AFM Monowar Hossain (He/Him/His)

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SUMMARY

- Experienced in steel raw materials, primary (EAF) & secondary (LMF) steel production, process control, and optimization
- Trained in steel casting process (CCM), hot rolling, and quality control
- Proficient in steel processing techniques and microstructural analysis
- Skilled in mechanical characterizations, failure analysis, and data interpretation
- Strong technical writing, presentation, planning, and communication skills

EDUCATION

The University of Alabama — Tuscaloosa, AL
PhD in Materials Science — April 2024

Dissertation: Understanding the microstructural evolution and mechanical properties in a thick gauge high strength niobium-microalloyed line pipe steel

The University of Alabama — Tuscaloosa, AL
MS in Metallurgical Engineering — July 2021

Thesis: Microstructure and mechanical properties of a dual phase transformation induced plasticity Fe-Mn-Co-Cr high entropy alloy

Bangladesh University of Engineering and Technology (BUET) — Dhaka, Bangladesh
BSc in Materials and Metallurgical Engineering — February 2017

Project: Heat treatment (annealing, normalizing, and hardening) of steel and tempering of hardened steel to get 75% of the hardness of that as quenched steel

INDUSTRY EXPERIENCE

Abul Khair Steel Melting Limited (AKSML) — Chattogram, Bangladesh
Metallurgical Engineer-Production — April 2017- June 2019

- Led Ladle Metallurgy Furnace (LMF) production unit, managing chemical composition of secondary steel and ensuring productive operation
- Awarded employee of the month as a testament to maintaining minimum breakdowns and achieving maximum efficiency during the shifts
- Worked in steel raw materials handling section and obtained training on Electric Arc Furnace (EAF) operation, Continuous casting (CCM), and hot rolling process

SKILLS & INTERESTS

Microstructural Techniques:

- Etching and Optical Microscopy (OM)
- Focus Ion Beam (FIB) technique
- Scanning Electron Microscopy (SEM)
- Electron Backscatter Diffraction (EBSD)
- Transmission Electron Microscopy (TEM)
- Atom Probe Tomography (APT)

Software Tools:

- Adobe Photoshop & Illustrator, AutoCAD, SolidWorks, G code, Origin, OIM, HKL Channel 5, HSC chemistry, CES Edu-Pack

Mechanical Characterization Tools:

- Materials processing simulator (Gleeble)
- Tensile testing
- In situ SEM tensile testing
- Digital Image Correlation technique (DIC)
- Hardness testing
- Charpy Impact testing

Affiliations:

- The Minerals, Metals & Materials Society (TMS), Association for Iron & Steel Technology (AIST), ASM International

VOLUNTEER EXPERIENCE

- Worked as a student runner at the Association for Iron & Steel Technology conference (AISTech) in 2021
- Performed as an organizing graduate student in The University of Alabama Steel Day (2021-2023)
- Served as a judge for The University of Alabama Undergraduate Research and Creative Activities Conference (URCA) in 2023

RESEARCH EXPERIENCE

Graduate Researcher August 2019 - Present

Project: *"Understanding the microstructural evolution and mechanical properties in a thick gauge high strength niobium-microalloyed line pipe steel"*

- Evaluated microstructure, texture, and precipitation behavior
- Characterized mechanical anisotropic behavior
- Studied the effects of microstructural properties on strengthening contributions toward yield strength
- Determined correlation between microstructure and fracture behavior of line pipe steels

Project: *"High temperature processing and characterization of a multi-phase Advanced High Strength Steel (AHSS)"*

- Processed AHSS to control number of phases and their fractions to study the characteristics of the phases
- Studied microstructure, mechanical properties, and fracture behavior to improve the strength of the steel

Project: *"Microstructure and Mechanical Properties of a Dual Phase Transformation Induced Plasticity Fe-Mn-Co-Cr High Entropy Alloy"*

- Investigated microstructure and mechanical property correlation
- Studied localized deformation behavior, and post plastic deformation analysis
- Evaluated the Transformation Induced Plasticity (TRIP) behavior of the alloy

PUBLICATIONS & PRESENTATIONS

Publications

[1] **AFMM Hossain**, N. Kumar, Microstructure and mechanical properties of a dual phase transformation induced plasticity Fe-Mn-Co-Cr high entropy alloy, Journal of Alloys and Compounds. 893 (2022) 162152.

[2] **AFMM Hossain**, N. Kumar, Microstructural and plastic deformation study of a multi-Phase advanced high-strength steel, AISTech 2021-Proceedings of the Iron & Steel Technology Conference, 2021. 10.33313/382/097.

Select Presentations

[1] **AFMM Hossain**, N. Kumar, "Effect of microstructural variations through the thickness on mechanical properties of an Nb-microalloyed thick gauge line pipe steel", International Materials, Applications & Technologies 2023.

[2] **AFMM Hossain**, X. Wen, M. Mulholland, B. Ehrhardt, S. Jansto, GB. Thompson, and N. Kumar, "Understanding microstructural evolution in a thick gauge high strength niobium-microalloyed line pipe steel", 2022 TMS Annual Meeting & Exhibition, 2022.

[3] **AFMM Hossain**, N. Kumar, "Microstructural and plastic deformation study of a multiphase advanced high strength steel", AISTech 2021 — Proceedings of the Iron & Steel Technology Conference.

[4] **AFMM Hossain** N. Kumar, "Microstructure and Mechanical Properties of a Dual Phase Transformation Induced Plasticity Fe-Mn-Co-Cr High Entropy Alloy", 2021 TMS Annual Meeting & Exhibition, 2021.