Curriculum Vitae

Dr. BHAWNA

Husband's Name: Nikhil Verma

Contact No. +91-9560067893

Email id: bhawnaverma537@gmail.com; vermadubhawna@gmail.com

Google Scholar: https://scholar.google.com/citations?user

ORCID ID: https://orcid.org/0000-0001-9141-6885

Current Position: Assistant Professor, Department of Chemistry, SRM Institute of Science and Technology Delhi NCR Campus Modinagar Ghaziabad, Uttar Pradesh (**August, 2023 - Present**).

Education

Ph.D. (2024) Department of Chemistry, University of Delhi, Delhi, 110021, India.

Thesis Title: Synthesis and Applications of Engineered SnO_2 Nanoparticles: Photocatalytic Water Splitting, Dye Degradation and Plastic Waste Conversion to Fuel Production.

M.Sc. Chemistry (Physical Chemistry) (2016), DCRUST Murthal, Haryana, India

B.Sc. Chemistry (Hons.) (2014), Ramjas College, University of Delhi, Delhi, India

Research Interests

- Worked as a JRF in a project entitled "Designation and Strategies of Nanocrystals for Photocatalytic Water Splitting" (12/12/2017 – 11/12/2018)
- Functionalized Nanomaterials, Crystallography, Water Splitting, Optical Property, Degradation of Toxic Organic Pollutants, Water Purification, Solid Waste Management
- Synthesis and characterization of functionalized nanomaterials using advanced characterization techniques with demonstrated skills in data analysis, scientific writing, and interdisciplinary collaboration.

➢ **Proficient Work-**

- Photocatalytic Splitting of water for Hydrogen generation
- Photocatalytic Dye Degradation
- Degradation of Pesticides and pharmaceuticals.
- Pyrolysis of plastic and biomass waste to valuable fuels.
- Removal of heavy metal ions from water

- **Skills-**
  - **Instrumentation & Analytical Techniques-**
  - Hands-on experience in Gas Chromatograph (TCD/FID), Scanning electron microscopy, Powder X-ray diffraction, UV-Visible spectroscopy, Zeta potential, Raman Spectroscopy, Fourier-Transform Infrared Spectroscopy, and Photoluminescence
  - Additional experience in Brunauer-Emmett-Teller (BET), Transmission electron microscopy, Mass Spectroscopy, Dynamic Light Scattering, and Diffuse Reflectance Spectroscopy
- **Data Analysis**
  - OriginPro 2024
  - Graph Prism
  - ImageJ and Gatan Software
  - FullProf Suite (Le-bail Fit and Rietveld analysis)
  - Design of Experiments (CCD/BBD-RSM)
  - MS Excel
- **Research Platforms and Literature Tools**
  - Google Scholar, ResearchGate, Scopus, Web of Science
  - SciFinder, ScienceDirect
  - Mendeley, Endnote
- **Soft Skills**
  - Communication | Collaboration & Teamwork | Time Management | Leadership & Initiative | Organizational Skills
- **Mentorship**
  - Mentored three Master's students and two Ph.D. juniors during Ph.D. tenure. These students have successfully published research articles in reputed international journals such as *Science of the Total Environment, Sustainable Energy & Fuels, Journal of Physical Chemistry C, Journal of Materials Science, and ACS Omega.*

Activities

- Chairperson- International Conference on Chemical and Biological Sciences (ICCBS) – 2024 organized by Atma Ram Sanatan Dharma College, University of Delhi, under the Aegis of IQAC and DBT Star College Scheme, 27th-29th January, 2024.
- Key Secretary- International Conference on Viksit Bharat 2047: Reaching the Unreached Through Chemical and Biological Sciences (VBCB-2025) 18th-20th February 2025.

- Volunteer, Student Organizing Committee – 2nd National Conference "Emerging Trends and Future Challenges in Chemical Sciences" which will be held on 10th January - 11th January 2020, at the Conference Centre, University of Delhi.
- Event Coordinator- Seminar on Beyond the Visible Exploring the Realm of Nanotechnology, 09/11/2023, SRMIST Modinagar Delhi NCR Campus, Ghaziabad.
- Event Coordinator- The Science Showdown: Project Expo, 15/10/2024, SRMIST Modinagar Delhi NCR Campus, Ghaziabad.

