

CURRICULUM VITAE

	Dr. SANJEEV KUMAR SHARMA PhD, Materials Science, IIT Kharagpur, India Date of Birth: 04 April, 1989 Nationality: Indian Sex: Male Email: jms.sanjeev@gmail.com sksharma@matsc.iitkgp.ac.in Mobile No.: +91 8436237761 +91 7551055720 Language Known: English, Hindi Permanent Address: S/O Bashishth Sharma, Village – Chamukha, Post – Pindi, District – Deoria, Uttar Pradesh – 274 508, India
MOTIVATION:	
Development of smart solutions of the existing challenges through scientific interventions for the ease of living. A sincere, dedicated, collaborative, and adaptive researcher with a high interest in the development of multifunctional energy materials for the applications in the modern devices.	
BROAD AREAS OF RESEARCH:	
▪ Magnetism and magnetic materials: Permanent magnets, soft magnets, spintronics, and magnetocaloric ▪ Energy conversion and storage materials: Solar cells, solid oxide fuel cells, and Li-ion batteries ▪ Multifunctional dielectric materials: Electrical and dielectric properties for various device applications ▪ Bulk and nanostructured multifunctional materials: Alloys, compounds, and oxides for applications	
AREA OF EXPERTISE:	
▪ Bulk and nanostructured materials synthesis: Binary, ternary alloys and compounds ▪ Nanostructured materials synthesis: Metal oxides, ferrites, multiferroics, ceramics ▪ Synthesis of core-shells alloys/carbon and hard/soft alloys/ferrites nanocomposites ▪ Fabrications of samples/devices/electrodes for dielectric/ferroelectric measurements ▪ Characterization and measurements of magnetic, dielectric, ferroelectric, and other functional properties	
EDUCATIONAL QUALIFICATIONS:	
Ph. D. in Materials Science and Engineering from Materials Science Centre, Indian Institute of Technology Kharagpur, West Bengal, India	2021
M. Tech. in Materials Science and Engineering from Materials Science Centre, Indian Institute of Technology Kharagpur, West Bengal, India	CGPA: 8.43 2014
M. Sc. in Physics (specialization in Electronics) from D. D. U. Gorakhpur University, Gorakhpur, Uttar Pradesh, India	71.44 % 2011
B. Sc. in Physics and Mathematics from M. M. M. P. G. College Bhatpar Rani, Deoria, Uttar Pradesh, India (Affiliation: D. D. U. Gorakhpur University, Uttar Pradesh, India)	62.22 % 2009
Intermediate (12th): Board of High School and Intermediate Education U. P., Uttar Pradesh, India	72.80 % 2006
High School (10th): Board of High School and Intermediate Education U. P., Uttar Pradesh, India	68.50 % 2004
AWARDS/FELLOWSHIPS/ACHIEVEMENTS:	

- **Best Poster Presentation Award** (Third Prize) at Research Scholars Day held at Materials Science Centre, IIT Kharagpur, India (2018)
- **Best Student Award** (First Prize) in B.Sc. at M. M. M. P. G. College, Bhatpar Rani, Deoria, Uttar Pradesh, India (2009)
- Qualified **GATE** examination in **Physics** in 2012 conducted by IIT Delhi, New Delhi, India
- Recipient of **MHRD fellowship** from Govt. of India at IIT Kharagpur (July 2012 – June 2014)
- Recipient of **MHRD Fellowship** (SRF) from Govt. of India at IIT Kharagpur (July 2014 – July 2019)
- Recipient of **Teaching Assistantship** from IIT Kharagpur, India (September 2019 – July 2020)
- **President**, Materials Science Society, Materials Science Centre, IIT Kharagpur, India (2014-2015)

RESEARCH EXPERIENCES:

Ph.D. Research: July 2014 – August 2021

At Materials Science Centre, IIT Kharagpur, West Bengal, India

Thesis Title: **Synthesis and tailored magnetism of MnBi alloys and composites of small core-shell crystallites for powerful magnets and applications**

Supervisors: **Prof. Shanker Ram and Prof. Debabrata Pradhan**

M.Tech. Project: (July 2013 – June 2014)

