



DEPARTMENT OF CHEMISTRY

(DST-FIST Sponsored)



HoD's Desk...

Welcome to the Department of Chemistry, VNIT Nagpur! We, the Department of Chemistry, feel our enthusiasm to publish the 15th issue of our departmental newsletter, "CHEM NeWS". I, as a head of the department would like to thank all the faculty members, non-teaching staffs and students for their limitless support and sincere efforts for the betterment and development of department. On this occasion, I congratulate all the team members of the editorial board for bringing up this issue in a better shape.



FACULTY MEMBERS

DR. ANUPAMA KUMAR (HoD)
 DR. SURESH S. UMARE
 DR. JAYANT D. EKHE
 DR. SUJIT K. GHOSH
 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

Mission & Vision

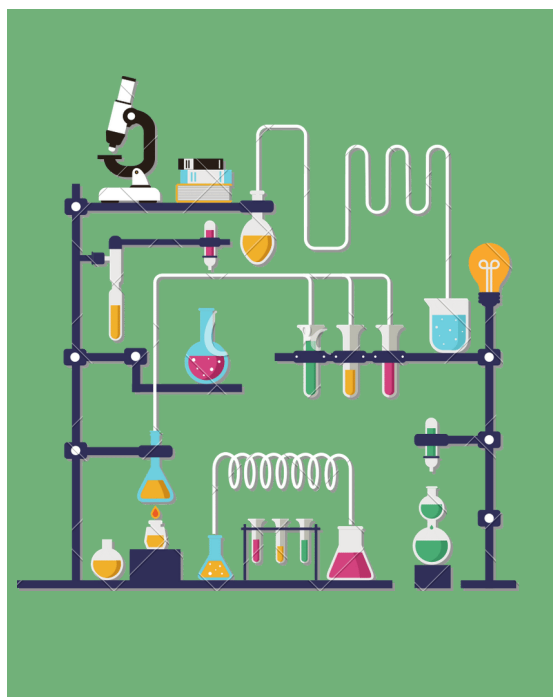
- Promote fundamentals of chemistry through UG and PG courses.
- Offer high end-research projects on concept-theory-practical topics.
- To establish excellent teachers, entrepreneurs and innovative independent researchers.
- Become a nationally recognised centre of chemical sciences.
- To establish state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



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 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 around twenty 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

INTERCOLLEGIATE COLLABORATION EXTENDING OUTREACH BEYOND BORDERS

About 55 students of Jawahar Navodaya Vidyalaya, Ghatanji, Yawatmal visited Department on 24 August, 2023 under Rashtriya Avishkar Abhiyan. Students were shown demonstration of Bomb Calorimeter by Dr. J.D Ekhe, Professor & Dean (P&D).



Dr. J. D. Ekhe, Professor & Dean (P&D) interacting with students

CHEMISTRY FACULTY OUTSTANDING TALKS

EXPANDING HORIZONS

BEYOND OUR CAMPUS

DR. SURESH UMARE

1) Delivered invited talk at Department of Applied Chemistry, Delhi Technical University, Delhi, on “Understanding Climatic Change and Sustainability Development” on 23/07/2023.

2) Lecture cum demonstration (outreach activity), Government English Medium Ashram School, Gadchiroli, on Everyday Chemistry, 25 th Sept. 2023.

3) Deliver invited talk at Department of Chemistry, Nabira Mahavidyalya Katol, District Nagpur on “Climatic Change, Corrective Actions and Human Responsibility” 30/09/2023.



DR. ATUL WANKHADE



1) Delivered an invited talk in Conference on “Catalysis for Energy, Environment and Sustainability” and CO₂ - India Network 2nd Annual Meet at IIT Mandi from September 25 to 27, 2023

2) Delivered an invited talk on topic “Publishing : Design of research paper, Citation, Acknowledgement” in workshop of Research Methodology in G.H. Raisoni College of Engineering, Amravti.

DR. CHAYAN DAS



Delivered an invited talk “Rubber composites with in situ incorporated non-black filler” at the 24th Rubber Conference and Expo held on 21 st to 23 rd September, 2023 at Chennai Trade Centre, Chennai on the theme “Sustainability and Circular Economy - Challenges and Opportunity for Rubber Industry.”

