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Item	Details
Faculty Name:	Dr. Yogesh Kalegowda
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Research Area:	Syncrotron Soft X-ray Spectroscopy and Spectro-microscopy Energy Storage and Conversion Materials Energy Storage Devices Artificial Intelligence and Machine Learning
Publications (Past 5 years)	1. Vidyashree PB, Ashoka S, Yogesh K, Venkataramanan NS. Defect-Engineered (Ni2V2O7) x/(FeVO4) y Trifunctional Heterostructure for Energy-Efficient Co-Electrolysis of Water and Formaldehyde. ChemCatChem. 2026 Aug;18(15):e70982. https://doi.org/10.1002/cctc.70982 2. HM A, SB SS, Santosh MS, Kalegowda Y, Siddaramanna A. Hexagonal NiS Electrocatalyst for Methanol-Assisted Water Electrolysis Enabling Low-Voltage Hydrogen and Formate Cogeneration. ChemCatChem. 2026 Mar;18(6):e01708. https://doi.org/10.1002/cctc.202501708 3. Manjunatha KB, Bhat RS, Shetty SK, Ramakrishna D, Kalegowda Y, Poornesh P, Chattopadhyay S, Selvakumar N, Barshilia HC. Enhanced nonlinear optical response of Zn–Ni alloy nanostructures on ITO for optical limiting applications. Materials Science in Semiconductor Processing. 2026 Feb 1;202:110120. https://doi.org/10.1016/j.mssp.2025.110120 4. Vidyashree PB, Ashoka S, Yogesh K, Kumar SG. Biphasic vanadyl phosphate promoted phenol electro-oxidation for efficient hydrogen evolution and effective management of water pollution. Materials Chemistry and Physics. 2025 Oct 15;344:131083. https://doi.org/10.1016/j.matchemphys.2025.131083 5. Lavanya G, Ashoka S, Nishchith BS, Yogesh K, Ravikumar BS, Braga MH. Effect of oxidizer-to-fuel ratio on manganese oxides formation and their physico-chemical properties towards supercapacitor application. Chemical Engineering Journal. 2025 Aug 24:167669.

https://doi.org/10.1016/j.cej.2025.167669

6. Sachin PD, Yogesh K. Fuel-Assisted Redox Engineering of Surface-Active Sites in Mn_2O_3 Cubic Bixbyite Nanostructures: An Efficient Bifunctional Electrocatalyst for Alkaline Water Electrolysis Under Industrial Conditions. Colloids and Surfaces A: Physicochemical and Engineering Aspects. 2025 Aug 8:137966. https://doi.org/10.1016/j.colsurfa.2025.137966

7. Akshaya, H. M., Nagarajaiah, Honnappa, Tshwane, D. M., Santosh, M. S., Kalegowda, Yogesh, Maphanga, Rapela, Oh Tae Hwan, Sriram, Ganesan, Siddaramanna, Ashoka. Coupling Biomass-Derived Substrate Oxidation with HER: Hexagonal NiS for Low-Voltage, High-Efficiency Hydrogen Production. Sustainable Energy & Fuels. 2025 Jul 11. https://doi.org/10.1039/D5SE00790A

8. Ashoka S, Sumanth N, Akshaya HM, Sanaga N, Venkataramanan NS, Yogesh K, Kumar MM, Kumar SG, Kumar SA. Simultaneous oxidation of aliphatic alcohols and green hydrogen production over nanostructured $CoV_2O_6 \cdot 4H_2O$ surface. Inorganic Chemistry Communications. 2025 Jun 7:114860. https://doi.org/10.1016/j.inoche.2025.114860

9. Ashoka S, Akshaya HM, Shirisha M, Venkataramanan NS, Yogesh K, Sanaga N, Yogeeshwari RT. Insights on the electrooxidation of formaldehyde over bimetallic $Co_2V_2O_7$ nanorod and its implication towards water electrolysis. Solid State Sciences. 2025 May 1;163:107903. https://doi.org/10.1016/j.solidstatesciences.2025.107903

10. Ashoka S, Sushmitha M, Shirisha M, Akshaya HM, Yogesh K, Kumar SG. Glucose oxidation on monoclinic $Co_2V_2O_7$ nanorods: Intuitions on cell potential reduction in hybrid electrolyzer. Materials Science in Semiconductor Processing. 2024 Dec 1;184:108838. https://doi.org/10.1016/j.mssp.2024.108838

