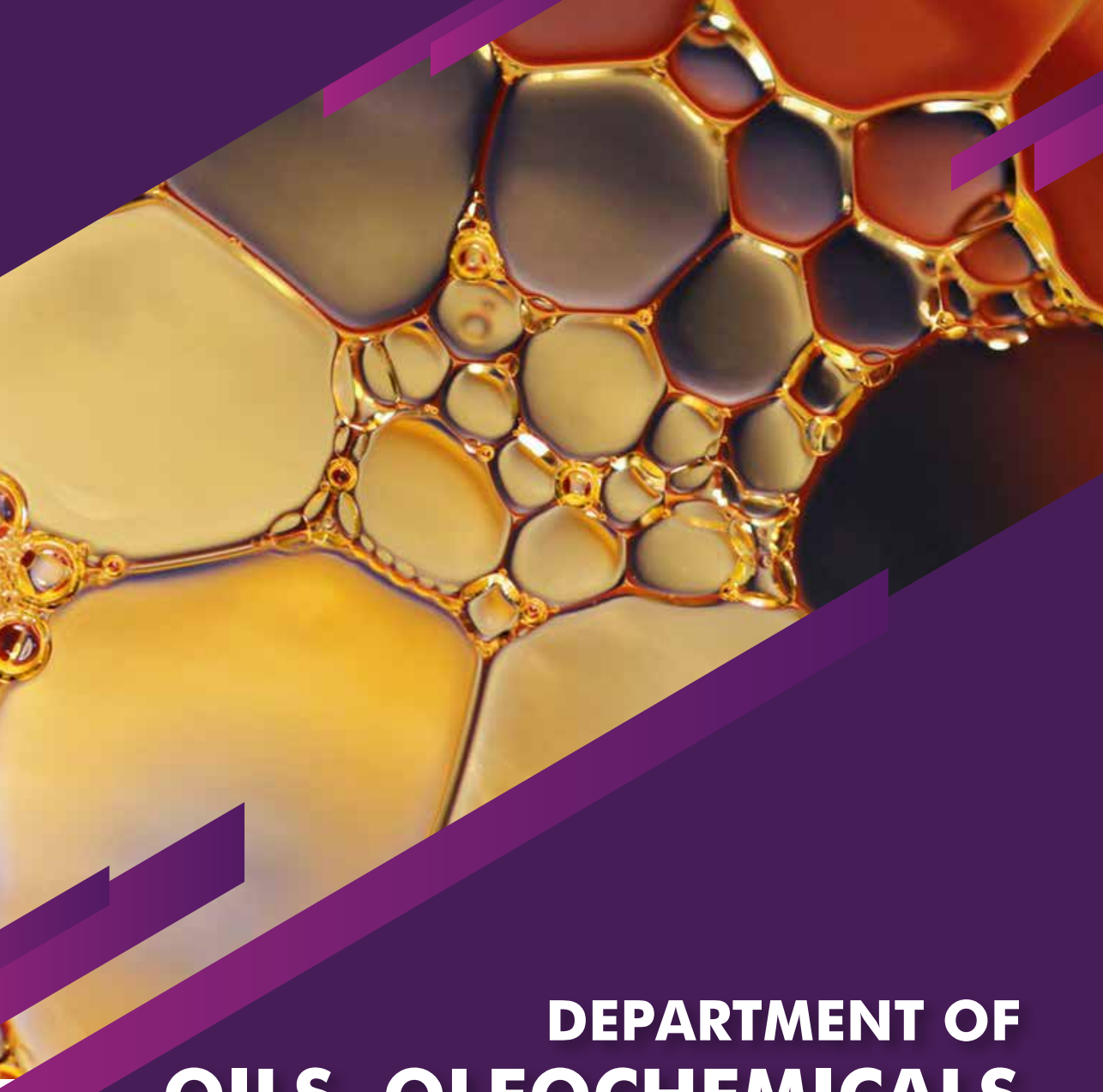


DEPARTMENT OF OILS, OLEOCHEMICALS AND SURFACTANTS TECHNOLOGY

PREFACE

PROF. AMIT P. PRATAP

Professor & Head Department Of Oils, Oleochemicals & Surfactant Technology

Ph. D. (Tech.)

The department was started as Division of Oils, Fats and Waxes in 1943 offering a 2-year course B.Sc. (Tech.) [Technology of Oils, Fats and Waxes] after B.Sc. (Chemistry). The duration of this course was increased to 3years from 1965. In 1998, this Division was renamed as Division of Oils, Oleochemicals and Surfactants. The undergraduate course was changed to a 4-year course, namely B. Chem. Tech. [Technology of Oils, Oleochemicals and Surfactants]. Students are admitted on the basis of MHCET and AIEEE after 12th Grade. The course is a combination of theory, practicals, and seminars, in plant trainings, industrial visits and project work. The course syllabus has been designed keeping in mind the requirement of the industry and international institutions. It is updated from time to time. Nearly 30% of our undergraduate students choose to pursue further education in top most universities abroad. Some of them opt for jobs in the edible oils, surfactants, cosmetics, perfumery, paints, and related industries. A few of them start their own industries. Students are generally well placed before the completion of their graduate course.

The Department also offers a Post Graduate and Doctoral Program. The Department has done pioneering work in the field of Oil Technology. From the time of its inception, faculty members have maintained a close interaction with industry and have been associated with the development of the oil industry. Several short and long term projects instituted by sponsoring bodies for process/product development at this Department have been supervised by faculty as part of their routine research activity. Alumni of this Department have reached very senior and responsible positions in the Indian oil and surfactant industry. The Department has excellent facilities for research and is equipped with advanced instruments such as: GasChromatograph GE17A.Gas Chromatograph-4890D,UV-Spectrophotometer,

Automatic Tensiometer,Karl Fischer Titrino, HPLC,HPTLC, Spray Dryer LSD-48, Lab Pervaporation Unit,Toilet Soap Plant, HighPressure Autoclave, ShortPath Distillation Unit, BatchSolvent Extraction Plant, Turg O-Tometer, RotaryVaccum Evaporator, Brookfield Viscometer, Pour Point Apparatus, Shear StabilityTesting Unit, Rancimate."Alumni of this Department have reached very senior and responsible positions in the Indian oil and surfactant industry"

MAJOR THRUST RESEARCH AREAS ARE:

- Edible oils and their products
- Oil seed processing and Utilization
- Biodegradable Lubricants and Specialty Products
- Natural Products
- Surfactants and Applications
- Perfumery and Cosmetics

FACULTY

PROF. AMIT P. PRATAP

Ph. D. (Tech.)

Professor& Head Department Of Oils, Oleochemicals & Surfactant Technology

Fellowships/ Memberships of Professional Bodies:

- Hon. Jt. Secretary of The Oil Technologists' Association of India – Western Zone.
- "Life member" of The Oil Technologists' Association of India – Western Zone
- "Life member" of Alumni Association of UDCT
- "Life member" of Indian Society for Surface Science and Technology (ISSST)
- "Life member" of Indian Association Nuclear Chemists' and Scientists (IANCAS)
- "Life member" of Chromatographic Society of India

Highlights of research work done and its impart:

SURFACTANTS

Reaching the benefits of Technology to rural and urban population through understanding science at work and designing products to meet the needs of the masses. One of the aims of our Institution has been to help the chemical industry to maximize their output so that the benefits finally reach the end user. A case in point is the pioneering work done by this division several years ago in understanding non-traditional oil as a source not only as an oleochemical for use in the soap and allied industries but also for edible purposes. The author believes that the division can contribute significantly to the industry and society at large by taking up technical issues relevant to the surfactant and related industry by helping provide innovative solutions to problems peculiar to this and other developing geographies. This is illustrated. in the following example:

Some decades ago a quiet revolution took place in our daily lives when the soap used in washing was replaced by synthetic detergents. This had two consequences. It freed up scant resource of oil for edible / toilet soaps and took the level of cleaning broadly to a higher level. However, these benefits did not reach grass roots of the society till someone came along to make it affordable to the masses.

The success of this transformation was in part due to the "helping hand" of the government and more importantly a clearly visible benefit to the consumer through a change in the existing habit. Today there are 5000 small scale units engaged in the manufacture of synthetic detergents in our country. It will be recognized for those in the business that a predominant number of these products are simple, having surfactant and a significant amount of Soda ash (that acts as a precipitating builder and provides alkalinity). Opportunities exist in the improvement of these types of products with consequent savings by focusing (initially) in three-four areas.

1. By having a non-ionic / cationic co-surfactant a significant reduction in overall surfactant concentration of up to ten per cent is possible through improved hardness tolerance and soil removal. Assuming about ten thousand tons of LAS is replaced this works out to a saving of -Rs. 400 M.
2. Through Polymers that can help prevent crystal growth of the inorganic Carbonate in hard water, leading to significant reduction in the total soda ash used. Unfortunately current manufactures "cannot" afford these materials as cost benefit is not immediately seen. However, by incorporating the polymer in Soda ash at the manufacturers end (as in Iodized salt) and making it mandatory for small

scale manufacturers to use this material, a significant change can be visualized.

