

A Brief Profile of Dr. D. Krishna Bhat

Name : Dr. D. KRISHNA BHAT
Designation : Professor (HAG)
Address : Department of Chemistry,
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Educational Qualification: M.Sc. (Mangalore University, 1992), Ph.D. (Mangalore University, 1997)



Areas of Research Interest:

- ❖ Nanomaterials: Synthesis of nanoparticles and nanocomposites with polymer and graphene based 2D materials by various methods for energy and environmental applications like supercapacitors and photocatalysis.
- ❖ Thermoelectrics: Synthesis of chalcogenides and perovskite oxide based thermoelectric materials and electronic structure engineering for achieving high figure of merit.
- ❖ Nanofluids: Synthesis of metal/metal oxide nanofluids with enhanced thermal conductivity and stability for advanced heat transfer applications.
- ❖ Polymer Science: Preparation of biodegradable polymer blends using commercial and natural polymers; characterization and study of physico-chemical properties of polymer blends.
- ❖ Solution Chemistry: Study of molecular interactions in polymer solutions; solutions of biologically important molecules in water and non-aqueous solvents in the presence of metal salts.

Research Projects:

- *Principal Investigator* of CSIR Research project titled 'Development of novel thermoelectric materials', Grant amount: 10.5 lakhs (2017-20).
- *Principal Investigator* of SERB Research project titled 'High performance thermoelectric materials via band engineering', Grant amount: 26.76 lakhs (2016-19).

- *Co-Investigator* of DRDO Research project titled ‘Development of supercapacitors based on polymer electrolytes’, Grant amount: 14.9 lakhs (2010-13).
- *Principal Investigator* of DRDO Research project titled ‘Molecular interactions in dipeptide metal salt solution systems’, Grant amount: 14.12 lakhs (2008-11).
- *Co-ordinator of* TEQIP Network Institutions Project titled ‘Preparation of ZnO nanomaterials for photocatalytic applications’, Grant amount: 1.5 lakhs (2007-08).
- *Co-ordinator of* SERC Young Scientist Project titled ‘Development of new magnetic nanocomposites’, Grant amount: 11.52 lakhs (2006-09).
- *Co-ordinator of* MHRD R&D Project titled ‘Development of new biodegradable polymers’, Grant amount: Rs. 9.0 lakhs (2005-08).
- *Co-Investigator* of DRDO Research project titled ‘Synthesis and evaluation of electrical, electronic, electrochemical and optical properties of some conducting polyheterocycles’, Grant amount: Rs. 15.21 lakhs (2003-06).
- *Co-ordinator of* MHRD R&D Project titled ‘Molecular interactions in some ionomer and polyelectrolyte solutions’, Grant amount: Rs.5.0 lakhs (2003-06).

Awards/Recognitions:

- ✚ Secured a position in the list of **top 2% scientists of the world for career long and single year impact continuously for the last five years (2020, 2021, 2022, 2023, 2024)** according to the study conducted by Stanford University in collaboration with Elsevier publications.
- ✚ Recognized as **Highly Cited Author (top 5 %, capped at top 100 papers)** across **Royal Society of Chemistry journals (2020, 2021, 2022, 2023, 2024)**.
- ✚ **SERC Young Scientist Award**, Department of Science and Technology (2006).
- ✚ **SERC Visiting Fellowship**, Department of Science and Technology (2006).

Google scholar link: <https://scholar.google.com/citations?user=Oa-3JSQAAAAJ&hl=en>

Vidwan profile link: <https://nitk.irins.org/profile/54553>

Publications in Journals: **165**; Conference presentations: **103**. Total Impact Factor: **675**; Number of citations: 7606; i10 index: **132**; h index: **59** as on July 21, 2026.

