HIMANSHU SHEKHAR

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EDUCATION

Texas A&M University, College Station, Texas *Jan '22 - Present*
Ph.D. in Materials Science & Engineering

Malaviya National Institute of Technology, Jaipur, India *Aug '14 – May '18*
Bachelor of Technology in Metallurgical and Materials Engineering

RESEARCH EXPERIENCE

Texas A&M University, College Station, Texas. *Jan '23 - Present*

Ph.D. Dissertation: Predictive computational synthesis of quantum material architectures

Advisor - Dr. Aravind Krishnamoorthy, Department of Mechanical Engineering, TAMU

- *Computational synthesis of refractory materials and low-dimensional semiconductors*
- *AI-driven forcefield parameterization for reactive materials*
- *Machine Learning for predictive retro-synthesis of solid-state materials*

Malaviya National Institute of Technology, Jaipur, India

- *Structure and properties investigation of Fe-MWCNT composite* *Aug '17 – May '18*
  - Developed Fe-MWCNT composite with varying MWCNT content using HEBM and SPS
  - Investigated the detailed aspects of the effects of processing and MWCNT content on the structure, bonding behavior in the composite using SEM, TEM, XRD, FTIR and Raman Spectroscopy
  - Determine the effects of MWCNT reinforcement on the mechanical, electrical and magnetic properties using microhardness, electrometer and VSM testing
- *Effect of Rapid Thermal Annealing (RTA) on microstructure and mechanical properties of cold rolled low carbon steel* *Jan '18 - May '18*
  - Utilized RTA technique with differential heating rate for heat treatment of the samples
  - Analyzed the effect of heating rate on grain size and microstructure through SEM, TEM and EDS mapping
  - Performed microhardness testing to observe the effect of heat treatment on the mechanical properties

Indian Institute of Engineering Science and Technology, Shibpur, India

- *Ultrafine bainitic steel with simultaneous enhancement of strength and ductility* *May '17 – Aug '17*
  - Designed a heat treatment cycle, using calculation from Thermo-Calc database TCFE-6
  - Determined the extent of transformation, volume fraction of untransformed austenite and microstructure through standard metallographic analysis technologies such as optical, TEM, FEG-SEM and XRD
  - Conducted tensile and microhardness testing to study the effect of heat treatment and microstructure developed on UTS, ductility and hardness value

PUBLICATIONS

[1] M. Kömürlü, **H. Shekhar**, A. Krishnamoorthy, A. Erdemir, Ultra-fast Synthesis and Characterization of Refractory Borides, *Under preparation* (2024)

[2] J. Elkins, **H. Shekhar**, A. Krishnamoorthy, A. Balan, P. Ajayan, Co-deposition of MoO_2 polymorphs in Physical Vapor Deposition, *Under preparation* (2024)

[3] A. Kumar, **H. Shekhar**, U. Banerjee, M.K. Chowrasia, M.K. Banerjee. Effect of MWCNT Content on the Structure and Properties of Spark Plasma-Sintered Iron-MWCNT Composite Synthesized by High-Energy Ball Milling, *Journal of Materials Engineering and Performance*, 2019, Vol 28, No.5, 2893-3000.

CONFERENCE PRESENTATIONS

[1] ***Materials Research Society 2024***, Seattle, Washington *April '24*
Computational Investigation into Synthesis of Transition Metal Borides

PROFICIENCY IN SOFTWARE & EXPERIMENTS

Materials Simulation: LAMMPS, VASP, Gaussian 16, AMS
Materials Characterization: XRD, EDS, SEM, NDT, Hardness, Fatigue test, Tensile test
Computer: Linux, Python, C/C++, MATLAB, Ansys, SolidWorks, LATEX, MS Office Tools
Analytical: CMWP, X'Pert Highscore Plus, WinplotR, MAUD, ImageJ, OriginPro

WORK EXPERIENCE & TRAINING

Bharat Aluminum Company Limited (BALCO), Chhattisgarh, India *Sep '18 - Oct '20*
Assistant Manager – Green Anode Plant (GAP)

- Assigned the role of Shift In-charge, accountable for the production of green anodes, maintenance supervision, and adherence to safety norms and company policy
- Fostered participation of contract workers and technicians in '5S drive' and 'Quality Circle Concept' in GAP

Steel Authority of India Limited, Government of India *Sep '18 - Oct '20*
Vocational Trainee

- Worked at the heat-treatment facility, in the quality assurance and quality control department
- Analyzed processing routes and learned about the importance of interaction and synchronization of several departments of an integrated steel plant

PROFESSIONAL PROJECTS

Bharat Aluminum Company Limited, Chhattisgarh, India *Feb '19 - Oct '20*

- Completed theoretical study and experimental analysis about the influence of kneader's operational and mechanical parameters on paste mixing. Optimized different operational and physical parameters of kneader and heating medium to reduce the time taken to achieve power for paste mixing
- Reduced rejection in green scrap and anode by 0.5%, by reducing the time taken to achieve power, resulting in an annual saving of 18 million rupees

TEACHING EXPERIENCE

- Teaching Assistant for Research and Writing (MSEN 689) at Texas A&M University
- Teaching Assistant for Fundamentals of Materials Science (MSEN 201) at Texas A&M University
- Teaching Assistant for Materials Science (MSEN 222) at Texas A&M University
- Lab Assistant for Testing of Materials (MTP 222) at MNIT, Jaipur, India

AWARDS & ACADEMIC ACHIEVEMENTS

- Received Fellowship for Computational Materials Science Summer School, 2023 at Texas A&M University
- Received MSEN department fellowship for year 2022
- Won 'Par Excellence' award at the 27th Chapter Convention on Quality Concept (CCQC), 2019
- Evaluated as 'excellent employee' during 2018-2019 yearly performance evaluation at BALCO.