CHEMISTRY FACULTY EXCELLENCE

DR. ANUPAMA KUMAR



- 1) Delivered a talk at the International Conference on Chitosan & 10th Indian Chitin Chitosan Symposium on 08–09th December, 2023 at Kolkata, WB, Organised by NIPER, Kolkatta and Indian Chitin and Chitosan Society. Title of the talk: Chitosan encapsulated Potato peel derived polyphenolic antioxidants for Sustainable Healthcare
- 2) Awarded **Best Oral presentation** at "National symposium cum Industrial Meet (NSIM) 2023: Agri-business in Alliums: Innovation, Promotion & Sustainability" organised by ICAR–Directorate of Onion and Garlic research (DOGR), Pune during 20–22 December, 2023. Title of the talk was "Value addition of Onion peels for Nutraceutical application". Research team comprised of Shivali Singh Gaharwar, Ranjita S. Das and Santosh kumar Senapati.
- 3) Elected as **Fellow of Maharashtra Academy of Sciences**

DR. SANGESH ZODAPE



- 1) Received the prestigious "**Professor Shantilal Oswal Young Scientist Award–2021**" in the field of thermodynamics by the Indian Thermodynamics Society at the 13th National Conference on Thermodynamics of Chemical and Biological Systems, (NCTCBS–2023), from 26 to 28 October 2023 organised at R.T. M. Nagpur University, Nagpur.
- 2) Delivered invited talk on topic "Exploring the Volumetric and Compressibility Behaviour of Ionic Liquids and Drugs in Aqueous Solutions" in 13th National Conference on Thermodynamics of chemical and Biological systems (NCTCBS–2023), from 26 to 28 October 2023 organised at R.T. M. Nagpur University, Nagpur.

DOCTORAL TITLE UNVEILED



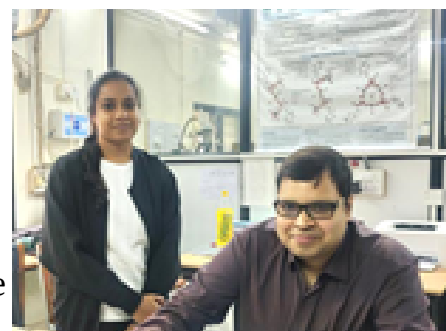
Mr. Dewendra Thakre

(Topic of Thesis: Ethylidene Pyridine Bisphosphonate based Polyoxometalates: Synthesis, Structure and Properties)

On september 15, 2023, Conferring degrees to Ph.D graduates in Chemistry

Ph.D. graduates Mr. Dewendra Thakre and Ms. Yesleen Gupta conferred with Doctoral Degree under the guidance of Supervisor

Dr. Abishek Banerjee



Ms. Yesleen Gupta

(Topic of Thesis: Inorganic and Organic derivatives of Poly-Oxo-Thio-Molybdates: Synthesis, Structure and Catalytic properties)



Ms. Prerna Khagar

Ph.D. graduate conferred with Doctoral Degree under the guidance of Supervisor **Dr. Atul V. Wankhade** (Topic of Thesis: Bioactive chemical assisted synthesis of Nanomaterials for Biomimetic applications)

Ms. Saroj Sahare

Ph.D. graduate conferred with Doctoral Degree under the guidance of Supervisor **Dr. Sangesh Zodape** (Topic of Thesis: Synthesis, Characterization and Applications of Modified Ferrites)



Mr. Dayaram Sarve

Ph.D. graduate conferred with Doctoral Degree under the guidance of Supervisor **Dr. Jayant Ekhe** (Topic of Thesis: Applications of Metal(Ni,W) oxide loaded H-ZSM-5 for ethanol dehydration and lignin pyrolysis)



Ms. Toshali Bhojar

Ph.D. graduate conferred with Doctoral Degree under the guidance of Supervisor **Dr. Suresh Umare** (Topic of Thesis: Development of modified Carbon Nitride Scaffolds for photocatalytic applications)