At Materials Science Centre, IIT Kharagpur and CSIR-CMERI Durgapur, West Bengal, India

Thesis Title: **Development of lithium manganese phosphate as a cathode material for lithium ion batteries**

Supervisors: **Prof. Shanker Ram and Dr. Sivaprakash S.**

BRIEF DETAILS OF PUBLICATIONS AND CONFERENCES/WORKSHOPS:

- **Journal/conference publications:** In the field of Magnetic materials, dielectric materials, energy conversion and storage such as; solar cells, solid oxide fuel cells, batteries, and others.
 - Articles in Journals: **First author: 5; Co-author: 13**
 - Conference proceedings: **First author: 2; Co-author: 1**
 - Manuscripts under review/consideration/submitted: **First author: 2**
- **Papers presented in national/international workshop/conferences: International: 7; National: 4**
- **Training/workshop attended/participated: National: 8**
- **Google Scholar link:** <https://scholar.google.com/citations?hl=en&user=RVgUDMYAAAAJ>
- **ResearchGate link:** <https://www.researchgate.net/profile/Sanjeev-Sharma-61>
- **ORCID ID:** <https://orcid.org/0000-0001-9694-146X>

PROFESSIONAL/TECHNICAL SKILLS:

- **Synthesis/processing methods:** Arc melting, hydrothermal/solvothermal, microwave assisted, sol-gel, combustion, solid state route, flash pyrolysis, spin coating, co-precipitation, sintering, and ball milling
- **Synthesis/processing equipment's/techniques:** Arc melting furnace, autoclaves, muffle/tube/microwave furnaces, microwave digestion systems, ball mill, spin coater, centrifuge machine, ultra/probe sonicators, hot press machine
- **Characterization/measurements techniques/results analyses:** XRD, EDX, FESEM, HRTEM, XPS, Raman, FT-IR, UV-visible, TGA, DSC, BET, Hot Disk, Impedance analyzer, M-H/P-E loop tracer, SQUID, VSM
- **Software/computer expertise:** MS Office, Origin, X'Pert HighScore Plus, CasaXPS, ImageJ, Rietveld refinement of XRD using Fullprof suit, MAUD, and Diamond

TEACHING EXPERIENCE:

- Advanced Materials Lab (Ceramics) at Materials Science Centre, Indian Institute of Technology Kharagpur, Spring Semester, January to April, 2014 (1 term)
- Advanced Materials Lab (Ceramics) at Materials Science Centre, Indian Institute of Technology Kharagpur, Spring Semester, January to April, 2015 (1 term)

REFERENCES:

 **Prof. Shanker Ram**, Former Senior Professor, Materials Science Centre, Indian Institute of Technology Kharagpur, West Bengal – 721 302, India, Email ID: sram@matsc.iitkgp.ac.in, Phone: +91 8145693155

 **Prof. Debabrata Pradhan**, Professor, Materials Science Centre, Indian Institute of Technology Kharagpur, West Bengal – 721 302, India, Email ID: deb@matsc.iitkgp.ac.in, Phone: +91-3222-281798

