

Dr. HARI SINGH

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Ph.D. Title: Development of Novel Nanostructured Porous Nickel Catalysts (Guide-Prof. Dr. Anil Kumar Sinha, CSIR-IIP)

Worked at high temp & high-pressure reactors and pilot plants.

JRF (2014-2015) & SRF (2015-2019) at CSIR-IIP.

Education



Ph.D. (Chemistry)	2019	Academy of Scientific & Innovative Research (AcSIR)/CSIR- Indian Institute of Petroleum (CSIR-IIP), Dehradun UK, India.
M.Sc (Ind. Chemistry) (74%)	2012	Aligarh Muslim University, Aligarh, UP
B.Sc (H) (Ind. Chemistry)(73%)	2010	Aligarh Muslim University, Aligarh, UP
HSC (PCB) with 63%	2005	CBSE BOARD
SSC with 67.8%	2003	CBSE BOARD

Experience-Total 5 years of experience (Teaching & Research)

Sept 2019- Till date	Assistant Professor RIMT University Mandi Gobindgarh Punjab
Feb 2013 – Aug 2014	Project Assistant, Project titled “Production of second & third generation biofuels (Biomass to liquid) at CSIR-IIP, Dehradun Uttarakhand

Research Interest

- Nanomaterials (Nanoporous materials, Characterization & applications), High pressure & high temp reactions
- Heterogeneous catalysis (Hydroprocessing, reforming, Hydrogenation, dehydrogenation, biofuels and biomass conversion)
- Photocatalysis (CO₂ reduction, CO₂ Hydrogenation & Photocatalytic oxidation)

Publications

1. Synthesis of surfactant assisted zero-dimensional iron nanomaterials for cellobiose hydrolysis, **Hari Singh***, A. K. Sinha, S. Kour, and Gaurav Goel, Materials Advances, 2023 (Submitted- under review).
2. Gadolinium Nanoparticles for use as MRI contrast agent, **Hari Singh***, A. K. Sinha, and Gaurav Goel, Materials Advances, 2023(Submitted-under review).
3. People’s perceptions on COVID-19 vaccination: an analysis of twitter discourse from four countries, Manah Verma, Nikhil Moudgil, Gaurav Goel, Peehu Pardeshi, Jacquleen Joseph, Neeraj Kumar, **Hari Singh** & Prakash Babu Kodali, Scientific Reports, 13, 14281 (2023)
4. Challenges in the synthesis methods of iron-based nanomaterials and Their Applications, **Hari Singh***, Gaurav Goel, Sharanmeet Kour, and Suneel Singh Barheyan, Journal of Environmental Science & Engineering, 2023 (Accepted).
5. Magnetically Separable Template Assisted Iron Nanoparticle for the Enhancement of Latent Fingerprints, **Hari Singh***, Sharanmeet Kour, M. Selvaraj, J. Indian Chem. Soc. 99, 9, 100661, 2022.
6. The Development of Mesoporous Ni-Based Catalysts and Evaluation of Their Catalytic and Photocatalytic Applications, Sharanmeet kour, Ankit Mishra, Anil Sinha, Pawandeep kaur, **Hari Singh*** Chemistry Select, 2020, 5, 3710-3723.
7. Magnetically Recoverable Support-free Mesoporous Ni/NiO Catalyst for Conversion of Oxygenates to Fuels and Chemicals, **Hari Singh**, Nishant Iyengar, Paramani Rajput, Anil Kumar Sinha, Material research bulletin, 2019, 112, 363-375.
8. Facile Conversion of Levulinic acid to γ -Valerolactone using, High Surface Area Magnetically Separable Ni/NiO Catalyst, **Hari Singh**, Nishant Iyengar, Rajkumar Yadav, Aditya Rai, Anil K. Sinha, Sustainable Energy Fuels, 2018, 2, 1699-1706.
9. Glucose hydrogenation to sorbitol over unsupported mesoporous Ni/NiO catalyst, **Hari Singh**, Aditya Rai, Rajkumar Yadav, Anil K. Sinha, Molecular Catalysis, 2018, 451, 186-191.