Recognition received by the research publications:

- * Editor's Choice paper in Materials Today Physics: **Bhat DK**, Shenoy SU. *Mat. Today Phys.* 2018; 4: 12 - 18.
- * Most cited articles (top 25) since 2017 as per scopus data in Materials Today Chemistry: Sadiq MMJ, Shenoy SU, **Bhat DK**. *Mat. Today. Chem.* 2017; 4: 133 - 141.
- * Most cited articles (top 25) since 2018 as per scopus data in Materials Today Physics: **Bhat DK**, Shenoy SU. *Mat. Today Phys.* 2018; 4: 12 - 18.
- * Most cited articles (top 25) since 2019 as per scopus data in Materials Today Physics: **Bhat DK**, Shenoy SU. *Mat. Today Phys.* 2019; 11: 100158.
- * Hot article in Nanoscale Advances in 2020: **Bhat DK**, Bantawal H, Shenoy SU. *Nanoscale Adv.* 2020; 2: 5688 - 5698.
- * Most popular article in Journal of Materials Chemistry C in 2020: Shenoy SU, **Bhat DK**. *J. Mater. Chem. C* 2020; 8: 2036 - 2042.
- * Hot paper in Energy Advances in 2022: Shenoy SU, **Bhat DK**. *Energy Adv.* 2022; 1:9-14.
- * Hot paper and Highlight India in Energy Advances in 2022: Shenoy SU, **Bhat DK**. *Energy Adv.* 2022; 1:15-20.

List of Research Publications (Last five years):

1. J.N. Kahi, D. Shin, S.K. Kihoi, S. Abbey, M.A. Okirigiti, U.S. Shenoy, **D.K. Bhat**, M.W. Oh, K.I. Park, H.S. Lee, (2026). "Cobalt-induced strong anharmonicity coupled with hierarchical defect and band structure engineering for enhanced n- and p-type thermoelectric performance in $\text{ZrFe}_{0.5}\text{Ni}_{0.5}\text{Sb}$ double half-heuslers." *Small Structures*, **2026**, 7, e70493.
2. U.S. Shenoy, S.P. Kumar, **D.K. Bhat**, "A one-step eco-friendly approach for the synthesis of cuprous oxide nanofluid for energy systems with excellent thermal conductivity and stability." *New Journal of Chemistry*, **2026**, 50, 4389 - 4398.

3. D. Shin, U.S. Shenoy, H. Choi, J.N. Kahi, E.J. Meang, K.I. Park, K.H. Park, **D.K. Bhat**, H.S. Lee, "Synergistic effect of tri-doping with Mn, Ge, and Bi and thermoelectric enhancement of SnTe induced by grain boundary engineering and nanostructuring." *Journal of Materiomics*, **2026**, 12, 101119.
4. T.P. Ramesh, U.S. Shenoy, **D.K. Bhat**, "Exploring the potential of CoAl₂O₄ nanoflakes in supercapacitor applications." *Journal of Alloys and Compounds Communications*, **2025**, 8, 100111.
5. P. Sarkar, P. Gupta, U.S. Shenoy, S. Singh, S. Kundu, N. Kumawat, D. Kedia, **D.K. Bhat**, S. Bhattacharya, A. Singh, "High figure-of-merit in Zn, Sb Co-doped Mg₂Si_{0.3}Sn_{0.7} alloy through simultaneous optimization of electrical and thermal transports." *Materials Today Physics*, **2025**, 57, 101776.
6. M. Saquib, R. Nayak, M. Selvakumar, **D.K. Bhat**, C.S. Rout, "Enhanced flexibility and performance of interdigitated microsupercapacitors through in-situ rGO growth in NiCuSe nanocomposite conductive ink." *Journal of Alloys and Compounds*, **2025**, 1027, 180574.
7. U.S. Shenoy, B. Amin, **D.K. Bhat**, "Exploring the impact of modulation of electronic structure via doping in the realm of environmental applications." *Nano Trends*, **2025**, 9, 100075.
8. **D.K. Bhat**, S.P. Kumar, U.S. Shenoy, "Enhancing the thermal conductivity and stability of cuprous oxide nanofluids: Ribose-mediated single step chemical synthesis for solar energy applications." *Nano Trends*, **2025**, 9, 100071.
9. **D.K. Bhat**, S.P. Kumar, U.S. Shenoy, "Fructose-mediated single-step synthesis of copper nanofluids with enhanced stability and thermal conductivity for advanced heat transfer applications." *Chemical Engineering Communications*, **2025**, 212, 21 - 29.
10. M. Saquib, M. Selvakumar, R. Nayak, A. Prakash, Y.N. Sudhakar, S. Senthilkumar, **D.K. Bhat**, "Formulation and optimization of Ni-MOF/CuSe nanocomposite ink for high-performance flexible microsupercapacitor." *Journal of Energy Storage*, **2024**, 103, 114230.