3. Polymers that are of natural origin and specific to this country such as Guar gums are available in significant quantities. Several modifications can be envisaged for making polymers that could be viscosity modifiers, soil dispersing agents, soil release polymers for use in detergent formulations in different forms. Such modifications can add huge value to these natural polymers and replace those polymers derived from petroleum sources.
4. Photo bleaches (such as Zinc/Si/Al Phthalocyanine Sulphonates) can be cost effective ingredients that can significantly improve cleaning and this is in sync with the current consumer habits.
5. Use of Polymeric materials that help in removal of soil peculiar to developing geographies (eg- Carbon in the atmosphere due to vehicular pollution and clay soil encountered in the rural areas).

Through the above one can realize a saving of at least 10 per cent in the cost of Raw materials in the inexpensive detergent industry segment.

Currently there is a project that is being undertaken by the section to look at developing value added products from by products of the fatty alcohol industry through Guerbet chemistry. When successful scaled up this could be the forerunner of many other similar products.

BIO – DIESEL (ALTERNATIVE FUELS OF BIOLOGICAL ORIGIN)

Fuel is a substance, which gives energy on combustion i.e. oxidation, where the oxygen from air plays a major role. Conventionally used fuels are solid (coal, coke, wood, paper etc.), liquid (kerosene, gasoline, low molecular weight alcohols, vegetable oils etc) and gaseous (methane, LPG, CNG, water gas, producer gas) in nature. The radioactive isotopes could be thought for the peaceful use of atomic energy that can be utilized as a fuel. Many of the above mentioned fuels namely natural gas, kerosene, gasoline etc. are derived from crude oil, which is diminishing very fast from earth's crust. It is predicted that these reserves (existing as of now and which will be found in near future) will be depleted in another 25 to 30 years. Day by day the rift between demand and supply is expected to be widened, which will lead to the unexpected hike in the price of fuels, which also reflects in the price of the crude oil as on today, which is at 70 $ per barrel. By looking at these aspects, the time has come to explore the new source of fuels.

Fuels derived from renewable biological resources for use in diesel engines are known as biofuels. This could be thought to partly cope up with fuels such ethanol, fatty acid methyl esters popularly known as biodiesel. The name "biodiesel" was introduced in the United States in 1992 by the "National Soydiesel Development Board" (now the "National Biodiesel Board"), which has pioneered the commercialization of biodiesel in the U.S. Chemically, biodiesel is referred to as the mono alkyl esters (methyl or ethyl) of long chain fatty acids or ester-based oxygenated fuels derived from renewable lipid sources. It can be used in compression-ignition (diesel) engines with little or no modifications. Pure biodiesel is biodegradable, nontoxic and essentially free of sulfur and aromatics.

This molecule (fatty acid methyl ester) has attracted the attention of many technologists and scientists across the globe. Major advantage of it includes renewability, better quality gas emissions and biodegradability. Biodiesel readily blends with diesel fuel in any percent. The blend level is a function of economics, the desired emissions profile, material compatibility, and combustion characteristics. The focus at the moment is on a 20 % (Vol.) blend of biodiesel in petrodiesel. India is a country with vast resources of inedible oils, some of which are derived from plants that grow in the wild. Yet, the development activity on biofuels in our country is at a primary stage. In this background, it is important that in order to harness the country's nonedible vegetable oil resources like neem, karaja, jatropha, mahua etc. towards renewable raw materials, development work on products, processes and technologies related to this vital field must be accelerated. Some of the comparatively cheaper sources those need a special attention are soap stock, acid oil, waste cooking oil etc.

An organized program of social forestry can generate enormous benefits to rural areas in terms of employment for collection of seeds and processing. The globalization has opened up opportunities to Indian oleochemicals industry in an unprecedented measure. Added to this, a wide scale introduction of biodiesel has brought to for the supply of glycerol, magnitude of which may likely to question the very economical viability of the oleochemical industry. Selection of a suitable topic on the utilization of glycerol will be made after preparation of a review report.

BIOSURFACTANTS

From the global viewpoint chemical, pharmaceutical, environmental and petrochemical industries have recognized the potential of living cells in pretreatment of raw materials, processing operations, product development, waste management, energy recycling and conservation. In this context, surfactants are increasingly recognized for their range of uses. The total quantity of biological and chemical surfactants all over the world is estimated at more than 25 billion pounds and 10 billion pounds respectively. The enormous market demands of 3 million tones per annum are currently met by synthetic, petroleum based surfactants. These surfactants are toxic to the environment and non biodegradable. The tightening environmental regulation and increasing awareness to protect ecosystems have therefore resulted in increasing interest in biosurfactants during past decade. The requirement of surfactant-based products is increasing at rate of 5% annually.

Biosurfactants are biologically synthesized surface-active agents produced as metabolic byproducts through microbial transformation of organic substrate. Besides their classical application as emulsifiers of hydrocarbons, they can be used in environmental protection, crude oil recovery, food processing industries, in various fields of biomedicine (antibacterial, antiviral and antifungal), textiles manufacturing, metal treatment, cosmetics, agriculture, paint industries and in paper and pulp processing. India being an agricultural country has enough availability of substrates like molasses, baggasse, glycerol, used oil and deoiled cake for production of biosurfactants. They have advantages over conventional surfactant in toxicity, biodegradability and the availability of renewable raw materials. Biosurfactants are also effective at wide temperatures, pH and salinity. Among the different types of biosurfactants, the glycolipids (e.g. ramnoslipids, sophoroselipid, mannosylerythritol, surfactin) and polysaccharide lipid complex have broad spectrum of applications. In the production of these biosurfactants, it has been estimated that raw material accounts for about 30% of overall cost where as downstream processing accounts for about 60% cost. Therefore further significant improvements in upstream as well as downstream processing by exploring system biology for strain improvement, fermentation engineering, integrated product recovery and reactor design are required. Attempt to characterize and to increase the number of applications is also desirable.

It is aimed at developing technology that would use waste carbon sources such as used oils, de-oiled cakes, and glycerol for the production of biosurfactants through fermentation, over-expression of glycolipids (rhamnoslipids, sophoroselipid and mannosylerythritol), Phospholipids, Polymeric Surfactants based on Carbohydrate-protein-lipid, Lipopeptide and Lipoproteins (Peptide-lipid and Surfactin) etc.

The proposed project will involve selection and development of strains aimed at producing select biosurfactants. Further, focus will be at identification and physico-chemical characterization and devising new strategies for purification of selected biosurfactants to give products that meet international specifications in terms of purity, safety profile etc. The work will also involve studies in kinetics of biosurfactants production in bioreactors and scale up. Biosurfactants, which is currently in its state of infancy, could get a further boost if larger numbers of applications are identified. This would also create technical expertise and ameliorate the availability of skilled manpower in the said field. The technology developed through this proposal will be patented according to intellectual property rights. Further the proposed process will scaled up to pilot scale production and will be offered to industries for commercialization.

TRIBOAPPLICATIONS OF OILS AND FATS

Over the last fifty years, urgency to find renewable alternatives for petroleum in lubricants has been acutely felt, primarily due to the serious environmental hazards related to the indiscriminate use of petroleum in lubricant formulations. In many countries, legislations have been enforced, making the use of environment friendly lubricants mandatory in certain sensitive high risk applications. In the era of modern technology, the gradual change-over from Petroleum based to Vegetable oil based environment friendly lubricants is inevitable.

India is a country with vast resources of inedible oils, some of which are derived from plants that grow in the wild. Yet, the development activity on vegetable oil based lubricants in our country is almost non-existent. In this background, it is important that in order to harness the Country's inedible vegetable oil resources towards viable alternative lubricants, development work on products, processes and technologies related to this vital field must be accelerated. It is believed that the Oils and Fats Department of UICT, with its long experience and strong expertise in the field of Vegetable oils, can play an important part towards achievement of this objective by taking on an intensive long term project aimed at

standardizing various aspects of this emerging and strategically important technological field. Some of the candidate Indian inedible vegetable oils, which can be considered for the study, include Jatropa, Mahua, Pilu, Castor and other tree borne oils. Studies will also be carried out on superior genetic varieties of Sunflower, Rapeseed and Soybean oils to generate comparative data.