11. Sriram G, Hegde G, Dhanabalan K, Kalegowda Y, Mouraliraman D, Vishwanath RS, Kurkuri M, Oh TH. Recent trends in hierarchical electrode materials in supercapacitor: Synthesis, electrochemical measurements, performance and their charge-storage mechanism. Journal of Energy Storage. 2024 Jul 30;94:112454. https://doi.org/10.1016/j.est.2024.112454

12. Sagar P, Ashoka S, Srinivasa N, Yogesh K, Girish Kumar S. Fuel assisted crystal structure tailoring of manganese oxides and their surface reactivity towards oxygen evolution reaction. Journal of Materials Science. 2024 Jul;59(28):12916-27. https://doi.org/10.1007/s10853-024-09908-7

13. Ashoka S, Navya HS, Meghana ST, Yogesh K, Kumar SG. Insights from Ethylene Glycol Oxidation toward Reduction in the Overpotential Using Sonochemically Derived Orthorhombic $CoV_2O_6 \cdot 2H_2O$

Sheetlike Structures. Energy & Fuels. 2024 Jan 26. https://doi.org/10.1021/acs.energyfuels.3c03298

14. Shruthi M, Ashoka S, Yogesh K, Jeong HH, Uthappa UT, Selvaraj M, Kiran GK. Influence of FeVO4 crystallinity on oxygen evolution reaction activity. Ceramics International. 2024 Jan 15;50(2):3366-72. https://doi.org/10.1016/j.ceramint.2023.11.082

15. BS N, N S, K Y, Adarakatti PS, Alhadhrami A, Almalki AS. A novel polyaniline based nanocomposite derived from used tea biomass: a promising electrocatalyst for oxygen evolution reaction. Inorganic and Nano-Metal Chemistry. 2023 Sep 27:1-9. https://doi.org/10.1080/24701556.2023.2264274
16. B.S. Nishchith, Yogesh Kalegowda*, S. Ashoka, L. Shreenivasa, Ganesan Sriram, Mahaveer D. Kurkuri, Kanalli Vinayak Ajeya, Ho-Young Jung, Electrochemical kinetic study and performance evaluation of surface-modified mesoporous sodium carbonophosphates nanostructures for pseudocapacitor applications, Journal of Alloys and Compounds, 939, 2023, 168711.

17. P. Sagar, K. Yogesh, Asad Syed, Najat Marraiki, Abdallah M. Elgorban, Nouf S. S. Zaghloul, S. Ashoka, Studies on the effect of crystalline Fe_2O_3 on OER performance of amorphous NiOOH electrodeposited on stainless steel substrate, Chemical Papers 76 (11), 2022, 7195-7203.

18. Srinivasa, N., Shreenivasa, L., Ashoka, S., & Yogesh, K, Studies on Co_3O_4-NiO nanocomposites for potential electrocatalyst for alkaline water electrolysis. Applied Physics A: Materials Science & Processing, 128(2), 2022, 158.

19. Shreenivasa, L., Ashoka, S., Yogesh, K., Syed, A., Marraiki, N., & Adarakatti, P. S., Glycine-nitrate derived cobalt-doped $BiPO_4$: An efficient OER catalyst for alkaline electrochemical cells. Solid State Sciences, 124, 2022, 106803.

20. Nishchith, B.S., Ashoka, S., Bhat, M.P., Kurkuri, M.D., Acharya, S., Kumar, R. and Kalegowda, Y*., Reversible surface reconstruction of $Na_3NiCO_3PO_4$: A battery type electrode for pseudocapacitor applications. Journal of Power Sources, 520, 2022, 230903.