RESEARCH CORNER

CHEM NEWS ISSUE 15



RESEACHER SPOTLIGHT: LATEST PUBLISHED WORK

- ▶▶▶▶ "Potassium Molten Salt-Mediated In Situ Structural Reconstruction of a Carbon Nitride Photocatalyst." **Akanksha Gupta, Toshali Bhojar, B. Moses Abraham, Dong Jin Kim, Kedhareswara Sairam Pasupuleti, Suresh S. Umare***, Devthade Vidyasagar, and Aharon Gedanken, *ACS Applied Mater Interfaces* 15(15) (2023) 18896 - 18906.
- ▶▶▶▶ "Neem gum and Pongamia pinnata plant leaves bio-extract assisted green synthesis and characterization of zirconia nanoparticles." **Surabhi Raut**, Gopal Lal Dhakar, Pretty Gogoi, Durgesh R. Pal, **Chayan Das*** *J Aust Ceram Soc* (2023).
- ▶▶▶▶ "Zero-valent silver decorated Ag₂MoO₄ nanorods: An excellent visible light active photocatalyst for persulfate ion activation with intrinsic bactericidal activity", **Rudra P. Singh, Adarsh K. Mourya, Prerna S. Khagar**, G.S. Gaikwad, Atul V. Maldhure, **Atul V. Wankhade*** *Inorganic Chemistry Communications Volume 157*, November 2023, 111375
- ▶▶▶▶ "Synthesis of quercetin-iron (Fe) complex and its in silico and in vitro confirmation towards antibacterial activity", **Prerna Khagar, Atul V Wankhade** & Sarvesh Sabarathinam, *Future Medicinal Chemistry Vol. 15*, No. 19
- ▶▶▶▶ "Green synthesis of reduced graphene oxide with multiple environmental applications." **RS Das, D. Lingait, SS Gaharwar, A Kumar***, S Gokhale, *Journal of Photochemistry and Photobiology A: Chemistry* 444, 115021.
- ▶▶▶▶ A "Investigation of Molecular Interactions of -Ethyl-3- methyl imidazolium Diethyl Phosphate in Water and Aqueous D-Glucose Solutions through Thermodynamic and Compressibility Parameters", **Anuja Jain and Sangesh P. Zodape**, *J. Chem. Eng. Data, ACS*, 68, 8, 1899-1910, 2023.
- ▶▶▶▶ "Thermophysical and Computational Studies of 1(2-Hydroxyethyl)- 3-methylimidazolium Chloride Ionic Liquid in Aqueous and Aqueous L-Alanine Solutions" **Anuja Jain, Ankita S. Chandak, and Sangesh P. Zodape**, *J. Chem. Eng. Data, ACS*, 69, 1, 59-72, 2023.
- ▶▶▶▶ "Expliciting the interactions of tramadol hydrochloride + choline chloride-based deep eutectic solvent + water systems: Thermodynamic aspects", **Ankita S. Chandak, Anuja Jain, Sangesh P. Zodape**, *J. Mol. Liq., Elsevier*, 383, 122100, 2023.
- ▶▶▶▶ "Electrocatalytic behaviour of self-assembled Cu-chitosan/f-MWCNT on glassy carbon electrode for detection of erythromycin in various samples" **Prashu Jain**, Sony Jagtap, Megha Chauhan, **Ramani V. Motghare**, *Sensing and Bio-Sensing Research Volume 41*, 100568
- ▶▶▶▶ A review on versatile applications of biomaterial/polycationic chitosan: An insight into the structure-property relationship **D Lingait, R Rahagude, SS Gaharwar, RS Das, MG Verma, N Srivastava, Anupama Kumar, Sachin Mandavgane**, *International Journal of Biological Macromolecules*, 128676, 2023
- ▶▶▶▶ Valorization of *Malus domestica* L. (Apple) peels: A case study of circular bioeconomy, **Shivali Singh Gaharwar, Anupama Kumar, Kishor S. Rathod, S.V. Shinde**, *Sustainable Chemistry and Pharmacy* 36, 101301
- ▶▶▶▶ Cryogenic treatment: Processing segment to tailor the interface and improve mechanical performance of impact modified PET/PBT blends, K Pande, S Chopra, AD Deshmukh, S Deo, **A Kumar**, *DR Peshwe, Results in Materials* 20, 10045, 2023

