

CURRICULUM VITAE

Mr. Mahesh Kumar

Current Position: Assistant Professor

Department of Chemistry

Govt. P.G. College, Kunidhar, Manila (Almora) Uttarakhand, India

Pursuing Ph.D. at CSIR–Indian Institute of Petroleum (CSIR-IIP), Dehradun, Uttarakhand, India.

(Specialized in Heterogeneous Catalysis & Material Synthesis)

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Education

🎓 **Master of Science | Organic Chemistry | 2018**

Govt. PG College, Gopeshwar, Chamoli, Uttarakhand

🎓 **Bachelor of Science | CBZ | 2016**

Govt. PG College, Gopeshwar, Chamoli, Uttarakhand

🎓 **Intermediate (Class 12) | 2013**

Tungeshwar GIC Chopta, Rudraprayag, Uttarakhand

🎓 **High-School (Class 10) | 2011**

HS School Khadapatiya, Rudraprayag, Uttarakhand

Competitive Exams & Certifications

✅ **CSIR-UGC NET – June & December 2019**

✅ **GATE 2019 (IIT Madras) – Rank 236**

Awards & Fellowships

🏆 **NFSC Fellowship Awardee – [June 2019 & December 2019]**

🏆 **51st SSBMT Outdoor Zonal Cricket Tournament held at CSIR-NIEST, Jorhat, Assam – Best Player of the match.**

Professional summary

A dynamic and results-oriented researcher with expertise in heterogeneous catalysis, material synthesis, and process optimization. Proficient in developing zeolite-based catalysts, reaction engineering, and utilizing advanced analytical characterization techniques to drive innovation. Committed to developing cost-effective and sustainable catalytic processes that enhance efficiency and environmental sustainability. In addition to my research expertise, I have **1.4 years of undergraduate teaching experience**, delivering courses and laboratory sessions in chemical sciences while mentoring students in both academic and practical aspects of the discipline. I am skilled in simplifying complex technical concepts, fostering an engaging learning environment, and guiding students toward academic excellence. My focus is on applying my technical knowledge, analytical abilities, and teaching skills to optimize catalyst performance, improve industrial applications, and contribute to high-quality education. I am dedicated to working in collaborative academic and research environments that promote innovation, professional growth, and impactful solutions to scientific challenges.

Research Experience

Thesis Title:

“Development of Solid Acid Catalyst for the production of Petrochemicals from Conventional and Unconventional Hydrocarbon feedstocks”

Work Experience:

- **Engineered and optimized catalytic materials** with enhanced properties to maximize yield, conversion efficiency, and process performance.
- **Led in-depth characterization efforts**, evaluating material properties and their applicability to a wide range of industrial and research applications.
- **Developed and tailored advanced catalytic systems**, driving significant improvements in selectivity, process efficiency, and reaction rates.
- **Independently designed and executed complex reaction studies** utilizing high-pressure micro-reactors and Parr reactors, ensuring high-quality experimental data.
- **Resolved critical operational issues** by troubleshooting plant systems, ensuring optimal functionality and minimal downtime for continuous production.
- **Synthesized cutting-edge insights from scientific literature** and technical reports, enabling innovative solutions to overcome project-specific challenges.
- **Conducted precise mass balance and process calculations**, validating experimental results and streamlining process optimization for scale-up.
- **Managed and supervised reactor operations** under stringent controlled conditions, adhering to safety protocols and achieving desired reaction outcomes.