Sanjeev Kumar Sharma

LIST OF PUBLICATIONS

A. Peer reviewed Journals

1. **S. K. Sharma**, D. Pradhan, and S. Ram, (2023), A core-shell magnet $\text{Mn}_{70}\text{Bi}_{30}$ grown at seeds in magnetic fields and its impacts on its spin-dynamics, Curie point and other tailored properties, **Nanotechnology**, Vol. 34, pp. 335703. <https://doi.org/10.1088/1361-6528/acd34c>
2. **S. K. Sharma**, Prakash H. R., D. Pradhan, H.-J. Fecht, and S. Ram, (2022), Structural ordering at magnetic seeds with twins at boundaries of a core-shell alloy $\text{Mn}_{60}\text{Bi}_{40}$ and tailored magnetic properties, **Nanotechnology**, Vol. 33, No. 40, pp. 405703. <https://doi.org/10.1088/1361-6528/ac7652>
3. **S. K. Sharma**, S. Ram, and D. Pradhan, (2021), Small core-shell $\text{Mn}_{0.5}\text{Bi}_{0.5}\text{-Bi}$ (≤ 3 at%) magnets of anisotropic growth of nanoplates of crystallites, interface-bridging, and tailored magnetic properties, **Nanotechnology**, Vol. 32, No. 4, pp. 045705 (1–18). <https://doi.org/10.1088/1361-6528/abac7d>
4. **S. K. Sharma**, P. V. Rajeswari, B. Tiwari, and S. Ram, (2017), Hydrothermal synthesis of $\text{LiMnPO}_4\text{-C}(\text{sp}^2)$ hybrids, conductive channels, and enhanced dielectric permittivity: a modulated ionic conductor, **Ionics**, Vol. 23, pp. 43–53. <https://doi.org/10.1007/s11581-016-1800-4>
5. **S. K. Sharma**, T. Majumder, M. Dewan, and S. Ram, (2017), LiMnPO_4 nanoplates with in-situ growth of a sp^2 -carbon surface layer from a liquid precursor, phase stability, and tailored impedance properties, **Current Physical Chemistry**, Vol. 7, No. 1, pp. 23–38. <https://doi.org/10.2174/1877946806666161115142518>
6. P. V. Rajeswari, **S. K. Sharma**, S. Ram, and D., Pradhan, (2023), Nanoporous N/O: sp^2 -C films functionalized at nonbonding electrons of a biogenic husk (green chili) with deep UV-visible light absorption-emission for photocatalysis and other applications, **Surfaces and Interfaces**, Vol. xx, pp. 102824. <https://doi.org/10.1016/j.surfin.2023.102824>
7. S. Jangu, **S. K. Sharma**, and S. Ram, (2022), A metastable Cr^{4+} -compound $\text{AlCrO}_{3+\delta}$, $\delta \leq 0.5$, grown at a nanocolloid, and its ultraviolet absorption, phonon bands, and dielectric properties, **Journal of Alloys and Compounds**, Vol. 927, pp. 166865. <https://doi.org/10.1016/j.jallcom.2022.166865>
8. K. Bhunia, **S. K. Sharma**, B. K. Satpathy, and D. Pradhan, (2021), Recent progress on the development of electrocatalysts for the electrochemical N_2 reduction reaction, **Materials Advances**, Vol. 3, pp. 888–917. <https://doi.org/10.1039/D1MA00680K>
9. S. Jangu, **S. K. Sharma**, A. K. Sudhansu, and S. Ram, (2021), Dielectric properties of Cr^{3+} doped Al_2O_3 of a hierarchical nanostructure synthesized using a highly porous precursor of tubular $\text{AlO}(\text{OH})\cdot\alpha\text{H}_2\text{O}$ fibers, **Material Research Forum**, Vol. 1019, pp. 135–141. <https://doi.org/10.4028/www.scientific.net/MSF.1019.135>
10. T. Ghosh, **S. K. Sharma**, and D. Pradhan, (2020), Giant dielectric constant and superior photovoltaic property of the mechanochemically synthesized stable $\text{CH}_3\text{NH}_3\text{PbBr}_3$ in a hole transporter-free solar cell, **ACS Sustainable Chemistry & Engineering**, Vol. 8(3), pp. 1445–1454. <https://doi.org/10.1021/acssuschemeng.9b05678>
11. B. Tiwari, **S. K. Sharma**, S. Ram, and P. Banerji, (2019), Synthesis of broad band violet–blue light-emitting core–shell $\text{Cr}^{3+}\text{:C-CaIn}_2\text{O}_4$ nanowires, **Journal of Nanoscience and Nanotechnology**, Vol. 19, No. 9, pp. 5769–5773. <https://doi.org/10.1166/jnn.2019.16596>
12. S. Gupta, **S. K. Sharma**, D. Pradhan, and N. H. Tai, (2019), Ultra-light 3D reduced graphene oxide aerogels decorated with cobalt ferrite and zinc oxide perform excellent electromagnetic interference shielding effectiveness, **Composites Part A: Applied Science and Manufacturing**, Vol. 123, pp. 232–241. <https://doi.org/10.1016/j.compositesa.2019.05.025>
13. H. R. Prakash, **S. K. Sharma**, S. Ram, and H.-J. Fecht, (2017), Hierarchical nanostructure, microstrain, and mechanical properties in Cr-doped magnetocaloric $\text{Ni}_{50}\text{Mn}_{37-\delta}\text{Cr}_\delta\text{Sn}_{13}$, $\delta \leq 2.0$, alloys, **Current Smart Materials**, Vol. 2, No. 2, pp. 112–129. <https://doi.org/10.2174/2405465801666161205122758>