11. **D.K. Bhat**, P.I. Uma, U.S. Shenoy, "Exceptional light harvesting in copper doped CaTiO_3 nanocuboids with surface nanosteps for the photo remediation of toxic Cr(VI) ions and dyes." *Journal of Alloys and Compounds Communications*, **2024**, 4, 100030.
12. R. Basu, U.S. Shenoy, A. Pathak, S. Singh, P. Jha, **D.K. Bhat**, H. Basu, A. Singh, "Entropy engineering in I-V-VI₂ clan: A paradigm to bestow suppression of phase transition in the entire operating temperature regime." *Material Advances*, **2024**, 5, 7637 - 7649.
13. U.S. Shenoy, P.I. Uma, **D.K. Bhat**, "Copper doping induced band structure and morphology transformation in CaTiO_3 for textile dye photodegradation applications." *Journal of Alloys and Compounds*, **2024**, 1004, 175779.
14. **D.K. Bhat**, S.P. Kumar, U.S. Shenoy, Design, synthesis, and characterization of stable copper nanofluid with enhanced thermal conductivity, *Materials Today Communications*, **2024**, 39, 109129.
15. U.S. Shenoy, **D.K. Bhat**, "Towards achieving an ideal convergence of light and heavy electron conduction bands in SnTe : Insights into copper doping." *Journal of Alloys and Compounds Communications*, **2024**, <https://doi.org/10.1016/j.jacomc.2024.03.001>.
16. **D.K. Bhat**, S.P. Kumar, U.S. Shenoy, "In-situ synthesis of cuprous oxide nanofluid using ribose for enhanced thermal conductivity and stability." *International Journal of Heat and Fluid Flow*, **2024**, 106, 109321.
17. U.S. Shenoy, **D.K. Bhat**, "Tuning the electronic structure of rhombohedral and cubic GeTe for thermoelectric application: Influence of molybdenum doping." *Journal of Physics and Chemistry of Solids*, **2024**, 188, 111943.
18. A. Bhava, U.S. Shenoy, **D.K. Bhat**, "Silver doped barium titanate nanoparticles for enhanced visible light photocatalytic degradation of dyes." *Environmental Pollution*, **2024**, 344, 123430.

19. S.P. Kumar, U.S. Shenoy, **D.K. Bhat**, “A direct approach towards synthesis of copper nanofluid by one step solution phase method.” *Journal of Crystal Growth.*, **2024**, 630, 127591.
20. S.K. Kihoi, U.S. Shenoy, H. Kim, J.N. Kahi, C.M. Kim, K. Park, **D.K. Bhat**, H.S. Lee, “Enhanced electrical, thermal and mechanical properties of SnTe through equimolar multication alloying for suitable device applications.” *ACS Applied Energy Materials*, **2024**, 7, 1149 - 1161.
21. **D.K. Bhat**, H Bantawal, P.I Uma, S.P Kumar, U.S Shenoy, ‘Designing Sustainable Porous Graphene-CaTiO₃ Nanocomposite for Environmental Remediation’, *Sustainable Chemistry for the Environment*, **2024**, 5, 100071
22. **D.K. Bhat**, P.I. Uma, U.S. Shenoy, “Insights into the dopant engineering in copper-doped SrTiO₃ nanocubes.” *Journal of Hazardous Materials Advances*, **2023**, 12, 100380.
23. P.I. Uma, U.S. Shenoy, **D.K. Bhat**, “Nanocubic copper doped SrTiO₃ for photoreduction of Cr (VI) and photodegradation of methyl violet.” *ACS Applied Nano Materials*, **2023**, 6, 16798 - 16804.
24. **D.K. Bhat**, H. Bantawal, P.I. Uma, U.S. Shenoy, “Enhanced photoresponse and efficient charge transfer in porous graphene-BaTiO₃ nanocomposite for high performance photocatalysis.” *Diamond and Related Materials*, **2023**, 139, 110312.
25. S.K. Kihoi, U.S. Shenoy, J.N. Kahi, H. Kim, **D.K. Bhat**, H.S. Lee, “Tailoring the thermoelectric performance of the layered topological insulator SnSb₂Te₄ through Bi positional doping at the Sn and Sb cation sites.” *ACS Applied Electronic Materials*, **2023**, 5, 4504 - 4513.
26. P.I. Uma, U.S. Shenoy, **D.K. Bhat**, “Doped BaTiO₃ cuboctahedral nanoparticles: Role of copper in photocatalytic degradation of dyes.” *Applied Surface Science Advances*, **2023**, 15, 100408.
27. J.N. Kahi, S.K. Kihoi, H. Kim, U.S. Shenoy, **D.K. Bhat**, H.S. Lee, “Asymmetric thermoelectric performance tuning in low-cost ZrFe_xNi_{1-x}Sb double half-Heusler

materials.” *ACS Applied Energy Materials*, **2023**, 6, 4305 - 4316.