STUDENT SUCCESS SPOTLIGHT: INSPIRING ACHIEVEMENTS

»»» DR. NUPUR SRIVASTAVA

An ICMR-Research Associate from department of Chemistry, VNIT, Nagpur, under the mentorship of **Dr. Anupama Kumar** received best poster paper award at Asian Citrus Congress-2023 organized by Indian Society of Citriculture, Nagpur in association with ICAR-Central Citrus Research Institute, Nagpur, India, Asia-Pacific, Association of Agricultural Research Institutions (APAARI), Bangkok, Thailand and Korean Society for Citrus and Subtropical Climate Fruits (KSCSCF), Jeju City, Republic of Korea held in Nagpur, India during 28-30 October 2023. Title of the poster: Green extraction of nutraceuticals from waste orange pomace via molecular imprinting technique.



»»» MR. GAURAV DEOLIKAR

PhD Student (Supervisor- **Dr. Ramani Motghare**) Won Second Prize in SERB Sponsored International Conference on Nanomaterials and Nanotechnology organised jointly by the Department of Physics and Chemical Engineering, VNIT, Nagpur, India, during September 11-13, 2023



»»» MS. RUCHIKA VINCHURKAR

PhD Student (Supervisor- **Dr. Suresh Umare**) Won Third Prize in poster presentation in the DST sponsored 13th National Conference on Thermodynamics of Chemical and Biological systems organised by Rashtrasant Tukdoji Maharaj Nagpur University 26-28 oct, 2023



»»» MR. SHAILESH KUMAR

M.Sc. Student Won First Prize in the Online Quiz Competition on Spectral Insights: A Quiz on Advanced Spectroscopy organized by Indian Society of Analytical Scientists, Pune Chapter on Sunday, 24th September 2023

SPORTING GLORY



CHEMISTRY CRICKET CONQUERORS

DR.UMESH PRATAP, DR.ATUL WANKHADE, DR.SANGESH ZODAPE

The National Institute of Technology, Tiruchirappalli (NITT), proudly hosted the prestigious All India Inter NIT Faculty and Staff Cricket Tournament from December 14th to 17th, 2023. This esteemed event witnessed the participation of 16 teams representing various NITs across the nation. Among the spirited competitors, the faculty team from VNIT Nagpur emerged victorious, showcasing their talent and dedication on the cricket field.

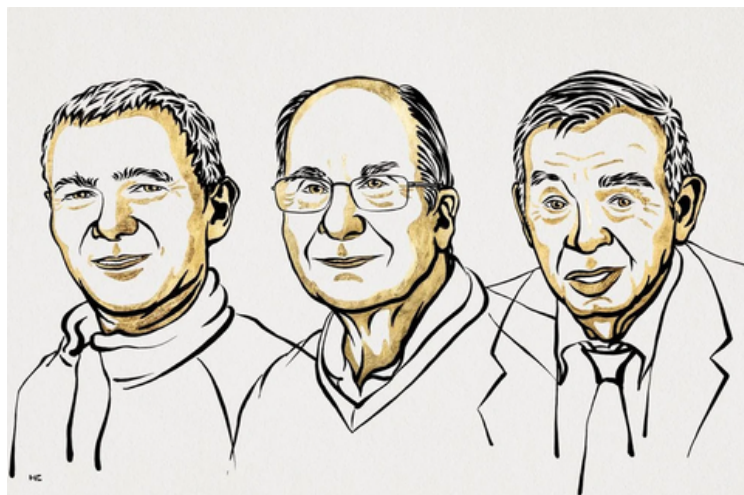


VNIT Nagpur Faculty Team with Director Dr. Pramod M. Padole

Nobel Prize in Chemistry

The 2023 chemistry laureates

Chemistry was the most important science for Alfred Nobel's own work. The development of his inventions as well as the industrial processes he employed were based upon chemical knowledge. Chemistry was the second prize area that Nobel mentioned in his will.



The Nobel Prize in Chemistry 2023 was awarded to **Mounji Bawendi, Louis Brus and Aleksey Yekimov** for the "Discovery and Synthesis of quantum dots."

Quantum dots now illuminate computer monitors and television screens based on QLED technology. They also add nuance to the light of some LED lamps, and biochemists and doctors use them to map biological tissue.



EDITORIAL BOARD

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