14. K. Bhunia, M. Chandra, **S. K. Sharma**, D. Pradhan, and S.-J. Kim, (2022), A critical review on transition metal phosphide based catalyst for electrochemical hydrogen evolution reaction: Gibbs free energy, composition, stability, and true identity of active site, **Coordination Chemistry Reviews**, Vol. 478, pp. 214956 (1-33). <https://doi.org/10.1016/j.ccr.2022.214956>
15. D. S. Saini, A. Ghosh, S. Tripathy, **S. K. Sharma**, A. Kumar, and D. Bhattacharya, (2018), Improved conductivity of spark plasma sintered Ho-substituted BaZrO₃ electrolyte ceramics for IT-SOFCs, **ACS Applied Energy Materials**, Vol. 1(7), pp. 3469–3478. <https://doi.org/10.1021/acsaem.8b00655>
16. D. S. Saini, S. Tripathy, A. Kumar, **S. K. Sharma**, A. Ghosh, and D. Bhattacharya, (2018), Impedance and modulus spectroscopic analysis of single phase BaZrO₃ ceramics for SOFC application, **Ionics**, Vol. 24, pp. 1161–1171. <https://doi.org/10.1007/s11581-017-2282-8>
17. R. Ramteke, K. Kumari, S. Bhattacharya, **S. K. Sharma**, and M. R. Rahman, (2021), Impedance spectroscopy study of zinc oxide incorporated iron borate glass-ceramic, *Current Applied Physics*, Vol. 22, pp. 84–93. <https://doi.org/10.1016/j.cap.2020.12.017>
18. D. S. Saini, A. Ghosh, S. Tripathy, A. Kumar, **S. K. Sharma**, N. Kumar, S. Majumdar, and D. Bhattacharya, (2020), A promising proton conducting electrolyte BaZr_{1-x}Ho_xO_{3-δ} (0.05 ≤ x ≤ 0.20) ceramics for intermediate temperature solid oxide fuel cells, **Scientific Reports**, Vol. 10(1), pp. 3461 (1–12). <https://doi.org/10.1038/s41598-020-60174-4>

B. Conference proceedings

1. **S. K. Sharma**, H. R. Prakash, S. Ram, and D. Pradhan, (2018), Synthesis and magnetic properties of rare-earth free MnBi alloy: A high-energy hard magnetic material, **AIP Conference Proceedings**, Vol. 1942, pp. 130044 (1-4). <https://doi.org/10.1063/1.5029114>
2. **S. K. Sharma**, H. R. Prakash, and S. Ram, (2016), Magnetic properties in MnBi alloy of small crystallites for permanent magnet devices, **AIP Conference Proceedings**, Vol. 1728, pp. 020657 (1-3). <https://doi.org/10.1063/1.4946708>
3. H. R. Prakash, **S. K. Sharma**, S. Ram, and S. Chatterjee, (2016), Large adiabatic temperature change in magnetoelastic transition in Ni₅₀Mn₃₅Cr₂Sn₁₃ Heusler alloy of granular nanostructure, **AIP Conference Proceedings**, Vol. 1728, pp. 020482 (1-4). <https://doi.org/10.1063/1.4946533>

C. Under review/consideration/Submitted

1. **S. K. Sharma**, D. S. Saini, D. Pradhan, and S. Ram, (2023), A carbon surface modified Mn_{0.5}Bi_{0.5} of small core-shell crystallites and tailored magnetic properties. ([Under review](#)).
2. **S. K. Sharma**, D. S. Saini, D. Pradhan, and S. Ram, (2023), An exchange coupled CoFe₂O₄-Mn_{0.5}Bi_{0.5} magnets and its granular nanostructure and magnetic properties. ([Under review](#))

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