CURRICULUM VITAE

Dr. VIJAY KUMAR

Assistant Professor
Dept. of Physics- **CBLU Bhiwani**, Haryana-127021

PERSONAL DETAILS

Date of Birth- 29 July 1990
Address: House no 228/7, Safidon city Dist- Jind Haryana-126112
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Languages Known: Hindi, English, and Punjabi.

Research & Teaching Experience:

- **DS Kothari Post Doc Fellow (DSKPDF) under UGC** Scheme 2021.
- **Research Associate-RA at IUAC-Delhi**.
- Two year teaching experience at **Department of Physics, NIT Kurukshetra.**

ACHIEVEMENTS:

- **Haryana State Research Fund (HSRF) Project,** under Haryana State Higher Education Council, Government of Haryana, Principal Investigator (PI).
- **University Research Project**, Chaudhary Bansi Lal University (CBLU), Bhiwani, Principal Investigator (PI).
- Junior Research Fellowship & Senior Research Fellowship funded by TEQIP-III during PhD.

RESEARCH EXPERIENCE

National Institute of Technology, Kurukshetra

- Ph.D. (Physics), National Institute of Technology, Kurukshetra, and Advisor- Dr. Chinnasamy Ramaraj Mariappan**.**
- **Thesis title-** Multifunctional Mesoporous Spinel-type Zn-Ni-Co Oxide Electrodes for Asymmetric Supercapacitor and NO_x Gas Sensing Applications.

Excellency-in:

- Potentiostat/Galvanostat Biologic SP-240,300 (CV, GCD, GCD cycles, EIS, Chronoamperometry), FTIR, SEM (JEOL), TEM, EDS, XRD, AFM, XPS, AC Impedance analysis, XRF, Gas sensing study & thin film study (spin coater).

Data Analysis Skills

- XRD, UV, FTIR, AFM, SEM, EDX, TEM, BET, XPS fitting, PL, AC Impedance analysis, Gas sensing analysis and thin film analysis.

RESEARCH PUBLICATIONS

1. **Vijay Kumar,** C. R. Mariappan, R. Azmi, D. Moock, S. Indris, M. Bruns, H. Ehrenberg, G. V. Prakash, Pseudocapacitance of Mesoporous Spinel-Type MCo_2O_4 (M= Co, Zn, and Ni) Rods Fabricated by a Facile Solvothermal Route, *ACS Omega* 2 (2017) 6003-6013 (**IF- 4.132**). DOI: 10.1021/acsomega.7b00709
2. **Vijay Kumar**, C. R. Mariappan, Characterization of mesoporous Zn doped $NiCo_2O_4$ rods produced by hydrothermal method for NO_x gas sensing application, *J. Alloys Compd.* 773 (2019) 158-167 (**IF- 6.371**). DOI: 10.1016/j.jallcom.2018.09.264
3. **Vijay Kumar,** V. Gajraj, K. I. Gnanasekar, S. Dsoke, S. Indris, H. Ehrenberg & C. R. Mariappan, Hybrid aqueous supercapacitors based on mesoporous spinel-analogous Zn-Ni-Co-O nanorods: Effect of Ni content on the structure and energy storage, *J. Alloys Compd.* 882 (2021) 160712 (**IF- 6.371**). DOI: 10.1016/j.jallcom.2021.160712
4. C. R. Mariappan, **Vijay Kumar**, R. Azmi, L. Esmezjan, S. Indris, M. Bruns, H. Ehrenberg, High electrochemical performance of 3D highly porous $Zn_{0.2}Ni_{0.8}Co_2O_4$ microspheres as an electrode material for electrochemical energy storage, *Cryst.Engg.Comm.* 20 (2018) 2159-2168 (**IF- 3.756**). DOI: 10.1039/c7ce02161e
5. C. R. Mariappan, S. Upadhyay, **Vijay Kumar**, S. Indris, H. Ehrenberg, Fabrication and characterization of monodispersed $Mn_{0.8}Ni_{0.2}Co_2O_4$ mesoporous microspheres for supercapacitor application, *Ceram. Int.* 44 (2018) 8864-8869 (**IF- 5.532**). DOI: 10.1016/j.ceramint.2018.02.071
6. J. Kumar, C. R. Mariappan, **Vijay Kumar**, S. Murugavel, G. V. Prakash, Study of spinel-type $ZnNi_xCo_{2-x}O_4$ nano-particles synthesized by thermal decomposition of ternary metal nitrate solutions, *Mater. Res. Bull.* 83 (2016) 632-639 (**IF- 5.6**). DOI: 10.1016/j.materresbull.2016.07.011
7. R. Sakla, R. Kaushik, **Vijay Kumar**, D. A. Jose, A. Ghosh, C. R. Mariappan, Light-induced water oxidation by polymorphs of Zn-Co-Ni Oxide spinel catalyst: A comparative study, *Sustainable Energy Fuels*, 3 (2019) 786-792 (**IF- 6.813**). DOI: 10.1039/C8SE00536B.
8. **Vijay Kumar**, C. R. Mariappan, Electrochemical performance of spinel-type Ni-doped $ZnCo_2O_4$ mesoporous rods as an electrode for supercapacitors, *AIP. Conf. Proceed.* 1961(2018) 030030. DOI: 10.1063/1.5035232
9. **Vijay Kumar**, C. R. Mariappan, Investigation on the electrochemical properties of mesoporous $Zn_{0.2}Ni_{0.05}Co_{0.5}O$ microspheres for supercapacitors, *Int. J. Environ. An. Chem.* (2020) 1-13. (**IF-2.731**). DOI: 10.1080/03067319.2019.1686491
10. Khichi, Pardeep, Priya Siwach, Latisha Gaba, **Vijay Kumar**, Jagdish Kumar, Anil Ohlan, and Rahul Tripathi. "Investigating and optimizing the variation of selenium infused MoS_2 as electrode material for supercapacitor applications." *FlatChem* (2024): 100688.DOI: 10.1016/j.flatc.2024.100688.
11. Vipin Kumar Jain, **Vijay Kumar**, and Ch V. Narasimhaji. "A Comprehensive Review on Ayurvedic Plants and Isolation of their Phytoconstituents." *Phytomedicine Plus*, 5 (2025): 100813 (**IF- 3.1**) DOI: 10.1016/j.phyplu.2025.100813.
12. Mariappan, C. R., and **Vijay Kumar**. "Correlation of structure–performance in mesoporous $Zn_{1-x}Ni_xCo_2O_4$ microspheres: Toward design of more efficient electrodes for asymmetric supercapacitors." *Journal of Electroanalytical Chemistry*, 1000 (2025): 119651 (**IF- 4.58**). DOI: 10.1016/j.jelechem.2025.119651