10. Magnetically recoverable Ni/NiO catalyst for hydrogenation of cashew nutshell oil to value-added products, **Hari Singh**, Rajkumar Yadav, Parasmani Rajput, D. Bhattacharyya, S. N. Jha, and A. K. Sinha, *Energy Fuels*, 2019, 33, 6, 5332-5342.
11. Nanoporous nickel oxide catalyst with uniform Ni dispersion for enhanced hydrogen production from organic waste, **Hari Singh**, Rajkumar Yadav, S.A. Farooqui, O. Dudnyk, A. K. Sinha, *Int. J Hydrogen Energy*, 2019, 44, 19573-19584.
12. Core-shell Ni/NiO grafted cobalt (II) complex: an efficient inorganic nanocomposite for photo-catalytic reduction of CO₂ under visible light irradiation, Pankaj K. Prajapati, **Hari Singh**, Rajkumar Yadav, Anil K. Sinha, Sabine Szunerits, Suman L. Jain, *Applied Surface Science*, 2019, 467-468, 370-381.
13. Nickel/Nickel oxide in combination with a photoredox catalyst for the reductive carboxylation of unsaturated hydrocarbons with CO₂ under visible light irradiation, Saini, Sandhya; **Singh, Hari**; Prajapati, Pankaj Kumar; Sinha, Anil; Jain, Suman, *ACS Sustainable Chem. Eng.* 2019, 7, 13, 11313-11322.
14. Mesoporous Ni/NiO-SiO₂ for effective hydrodeoxygenation of stearin into diesel range hydrocarbons **Singh, Hari**; Sinha, Anil, *Catalysis in Green Chemistry and Engineering*, 2018, 1, 127-138.
15. ZnAlMCM-41; a very ecofriendly and reusable solid acid catalyst for highly selective synthesis of 1, 3-dioxanes by Prins cyclization of olefins, Manickam Selvaraj, Mohammed A. Assiri, **Hari Singh**, Jimmy Nelson Appaturi, and Chang-Sik Ha, *Dalton Trans.*, 2021, 50, 1672-1682.
16. Photo-electrochemical hydrogen evolution over FTO/Ni_{0.98} Si_{0.02}O₂-Ni electrode induced by Visible and UV light irradiation, Rajkumar Yadav, **Hari Singh**, Sandhya Saini, Bijoy Biswas, Avnish Kumar, and Anil Kumar Sinha, *Journal of Applied Electrochemistry*, 2019, 49, 991-1002.
17. Ultra-fine size-controlled Pt (111) nanoparticles supported on mesoporous titania as an efficient photoelectrocatalyst for hydrogen evolution, Rajkumar Yadav, **Hari Singh**, and Anil Kumar Sinha, *Applied Surface Science*, 495, 2019, 143525.
18. Mechanistic in-operando FT-IR studies for hydroprocessing of triglycerides, Mohit Anand, Saleem Akhtar Farooqui, Jitendra Singh, Hari Singh, Anil Kumar Sinha, *Catalysis Today*, 2018, 309, 11-17.
19. Kinetics and Energetics for Hydrocracking Reactions of Renewable Oils, Anand, Mohit; Farooqui, Saleem; Rohit; Sibi, Malayil; Singh, Hari; Sinha, Anil, *Appl. Catal., A*, 2016, 516, 144-152.
20. Optimizing renewable oil hydrocracking conditions for aviation bio-kerosene production, Anand, Mohit; Farooqui, Saleem; Singh, Hari; Sinha, Anil, *Fuel Process. Technol.*, 2016, 151, 50-58.