Publications (peer reviewed) so far: 57 (National and International)

Patents : 15 (Applied)

Conference proceedings/papers: 50

Seminars/Lectures/Orations delivered : 35

Ph.D.s Awarded as single/ Co-Guide: 11/ 02

Masters Awarded as single/ Co-Guide : 60

h-Index : 9

Citations : 283

Subjects taught:

Technology of Oil and Fat Production, Processing of Oils and Waxes, Production of soaps, surfactants and detergents, Triboapplications Laboratory, Cosmetics Formulations, Byproducts Utilization and Waste Management, Functional Fluids and Performance Chemicals,

Research interest:

Vegetable oil based lubricants, additives, biosurfactants and specialty products

Research students :

RA - 01

Ph.D. (Tech.) - 05

Ph.D.(Sc) - 05

M. Tech. 14

Research publications:

International - 45

National- 12

Patents :

Indian – 15 (Applied)

Sponsored projects :

Government - 11
(Completed and ongoing)

Private - 20 (Completed and ongoing)

Professional Activities:

- Hon. Jt. Secretary of The Oil Technologists' Association of India – Western Zone.
- "Life member" of Oil Technologists' Association of India – Western Zone
- "Life member" of Alumni Association of UDCT
- "Life member" of Indian Society for Surface Science and Technology (ISSST)
- "Life member" of Indian Association Nuclear Chemists' and Scientists (IANCAS)
- "Life member" of Chromatographic Society of India

Undergraduate students' seminars/projects/home papers :

Seminars (2018-19)

Sr.	Name of Student	Seminar Topic
1	Rushikesh Darshanwad	Effluent treatment in Oleochemical plants
2	Prashant Kothavale	Extraction and application of Soy Concentrates and Isolates
3	Shritej Patel	Petroleum Industry Structure
4	Snehal Deshpande	Value added products from essential Oil
5	Rishabh Kakar	Renewable methods for enhanced oil recovery
6	Sammed Bhalerao	Waste utilisation via Syn gas fermentation
7	Indrajeet Bhise	Pectin Extraction
8	Suruchi Damle	Review on ingredients in personal care products
9	Kamini Gohil	Surfactants in Cosmetics
10	Dipti Bhave	Byproduct Utilisation and waste management using sustainable methods
11	Upendra Dabholkar	Extraction methods of natural essential oils
12	Govardhan Chanda	Enhancement of oil producing plants by genetic modification
13	Prasad Sanap	Flame Retardant Polyurethanes
14	Aishwarya Menon	Surfactants in drug delivery
15	Ishaan Jagyasi	Emulsions in Cosmetic formulations

Project / Home paper:

Sr.	Name of Student	Project Topic
1	Rushikesh Darshanwad	Oil based polymer coating over textile material
2	Prashant Kothavale	Design a plant to manufacture epoxides from non-edible vegetable oil
3	Shritej Patel	Oil Water Separation
4	Snehal Deshpande	Blends of recycled HDPE and PP
5	Rishabh Kakar	Guerbet/ Branched Alcohols from Sustainable Sources
6	Sammed Bhalerao	Guerbet/ Branched Alcohols from Sustainable Sources
7	Indrajeet Bhise	Formulation of fish oil soft gels and nutritional bar
8	Suruchi Damle	Assessment of comparative merits of liquid bromine and bromide-bromate intermediate of air blowing process in commercially important bromination reactions
9	Kamini Gohil	Pickering emulsions for topical applications containing actives such as antiseptics, volatile oils. End product is incorporation in soap bars, shower gels, face wash for topical use
10	Dipti Bhave	To design a plant to manufacture 2 chlorotrityl chloride- a key intermediate of Clotrimazole
11	Upendra Dabholkar	Synthesis of Novel Silicon Surfactants from Renewable sources
12	Govardhan Chanda	Formulation of fish oil soft gels and nutritional bar
13	Prasad Sanap	Pickering emulsions for topical applications containing actives such as antiseptics, volatile oils. End product is incorporation in soap bars, shower gels, face wash for topical use
14	Aishwarya Menon	Process Development for Tranexamic acid
15	Ishaan Jagyasi	Process development for Tranexamic acid

Post graduate students' seminars/projects :

Seminars

No.	Name of the Student	Seminar Topic
1	Patil Apurva Avinash	Recovery of oil from emulsion effluents
2	Ayushi Sur	Oilseed Meal Processing for Protein Recovery
3	Kamble Harshada Digamber	Solar distillation using fatty acids
4	Himanshu Balani	Silicon Surfactants from Renewable Sources
5	Karishma Anand	Recent Advantages in Multigrade Oils
6	Joshi Omkar Kishorrao	Recovery methods of □ oryzanol from Rice bran oilsss
7	Thakare Prachi Shrikant	Cosmeceuticals- Challenges and Application
8	Prasad Varavadekar	Nutritive value of masasinor Oilseeds and its Applications
9	Raut Pratik Adinath	Production of Biodiesel from Castor Oil
10	Shailesh Shingade	Production and Utilization of Biosurfactant From Renewable Resources
11	Shaziya Chowdhary	Branched Chemicals Based from Sustainable Sources
12	Sushmita Chikate	Design of fractionating column for fatty acid methyl esters.
13	Nikhar Vaibhav Pradip	Silicone block co-polymers and its applications
14	Dnyaneshwar Kolhe	Extraction of essential oil by using Ionic Liquid as Solvent
15	Pavankumar Jadhav	Protein in Oilseeds

16	Sutej kumar Jain	Natural Pesticides as Repellents
17	Waghmode Sneha Gopal	Advanced Methods of Essential Oil Extraction
18	Shaikh Asif Shafiq	Alternative Fuels

Seminars:

No.	Name of the Student	Project Topics
1	Patil Apurva Avinash	Synthesis of amino acid based fatty acid esters
2	Ayushi Sur	Value Addition to Lecithin
3	Kamble Harshada Digamber	Isolation and characterisation of Nutraceuticals from rice bran oil refining byproduct, niger seed oil and evening primrose seed oil.
4	Himanshu Balani	Starch Based Biosurfactants
5	Karishma Anand	Performance Chemicals from Tree Borne Oils
6	Joshi Omkar Kishorrao	Production of palm based oil based biolubricants with enhanced low temperature flow and oxidation stability properties.
7	Thakare Prachi Shrikant	Synthesis, Characterization and Application of Alkylpolyglucoside Surfactants in Cosmetic and Personal Care Applications
8	Prasad Varavadekar	Extraction of essential oil from lemon peel and its application
9	Raut Pratik Adinath	Biopolymers from castor oil.
10	Shailesh Shingade	Saponin Based Biosurfactant and its value added products.
11	Shaziya Chowdhary	Mitigation of 3-MCPD and Glycidol Esters formed during Processing of Cooking Oils
12	Sushmita Chikate	Synthesis, Characterization and Performance evaluation of POLYQUATs as hair care surfactant
13	Nikhar Vaibhav Pradip	Silicone based defoamersas
14	Dnyaneshwar Kolhe	Extraction of essential oil (Cumin, Fenugreek) and its application in food
15	Pavankumar Jadhav	Extraction of protein from defatted rice bran and its utilization in food product
16	Sutej kumar Jain	Protein based Surfactants using different crude cakes and its application.
17	Waghmode Sneha Gopal	Natural antioxidant from Indian spices.
18	Shaikh Asif Shafiq	Production of biodiesel from WCO by using synthesized novel catalyst.

No.	Name of the Student	Previous Institution	Supervisor
1	Patil Apurva Avinash	Datta meghe college of engineering, Airoli	PRN
2	Ayushi Sur	LIT, Nagpur, Nagpur University	APP
3	Kamble Harshada Digamber	Datta Meghe college of Engineering, Airoli	RDK
4	Himanshu Balani	LIT, Nagpur, Nagpur University	APP
5	Karishma Anand	University, Rajasthan	APP
6	Joshi Omkar Kishorrao	UDCT,NMU, Jalgaon	RDK
7	Thakare Prachi Shrikant	ICT, Mumbai	RDK
8	Prasad Varavadekar	UDCT, Dr. BAMU, Aurangabad	JSW
9	Raut Pratik Adinath	Mumbai University	CSM
10	Shailesh Shingade	UDCT ,NMU, Jalgaon	CSM
11	Shaziya Chowdhary	Thadomal Sahani Engg. College, Mumbai UNiversity	APP
12	Sushmita Chikate	Bharati Vidyapeeth College of Engg, Navi Mumbai	RDK
13	Nikhar Vaibhav Pradip	ICT, Mumbai	PRN
14	Dnyaneshwar Kolhe	VNKV, Parbhani	CSM
15	Pavankumar Jadhav	UDCT, Dr. BAMU, Aurangabad	JSW
16	Sutej kumar Jain	Priyadarshani College of Engg., Nagpur, Nagpur University	JSW
17	Waghmode Sneha Gopal	MIT CFT Pune ,MPKV, Rahuri	CSM
18	Shaikh Asif Shafiq	M.G.M.C.E.T, Kamothe, Navi-Mumbai	JSW