	6. Shreenivasa, L., Yogeeshwari, R.T., Viswanatha, R., Yogesh, K. and Ashoka, S., Sucrose-assisted rapid synthesis of multifunctional $CrVO_4$ nanoparticles: a new high-performance cathode material for lithium ion batteries. Ionics, 27(1), 2021, 39-48. 7. Shreenivasa, L., Viswanatha, R., Ganesan, S., Kalegowda, Y., Kurkuri, M.D. and Ashoka, S., Scalable chemical approach to prepare crystalline $Mn_2V_2O_7$ nanoparticles: introducing a new long-term cycling cathode material for lithium-ion battery. Journal of Materials Science: Materials in Electronics, 31(22), 2020, 19638-19646. 8. Shreenivasa, L., Yogesh, K., Prashanth, S.A., Viswanatha, R. and Ashoka, S., Enhancement of cycling stability and capacity of lithium secondary battery by engineering highly porous AlV_3O_9. Journal of Materials Science, 55(4), 2020, 1648-1658. 9. Shreenivasa, L., Yogeeshwari, R.T., Viswanatha, R., Sriram, G., Kalegowda, Y., Kurkuri, M.D. and Ashoka, S., An introduction of new nanostructured $Zn_{0.29}V_2O_5$ cathode material for lithium ion battery: a detailed studies on synthesis, characterization and lithium uptake. Materials Research Express, 6(11), 2019, 115035. 10. Shreenivasa, L., Prashanth, S.A., Eranjaneya, H., Viswanatha, R., Yogesh, K., Nagaraju, G. and Ashoka, S., Engineering of highly conductive and mesoporous ZrV_2O_7: a cathode material for lithium secondary batteries. Journal of Solid State Electrochemistry, 23(4), 2019, 1201-1209. 11. Lakkepally, S., Kalegowda, Y., Ramarao, V., Hanumantharayappa, E. and Siddaramanna, A., Room temperature synthesis of amorphous $Bi_4V_2O_{11}$ as cathode material for Li secondary batteries. Materials Research Express, 5(11), 2018, 115501. 12. Lakkepally, S., Kalegowda, Y., Ganganagappa, N. and Siddaramanna, A., A new and effective approach for $Fe_2V_4O_{13}$ nanoparticles synthesis: Evaluation of electrochemical performance as cathode for lithium secondary batteries. Journal of Alloys and Compounds, 737, 2018, 665-671. 13. Varhade, S., Bhat, Z.M., Thimmappa, R., Devendrachari, M.C., Kottaichamy, A.R., Gautam, M., Shafi, S.P., Kalegowda, Y. and Thotiyl, M.O., A hybrid hydrazine redox flow battery with a reversible electron acceptor. Physical Chemistry Chemical Physics, 20(33), 2018, 21724-21731.
Sponsored Projects (Past and Ongoing)	Graphene oxide (GO) and reduced graphene oxide (rGO) based nanomaterials for photothermal supercapacitor applications (DST-SERB project-Ongoing)

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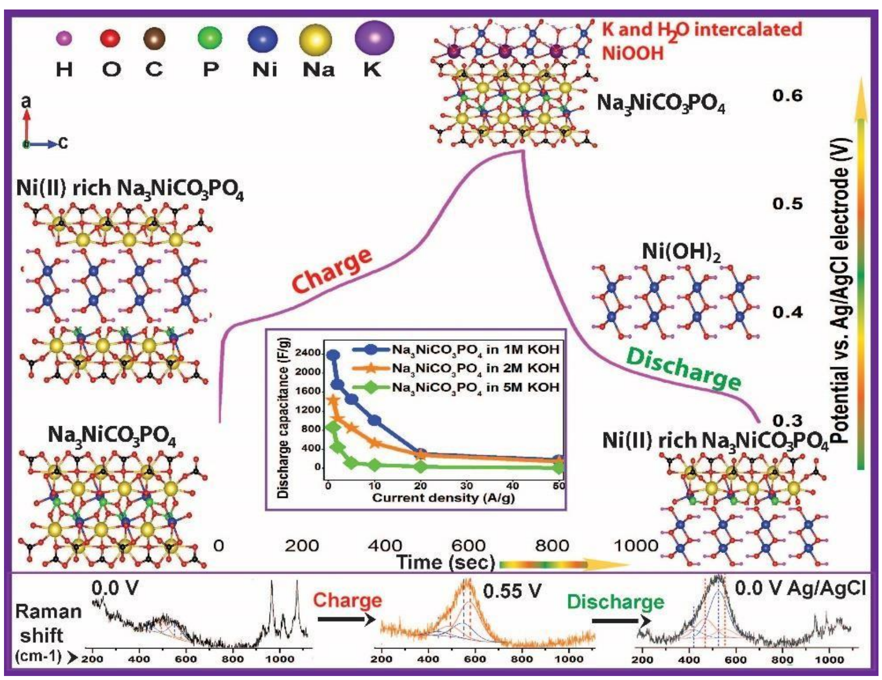
<tr><td>Profile Links: Scopus and Orcid</td><td>https://orcid.org/0000-0001-6956-9164
AAV-7055-2021 (Web of Science)
https://scholar.google.com/citations?hl=en&authuser=1&user=ri4QDysAAAAJ</td></tr>
<tr><td>Research Activities (Write about your best research results max of 2-3 pages including diagrams)</td><td>