Awards and Achievements

- ***Young Scientist Award*** 2025
  Viksit Bharat 2047: Reaching the Unreached Through Chemical and Biological Sciences (VBCB-2025), 18-20 February, 2025.
- ***Grant Award (Registration+Accomodation+Travel)***
  International Workshop on Advanced Materials (IWAM) 2024, organized and sponsored by the Ras Al Khaimah Center for Advanced Materials (RAK CAM), Ras Al Khaimah, United Arab Emirates, 19-21 February 2024. *(Oral Presentation)* 2024
- ***Best Poster Award***
  International Webinar on Functional Energy Materials, Clemson University, USA, November 18th-19th 2020. 2020
- ***Best Poster Award*** 2022
  Conference on Advances in Chemical Sciences & Nanocomposites (ACSN-2022), Zakir Husain Delhi College, Delhi, 1st & 2nd April, 2022
- Joint CSIR-UGC JRF 2018
- Joint CSIR-UGC NET 2016

Publication Details

1. "Exploring the potential of Ti^{3+} in TiO_2 through experimental analysis and response surface methodology: Photocatalytic degradation of pharmaceuticals"; Sanjeev Kumar, Shikha Jyoti Borah, **Bhawna**, Ravinder Kumar, Rajkumar Joshi, Ravi Kant, Akanksha Gupta, Priyanka Jhajharia, Kashyap Kumar Dubey and Vinod Kumar. Energy & Environment, 2025.

https://doi.org/10.1177/0958305X2513430

2. "Effective Flame-Retardant Coatings for Expanded Polystyrene Foam: A Study Based on Deep Eutectic Solvent and Graphene Oxide"; Vijay Kumar Vishvakarma, Gyanendra Kumar, Sandeep Kumar, **Bhawna**, Dhanraj T. Masram. ACS Omega, 10, 24307-24319, 2025. https://doi.org/10.1021/acsomega.5c00242
3. "Synergistic heterojunction effects in Ag_3PO_4/SnO_2 nanocomposites: a photocatalytic study on isoproturon degradation"; Rishi Ram, **Bhawna**, Sanjeev Kumar, Akanksha Gupta, Ravinder Kumar, Kashyap Kumar Dubey and Vinod Kumar. Frontiers in Bioengineering and Biotechnology, 13, 2025. https://doi.org/10.3389/fbioe.2025.1458965
4. "Fabrication of Graphene Oxide on CdS- and PbS-Doped Bismuth Titanates for Photocatalytic Hydrogen Production"; Amika Gahlawat, Deepak Kumar, P. E. Lokhande, Rajesh Sharma, **Bhawna Verma**, Udayabhaskar Rednam, Suresh Ghotekar, Ayman A. Ghfar, Yedluri Anil Kumar, Seepana Praveenkumar. Journal of Electronic Materials, 53, 7753–7761, 2024. (IF-2.2) https://doi.org/10.1007/s11664-024-11520-z
5. "Advances in metallopolymers: Synthesis strategies, catalytic insights, and environmental remediation applications"; Mohd Aslam, Anjali Rania, Javed Khana, Ritika Sharma, Bhaskara Nand Pant, Prashant Singh, Vinod Kumar, Garima Pandey, **Bhawna.** Sustainable Chemistry and Pharmacy, 2024. (IF-6.0) https://doi.org/10.1016/j.scp.2024.101630
6. "Investigating AgCl-SnO_2 nanocomposite for photocatalytic degradation of azo dye, associated reaction pathways, and its antibacterial activity"; Ritika Sharma, Shikha Jyoti Borah, **Bhawna**, Akanksha Gupta, Priyanka Jhajharia, Kashyap Kumar Dubey, Vinod Kumar. Journal of Photochemistry & Photobiology, A: Chemistry, 456, 115800, 2024. (IF-4.1) https://doi.org/10.1016/j.jphotochem.2024.115800
7. "Harnessing Dual-Functionality of N, F-Codoped SnO_2 Material for Efficient Hydrogen Generation and Dye Degradation"; **Bhawna**, Sanjeev Kumar, Akanksha Gupta, Vinod Kumar, Prashant Kumar, Kashyap Kumar Dubey, Prashant Singh, Ajay Kumar Mishra, Ravinder Kumar. Journal of Inorganic and Organometallic Polymers and Materials, 34, 3056–3067, 2024. (IF – 3.9) https://doi.org/10.1007/s10904-024-03074-8
8. "An Understanding for the Synthesis of Metal NPs to Photocatalysis to Toxicity", Mohd. Aslam, Abhay Giri Goswami, Bhawna, Prashant Singh, Vinod Kumar, Bhaskara Nand Pant, Garima Pandey, Kamlesh Kumari. Plasmonics, 2023, (IF-3.0) **https://doi.org/10.1007/s11468-023-02151-x**
9. "Grasping the supremacy of microplastic in the environment to understand its implications and eradication: a review"; Shikha Jyoti Borah, Abhijeet Kumar Gupta, Akanksha Gupta, **Bhawna**, Sanjeev Kumar, Ritika Sharma, Ravinder Kumar, Pramod Kumar, Kashyap

