



DEPARTMENT OF CHEMISTRY

(DST-FIST Sponsored)



HoD's Desk...

Myself, as the Head of the Department, welcome all to the 21st issue of the Department of Chemistry Newsletter "Chem News". The Department of Chemistry at Visvesvaraya National Institute of Technology stands as one of the pioneering departments established within our esteemed institution. With a legacy steeped in academic excellence and research innovation, our department has played a pivotal role in shaping the scientific landscape not only within the institute but also beyond its boundaries. Our faculty members, renowned for their expertise and commitment to teaching and research, spearhead numerous interdisciplinary initiatives that contribute significantly to advancing knowledge in various domains of chemistry. Beyond the classroom, our department serves as a crucible for nurturing the next generation of scientists and innovators, instilling in them the values of critical thinking, problem-solving, and ethical conduct. Moreover, our research endeavors span a wide spectrum, from fundamental studies elucidating the intricacies of chemical reactions to applied research addressing pressing societal challenges, thereby making tangible contributions to the fields of materials science, environmental sustainability, and healthcare. In this 21st issue of the Department Newsletter, we continue on our journey of academic and research excellence. We remain steadfast in our commitment to pushing the boundaries of scientific discovery and grooming future leaders who will drive positive change in the world through the transformative power of chemistry.



Mission & Vision

- Promote fundamentals of chemistry through UG and PG courses.
- Offer high end-research projects on concept-theory-practical topics.
- To establish excellent teachers, entrepreneurs and innovative independent researchers.
- Become a nationally recognised centre of chemical sciences.
- To establish state of art centralised research facility.

FACULTY MEMBERS

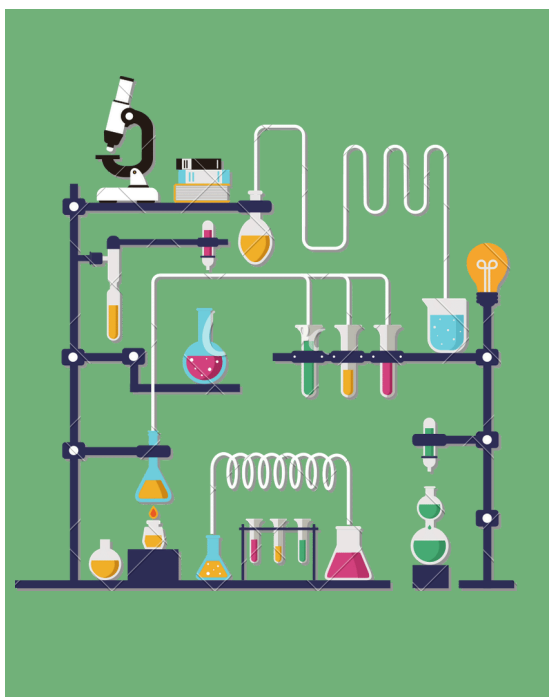
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 DR. SURESH S. UMARE
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 DR. RAMANI V. MOTGHARE
 DR. CHAYAN DAS
 DR. ATUL V. WANKHADE
 DR. UMESH R. PRATAP
 DR. SANGESH P. ZODAPE
 DR. SUSANTA K. NAYAK
 DR. S. LAXMI GAYATRI
 DR. ABHISHEK BANERJEE
 DR. SANDIPAN HALDER



UNVEILING OUR CHEMISTRY DEPARTMENT

>>> A CLOSER LOOK: CHEMISTRY DEPARTMENT

Department of Chemistry is one of the oldest departments in the Institute. This Department has been serving to cater to the needs of UG and PG level students of sciences and engineering discipline of various branches, in the field of chemistry, since long. Initially involved in the teaching of UG engineering, the department started the two years M.Sc. Programme in Chemistry in 2012. The Department has highly qualified faculty members who are actively engaged in R&D work in different areas of science and technology. Faculty members of the Department have been awarded various research fellowships and grants. Organizing and participation in national and international conferences, and publishing research work in various reputed journals are the regular activities of the Department. The faculties from the department have also authored many books, which are used regularly in course curricula at VNIT and other institutes.



>>> DISCOVERING DEPARTMENT EXCELLENCE

The department has been successful in obtaining Many R&D projects funded by different funding agencies which includes DST, SERB, MHRD, UGC, BRNS, CSIR, MoE and others. Some of the R&D projects have been completed by the department and some are currently under progress. More than fifty Ph.D. degrees have been awarded from the department while above forty students are currently pursuing their research work for Ph.D. Degree. The department has also been involved in Continuing Education programmes such as STTP courses, Seminars and conferences. Department has well equipped laboratories with modern instrumental facilities. Since 2017 the Department has had an unique distinction to be a DST-FIST Sponsored Department !!!