- **Two more papers communicated into peer reviewed journal.**

BOOK CHAPTER

- **Vijay Kumar**, Narender Ranga & Rohit Ranga (2023). BIOCERAMICA FOR TISSUE ENGINEERING APPLICATIONS, edited book Futuristic Trends in Physical Sciences, IIP Proceedings, volume 2, *Iterative International Publishers*, ISBN: 978-93-95632-68-3

INTERNATIONAL CONFERENCES PRESENTATION

1. Presented a poster on "Synthesis of Ni-doped $ZnCo_2O_4$ Mesoporous rods for supercapacitors application" International conference on Multifunctional Materials Analytical Technique and Diverse Applications (MMAD18) organized by Department of chemistry NIT Kurukshetra, and **won the Best poster award**.
2. Presented a poster and published a paper on "Electrochemical performance of spinel type Ni-doped $ZnCo_2O_4$ Mesoporous rods as electrode for supercapacitors." International conference on Nanomaterials for Energy Conversion and Storage Applications (NECSA-2018) held at Pandit Deendyal petroleum University Gandhinagar.
3. Presented oral presentation and published a paper on "Structural and Electrochemical Properties of Spinel-type Ni doped $ZnCo_2O_4$ Mesoporous Rods as an Electrode for Supercapacitor" International Conference on Advances in Nanomaterials and Devices for Energy and Environment (ICAN-2019) at ABV-IITM Gwalior from 27^{th} -29^{th} January 2019.
4. Presented oral presentation in International Conference on Renewable Energy (ICRE-2022) organized by Centre for Non-Conventional Energy Resources (CNCER), University of Rajasthan, Jaipur, India in association with International Association for Hydrogen Energy (IAHE), USA & MRSI, Rajasthan Chapter held on **February 25-27, 2022** on High-performance electrochemical study of spinel-type Zn-Ni-Co-O 3D highly porous microspheres for hybrid supercapacitors applications: Effect of Ni content on energy storage mechanism.
5. Presented oral presentation, International Conference on Emerging Frontiers in Sustainable, Functional, and Advanced Materials (IC-SFAM 2026) **April 09-10, 2026** Organized by Department of Physics, Shivaji College, University of Delhi, entitled "Multifunctional Study of Spinel-type Ni doped $ZnCo_2O_4$ Mesoporous Microspheres".

NATIONAL CONFERENCES

1. **Vijay Kumar** and C. R. Mariappan, "Synthesis and characterization of $Zn_{1-x}Ni_xC0_2O_4$ (x=0.0-0.6) thin films" 3^{rd} National Conference on Nanoscience and Instrumentation Technology (NCNIT-2015), at Physics Department, NIT Kurukshetra, June 6-7, 2015.
2. **Vijay Kumar** and C. R. Mariappan, "Synthesis and characterization of $Zn_{1-x}Ni_xC0_2O_4$ (x=0.0-0.6) Mesoporous rods*"* 4^{th} National Conference on Nanoscience and Instrumentation Technology (NCNIT-2016), at Physics Department, NIT Kurukshetra, June 4-5, 2016.
3. **Vijay Kumar** and C. R. Mariappan, "Structural and electrochemical properties of Ni-doped $MnCo_2O_4$ porous rods obtained by surfactant-free hydrothermal route*"* 5^{th} National Conference on Nanoscience and Instrumentation Technology (NCNIT-2017), at Physics Department, NIT Kurukshetra, March 5-6, 2017
4. **Vijay Kumar** and C. R. Mariappan, "Structural and electrochemical properties of Ni-doped $MnCo_2O_4$ porous rods obtained by surfactant-free hydrothermal route*"* 5^{th} National

Conference on Nanoscience and Instrumentation Technology (NCNIT-2018), at Physics Department, NIT Kurukshetra, March 29-30, 2018, four more national conference attended.

5. **Three more Posters presented and one inviting talk delivered in (NCNIT) national conferences at NIT Kurukshetra.**