Kumar Dubey, Sandeep Kaushik, Ajay Kumar Mishra, and Vinod Kumar. Journal of Materials Science, 2023, 58, 12899–12928. (IF-4.5) https://doi.org/10.1007/s10853-023-08806-8.

10. "Emerging trends in nano-based antidiabetic therapeutics: a path to effective diabetes management"; Ritika Sharma, Shikha Jyoti Borah, **Bhawna**, Sanjeev Kumar, Akanksha Gupta, Vandana Kumari, Ravinder Kumar, Kashyap Kumar Dubey, Vinod Kumar. Materials Advances, 2023, 4, 3091-3113. (IF-5.0) https://doi.org/10.1039/d3ma00159h.
11. "Catalytic heterostructured materials for CO_2 mitigation and conversion into fuels:a renewable energy approach towards a sustainable environment"; **Bhawna**, Sanjeev Kumar, Ritika Sharma, Shikha Jyoti Borah, Akanksha Gupta, Manoj Kumar Gupta, Ravinder Kumar, Kashyap Kumar Dubey, Yogendra Kumar Mishra, Vinod Kumar. Sustainable Energy & Fuels, 2023, 7, 4354-4395. (IF-5.6) https://doi.org/10.1039/d3se00516j.
12. "Unlocking the Potential of N-Doped SnO_2 for Sustainable Photocatalytic Degradation of Carcinogenic Dyes"; **Bhawna**, Ritika Sharma, Sanjeev Kumar, Ravinder Kumar, Prasanta Kumar Sahu, VandanaKumari, Ajay Kumar Mishra, and Vinod Kumar. Seperations, 2023, 10, 322. (IF-2.7) https://doi.org/10.3390/separations10060322.
13. "New Insights into $Cu/Cu_2O/CuO$ Nanocomposite Heterojunction Facilitating Photocatalytic Generation of Green Fuel and Detoxification of Organic Pollutants"; Sanjeev Kumar, **Bhawna**, Akanksha Gupta, Ravinder Kumar, Akhilesh Bharti, Ashwani Kumar, and Vinod Kumar. Journal of Physical Chemistry C, 2023, 127 (15), 7095-7106. (IF- 4.177) https://doi.org/10.1021/acs.jpcc.2c08094.
14. "B-doped SnO_2 nanoparticles: a new insight into the photocatalytic hydrogen generation by water splitting and degradation of dyes"; Kumar, Sanjeev, **Bhawna**, Sanjeev Kumar Yadav, Akanksha Gupta, Ravinder Kumar,Jahangeer Ahmed, Monika Chaudhary, and Vinod Kumar. Environmental Science and Pollution Research, 2022, 29, 1-14. (IF-5.19) https://doi.org/10.1007/s11356-022-18946-0
15. "TiO_2 based Photocatalysis membranes: An efficient strategy for pharmaceutical mineralization"; Sanjeev Kumar, **Bhawna**, Ritika Sharma, Akanksha Gupta, Kashyap Kumar Dubey, A.M. Khan, Rahul Singhal, Ravinder Kumar, Akhilesh Bharti, Prashant Singh, Ravi Kant. Vinod Kumar. Science of the Total Environment, 2022, 845, 157221. (IF-10.754) http://dx.doi.org/10.1016/j.scitotenv.2022.157221.
16. "Recent insights into SnO_2-based engineered nanoparticlesfor sustainable H2 generation and remediation of pesticides"; **Bhawna**, Kumar, Sanjeev, Ritika Sharma, Akanksha