28. P.I. Uma, U.S. Shenoy, **D.K. Bhat**, “Electronic structure engineering of BaTiO₃ cuboctahedrons by doping copper to enhance the photocatalytic activity for environmental remediation.” *Journal of Alloys and Compounds*, **2023**, 948, 169600.
29. S.K. Kihoi, U.S. Shenoy, J.N. Kahi, H. Kim, **D.K. Bhat**, H.S. Lee, “Pushing the limit of synergy in SnTe-based thermoelectric materials leading to an ultra-low lattice thermal conductivity and enhanced ZT.” *Sustainable Energy and Fuels*, **2023**, 7, 1916 - 1929.
30. H. Kim, S.K. Kihoi, U.S. Shenoy, J.N. Kahi, D.H. Shin, **D.K. Bhat**, H.S. Lee, “High thermoelectric and mechanical performance achieved by hyperconverged electronic structure and low lattice thermal conductivity in GeTe through CuInTe₂ alloying.” *Journal of Materials Chemistry A*, **2023**, 11, 8119 - 8130.
31. Y.N. Sudhakar, M. Selvakumar, **D.K. Bhat**, “Enhancement and investigation of biodegradability of poly (methyl methacrylate) and poly (vinyl chloride) by blending with biodegradable polymer.” *Polymer Bulletin*, **2022**, 80, 5623 - 5639.
32. U.S. Shenoy, D.K. Goutham, **D.K. Bhat**, “Probing of Bi doped GeTe thermoelectrics leads to revelation of resonant states.” *Journal of Alloys and Compounds*, **2022**, 921, 165965.
33. U.S. Shenoy, D.K. Goutham, **D.K. Bhat**, “A case of perfect convergence of light and heavy hole valence bands in SnTe: The role of Ge and Zn co-dopants.” *Materials Advances*, **2022**, 3, 5941 - 5946.
34. U.S. Shenoy, D.K. Goutham, and **D.K. Bhat**, “Resonance states and hyperconvergence induced by tungsten doping in SnTe: Multiband transport leading to a propitious thermoelectric material.” *Journal of Alloys and Compounds*, **2022**, 905, 164146.
35. S.K. Kihoi, U.S. Shenoy, J.N. Kahi, H. Kim, **D.K. Bhat** and H.S. Lee, “Ultra-low lattice thermal conductivity and enhanced mechanical properties of Cu and Sb co-doped SnTe thermoelectric material with a complex microstructure evolution.” *ACS Sustainable Chemistry and Engineering*, **2022**, 10, 1367 - 1372.
36. U.S. Shenoy, **D.K. Bhat**, “Halide (X = I, Br, Cl) Doping to tune the electronic structure for

conversion of $\text{Pb}_{0.6}\text{Sn}_{0.4}\text{Te}$ into a high performing thermoelectric material.” *Energy Advances*, **2022**, 1, 15 – 20.