Research Projects

No.	Research Scholar	Previous Institution	Project	Supervisor
1	Mesrti Rohan	ICT, Mumbai	Surfactants Based on Renewable Sources through sustainable technology	APP
2	Jadhav Jagruti	ICT, Mumbai	Biobased Surfactant Fermentative Production, Purification and Development of Application	APP
3	Kirti Datir	ICT, Mumbai	Product and process Development of Amphiphilic Molecule and its Application	APP
4	Patil Harshada	NMU, Jalgaon	Fermentative Production and Downstream Processing of Microbial Surfactants	APP
5	Parekh Rutu	ICT, Mumbai	Synthesis and application of sustainable surfactants from renewable resources	APP
6	Parmar Ronak	ICT, Mumbai	Biofuel and Natural Wax Related Products	APP
7	Wankhede Dharmendra	ICT, Mumbai	Studies in Cost Effective Terpenes Based on Fragrance and Flavor Materials	APP
8	Deepak Sonawane	ICT Mumbai	Guarbet	APP
9	Pavan Paraskar	NMU, Jalgaon	Novel Renewable Lipids-based Polyurethanes: Synthesis, Characterizations and High Performance Applications	RDK
10	Harshal Patil	NMU, Jalgaon	Formulation and Application of Laser Printing Ink Jet Toners	RDK
11	Kulkarni Shivani	LIT, Nagpur	Synthesis of novel speciality surfactants and exploration of their application In health care and personal care industries	RDK
12	Jadhav Pravin	BATU, Lonere	Removal of Diglycidyl ester from crude palm oil	RDK
13	Fakir Asma	ICT, Mumbai	Studies on Nutraceuticals Oils and their Applications	JSW
14	Wanjari Nikita	ICT, Mumbai	A study on Vegetable Oilseed Meal Applications for Surfactants, Nutraceuticals and Cosmeceuticals	JSW
15	Deshpande Ratnakar	LIT, Nagpur	Enzymatic Intetensification to form Saturated Lipids	JSW
16	Rakhi Suresh Patil	ICT Mumbai	Value addition to defatted seed cake	JSW

Ph.D. (Science)

No.	Research Scholar	Previous Institution	Project	Supervisor
1	Rajput Yogeshsing	NMU, Jalgaon	Green synthesis of Carbohydrate and Fat based Specialty Surfactants for development of milder and Sulphate free Skin, Hair and Oral Care Cosmetic Products.	RDK
2	Kedar Rahul	NMU, Jalgaon	Studies in Nutraceuticals, Lipid excipient and Topical pharma bases from vegetable oil	RDK
3	Girase Chetan	NMU, Jalgaon	Synthesis of cationic Polymers and their applications	RDK
4	More Snehal	Mumbai University	Synthesis of Structured Lipids and their Applications	JSW
5	Shelke Prem	Marathwada University Aurangabad	Bioactives from Selected Spices: Separation and Applications	APP
6	Dalvi Ankush	Amaravati University	Studies in Oleoresins from Spices	APP
7	Singh Priya	Mumbai University	Synthesis and Applications of Amino Sugar Surfactants: A Novel Green Surfactant	APP
8	Ninad Mhatre	The Institute of Science, Mumbai	Scale Up Studies for Production of Biosurfactant from Hydrocarbon Utilising Bacteria & Product Characterisation	APP
9	SK Aminul Islam	SK Porwal College, Nagpur University	Molecular Switch	PKK
10	J. Pradeepruban	St. Joseph College, Bharathadasan University, Trichy	Synthesis and Applications of Spriropyran Derived Molecules on Materials for Photoswithable Catalyst	PKK

Details of sponsored projects – Government and Private

Government Agencies:

Sponsor	RGSTC, Mumbai
Title	Pilot Study and Evaluation of Production of Green Surfactants from Non-edible/Edible Oils and Treated Oil Seed Meals
Duration	2016-19
Total amount	2,45,78,000/-
Principal Investigator	Professor (Dr.) Amit P. Pratap
Research Fellows	Ms. Jagruti Jadhav

Sponsor	Naval Materials Research Laboratory (DRDO)
Title	Scale Up Studies for Production of Biosurfactant from Hydrocarbon Utilising Bacteria & Product Characterisation
Duration	2017-19
Total amount	13,70,770/-
Principal Investigator	Professor (Dr.)Amit P. Pratap
Research Fellows	Mr. Ninad Mhatre

II. Private agencies:

Sponsor	M/s Bio Sols India Pvt. Ltd., Mumbai
Title	Novel Oleochemicals and its Applications
Duration	2017-21
Total amount	31,39,040/-
Principal Investigator	Professor (Dr.)Amit P. Pratap
Research Fellows	Ms. Kirti Datir

Sponsor	M/s Anshika Polysurf Ltd., New Delhi
Title	Synthesis and Applications of Newer Novel Surfactants
Duration	2017-20
Total amount	23,54,280/-
Principal Investigator	Professor (Dr.)Amit P. Pratap
Research Fellows	Mr. Rohan Mestri

Sponsor	M/s Kedia Organic Chemicals Pvt. Ltd., Navi Mumbai
Title	Biofuel and Natural Wax Related Products
Duration	2017-21
Total amount	31,39,040/-
Principal Investigator	Professor (Dr.) Amit P. Pratap
Research Fellows	Mr. Ronak Parmar

Sponsor	M/s Midad Chemicals Company Ltd., Dammam, Kingdom of Saudi Arabia
Title	Novel Performance Chemicals
Duration	2018-19
Total amount	5,20,616/-
Principal Investigator	Professor (Dr.) Amit P. Pratap
Research Fellows	Ms. Priya Singh

Publications:

No.	Title and authors	Journal	Vol. No.	Pages	Year
1	Ultrasound-assisted lipase catalyzed hydrolysis of aspirin methyl ester by Chiplunkar, P.P., Zhao, Tomke, P.D., Pratap, A.P., Cavaco-Paulo, A.	Ultrasonics Sonochemistry	40	587-593	2018.
2	Fermentative production of Rhamnolipid and purification by adsorption chromatography by Jagruti Jadhav, Sruba Dutta, Sandeep Kale and Amit Pratap	Journal of Preparative Biochemistry and Biotechnology	48:3	234–241	2018
3	Production and Quantitative Analysis of Trehalose Lipids Biosurfactants by High Performance Liquid Chromatography by Harshada Patil and Amit Pratap	Journal of Surfactants Detergents	21:	553–564	2018
4	Fermentative production of Sophorolipid and purification by adsorption chromatography by Jagruti Jadhav, Pinky Samtani, Sandeep Kale and Amit Pratap	Tenside, Surfactants, Detergent	55(6),	467-476	2018
5	Chitosan hydrochloride mediated efficient, green catalysis for the synthesis of perimidine derivatives by Shelke, P.B., Mali, S.N., Chaudhari, H.K. and Pratap, A.P.	Journal of Heterocyclic Chemistry	56 (11)	3048-3054	2019

6	Sunflower Acid Oil-Based Production of Rhamnolipid Using Pseudomonas aeruginosa and Its Application in Liquid Detergents by Jadhav, J.V., Anbu, P., Yadav, S., Pratap, A.P., Kale, S.B.	Journal of Surfactants and Detergents	22 (3)	463-476	2019
7	valuation of sunflower oil refinery waste as feedstock for production of sophorolipid by Jadhav, J.V., Kale, S.B. and Pratap, A.P.,	Process Biochemistry	78	15-24	2019
8	Preparation of antibacterial peel-off facial mask formulation incorporating biosynthesized silver nanoparticles by Badnore, A.U., Sorde, K.I., Datir, K.A., Pratap, A.P. and Pandit, A.B.	Applied Nanoscience (Switzerland)	9 (2)	279-287	2019
9	Synthesis of cleavable silicone surfactant for water-repellent application by Mestri, R.S., Pratap, A.P., Panchal, K.H., Gamot, K., Datir, K.A.	Chemical Papers	In Press	In Press	2019

Membership of In-house Committees :

- Member, Postgraduate Admission Committee
- Member, Merit cum means scholarship committee
- Member, Golden Jubilee Travel Grant Committee
- Member, Innovation Council
- Convener, E Cell

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

- One week short term Course under QIP on “Research Methodology for Engineering and Management Research” Organized by Production Engineering Department, VJTI during July 9-14, 2018
- National Workshop on “NBA and NAAC Accreditation for TEQIP-III funded Universities and Institutions” Organized by Engineering Staff College of India (ESCI), during July 18-22, 2018 at Lonavala, Maharashtra
- One week short term Course under TEQIP on “Tailoring Technologies for Rural Sector: Development and Dissemination” sponsored by Ministry of Human Resource Development, Govt. of India organized by Centre for Educational Technology (CET) held at Indian Institute of Technology Guwahati (IITG) during 29/10/2018 to 02/11/2018
- Professional Development Programme on “Holistic Development for Personal & Professional Excellence” at ESCI, Hyderabad during 29/07/2019 to 31/07/2019
- Two day conference on "Process Audit in Oil Seeds & Oil Processing Industries” on 28-29 September 2019 at OTAI Building HBTU, Kanpur

Papers Presented during International Conferences

- “Tribological Properties of Branched Fatty Esters as Lube Oil Base Stock” in International Conference on Mechanical Engineering and Applied Composite Materials (MEACM 2019) during November 22-23, 2019 in Singapore
- “Tribological Propoerties of the Functional Fluids Based on Renewable Resources” in National Conference on Advances in Mechanical Engineering at GCE, Keonjhar, Odisha on February 25-26, 2019

Industrial Consultancy :

- M/s Galaxy Surfactants Ltd.
- M/s Hindustan Unilever Ltd.
- M/s BASF India Ltd.