Gupta, Adish Tyagi, Prashant Singh, Anup Kumar, and Vinod Kumar. New Journal of Chemistry, 2022, 46, 4014-4048. (IF-3.3) https://doi.org/10.1039/D1NJ05808H

17. "Recent updates on applications of ionic liquids (ILs) for biomedical sciences"; Sharma, Ritika, **Bhawna**, Sanjeev Kumar, Akanksha Gupta, Prasanta Kumar Sahu, PrashantSingh, and Vinod Kumar. Journal of the Iranian Chemical Society, 2022, 1-14. (IF-2.271) https://doi.org/10.1007/s13738-022-02544-5
18. "An Insight of Nanomaterials in Tissue Engineering from Fabrication to Applications"; Ritika Sharma, Sanjeev Kumar, **Bhawna**, Akanksha Gupta, Neelu Dheer, Pallavi Jain, Prashant Singh & Vinod Kumar. Tissue Engineering and Regenerative Medicine, 2022, 19(5), 927–960. (IF-3.6) https://doi.org/10.1007/s13770-022-00459-z
19. "Prospects of Biosensors Based on Functionalized and Nanostructured Solitary Materials: Detection of Viral Infections and Other Risks"; Sanjeev Kumar, Ritika Sharma, **Bhawna**, Akanksha Gupta, Prashant Singh, Susheel Kalia,Pankaj Thakur, and Vinod Kumar. ACS Omega, 2022, 26, 73-88. (IF-4.1) https://doi.org/10.1021/acsomega.2c01033
20. "An update on Graphene Oxide: Applications and toxicity"; Yadav, Sandeep; Raman, Anirudh; Meena, Harshvardhan; Goswami, Abhay; **Bhawna**;Kumar, Vinod; Jain, Pallavi; Kumar, Gyanendra; Rana, Devendra; Bahadur, Indra; Singh, Prashant. ACS Omega, 2022,7, 387-445. (IF-4.1) https://doi.org/10.1021/acsomega.2c03171
21. "Functionalized Peptide-Based Nanoparticles for Targeted Cancer Nanotherapeutics: A State-of-the-Art Review"; Ritika Sharma, Shikha Jyoti Borah, **Bhawna**, Sanjeev Kumar, Akanksha Gupta, Poonam Singh, Vijay Kumar Goel, Ravinder Kumar, Vinod Kumar. ACS Omega, 2022, 41, 92-107. (IF-4.1) https://doi.org/10.1021/acsomega.2c03974
22. "Layered Double Hydroxide Nanomaterials: Biomedical Applications, Current Status and Challenges"; R.Sharma, **Bhawna**, S. Kumar, P. Singh, A. Gupta, Vinod Kumar. Nano LIFE, 2021, 11(03), 2130008. (IF-0.8) https://doi.org/10.1142/S1793984421300089
23. "Facile Synthesis of N doped SnO_2 nanoparticles: A promising cocatalyst free photocatalyst for hydrogen generation"; **Bhawna**, A. Gupta, P. Kumar, A. Tyagi, R. Kumar, A. Kumar, P. Singh, R.P. Singh, Vinod Kumar. ChemistrySelect, 2020, 5, 7775-7782. (IF-1.9) https://doi.org/10.1002/slct.202001301
24. "Synthesis, Antimicrobial Activity and Photocatalytic Performance of Ce doped SnO_2 Nanoparticles"; **Bhawna**, A. K. Choudhary, A. Gupta, S. Kumar, P. Kumar, R. P. Singh, P. Singh, Vinod Kumar. Frontiers in Nanotechnology, 2020, 2, 595352. (IF-3.8) https://doi.org/10.3389/fnano.2020.595352
25. "Facile synthesis of Ce doped SnO_2 nanoparticles: A promising photocatalyst for hydrogen

evolution and dyes degradation"; Vinod Kumar, **Bhawna**, S. K. Yadav, A. Gupta, B. Dwivedi, A. Kumar, P. Singh and K. Deori. ChemistrySelect, 2019, 4, 3722 –3729. (IF-1.9) https://doi.org/10.1002/slct.201900032