FACULTY MEMBERS

HONORARY TALKS

EXPANDING HORIZONS BEYOND OUR CAMPUS

PROF. ANUPAMA KUMAR



Prof. Anupama Kumar delivered an invited talk, chaired a Technical session, and served as a Panelist during the APA International Conference on Polymers for Advanced Technology (APA-2025), held in Udaipur, 13th to 15th October 2025.

DR. SUSANTA KUMAR NAYAK



Dr. Susanta K. Nayak delivered an invited talk on “Exploring Halogen Bonding Supramolecular Liquid Crystalline Systems for Photo-responsive Property” at the 32nd National Conference on Liquid Crystals (NCLC-32), November 20–22, 2025, held at the Department of Physics, BITS Pilani, Pilani Campus, India.

CHEMISTRY FACULTY EXCELLENCE

DR. ABHISHEK BANERJEE



Dr. Abhishek Banerjee has secured funding of ₹12.4 lakhs from Oil Field Instrumentation (India) Private Limited under the company's Corporate Social Responsibility (CSR) initiative. The funding is expected to support ongoing research activities and strengthen scientific infrastructure within the research group.

In another significant academic achievement, **Mr. Kalyankumar S. Morla** has successfully submitted his Ph.D. thesis entitled "Electrochemical Energy Storage Studies of Diphosphonate-Functionalized Polyoxometalates" under the supervision of Dr. Abhishek Banerjee. The research contributes to the advancement of electrochemical energy storage technologies through the development and investigation of functionalized polyoxometalate-based materials.

STUDENTS EXCELLENCE



>>> MS. HIMANSHI BHARADWAJ

Ms. Himanshi Bhardwaj, a PhD research Scholar, got a Best RSC poster Presentation Award in APA International Conference on Polymers for Advanced Technology (APA-2025), held in Udaipur, 13th to 15th October 2025.



>>> MS. SANSKRUTI S. KANFADE

Ms. Sanskruti S. Kanfade was honored with the ICNAN Best Poster Presentation Award 2025 given by iScience at the 3rd International Conference on Nanoscience and Nanotechnology (ICNAN 2025), organized by the Centre for Nanotechnology Research and held at VIT Vellore, Tamil Nadu, from December 16th–19th, 2025. The award was received for the poster presentation titled “Portable Electrochemical Sensors For Clinical Diagonistics Using Modified Screen Printed Electrode.”



>>> MR. GAURAV L. DEOLIKAR

Mr. Gaurav L. Deollikar was honoured with the ICNAN–RSC Best Oral Presentation Award 2025 at the 3rd International Conference on Nanoscience and Nanotechnology (ICNAN 2025), organized by the Centre for Nanotechnology Research, held at VIT Vellore, Tamil Nadu, from December 16–19, 2025. The award was received for the oral presentation titled “A novel $\text{Co}_3\text{O}_4/\text{MWCNT}$ composite-based electrochemical sensor for the detection of Atenolol.”



RESEARCHER SPOTLIGHT: LATEST PUBLISHED WORK

- Tetragonal Symmetric Shaped {V IV 4 O 8} Cubane-Encasing Vanado-Phosphate Derivative: Prototype Liquid Configured Device Grade Supercapacitor with Enhanced Performance. **Shikha Singh**, T. Kedara Shivasharma, Subuhan Ahamed, Saurav Ghosh, Kartik Chandra Mondal, Babasaheb R. Sankapal, and **Abhishek Banerjee*** Journal of Materials Chemistry A, 2026, DOI: 10.1039/D5TA07057K.
- "Ligand-directed assembly and transformation of hybrid oxo-vanadates into 3d-3d oxo-vanado-cuprates: structural diversification and superior electrochemical performance in a prototype liquid-configured-device-grade supercapacitor." **Kalyankumar S Morla**, Rajulal Sahu, Subuhan Ahamed, Saurav Ghosh, Kartik Chandra Mondal, Babasaheb R Sankapal, **Abhishek Banerjee*** Dalton Transactions, 2025, Volume 54, Pages 17322–17335
- “Ultrasonication-enhanced β -carotene extraction for sustainable edible oil fortification”– **Manisha G. Verma**, Nayan Sarkar, **Anupama Kumar*** in Journal of Food Management and Characterization.
- “Chitosan-corn starch films with sporopollenin as natural reinforcing cum encapsulating agent for postharvest preservation of sapodilla.”– **Diksha Lingait**, **Anupama Kumar*** in Journal of Food Management and Characterization.