Seminars and Conferences

1. Insight of iron incorporated gadolinium based zero-dimensional nanomaterial as MRI agent, International conference on science for survival: to explore the unexplored dimensions organised by Govt. College for women Udhampur, J&K, INDIA, March 2023, page- 43
2. Hydrogenation of Biomass Derived Oil to Biofuels over Ni/NiO Robust Catalyst, ICRTESE 2021 (Virtual mode) at Rajiv Gandhi Institute of Petroleum Technology (**RGPT**), Jais, Amethi, India
3. Oral presentation at the 23rd National Symposium on Catalysis titled Applied Catalysis in Emerging Technologies for Chemicals, organised by Catalysis society of India, January 17-19, 2018, at Royal Orchid Convention Centre, Yelahanka, Bengaluru, Karnataka. "Nanoporous Ni/NiO catalyst for enhanced hydrogen production from organic waste", page-113.
4. Oral presentation in the 5th Asia -Oceania conference on green and sustainable chemistry, organised by North India Section of the RSC (Landon). Green chemistry Network centre (New Delhi) and The Energy and Resources Institute (New Delhi) on 15-17 Jan 2015 at India Habitat Centre, Delhi, "Porous Nickel containing silica as catalyst for hydrogenation of methyl oleate & glyceryl tristerate into renewable diesel range hydrocarbon".
5. Oral presentation in (IISF)-India International Science Festival, organised by (DST) Department of Science and Technology on 7-11 Dec, 2016 at CSIR-NPL, Delhi.
6. Oral presentation in APCAT, 7th Asia-Pacific Congress on Catalysis organised by Institute of Chemical Technology, supported by Catalysis Society of India, on 17-21 January 2017, at The Lalit Hotel, Mumbai, "Magnetically separable nanoporous Ni/NiO as catalyst for hydrodeoxygenation and hydrogenation".
7. Organized Symposium on "Shaping the Energy Future: Challenges and Opportunities (SEFCO-2017)", at CSIR-IIP, Dehradun, 11-12 May 2017.
8. Organised a national conference, "Trends in Basic and Applied Sciences "on 7-8 Dec 2020 at Department of Forensic Science and Chemistry RIMT University, Punjab. (<https://rimt.ac.in/wp-content/uploads/2020/11/Conference-Boucher.pdf>)

Awards & Honours

- Supervised one Ph.D. and two M.Phil. Thesis.
- Got Institute postdoc fellowship (IIT Roorkee).
- **Worked in a team who produced bio-jet fuels from Jatropha oil and tested by SpiceJet as India's first biofuel flight on 28 Aug 2018.**
- **Published two books and two book chapters.**
- **Published Indian patent (No-202211013698) title-“DMSO SOLUBLE, NON-TOXIC IRON INCORPORATED LANTHANUM BASED NANOMATERIAL AND ITS APPLICATION IN BIOMEDICAL IMAGING”**
- A project in DST under consideration project no- **DST/TDT/TDP/2022/1057**
- Reviewed-Science Technology of Advanced Materials (STAM) Journal, (Taylor & Francis) in 2020.

Other activities/Achievements

- Experience of handling sophisticated instruments like N₂ Adsorption, FTIR, GC, HPLC, CHNSO, TPD-TPR, and SEM and TEM, etc.
- Have basic knowledge of sample preparation and handling of TEM.
- Worked on Indus synchrotron radiations (EXAFS analysis) at RRCAT (a unit of BARC) Indore.

References

Dr. Anil Kumar Sinha (Ph.D. Guide)	Chief Scientist, HOD, Biofuels division, Hydro processed Renewable Fuels, CSIR-IIP, Dehradun, India, mail- asinha@iip.res.in, phone-+919410188577
Prof. Dr. Asim Bhaumik	Senior Professor , Department of material science, Indian Association for Cultivation of Science, Kolkata, India, mail-msab@iacs.res.in , phone-+919674629416
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Prof. Dr. Anees Ahmad	Senior Professor, HOD Chemistry Department, Aligarh Muslim University, Aligarh, 202002, Uttar Pradesh, Email-aneesahmad@yahoo.com, Phone-9536322688

Personal Information

- Date of Birth: **9th June 1988**
- Permanent Address: House 1181 Maharana Pratap Nagar ward Pichhor Jhansi, UP 284001
- Corresponding address: Chemistry Department, RIMT University Mandi Gobindgarh Punjab 147301
- Marital status: Married
- Gender: Male