Laboratory

Turg-O-Tometer

HP-TLC

Homogeniser

Rancimat

Spray Drier

Tintometer

Autoclave Reactor

Homogeniser

FTIR Spectrophotometer

UV Spectrophotometer

Reflectance meter

Laboratory

Kjeldahl

GC

HPLC

Laminar Flow

Rotary Evaporator

Four Ball Test

Incubator

Fermentor

Autoclave

Viscometer

Kari Fisher

Prof. Amit P. Pratap Research Group

PROF. DR. RAVINDRA D. KULKARNI

M. Tech. (Chem. Tech.), Ph. D.

Professor

Fellowships/ Memberships of Professional Bodies:

- Fellow Member, Essential Oil Association of India
- Life Member, Oil Technologists Association of India (No. OTA/ LM/300/2013)
- Life Member, Indian Society for Technical Education (LM)
- Life Member, Asian Polymer Society, Delhi (No. L173; www.apa-asia.org)
- U. G. C. Fellowship

Publications (peer reviewed) so far: 78 , 12 Communicated

Patents:

02 Granted, 05 Filed, 2 Communicated

Conference proceedings/papers: 127, 71 (International) + 56 (National)

Seminars/Lectures/Orations delivered : 61 (6 International + 55 National/ Regional)

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

Masters Awarded as single/ Co-Guide : 45/09

h-Index : 12

Citations : 436

Research interests :

Chemical Modification of Fats, Oleochemicals & Specialty Surfactants; Essential Oils & Cosmetics; UV cure Polymers, Nano and High Performance Pigments, Eco-friendly Functional Coatings; Green Chemistry; Nanotechnology; Reaction Engg. & Catalysis; Biolubricants& Tribology; Environmental Engg.

Research students :

P.D.F.- 2

Ph.D. (Tech.) - 4

Ph.D.(Sc) - 4

M.Tech. -9

Research publications:

International- 6

Patents Published: 1

Sponsored projects :

Government - 1

Private - 7

Postdoctoral/Ph.D. students' research projects :

No.	Research Scholar	Previous Institution	Project	Supervisor
1	Dr. Bhagyashri Dandi	NMU, Jalgaon	A green Chemistry approach to the production of microbial chitosan biopolymer and it's studies on it's potential applications in the paints industry	Prof. R. D. Kulkarni

Details of sponsored projects – Government and Private

Government Agencies:

Sponsor	DST-WMT, New Delhi
Title	Processing of Vegetable Oil Refinery and Oleochemical Waste Streams for regeneration of Value Added Nutraceuticals and Specialty Chemicals (DST/TDT/WMT/2017/051,13-06-2017)
Duration	2017-18
Total amount	21.18528 lakhs
Principal Investigator	Prof. R. D. Kulkarni
Research Fellows	Pritesh Patil, Dr. MachindraBhalerao

Private Agencies:

Sponsor	SYNTHITE, Kolenchery, Kerala
Title	Enhanced Low Temperature Clarity of Sea buckthorn Oil
Duration	Ongoing
Total amount	Rs.3.4 lakh
Principal Investigator	Prof. R. D. Kulkarni
Research Fellows	-

Sponsor	Kumar Metals, Thane
Title	Roseheep Oil seed Extraction
Duration	Ongoing
Total amount	Rs.3.0 lakh
Principal Investigator	Prof. R. D. Kulkarni
Research Fellows	-

Sponsor	SUMWIN Global, Malaysia
Title	Manufacture of Polyol ester
Duration	Ongoing
Total amount	Rs. 11.00 lakh
Principal Investigator	Prof. R. D. Kulkarni
Research Fellows	Pravin Jadhav

Sponsor	Godrej Industries, Mumbai
Title	Cationic Polymers
Duration	Ongoing
Total amount	Rs. 5.90 lakh
Principal Investigator	Prof. R. D. Kulkarni
Research Fellows	-

Sponsor	Transpek-Silox Industry Pvt. Ltd., Vadodara
Title	Explorations of Metallic Soaps for diverse applications in Cosmetics, Polymer, Paint and Rubber Industries: Rs. 5.90 lakh
Duration	Ongoing
Total amount	Rs. 5.90 lakh
Principal Investigator	Prof. R. D. Kulkarni
Research Fellows	-

Sponsor	Ultramarine Pigments, Chennai
Title	Specialty Surfactants, Pigment Concentrates
Duration	Ongoing
Total amount	-
Principal Investigator	Prof. R. D. Kulkarni
Research Fellows	-

Sponsor	Directorate of Revenue Intelligence, Mumbai-20.
Title	Analysis of Samples 'Kolliwax' HCO, 'Kolliphor RH 40' and 'Kolliwax S Fine'
Duration	Sep t- Oct 2017
Total amount	0.50/- Lakh
Principal Investigator	Prof. R. D. Kulkarni
Research Fellows	-

Publications:

No	Title and authors	Journal	Vol./Page	Year
1	Ravindra D. Kulkarni, Vikas V. GiteUtilisation of sebacic acid and nano hydroxyapatite in polyurethane nano-composite coating Abhijeet Anand,	Green Materials	Accepted	2018
2	Hatkar VM, Patil VJ, Bhoge YE, NarkhedeJS, Patil UD, Kulkarni R D Solution spray synthesis and surface modification of SiO2 nanoparticle for development of UV curable concrete coatings	Vacuum, DOI:10.1016/j. vacuum.2017.10.021	147, pp. 158-162	2018
3	Uday D Bagale, Shirish H Sonawane, Bharat A Bhanvase, Ravindra D Kulkarni, Parag R Gogate, Green synthesis of nanocapsules for self-healing anticorrosion coating using ultrasound-assisted approach	Green Processing and Synthesis	7, pp 147-159	2018
4	Virendra J Patil, Ujwal D Patil, Ravindra D Kulkarni, Nippon Ghosh, Synthesis of nano CaCO3/acrylic co-polymer latex composites for interior decorative paints	Polymer Composites	39, 4 pp. 1350-1360	2018
5	Abhijeet Anand, Harishchandra D Jirimali, Ravindra D Kulkarni, Vikas V Gite, Utilisation of sebacic acid and nanohydroxyapatite in polyurethane nanocomposite coating	Green Materials	6, 2, pp 65-75	2018
6	Uday D Bagale, Rhushikesh Desale, Shirish H Sonawane, Ravindra D Kulkarni, An Active Corrosion Inhibition Coating of Two Pack Epoxy Polyamide System using Halloysite Nanocontainer	Protection of Metals and Physical Chemistry of Surfaces	54:2, 230-239	2018

Patents:

No.	Inventors	Title	Country	Funding agency
1.	S. H. Sonawane, R. D. Kulkarni, Uday Bagle,	"Improved Self Healing Corrosion Inhibition Coating Based OnNanocapsule Using Sonochemical Approach"		

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

No.	Title of Talk	Programme	Organiser	Date
1	Lipids as Phase Changing Material in Solar Thermal Energy Storage	AICTE STTP on Solar Energy'	SGGS Institute of Engg& Tech, Nanded	March 31, 2018
2	Green Synthesis of MutifunctionalPhotoinitiators	Plenary Lecture in Two days UGC-SAP Sponsored National Conference ICLS-2018	School of Chemical Sciences, North Maharashtra University, Jalgaon, MS	March 5-6, 2018
3	Solution spray synthesis of Bismuth Vanadate and Iron Oxide nanopigments and formulation of Special Purpose Coatings	Seventh Conference on 'Recent Advances in Polymer Technology' (RAPT)	UICT, North Maharashtra University, Jalgaon, MS	Feb. 16, 2018
4	Preparation of High Performance Copper Phthalocyanine Pigment Concentrates and Modelling studies	National Conference on Trends and Challenges in Architectural Coatings	Society for Industrial Chemistry in association with Dept of Polymer & Surface Engg, ICT, Mumbai	Feb. 10, 2018
5	Recent Trends in Science and Technology	Expert Talk	AMITY University, Panvel, MS 410206	Feb. 02, 2018
6	Nutritional Properties of Palm & Other Oils	Workshop on Palm Oil	SNDT Campus, Juhu, Palm Oil Council, Malysia& OTAI	Jan. 22, 2018
7	Surfactant Mediated Reactive Crystallization for Polymorph Selective Synthesis of Nanomaterials	Twinning Programme under TEQIP-III	BITS-MESRA, RANCHI	Jan. 17, 2018

Industrial Consultancy:

- SYNTHITE, Kolenchery, Kerala
- Kumar Metals, Thane
- SUMWIN Global, Malaysia
- Godrej Industries, Mumbai
- Ultramarine Pigments, Chennai
- Transpek-Silox Industry Pvt.Ltd., Vadodara

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

Name	Course	Title
Shaikh Mohd.Aizaz	M. Tech.	Green Synthesis Of Cationic And Amphoteric Surfactants And Their Application.
Deshpande Shriya	M. Tech.	Surfactants Assisted Synthesis Of Zinc Oxide Nanomaterials And Graphene Nanocomposites For Explorations In Cosmetics And Ammonia Sensor Application
LembheAkshay	M. Tech.	Chemical Modification Of Oleochemicals And Its Application In Lubricant Industry.
Dr. Abhijit Anand	Ph.D	Synthesis of renewable polyols and formulation and characterization of 1K and 2K PU nano-composite coatings
Dr. Yogesh Bhoge	Ph.D	Synthesis and crystal design of high performance pigments for development of special effect coatings
Dr. Hansraj Patil	Ph.D	Synthesis and characterization of Surfactants as Micro heterogeneous System for Wet Chemical Synthesis of Nanoparticles

Dr. Virendrasing Patil	Ph.D	Synthesis and characterization of Surfactants as Micro heterogeneous System for Wet Chemical Synthesis of Nanoparticles
Dr. Shashikant Pardeshi	Ph.D	Studies on Calibration and Standardization of Physico-Chemical Analysis of lipids.
Dr. Miss Kalpana Shimpi	Ph.D	Techno Commercial and Environmental Evaluation of Biodiesel as Engine fuel
Dr. Badgujar Nilesh	Ph.D.	Physicochemical characterisation, process Engg. and mathematical modeling of Pigmented Dispersion for formulation of Coatings

DR. JYOTSNA WAGHMARE

Ph.D. (Tech.)
Associate Professor

Fellowships/ Memberships of Professional Bodies :

- Secreatary of Oil Technologist Association of India.
- Member of Indian society for surface science and Technology.
- Member of American oil chemist society, USA.
- Member of Society of Chemical Industry, UK.