Reversible Surface Reconstruction of $Na_3NiCO_3PO_4$: A Battery Type Electrode for Pseudocapacitor Application
(https://doi.org/10.1016/j.jpowsour.2021.230903)

This work establishes fundamental understanding on the pseudocapacitance mechanism associated with surface self-reconstruction of mixed polyanionic compounds. The reconstruction-derived self-limiting dense $Ni(OH)_2$ layers at the surface and its oxidation to NiOOH at anodic potentials can be attributed to the observed high performance pseudocapacitive behavior. The surface reconstructed $Na_3NiCO_3PO_4$ electrode exhibits high specific capacitance (2378.2 and 169.5 F g^{-1} at 1 and 50 A g^{-1}, respectively) and long cycle life (15000 at 50 A g^{-1}) in 1 M KOH electrolyte. The assembled symmetric pseudocapacitor delivers a highest energy density of 146.0 Wh kg^{-1} and power density of 1600 W kg^{-1} at 1 Ag^{-1}.



Electrochemical Kinetic Study and Performance Evaluation of Surface-modified Mesoporous Sodium Carbonophosphates Nanostructures for Pseudocapacitor Applications
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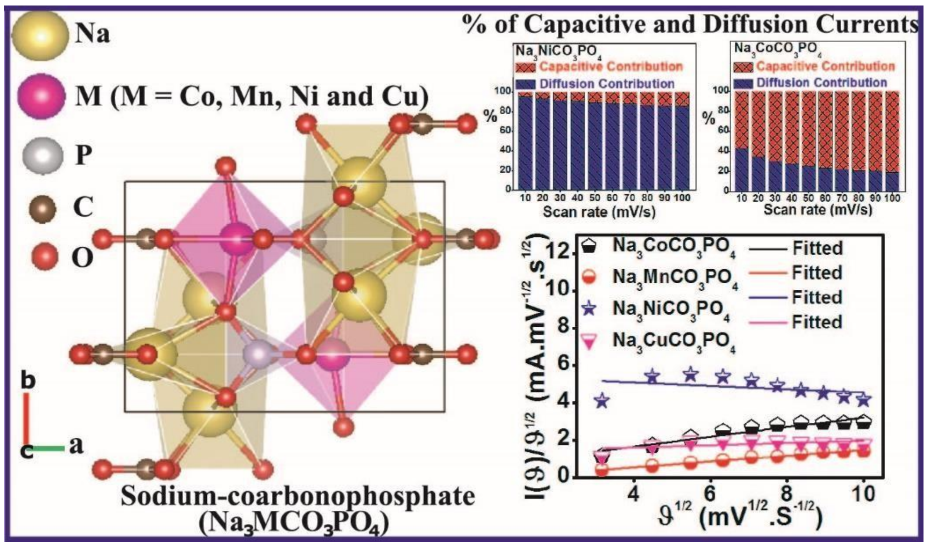
<td>(https://doi.org/10.1016/j.jallcom.2023.168711)

• The pseudocapacitive behavior of the surface modified $Na_3MCO_3PO_4$ (M=Ni, Co, Mn and Cu) nanostructures is tested.
• The $Na_3MCO_3PO_4$ (M=Co and Mn) undergo deep reconstruction in 1 M KOH to form $M(OH)_2/M_3O_4$ nanocomposite.
• The capacitive and diffusion currents contribution are clearly Identified.
• The deep reconstructed $Co(OH)_2/Co_3O_4$ symmetric supercapacitor delivers a high energy and power densities.


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<td>Group Members (PhD Students and Projects)

Open Positions: If any</td>
<td>Vignesh S, Chandra Mouli P, Gagana R, Impana C S, Prasanna DG, Narasimha SA

Project Assistant-1
Qualification: M.Sc. Physics</td>
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</table>