

## Curriculum Vitae

### **BHAWNA**

Father's Name: Shiv Prakash Verma

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**Carrier objectives:** My goal is to attain prominent positions within the academic, administrative, or industrial sectors, with the aim of leveraging my skills and expertise to contribute significantly to the advancement and development of the respective systems.

### **Education**

**Ph.D.** (Thesis submitted 24/07/2023) Department of Chemistry, University of Delhi, Delhi, 110021, India. Viva to be defended soon.

**Thesis Title:** Synthesis and Applications of Engineered SnO<sub>2</sub> Nanoparticles: Photocatalytic Water Splitting, Dye Degradation and Plastic Waste Conversion to Fuel Production.

**M.Sc.** Chemistry, DCRUST Murthal, Haryana, India

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

### **Research**

- 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 of functionalized nanomaterials through different techniques.
- **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

- Expertise in analysis of following data using softwares-
- ✓ XRD, FTIR, Raman, BET, UV-DRS, PL, XPS, SEM, TEM, ICP-MS etc.
- **Instruments handled-**  
GC (TCD/FID), SEM, UV-Spectrophotometer, Raman, XRD, AFM, FTIR, Raman and many others.

### **Awards and Achievements**

- **Best Poster Award** 2020  
International Webinar on Functional Energy Materials, Clemson University, USA, November 18th-19th 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

### **Skills**

Data handling and analysis; presentation skills; written and oral communication; interpersonal and collaborative skills; teamwork and correspondence skills; and scientific editing, writing, and illustrating.

### **Publication Details**

- 1) Ritika Sharma, Shikha Jyoti Borah, **Bhawna**, Sanjeev Kumar, Akanksha Gupta, Vandana Kumari, Ravinder Kumar, Kashyap Kumar Dubey, Vinod Kumar. “Emerging trends in nano-based antidiabetic therapeutics: a path to effective diabetes management” *Materials Advances*, 2023, 4, 3091-3113. (IF-5.0) <https://doi.org/10.1039/d3ma00159h>.
- 2) **Bhawna**, Sanjeev Kumar, Ritika Sharma, Shikha Jyoti Borah, Akanksha Gupta, Manoj Kumar Gupta, Ravinder Kumar, Kashyap Kumar Dubey, Yogendra Kumar Mishra, Vinod Kumar. “Catalytic heterostructured materials for CO<sub>2</sub> mitigation and conversion into fuels: a renewable energy approach towards a sustainable environment” *Sustainable Energy & Fuels*, 2023, 7, 4354-4395. (IF-5.6) <https://doi.org/10.1039/d3se00516j>.
- 3) **Bhawna**, Ritika Sharma, Sanjeev Kumar, Ravinder Kumar, Prasanta Kumar Sahu, Vandana Kumari, Ajay Kumar Mishra, and Vinod Kumar. “Unlocking the Potential of N-Doped SnO<sub>2</sub> for Sustainable Photocatalytic Degradation of Carcinogenic Dyes” *Separations*, 2023,

- 10, 322. (IF-2.6) <https://doi.org/10.3390/separations10060322>.
- 4) Sanjeev Kumar, **Bhawna**, Akanksha Gupta, Ravinder Kumar, Akhilesh Bharti, Ashwani Kumar, and Vinod Kumar. "New Insights into Cu/Cu<sub>2</sub>O/CuO Nanocomposite Heterojunction Facilitating Photocatalytic Generation of Green Fuel and Detoxification of Organic Pollutants." *Journal of Physical Chemistry C*, 2023, 127 (15), 7095-7106. (IF-4.177) <https://doi.org/10.1021/acs.jpcc.2c08094>.
  - 5) Kumar, Sanjeev, **Bhawna**, Sanjeev Kumar Yadav, Akanksha Gupta, Ravinder Kumar, Jahangeer Ahmed, Monika Chaudhary, and Vinod Kumar. "B-doped SnO<sub>2</sub> nanoparticles: a new insight into the photocatalytic hydrogen generation by water splitting and degradation of dyes." *Environmental Science and Pollution Research*, 2022, 29, 1-14. (IF-5.19) <https://doi.org/10.1007/s11356-022-18946-0>
  - 6) 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. "TiO<sub>2</sub> based Photocatalysis membranes: An efficient strategy for pharmaceutical mineralization." *Science of the Total Environment*, 2022, 845, 157221. (IF-10.754) <http://dx.doi.org/10.1016/j.scitotenv.2022.157221>.
  - 7) **Bhawna**, Kumar, Sanjeev, Ritika Sharma, Akanksha Gupta, Adish Tyagi, Prashant Singh, Anup Kumar, and Vinod Kumar. "Recent insights into SnO<sub>2</sub>-based engineered nanoparticles for sustainable H<sub>2</sub> generation and remediation of pesticides." *New Journal of Chemistry*, 2022, 46, 4014-4048. (IF-3.3) <https://doi.org/10.1039/D1NJ05808H>
  - 8) Sharma, Ritika, **Bhawna**, Sanjeev Kumar, Akanksha Gupta, Prasanta Kumar Sahu, Prashant Singh, and Vinod Kumar. "Recent updates on applications of ionic liquids (ILs) for biomedical sciences." *Journal of the Iranian Chemical Society*, 2022, 1-14. (IF-2.271) <https://doi.org/10.1007/s13738-022-02544-5>
  - 9) Ritika Sharma, Sanjeev Kumar, **Bhawna**, Akanksha Gupta, Neelu Dheer, Pallavi Jain, Prashant Singh & Vinod Kumar. "An Insight of Nanomaterials in Tissue Engineering from Fabrication to Applications." *Tissue Engineering and Regenerative Medicine*, 2022, 19(5), 927–960. (IF-3.6) <https://doi.org/10.1007/s13770-022-00459-z>
  - 10) Sanjeev Kumar, Ritika Sharma, **Bhawna**, Akanksha Gupta, Prashant Singh, Susheel Kalia, Pankaj Thakur, and Vinod Kumar. "Prospects of Biosensors Based on Functionalized and Nanostructured Solitary Materials: Detection of Viral Infections and Other Risks". *ACS Omega*, 2022, 26, 73-88. (IF-4.1) <https://doi.org/10.1021/acsomega.2c01033>
  - 11) Yadav, Sandeep; Raman, Anirudh; Meena, Harshvardhan; Goswami, Abhay; **Bhawna**; Kumar, Vinod; Jain, Pallavi; Kumar, Gyanendra; Rana, Devendra; Bahadur, Indra; Singh,