Highlights of research work done and its impart:

Publications (peer reviewed) so far: 63

Patents: 1

Conference proceedings/papers: 35

Seminars/Lectures/Orations delivered : 5

Ph.D.s Awarded as single/ Co-Guide: 01/01

Masters Awarded as single/ Co-Guide : 24

h-Index : 12
Citations : 295

Subjects taught:

Technology of oils and fat based products, Nutraceuticals, Technology and science of Essential oils, Nutraceuticals, Advances in oils and fats, Analysis of Oilseed, oils and raw materials of oils and soap industries, Analysis of Surfactants, Oil Tech Lab I, Oil and fat production and edible oil processing

Research interests :

Nutraceuticals, Oxidation studies, Structure lipids, Designer lipids, Application of surfactant, Cosmetics, Perfume, Flavor and Fragrances, Enzymology, Biofuel and emulsion, surfactants, designer lipids

Research students :

Ph.D. (Tech.) - 4

M.Tech. - 10

Research publications:

International- 7

Books Chapter 03

Patents :

Indian - 1

Sponsored projects :

Government - 1

Private - 1

Professional Activities:

Member of Handbook committee

Details of sponsored projects – Government and Private

I. Government Agencies:

Personal / Departmental	Personal
Principle Investigator	Dr.Jyotsna Waghmare
sponsor – Govt./ Private	Government
Name of sponsor	TEQIP
Date of sanction	-
Title	Develop a viable process for preparation of indigenous oil seed protein isolate for food application and surfactant synthesis
Duration (from – to-)	2018-2020
Amount sanctioned, in Rs.	-

Personal / Departmental	Personal
Principle Investigator	Dr.Jyotsna Waghmare
sponsor – Govt./ Private	Government
Name of sponsor	TEQIP
Date of sanction	-
Title	Spices as Biopesticide
Duration (from – to-)	2016
Amount sanctioned, in Rs.	-

Personal / Departmental	Personal
Principle Investigator	Dr.Jyotsna Waghmare
sponsor – Govt./ Private	Private
Name of sponsor	HUL
Title	Identify and Validate solutions within and without surfactant space such that the proposal delivers parity performance on Sensorials (Lather, speed of lather, stability of lather etc)
Duration (from – to-)	2016-2018
Amount sanctioned, in Rs.	1200000

Personal / Departmental	Personal
Principle Investigator	Dr.Jyotsna Waghmare
sponsor – Govt./ Private	Private
Name of sponsor	HUL
Title	Surfactant
Duration (from – to-)	From 2018
Amount sanctioned, in Rs.	-

Publications

No.	Title & Authors (INDICATE Corresponding author by * and Co-author faculty by #)	Journal		
		Vol.	Pages	Year
1	JyotsnaWaghmare Asma Fakir, Watermelon waste: A potential source of omega-6 fatty acid and protein,International journal of Chem Tech research	10	384-392	2018
2	JyotsnaWaghmare, Fakir A, Application of Microencapsulated Fish oil in Instant soup mix as a source of omega-3 fatty acids,International journal of Pharmtech research	11	305-313	2018
3	JyotsnaWaghmare, Snehal B. More, Parag R. Gogate, Satyanarayan N Naik Intensified synthesis of structured lipids from oleic acid rich moringa oil in the presence of supercritical CO2	112	86-95	2018
4	Snehal B More, Jyotsna S Waghmare, Parag R Gogate, Satyanarayan N Naik, Improved synthesis of medium chain triacylglycerol catalyzed by lipase based on use of supercritical carbon dioxide pretreatment	334	1977-1987	2018
5	Snehal B More, Parag R Gogate, Jyotsna S Waghmare, Satyanarayan N Naik, Intensified synthesis of structured triacylglycerols from fish, flaxseed and rice bran oil using supercritical CO2 or ultrasound	144	107650	2019
6	Nikita Wanjari, Rohini Shelar, Mohd Asif Siddiqui, Jyotsna Waghmare, A study on synthesis and application of vegetable de-oiled cake protein based crude biosurfactant	10	1320-29	2019
7	Nikita Wanjari, Jyotsna Waghmare, Extraction and purificatinof Sunflower meal Extract for development of cosmeceutical antioxidant skincare cream	Vol 2019		2019

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

Name of the Course/ Workshop/ Summer or Winter School	Place	Duration (from…… to……)	Sponsoring Agency
Lecture on Wonderland of Oils and fats	SNDT, Juhu	22 Jan 2018	OTAI, MPOC & SNDTWU
Workshop on Creative and Formulation of Natural and Organic Cosmetics	Courtyars by Marriot Mumbi	28th-29th of November 2018	ISCC

Dr. Jyotsna Waghmare Reserach Group

From Left to right: *Nikita Wanjari, Snehal More, Dr. Jyotsna Waghmare, Asma Fakir, Rakhi Patil*

DR. CHANDU S. MADANKAR

M Tech, PhD

Prof. J. G. Kane Assistant Professor

Fellowships/ Memberships of Professional Bodies :

- S.R. Bhatnagar Memorial Research award, 2013 by the Oil Technologist Association of India
- Canadian Commonwealth Scholarship by the Canadian Bureau for International Education (CBIE) on behalf of Foreign Affairs and International Trade Canada (DFAIT) in Department of Chemical Engineering, University of Saskatchewan, 2011-12.
- Life Member of Oil Technologist Association of India (OTAI)
- Life Member of Tribological Society of India (TSI).
- Member of American Oil Chemist Society (AOCS)

Highlights of research work done and it's impact:

My research area is mainly focused on development of environmentally friendly processes for oleochemicals, studies on encapsulation of essential oils and spices for food applications, nutraceuticals, biosurfactants and supercritical carbon dioxide extraction.

Some of the work includes studies of rosemary oil and antioxidant extract; its extraction methods and analysis based on functional groups and its components. The main components present in rosemary oil using both methods are α-Pinene, Camphene, β-Pinene, β-Myrcene, Camphor, etc. On the other hand solvent extraction gives the non-volatile component i.e. rosemarinic acid, carnsic acid, cornosol, ursonic acid etc. which are responsible for antioxidant, antimicrobial and anti-cancerous activity. Antioxidant compounds are extracted using solvent extraction using different solvent and ultrasound extraction.

Stevioside, a glycoside which is 300 times sweeter than sucrose, is a low calorie sugar, whereas Gymnemic acid, another glycoside is bitter in taste and is known as the destroyer of sugar. Both are bioactives from indigenous plants, viz, Stevia rebaudiana and Gymnema sylvestre. Due to their structural similarities yet opposite tastes, they can be used in a combination to deliver a desired therapeutic value and can be proposed as an additive in functional foods for better management of metabolic diseases, apart from prescribed drugs. This study was carried out in three parts. To replace common conventional extraction techniques (e.g. Soxhlet), the present study reports the optimal enzyme assisted ultrasound-assisted extraction conditions for Stevioside and Gymnemic acid.

Study on ginger oleoresin to develop stable formulations using microencapsulation technology. Not much research has been done on the use of ginger in cosmetics or for topical applications; hence the study aims to provide an insight on this. Different formulations were processed for this purpose. Microencapsulated powder of ginger oleoresin was formulated using spray drying technique and pellets of the oleoresin were processed using Extrusion-Spheronization technique.

Publications (peer reviewed) so far: 10

Conference proceedings/papers: 11

Seminars/Lectures/Orations delivered : 15

Masters Awarded as single/ Co-Guide : 07

h-Index : 4
Citations : 200

Subjects taught :

Chemistry of oils, lipids, essential Oils natural products and their applications; Technology of Oleochemicals; Cosmetics Science; Chemistry and Technology of Castor and Nonconventional Oils, Microbiology and Biochemistry Lab I, Microbiology and Biochemistry Lab II

Research interests:

Biolubricants, Biosurfactants, Extraction and value added products from essential oils and spices, Supercritical CO_2 technology.