Analytical Skills

- **Gas Chromatography (GC) & GC-MS:** Advanced proficiency in analyzing chemical mixtures and identifying compounds.
- **X-ray Diffraction (XRD):** Expertise in phase identification and structural analysis of crystalline materials.
- **Fourier Transform Infrared Spectroscopy (FTIR):** Skilled in identifying molecular functional groups and chemical bonding.
- **Chemisorption Techniques:**
 - ❖ **Temperature Programmed Desorption (TPD):** Experience in surface and acidity characterization of catalysts.
 - ❖ **Temperature Programmed Reduction (TPR):** Expertise in assessing the reduction behavior of catalytic materials.
- **Brunauer-Emmett-Teller (BET):** Proficient in determining surface area and pore structure of materials.
- **Pyridine-FTIR:** Skilled in characterizing acid sites in catalysts for surface chemistry analysis.
- **Transmission Electron Microscopy (TEM) & Scanning Electron Microscopy (SEM):** Experienced in detailed imaging and morphological analysis at micro and nano scales.
- **Ultraviolet-Visible Diffuse Reflectance Spectroscopy (UV-Vis-DRS):** Expertise in studying the electronic properties of materials.
- **Data Interpretation:** Strong ability in analyzing data from techniques such as NMR, FTIR, BET, SEM, TEM, TPD, TPR, TGA, XPS, UV-Vis, and more.

Publications and Conferences

List of Publications:

- ❖ **Mahesh Kumar**; Vijendra Singh; Saurabh Kumar; Anup Prakash Tathod; Selvamani Arumugam; Nagabhatla Viswanadham; Biodiesel-derived waste glycerol as a green template for creating mesopores in the ZSM-5 catalyst for aromatics production application, ACS Langmuir, 2024, , 40, 2686-2697, <https://doi.org/10.1021/acs.langmuir.3c03210>.
- ❖ **Mahesh Kumar**; Anup Prakash Tathod; Selvamani Arumugam; Vijendra Singh; Nagabhatla Viswanadham, Highly Versatile, Non-noble Metal-based Catalytic Process for the Production of Green Aromatics and High-octane Fuel from Bio-derived Hydrocarbon Mix, Chemistryselect, 2024, 9, 1-8, <http://doi.org/10.1002/slct.202304302>.
- ❖ Vijendra Singh; Selvamani Arumugam; **Mahesh Kumar**; Anup Prakash Tathod; Nagabhatla Viswanadham, Renewable p-Xylene Production by Catalytic Conversion of Crude Bio-glycerol (GTA-pX Process, ACS Industrial & Engineering Chemistry Research, 2023, 62, 1788-1796, <https://doi.org/10.1021/acs.iecr.2c04234>.
- ❖ Vijendra Singh; Selvamani Arumugam; Deepak Joshi; **Mahesh Kumar**; Sadhna Semalty; Nagabhatla Viswanadham, High value-added green fuel additive production from bio-waste glycerol over versatile nanohybrid catalyst, RSC New Journal of Chemistry, 2024, 48, 8172-8180, <https://doi.org/10.1039/D3NJ04606K>.
- ❖ Saurabh Kumar; Selvamani Arumugam; Vijendra Singh; **Mahesh Kumar**; Anup Prakash Tathod; Nagabhatla Viswanadham, Sustainable approach for the production of green fuel additives ACS Sustainable Resource Management, 2024, 1, 1444-1452. <https://doi.org/10.1021/acssusresmgt.4c00098>.

Computational and Software Proficiency:

- **MS Office Suite:** (Word, Excel, PowerPoint) for document preparation, data analysis, and creating professional presentations.
- **Origin:** for statistical analysis, data visualization, and curve fitting.
- **ChemDraw:** for creating chemical structures, reactions, and diagrams.
- **Mendeley:** for organizing references, managing citations, and streamlining research workflow.

Languages Known

- Hindi-Native
- English-Moderate

Hobbies

- **Sports & Fitness Enthusiast:**
 - ❖ Cricket
 - ❖ Gymnasium
- **Strategic Games & Puzzles:**
 - ❖ Chess
- **Musical Exploration:**
 - ❖ Various types of genres especially Classical, Jazz, and Rock.

Declaration:

All the above mention statements are true & correct to best of my knowledge & belief. I assure you that with my endeavors, I will prove myself best & beneficial for the company.

Mahesh Kumar

***Current location: Govt. PG
College Kunidhar Manila Almora***