- Prashant. "An update on Graphene Oxide: Applications and toxicity". ACS Omega, 2022, 7, 387-445. (IF-4.1) <https://doi.org/10.1021/acsomega.2c03171>
- 12) Ritika Sharma, Shikha Jyoti Borah, **Bhawna**, Sanjeev Kumar, Akanksha Gupta, Poonam Singh, Vijay Kumar Goel, Ravinder Kumar, Vinod Kumar. "Functionalized Peptide-Based Nanoparticles for Targeted Cancer Nanotherapeutics: A State-of-the-Art Review". ACS Omega, 2022, 41, 92-107. (IF-4.1) <https://doi.org/10.1021/acsomega.2c03974>
- 13) R.Sharma, **Bhawna**, S. Kumar, P. Singh, A. Gupta, Vinod Kumar. "Layered Double Hydroxide Nanomaterials: Biomedical Applications, Current Status and Challenges". Nano LIFE, 2021, 11(03), 2130008. (IF-0.8) <https://doi.org/10.1142/S1793984421300089>
- 14) **Bhawna**, A. Gupta, P. Kumar, A. Tyagi, R. Kumar, A. Kumar, P. Singh, R.P. Singh, Vinod Kumar. "Novel Synthesis of N doped SnO<sub>2</sub> nanoparticles: A promising cocatalyst free photocatalyst for hydrogen generation" ChemistrySelect, 2020, 5, 7775-7782. (IF-2.307) <https://doi.org/10.1002/slct.202001301>
- 15) **Bhawna**, A. K. Choudhary, A. Gupta, S. Kumar, P. Kumar, R. P. Singh, P. Singh, Vinod Kumar. "Synthesis, Antimicrobial Activity and Photocatalytic Performance of Ce doped SnO<sub>2</sub> Nanoparticles" Frontiers in Nanotechnology, 2020, 2, 595352. <https://doi.org/10.3389/fnano.2020.595352>
- 16) Vinod Kumar, **Bhawna**, S. K. Yadav, A. Gupta, B. Dwivedi, A. Kumar, P. Singh and K. Deori. "Facile synthesis of Ce doped SnO<sub>2</sub> nanoparticles: A promising photocatalyst for hydrogen evolution and dyes degradation" ChemistrySelect, 2019, 4, 3722 –3729. (IF-2.307) <https://doi.org/10.1002/slct.201900032>

### **Conferences attended**

- Synthesis, Antimicrobial Activity and Photocatalytic Performance of Ce doped SnO<sub>2</sub> Nanoparticles, Recent Advances in Nano Medical Sciences (RANMS-2022), University of Delhi, Delhi-110007, India; 22nd - 23rd June, 2022.
- Exploring Anion doped SnO<sub>2</sub> 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.
- N, F codoped SnO<sub>2</sub>: 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> Nanoparticles, Banaras Hindu University, 17-18th Nov. 2018.
- H<sub>2</sub> Generation using Ce-Sn-O nanocrystals, Indian Institute of Petroleum (IIP), Dehradun, 10-13th May 2018 SEFCO.

### **References**

#### **1 Dr. Vinod Kumar**

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### **Declaration**

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



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