37. U.S. Shenoy, **D.K. Bhat**, “Molybdenum as a versatile dopant in SnTe: A promising material for thermoelectric application.” *Energy Advances*, **2022**, 1, 9 - 14.
38. U.S. Shenoy, **D.K. Bhat**, “Selective co-doping improves the thermoelectric performance of SnTe: An outcome of electronic structure engineering.” *Journal of Alloys and Compounds*, **2021**, 892, 162221.
39. R. Basu, S. Mandava, U.S. Shenoy, D.K. Bhat, B. Khasimsaheb, A.K. Debnath, A. Singh, S. Neeleshwar, “Synergistic manifestation of band and scattering engineering in single aliovalent Sb alloyed anharmonic SnTe alloy in concurrence with rule of parsimony.” *Materials Advances*, **2021**, 2, 7891 - 7906.
40. J.N. Kahi, U.S. Shenoy, S.K. Kihoi, H. Kim, S. Yi, **D.K. Bhat**, H.S. Lee, “Optimized electronic performance in half-Heusler Ti-doped NbFeSb materials by stoichiometric tuning at the Fe and Sb sites.” *Journal of Alloys and Compounds*, **2021**, 891, 162033.
41. U.S. Shenoy, **D.K. Bhat**, “Vanadium: A protean dopant in SnTe for augmenting its thermoelectric performance.” *ACS Sustainable Chemistry and Engineering*, **2021**, 9, 13033 - 13038.
42. U.S. Shenoy, **D.K. Bhat**, “Improving ZT of SnTe by electronic structure engineering: Unusual behaviour of Bi dopant in the presence of Pb as a co-dopant.” *Materials Advances*, **2021**, 2, 6267 - 6271.
43. H. Bantawal, U.S. Shenoy, **D.K. Bhat**, “Vanadium doped CaTiO_3 cuboids: Role of vanadium in improving the photocatalytic activity.” *Nanoscale Advances*, **2021**, 3, 5301 - 5311.
44. S.K. Kihoi, U.S. Shenoy, **D.K. Bhat**, H.S. Lee, “Complimentary effect of co-doping aliovalent elements Bi and Sb in self-compensated SnTe-based thermoelectric materials.” *Journal of Materials Chemistry C*, **2021**, 9, 9922 - 9931.
45. U.S. Shenoy, **D.K. Bhat**, “Electronic structure modulation of $\text{Pb}_{0.6}\text{Sn}_{0.4}\text{Te}$ via zinc doping

- and its effect on the thermoelectric properties.” *Journal of Alloys and Compounds*, **2021**, 872, 159681.
46. M. Sethi, U.S. Shenoy, **D.K. Bhat**, “Hassle-free solvothermal synthesis of NiO nanoflakes for supercapacitor application.” *Physica B Condensed Materials*, **2021**, 611, 412959.
 47. S.K. Kihoi, J.N. Kahi, H. Kim, U.S. Shenoy, **D.K. Bhat**, S. Yi, H.S. Lee, “Optimized Mn and Bi co-doping in SnTe based thermoelectric material: A case of band engineering and density of states tuning.” *Journal of Materials Science and Technology*, **2021**, 85, 76 - 86.
 48. M. Sethi, U.S. Shenoy, **D.K. Bhat**, “Simple solvothermal synthesis of porous graphene-NiO nanocomposites with high cyclic stability for supercapacitor application.” *Journal of Alloys and Compounds*, **2021**, 854, 157190.
 49. U.S. Shenoy, **D.K. Bhat**, “Electronic structure engineering of SrTiO₃ via rhodium doping: A DFT study.” *Journal of Physics and Chemistry of Solids*, **2021**, 148, 109708.
 50. Y.N. Sudhakar, M. Selvakumar, **D.K. Bhat**, “Investigations on thermo-mechanical properties of organically modified clay nanocomposites for packaging applications.” *Polymers and Polymer Composites*, **2021**, 29, 1191 - 1199.

Book Published:

-  Y.N. Sudhakar, M. Selvakumar, **D. K. Bhat**, “Biopolymer Electrolytes: Fundamentals and Applications in Energy Storage” *Elsevier Oxford UK*, **2018**, ISBN: 9780128134474.

Book Chapter:

-  M. Sethi, U.S. Shenoy, **D.K. Bhat**, ‘Iron Oxide-Functionalized Graphene Nanocomposites for Supercapacitor Application’. In the book titled, ‘Iron Oxide-Based Nanocomposites and Nanoenzymes’, Springer Nature, **2023**, DOI: 10.1007/978-3-031-44599-6.

Membership of Academical Bodies:

1. Life member of Indian Society of Technical Education.
2. Life member of Indian Association of Applied Psychologists.

3. Life member of Indian Council of Chemists.
4. Life member of Society for Advancement of Electrochemical Science and Technology.
5. Life member of Chemical Research Society of India.
6. Life member of Indian Science Congress Association.
7. Life member of Materials Research Society of India.
8. Life member of Catalysis Society of India.
9. Life member of The Indian Thermodynamics Society.
10. Life member of Society for Materials Chemistry.