Research students :

M.Tech. - 07

Research publications:

International - 02

Conference proceeding- 02

Sponsored projects :

Government

Project Proposal On Extraction and optimization of Steviol glycosides and Gymnemic acid for enhanced yield and their therapeutic implications in functional food submitted to SEED, DST

Professional Activities:

- Life Member of Oil Technologist Association of India (OTAI)
- Life Member of Tribological Society of India (TSI).

Undergraduate students' seminars/projects/home papers :

Seminars

No.	Name of the Student	Topic
1	Kakar Rishabh	Biosurfactants
2	Bhalerao Sammed	Water based Alkyd resins
3	Sanap Prasad	Polyurathanes from vegetable oils

Project / Home paper

No.	Name of the Student	Topics
	Jalan Aashna	Studies of value added products from Rosemary essential oil and its applications
	Shah Arjun	
	Patel Bhargav	
	Navandar Anay	
	Umathe Anishka	
	Singh Manjot	

Post graduate students' seminars/projects :

Seminars

No.	Name of the Student	Topic
1	Bairagi Tilottama	Effect of fat modification on physical, rheological and sensory characteristic of compound chocolate.
2	Barage Suraj	The study of rice bran oil and to improve color and optimize bleaching efficiency of rice bran oil process by using various adsorbent materials
3	Naik Bharati	Extraction, Characterization and Encapsulation of Limonene from Citrus fruits and its Application in Cosmetics.
4	Raut Pratik Adinath	Biopolymer from castor oil
5	Shingade Shailesh Vasanta	Saponin based surfactant and its value added products
6	Kolhe Dnyaneshwar Madanrao	Extraction of fenugreek essential oil
7	Waghmode Sneha Gopal	Natural antioxidants in Indian spices

Research Projects

M. Tech. / M.Chem. Eng.

No.	Research Scholar	Previous Institution	Project	Supervisor
1	Nair Aishwarya	Mumbai University	Development of Stable Formulations of Ginger Oleoresin for Applications in Microemulsion based Topical Drug Delivery	Dr. CS Madankar
2	Pawar Prasanjeet	BATU Lonere	Studies of extraction, characterization, and value-added products from Calotropis procera seeds oil	Dr. CS Madankar
3	Bakhal Meera	VNMKV University	Studies of Value Added Products From Date Seed Oil And its Application	Dr. CS Madankar
4	Bairagi Tilottama	Shivaji University	Effect of fat modification on physical, rheological and sensory characteristic of compound chocolate.	Dr. CS Madankar
5	Barage Suraj	Shivaji University	The study of rice bran oil and to improve color and optimize bleaching efficiency of rice bran oil process by using various adsorbent materials	Dr. CS Madankar
6	Naik Bharati	RTM Nagpur University	Extraction, Characterization and Encapsulation of Limonene from Citrus fruits and its Application in Cosmetics.	Dr. CS Madankar

Details of sponsored projects – Government and Private

Government Agencies:

Applied for funding to the DST SEED for INR 43,01,000/- titled Extraction and optimization of Steviol glycosides and Gymnemic acid for enhanced yield and their therapeutic implications in functional food

Publications

No.	Title and authors	Journal	Vol. No.	Pages	Year
1	Patil A D, Baral S S, Dhanke P B, Madankar C S, Patil U S., Parametric studies of methyl esters synthesis from Thumba seed oil using heterogeneous catalyst under conventional stirring and ultrasonic cavitation.	Materials Science for Energy Technologies	1	106-16	2018
2	Madankar C.S., Sharma R.V., Dalai Ajay, Naik S.N., Epoxidation of Canola Oil for the production of biolubricant using silica-titania TiSBA-15 heterogeneous catalysts	Catalysis in Green chemistry and Engineering	1	51-63	2018

Membership of In-house Committees :

Member of Campus Safety, Disposal and Dead-stock committee.

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

1. Attended TEQIP III sponsored workshop on “Decoding Cyber Security Crimes” from 19-21 August, 2019 in ICT Mumbai.
2. Attended GIAN, MHRD sponsored one week course on “Nanotechnology Advances and challenges in Engineering materials and manufacturing” from 8-13 July, 2019 in VJTI Mumbai.
3. Attended TEQIP III sponsored one week Management Development Programme for teaching staff conducted by Engineering Staff Collage of India in Ooty from 24/05/2019 to 28/05/2019.

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

Name	Course	Title
Sahare Pragya	M.Tech	Extraction of Rosemary Essential Oil, Antioxidant Extract and its value addition Products
Agarwal Suamya	M.Tech	Synthesis of biolubricant using vegetable oil and study of its tribological applications
Shahane Swapna	M.Tech	Synthesis of Modified Alkyd Resin and its Applications
Thakur Parul	M.Tech	Studies on steviol glycosides and gymnemic acid for therapeutic implications in functional foods
Nair Aishwarya	M.Tech	Development of Stable Formulations of Ginger Oleoresin for Applications in Microemulsion based Topical Drug Delivery
Pawar Prasanjeet	M.Tech	Studies of extraction, characterization, and value-added products from Calotropis procera seeds oil
Bakhal Meera	M.Tech	Studies of Value Added Products From Date Seed Oil And its Application

DR. PARAG R. NEMADE

B. Chem. Eng., M. S., Ph.D.
UGC Assistant Professor

Fellowships/ Memberships of Professional Bodies:

- Member, Indian Membrane Society
- Member, Oil Technologists Association of India
- Member, Indian Institution of Chemical Engineers

Publications (peer reviewed) so far: 10

Patents : 5 (filed)

Seminars/Lectures/Orations delivered: 2

Masters Awarded as single/ Co-Guide : 13

Awards/honors:

National - 1

International - 1

h-Index : 5

Citations : 272

Subjects Taught :

- Advanced Momentum Transfer, Nanotechnology, Advanced Membrane Separation Processes, Chemical Engineering Laboratory

Specific Research Interests :

Membrane Separations, Catalysis, Sensors, Sustainability Engineering

Research students:

RA - 2
Ph.D. (Tech.) - 3
Ph.D.(Sc) - 2
M.Tech. - 8
M. Chem. Eng – 2
Undergraduate Summer Fellows (if any) - 3

Research Publications:

International - 2

Conference proceeding - 8

Professional Activities:

- Membership of important Committees:
- Membership of Editorial Boards with name of journal and agency

DR. PINTU KUMAR KUNDU

Post-doctoral experiences (February 2012 – February 2015; Weizmann Institute of Science, Israel) and (May 2015 – May 2016; IIT-Bombay)]
Ph.D (September 2006 – January 2012; Chemical Sciences, Bhabha Atomic Research Centre, Homi Bhabha National Institute, Mumbai, India)
M.Sc. (2004 – 2006; Chemistry, Indian Institute of Technology, Madras, India)
B.Sc. (2001 – 2004; Chemistry Hons., University of Calcutta, India).
UGC FRP Assistant Professor

Fellowships/ Memberships of Professional Bodies:

- Institutes' Post-Doctoral Fellowship, IIT Bombay, India.
- Post-Doctoral Fellowship, Weizmann Institute of Science, Israel.
- Doctoral Fellowship at Bhabha Atomic Research Centre, DAE, India.
- Life members: Society for Materials Chemistry, India.

Publications (peer reviewed) so far:16 (Impact factor~140)

Conference proceedings/papers : 2

Seminars/Lectures/Orations delivered : 19

h-Index: 10 (Google Scholar)

Citations: 588 (Google Scholar)

Subjects taught:

- Chemistry of Oils and Fatty Acids; Second Year B. Tech. Semester III.
- Technology of Perfumery Chemicals; Third Year B. Tech. Semester V.
- Supramolecular Chemistry of Nanomaterials; Third Year B. Tech. Semester VI.
- Structural Elucidations by Advanced Spectroscopy; Final Year B. Tech. Semester VIII.

Research interests:

Organic photochromism / Molecular photoswitches; Photoswitchable catalysis; Stimuli-responsive molecules and materials; Functional porous organic materials; Synthetic organic chemistry.

Research students :

Ph.D.(Sc) - 2 (ongoing)

Research publications:

International - 1
Conference proceeding - 2

Sponsored projects :

Government- 1 (ongoing)

Professional Activities:

- Life members in 'Society for Materials Chemistry, India'.

Special Awards/Honours:

- Honour: "Guest of Honour" (L-ward Science Exhibition 2018 – 2019; L- Ward, North Zone. Mumbai). Date: 4th December 2018.