Chapters

- Bismuth Oxyhalide Photocatalysts: Pioneering Efficiency in Hydrogen Generation; **Bhawna**, Ritika Sharma, Sanjeev Kumar, Vijay Kumar Vishvakarma, Garima Pandey, and Vinod Kumar, Towards Sustainable and Green Hydrogen Production by Photocatalysis: Insights into Design and Development of Efficient Materials (Volume 2) Chapter 9 pp 241-254, eISBN: 978084129670110.
- Organic Small Molecule Materials and Display Technologies for OLDEs; **Bhawna**, Shikha Jyoti Borah, Sanjeev Kumar, Ritika Sharma, Juhi Kumari, Neelu Dheer, Akanksha Gupta, Vinod Kumar, Dhananjay Kumar, CRC Press, 2023, e Book ISBN 9781003260417.
- Utilization of Metallopolymer Nanomaterials in Optoelectronic Sensing; **Bhawna**, Ritika Sharma, Sanjeev Kumar, Prasanta Kumar Sahu, Akanksha Gupta, and Vinod Kumar, Progress in Optical Science and Photonics, Volume 27, Springer.

Conferences attended

- "Synergistic N, F codoping of SnO_2 nanoparticles: Revolutionizing photocatalytic hydrogen generation and dye eradiction" International Workshop on Advanced Materials (IWAM) 2024, Ras Al Khaimah Center for Advanced Materials (RAK CAM) Ras Al Khaimah, United Arab Emirates, 19-21 Feb. 2024. **(Oral Presentation)**
- "Strategic Modification of Tungsten Oxynitrides for Efficient UV-driven Hydrogen Evolution" International Conference on Chemical and Biological Sciences (ICCBS-2024), 27-29 January, 2024. **(Oral Presentation)**
- Synthesis, Antimicrobial Activity and Photocatalytic Performance of Ce doped SnO_2 Nanoparticles, Recent Advances in Nano Medical Sciences (RANMS-2022), University of Delhi, Delhi-110007, India; 22nd - 23rd June, 2022. **(Oral Presentation)**
- Exploring Anion doped SnO_2 for photocatalytic hydrogen generation and dye degradation, One day Symposium on "Sensors for Society" ECS-JNU conference, Convention Centre, Jawaharlal Nehru University, New Delhi, 27 April 2022. **(Oral Presentation)**
- N, F codoped SnO_2: A Potential Photocatalyst for Photocatalytic Hydrogen Generation and Dye Degradation; Conference on Advances in Chemical Sciences & Nanocomposites

(ACSN-2022), Zakir Husain Delhi College, Delhi, 1st & 2nd April, 2022.

- A Cocatalyst Free Hydrogen Generation using N-Doped SnO_2 Nanoparticles; International Webinar on Functional Energy Materials, Clemson University, USA, November 18th-19th 2020.
- National Conference on Relationship between Chemical Sciences and Society (RCSS-2020), Shivaji College, University of Delhi, 16-17th January 2020.
- Facile Synthesis of Ce-Doped SnO_2 nanoparticles: A Promising Photocatalyst for Hydrogen Evolution and Dyes Degradation; 2nd National Conference on Emerging Trends and Future Challenges in Chemical Sciences (ETFC-2020), University of Delhi, Delhi, 10-11th January 2020.
- Photocatalytic Dyes Degradation Using Ce doped SnO_2 Nanoparticles, Banaras Hindu University, 17-18th Nov. 2018.
- H_2 Generation using Ce-Sn-O nanocrystals, Indian Institute of Petroleum (IIP), Dehradun, 10-13th May 2018 SEFCO.

References

1 **Dr. Vinod Kumar**
Associate Professor
Department of Chemistry, University of Delhi, Delhi, India- 110007
Email: kumarv@jnu.ac.in

2 **Prof. Prashant Singh**
Professor
Department of Chemistry
Atma Ram Sanatan Dharma College, University of Delhi, New Delhi- 110021
Email: psingh@arsd.du.ac.in

Declaration

I hereby declare that all the above-mentioned information is true to the best of my knowledge.