

MUHAMMAD ALI IMAM

Ph.D. (Materials Science)

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Professional Summary

- Emerging materials engineering professional with 9+ years of experimental material research experience in solving complex technical challenges related to tool development, materials processing, and characterization.
- Possesses a comprehensive understanding of solid-state processing, characterization, failure mode analysis, and ability to improve yield, extend asset life, reduce costs, improve product attributes, and enable new products.
- Adept at collaborating with cross-functional teams to ensure optimal turnaround and experimental efficiency.

Education

2014–2018 **The University of Alabama**, *Ph.D*, Materials Science , *CGPA- 3.80/4.00*.

2012–2014 **Tuskegee University** , *MS*, Materials Science and Engineering, *CGPA- 3.90/4.00*.

2006–2011 **Bangladesh University of Engineering and Technology** , *B.Sc.*, Materials and Metallurgical Engineering, *CGPA- 3.50/4.00*.

Experience

Apr 2019 – Present **Assistant Researcher | Lab Manager**, THE UNIVERSITY OF WISCONSIN, Madison, WI.

- Demonstrated strong manufacturing (compression molding, VARTM, hand layup) skills by preparing polymer matrix (different resins) and ceramic matrix composites.
- Exhibit excellent managerial skills by managing multiple projects successfully with various stakeholders, including AFRL (Ceramic Matrix Composite for supersonic ablation), ONR (Polymer Matrix Composite for harsh environments), and STTR (3D printed soft materials) funded projects, resulting in three (3) peer-reviewed journals, and three (3) technical presentation in recognized scientific societies, informing on results of the study.
- Achieved substantial problem-solving skills through establishing ideas/methods by using my robust mechanical & materials characterization experiences i.e. optical, **SEM-EDS, micro CT, XRD, DSC, TGA, FT-IR, MALDI-TOF-MS, Nano-Indentation, Mode I and Mode II fracture test** (Static and Fatigue) with Statistical Process Control (SPC).

May 2015 – Dec 2018 **Graduate Research Assistant**, THE UNIVERSITY OF ALABAMA, Tuscaloosa, AL.

- Demonstrated strong processing skills by preparing thermoelectric and superconducting materials using **solid state processing** (Borides and Silicides based Ceramic) using EMF measurement and CALPHAD approaches (*Thermo-Calc, FactSage, Pycalphad, Pandat*) for high-temperature applications and their thermodynamic stability, resulting in a three (3) peer-reviewed book chapters, three (3) journals, and five (5) technical presentation in recognized scientific societies, informing on results of the study.
- Established innovative tool developing capabilities by constructing a prototype EMF setup with data acquisition system, creating concept through comprehensive testing, characterizations, and validation. Also, possessed a strong managing capability while directly managed and scheduled the EMF resulting in reducing the time to measure thermodynamic properties of materials by 90% in emf setup.
- Obtained robust materials characterization experiences by extensively using **SEM, EDS, XRD, DSC, ICP-MS and TGA** for different NSF endowed project including thermoelectric and electro-deposition project.
- Demonstrated managerial skills in handling the NSF project (USD 440K) by performing experiments, obtaining and analyzing the data, and preparing reports within the deadline, resulting in the renewal of the grant every year.

Aug 2014 – **Graduate Council Fellow**, THE UNIVERSITY OF ALABAMA, Tuscaloosa, AL.
Apr 2015

- Demonstrated firm micro-fabrication processing capabilities by developing *Ag*-coated WO_3 nanocubes on a *Si* wafer by sputtering and diffusion annealing process in a cleanroom environment, which led to a journal publications and a technical presentation in a recognized scientific society.
- Achieved substantial materials characterization skills by using **SEM, EDS, XRD, and UV-vis**.
- Showed excellent supervision ability by directly managed and trained undergraduate research students on the DC and RF sputtering system.

Skills & Areas of Expertise

Thin film Processing	XRD, SEM, TEM, EDS, EBSD	Six Sigma (DMAIC)	Python, MatLab
Electrochemistry (EMF)	Raman, FT-IR, UV-Vis	Root Cause Analysis	OriginLab, Excel
Extrusion	Alloy Development	Process improvement	L ^A T _E X, Word
Nano-materials Processing	Thermal & Electrical Conductivity	Team Collaboration	Solid Works
Waste Processing	DSC, TGA	Ownership & Accountability	FactSage, HSC
HT Plasma Processing	Sputtering (DC/AC)	Mechanical Testing	Labview

Awards & Recognition

- 2016-2018 Graduate Research and Travel fund (3 times) for attending scientific conference.
2014-2015 Graduate Council fellowship for the first year of Ph.D. at the University of Alabama.
2012-2014 NSF-Crest fellowship for pursuing MS at Tuskegee University
2011 Occupational Trainee Funding from Victoria University training internship for ten (10) months.
2011 Best Paper Award, 18th International Corrosion Congress (Perth, Australia).
1998-2010 Education Board Scholarship (Government)
2006-2010 Technical Study Scholarship (Government)
2016-2017 Represent MTE Dept. team, Intramural Soccer League, UA

Professional Affiliation & Membership

- 2017-Current **Reviewer**, *Journal of Phase Equilibria and Diffusion*.
2015-2018 **Student Member**, TMS, ACerS, UNIVERSITY OF ALABAMA CHAPTER.
2014-2015 **Treasurer**, American Vacuum Society, UNIVERSITY OF ALABAMA CHAPTER.
2012-2014 **Student Member**, MRS, SAMPE, TUSKEGEE UNIVERSITY CHAPTER.
2009-2010 **General Secretary**, Student Association of Materials and Metallurgical Engineering, BUET.

Selected Publications

1. Adam M. Breister, **M.A.Imam**, Zhichao Zhou, Karthik Anantharaman, Pavana Prabhakar. "Soil microbiomes mediate degradation of vinyl ester-based polymer composites", **Nature Communication Materials**, **2020**, <https://doi.org/10.1038/s43246-020-00102-1>;
2. **M.A.Imam**, J.S. Young and R. G. Reddy. "Effect of Oxygen Partial Pressure and Temperature on the Oxidation Behavior of SiB₆." **Metallurgical and Materials Transactions B** 51 (1), **2020**, pp.386-394.
3. **M.A.Imam**, J.S. Young, R.G. Reddy, Determination of Thermodynamic Properties of *Si-B* Alloys, **Metallurgical and Materials Transactions B**, **2019**, 50(2), pp.981-990. <https://doi.org/10.1007/s11663-019-01515-1>
4. **M.A.Imam**, R.G. Reddy, Thermodynamic Properties of Magnesium-Boron Binary Alloys Determined using Solid State Electrochemical Measurements, **Metallurgical and Materials Transactions B**, **2018**, 49(6), pp.3504-3512.

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