Undergraduate students' seminars/projects/home papers :

Sr.	Name of the Student	Seminar Topic
1.	Kumar Aishwarya	Essential oils in soap
2.	Sankhe Anushka N.	Essential oils used in personal care
3.	Burte Atharva	Smell receptors
4.	Singh Gaurav	Constituents of essential oil
5.	Patil Manasi Nitinkumar	History of essential oils and perfumery
6.	Prabhudesai Mayur S.	Analytical techniques of essential oils
7.	Tayshete Neha	Industrial uses of essential oils
8.	Chavan Nikhil Vikrant	Extraction of essential oil
9.	Ghati Prayana	Classification of terpenes and terpenoids
10.	Parab Prasad A.	Benefits and application of essential oil
11.	Tiwari Pratyush	History of essential oils
12.	Doke Ranjeet B.	Essential oil
13.	Pawar Rupesh Santosh	Essential oils for sensory needs
14.	Hadke Saurabh	Adulteration in essential oil
15.	More Sandeep Saurabh	Curry leaf essential oil
16.	Sheth Sejal	Biosynthesis of geaniol and related terpenes
17.	Pandey Siddhant	Extraction methods of essential oils
18.	Sheth Sejal	Molecular Machines
19.	Kumar Aishwarya	Self-assembled monolayers
20.	Ghati Prayana	Self-assembly using metal templates
21.	Parab Prasad A.	Silver nanoparticles
22.	Hadke Saurabh	Molecular encapsulation
23.	More Sandeep Saurabh	Self-assembly capsules
24.	Pandey Siddhant	Application of supramolecule
25.	Swami Anjali	Study in metal organic framework for photochromic application
26.	Kumbhare Jaishree R.	Stimuli responsive nanoparticles
27.	Jadhao Aniket	Canola oil

28.	Goyal Arpit	Waxes
29.	Mehta Rushabh S.	Avocado oil
30.	Chandorkar Nikhil K.	Tocopherols
31.	Chaudhari Tejas	Castor oil
32.	Shikalgar Sahil	UV-induced DNA damage
33.	Mankar Uttkarsh	Unknown uses of oils
34.	Sangale Nidhi	Introduction to bio-surfactants and their analysis
35.	Deshmukh Aditi	Importance of omega-3 to omega-6 ratio
36.	Kulkarni Rahul	Palm oil
37.	Shukla Gaurang	Palm oil
38.	Singh Akash Shivmangal	Coconut oil
39.	Dhariya	Rancidity
40.	More Saurabh	Omega-3 Fatty acid
41.	Rajmane Kshitij	Biodiesel
42.	Thamizhavel Prathiba	Obesity and free fatty acids

Postdoctoral/Ph.D. students' research projects :

No.	Research Scholar	Previous Institution	Project	Supervisor
1.	Joseph Pradeepruban (Ph.D.; Science)	St. Joseph's College, Trichy (Bharathidasan University)	Stimuli-responsive Molecules and Materials	Dr. Pintu Kumar Kundu
2.	SK Aminul Islam (Ph.D.; Science)	S. K. Porwal College, Kamptee (R. T. M. Nagpur University)	Syntheses of Photoswitchable Organocatalyststo Control Organic Transformations via Light	Dr. Pintu Kumar Kundu

Details of sponsored projects – Government and Private

Government Agencies:

Sponsor	DST-SERB
Title	Azobenzene/Spiropyran-derived N-Heterocyclic Carbenes and their Transition Metal Complexes to Control Organic Transformations 'on Demand
Duration	3 Years (October 2016 – October 2019)
Total amount	Rs.33,20,000/-(Rs.Thirty Three LakhTwenty Thousand Only)
Principal Investigator	Dr. Pintu Kumar Kundu
Research Fellows	Aminul Islam SK

Details of National and International collaborations

- Prof. Vivek Polshettiwar; TIFR, Mumbai.
- Prof. Partha Sarathi Mukharjee; IISc. Bangalore.
- Dr. Kshama Kundu; BARC, Mumbai.

Publications

No.	Title and authors	Journal	Vol. No.	Pages	Year
1.	Merocyanines of Non-Activated Spiropyrans: Generation and Spectrokinetic Studies. Pradeepruban Joseph, Kshama Kundu, Pintu K. Kundu*.	ChemistrySelect	3	11065–11070	2018

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

Conference/Symposium: Attended and participated (December 4-8, 2018); DAE-BRNS 7th Interdisciplinary Symposium on Materials Chemistry (ISMC-2018) held at Bhabha Atomic Research Centre, Mumbai. Two conference proceedings were published; and the papers were presented as posters (presented by Aminul Islam SK and Pradeepruban Joseph).

i. Aminul Islam SK, Pintu K. Kundu*. Half-life of Photomerocyanines of 6-Nitro BIPS bonded to Porous Frameworks. ISMC, 2018.

ii. Pradeepruban Joseph, Pintu K. Kundu*. Generation of Four Major Isomers of 6-Phenyldiazenyl-BIPS. ISMC, 2018.

Major accomplishments:

DST-SERB sponsored Early Career Research Award (ECRA) project was transferred from SRM University, Chennai to ICT, Mumbai. The project report was defended successfully in the "group monitoring workshop" arranged by DST-SERB at IIT-Bombay and 3rd round of fund has been released. A couple of Ph.D students has been registered to work under my supervision. I was invited and so attended as Chief Guest ("Guest of Honour") to inaugurate 'L- ward Science Exhibition 2018 – 2019' held on 4th December 2018.

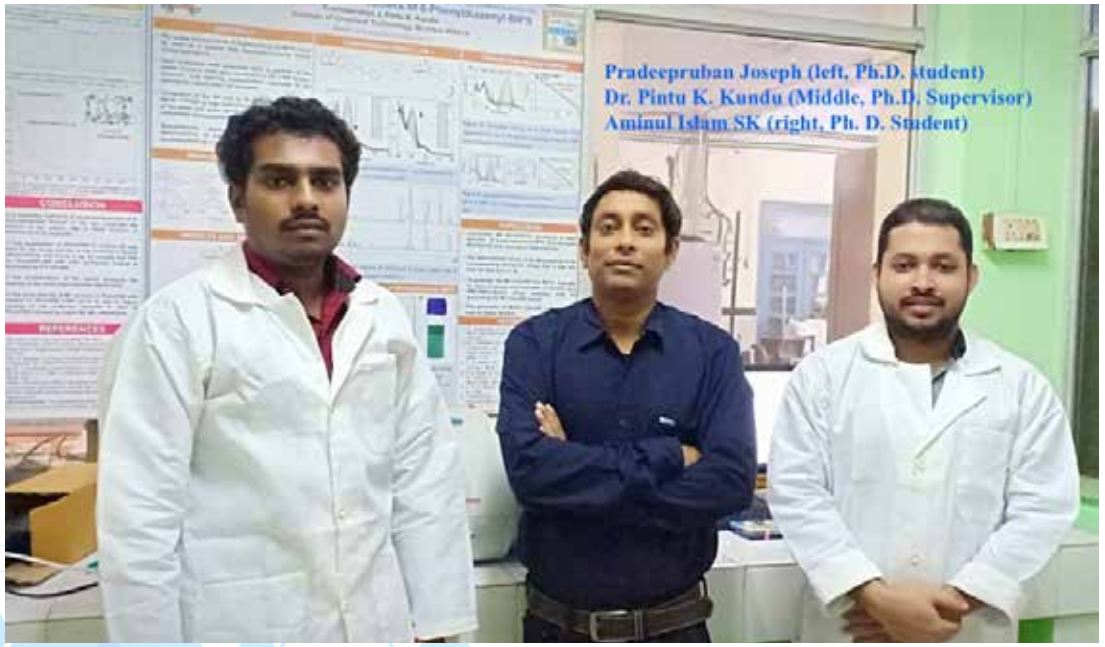
Profile:

I have studied my B.SC. (2001 - 2004) in chemistry from Ramakrishna Mission, Residential College, Narendrapur (University of Calcutta). After doing Master of Science in chemistry from IIT-Madras (2004 - 2006), I joined Bhabha Atomic Research Centre (BARC), one of the constituent institutions of HBNI for my Ph.D. (September 2006 - January 2012) in chemistry with Prof. Sunil K. Ghosh. My postdoctoral works at the Weizmann Institute of Science, Israel was with Prof. Rafal Klajn during February 2012 till February 2015. I have also worked as an Institutes' postdoctoral fellow at IIT Bombay (May 2015 - May 2016) before joining SRM University as an Assistant Professor (May 2016 - May 2018) in the Department of Chemistry. At present (May 2018 onwards), I am working at the Institute of Chemical Technology, Mumbai as an Assistant Professor (UGC) in the Department of Oils, Oleochemicals and Surfactants Technology. During my first year in ICT-Mumbai, two Ph.D. students (science) have joined in my research group. I was trained in synthetic organic chemistry during my doctoral work, which was then utilized successfully in my postdoctoral studies to make

molecules and materials, especially those which are stimuli-responsive. My present research work is mostly focused on organic photochromic molecules, especially, spiropyrans and azobenzenes. Research objectives of our group are syntheses of various photoswitchable molecules and functional organic materials and their utilization towards novel applications (multidisciplinary research). I have published 16 international peer reviewed high impact articles. A few of them would be worth mentioning: Nature Chemistry, 2015, 7, 646–652 (IF 25.3); Nature Commun. 2014, 5, 3588 (IF 11.47); J. Am. Chem. Soc. 2014, 136, 11276–11279 (IF 12.1); Nature Nanotech. 2016, 11, 82–88 (IF 34); Nanoscale 2016, 8, 19280–19286 (IF 7.8) etc. I have delivered invited talks at several IITs and IISERs and also delivered invited lectures in various seminar/conferences.

Laboratory

Dr. Pintu Kumar Kundu Research Group



Guest of honour