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RESEARCHER SPOTLIGHT: LATEST PUBLISHED WORK

- "Immobilization of Catalase on Polyhedral Oligomeric Silsesquioxane (POSS)-Based Matrix and Its Catalytical Activity in 3, 3', 5, 5'-Tetramethylbenzidine (TMB) Oxidation." **Sneha A. Wahurwagh**, Shivani Bhagat, Ankit Verma, and **Umesh R. Pratap***. Macromolecular Chemistry and Physics 226, no. 23 (2025): e00296.
- "Cascade Upgrading of Biomass-Derived Levulinic Acid to γ -Valerolactone (GVL): A Biofuel Precursor over a Zr-Coordinated Hydrothermal Carbon Sphere via Catalytic Transfer Hydrogenation." **Kamleshwar L. Patle**, Pooja Pardhi, Rakesh Kumar Tripathy, **Jayant D. Ekhe***, and Kailas L. Wasewar. Industrial & Engineering Chemistry Research 64, no. 45 (2025): 21449–21463.
- "Thermolysis, thermodynamic and kinetics analysis of [EMIm][MeSO₄] and molecular interaction study of [EMIm][MeSO₄] in 0.05/0.10 mol·kg⁻¹ aqueous LiCl solutions at different temperatures through volumetric and computational analysis." **Ankita S. Chandak**, Ratiram G. Chaudhary, and **Sanges P. Zodape**. Journal of Thermal Analysis and Calorimetry (2025): 1–23.
- "Structural and computational study of reversibly photo switchable (E)-4-((4-alkoxyphenyl)diazenyl)benzonitrile based liquid crystals." – **Jyoti Swarup Thakur**, Omkar Dash, Nagesh A. Bhale, Pradip Kumar Mondal, Amol G. Dikundwar, Maurizio Polentarutti, and **Susanta K. Nayak*** in CrystEngComm 28 (2026), 485–491.
- "Solvent and Catalyst-Free One-Pot Synthesis of Tetrahydropyrimidine Analogs for Their Larvicidal Activity and Structural Insights." – Keshab M. Bairagi, Sandeep Chandrashekharappa, **Jyoti Swarup Thakur**, Rahul D. Nagdeve, Rohit Bhowal, Manasmita Panda, Deepak Chopra, Raquel M. Gleiser, Abdulaziz Saleh Almulhim, Osama I. Alwassil, Katharigatta N. Venugopala, Viresh Mohanlall, and **Susanta K. Nayak*** in Archiv der Pharmazie 358 (2025), e70162.

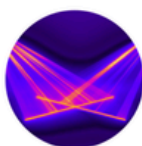
CHEMISTRY IN THE SPOTLIGHT

CHEM NEWS ISSUE 21

EXPLORE THESE RECENT DISCOVERIES IN CHEMISTRY



IUPAC Top Ten Emerging Technologies in Chemistry 2025



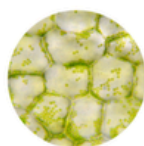
Xolography



Carbon dots



Nanochain biosensors



Synthetic cells



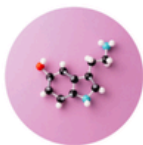
Single atom catalysis



Thermogelling polymers



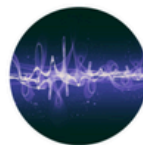
Additive manufacturing



Multimodal models for structural elucidation



Direct air capture



Electrochemical carbon conversion

#IUPACTop2025

IUPAC Announces Top 10 Emerging Technologies in Chemistry 2025

The International Union of Pure and Applied Chemistry (IUPAC) announced its Top 10 Emerging Technologies in Chemistry 2025 on 29 October 2025, highlighting transformative innovations with the potential to address global challenges in sustainability, healthcare, and advanced materials.

The technologies selected for 2025 include **Additive Manufacturing, Carbon Dots, Direct Air Capture, Electrochemical Carbon Capture and Conversion, Multimodal Foundation Models for Structure Elucidation, Nanochain Biosensors, Single-Atom Catalysis, Synthetic Cells, Thermogelling Polymers, and Xolography**. These emerging fields represent cutting-edge developments that bridge the gap between scientific discovery and real-world applications. IUPAC emphasized that these technologies have significant potential to drive innovation in chemistry while contributing to a more sustainable and equitable future.

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