ALIREZA KARIMI

Graduate Research Assistant, School of Materials Engineering, Iran University of Science and Technology, Tehran, Iran



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EDUCATION

2017 - 2020

M.Sc. in Materials Engineering

TEHRAN, IRAN

Iran University of Science and Technology (IUST)

- Thesis: Design and implement a novel sustainable combustion welding process for dissimilar joining of metalceramic couples using **NiTi** interlayers
- CGPA: 15.16/20 (Iranian Scale)
- Supervisors: Prof. Mandana Adeli and Prof. Mansour Soltanieh

2013 - 2017

B.Sc. in Metallurgy and Materials Engineering

ISFAHAN, IRAN

Golpayegan College, Isfahan University of Technology (IUT)

- Thesis: Production and characterization of corrosion-resistant amorphous Fe-Ni-Cr coatings
- CGPA: 15.17/20, last two years 17.17/20 (Iranian Scale)
- Supervisor: Prof. Seyed Mahdi Rafiaei

RESEARCH INTERESTS

- Advanced Materials (Metal Matrix Composites (MMCs), High Strength Lightweight Alloys, Shape Memory Alloys) Synthesis, Welding, processing, and Characterization.
- Machine learning, Predictive Modeling, Neural Networks, FEM simulation, FEM for Manufacturing Processes

RESEARCH EXPERIENCES

Investigating the effect of Mechanical Activation Duration (MAD) on microstructure and corrosion behaviour of synthesized TiAl

2021 - present

School of Materials and Metallurgy Engineering, IUST

- Fabricated TiAl Intermetallic compounds with various MADs using the SHS process.
- Investigated the effect of MAD on corrosion behavior (EIS1) and microstructure (SEM) of TiAl samples
- Employed Artificial Neural Network (ANN) models for investigating corrosion behaviour and microstructure of TiAl intermetallic in various MADs.

Study on the wear behavior of NiAl-TiC-TiB₂ composite produced by the combustion synthesis process

2020 - present

School of Materials and Metallurgy Engineering, IUST

- Fabricated NiAl / TiC-TiB₂ composites using a combustion synthesis process
- Enhanced composite hardness profile due to even distribution of TiC-TiB₂ phases
- Demonstrated superior wear resistance in composites with higher TiC-TiB2 using Sliding wear tests
- Trained an ANN model to predict the properties of composite with various TiC-TiB2 content.

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¹ Electrochemical Impedance Spectroscopy

Design and implement a novel and sustainable combustion joining process using combustion synthesis reactions in Ni-Ti powder mixtures

2018 - 2020

School of Materials and Metallurgy Engineering, IUST

- Fabricated VCN-150 steel joints and then WC-Co/VCN-150 dissimilar joints via combustion synthesis within Ni-Ti compound (Self-heating process)
- **Designed** and **fabricated** a novel **set-up** for exerting an **axial force** on the welding components in the **Argon** atmosphere and **decreasing** the interlayer porosity
- Performed microstructural and mechanical characterization of joints (SEM, XRD, Shear strength)

Effect of space holder materials on the porosity of synthesized NiTi Foams

2018-2019

School of Materials and Metallurgy Engineering, IUST

- Conducted thorough analysis to assess the impact of space holder material on porosity distribution and size.
- Executed microstructural characterization using SEM and conducted phase analysis through XRD techniques

Fabrication of amorphous Fe-Ni-Cr coatings by electric deposition process

2015 - 2017

Department of Materials Engineering, IUT

• Investigated current density's impact on coating thickness and structure (amorphous/crystalline)

PUBLICATION

- F. Soleimani, M. Adeli, M. Soltanieh, H. Saghafian, A. Karimi, Fabrication and wear behavior of TiC/TiB₂-reinforced NiAl intermetallic matrix composites, Wear, DOI: 10.2139/ssrn.4676363
- A. Karimi, M. Adeli, M. Soltanieh, Dissimilar joining of cemented carbide to low-carbon steel via combustion welding: Effect of process parameters on the interfacial microstructure and joint strength, Journal of Manufacturing Process, Vol. 77, Pages 551-560, https://doi.org/10.1016/j.jmapro.2022.03.043
- A. Karimi, M. Adeli, M. Soltanieh, The application of combustion synthesis reactions in Ni-Ti system in the joining of steel to tungsten carbide, Journal of New Materials, Vol. 11, pages 103-114, 20.1001.1.22285946.1399.11.41.8.2
- A. Karimi, M. Adeli, M. Soltanieh, **Investigating the possibility of establishing steel-steel joints using combustion synthesis reactions,** 8th International Conference and Exhibition on Materials Engineering and Metallurgy Oct. 2019, https://civilica.com/doc/963690/

HONORS AND AWARDS

Patent (In process): Intelligent atmosphere supply system for sinter furnaces.

• Facilitated the atmosphere-controlling process of box furnaces (design and implementation)

Awarded governmental full scholarship (Tuition Waiver) and governmental fund (Research Grant)

• Issued by Ministry of Science, Research and Technology due to national entrance exam for two years of M.Sc. (2017-IUST) and four years of B.Sc. (2013-IUT)

TEACHING EXPERIENCES

Graduate Teaching Assistant (Metallurgical Processes Laboratory)

2018 (Aug - Dec)

• School of Materials and Metallurgy Engineering (IUST), Prof. M. Adeli (adelim@iust.ac.ir)

Tutor (English - Math)

Feb2022-present

High-school students

WORK EXPERIENCES

Metallurgical Laboratory Manager

Sep2021-present

SEPAHAN FOOLAD ATASHGAH (STEEL CASTING)

- Led a team of 14 professionals in research and technological development.
- Achieved ISO/IEC 17025 Certification.
- Performed scientific workshops for laboratory members. (Steel Design, OES, Metallography)
- Collaborate with external partners (academia, lab equipment providers, and material suppliers).
- Supervised laboratory equipment calibration.

Research Assistant (part-time from Sep 2021)

Sep2018-present

IRAN UNIVERSITY OF SCIENCE AND TECHNOLOGY

- Played a key role in data analysis and interpretation as a dedicated research assistant.
- Assisted in literature reviews, experiment design, and comprehensive research documentation.
- Thrived in a collaborative research environment, showcasing a detail-oriented and proactive approach.

Metallurgical Laboratory Specialist

2021 (Feb-Sep)

HAMIRAN STEEL (REFERENCE LABORATORY)

- Acquired Hands-on experience with microstructural (SEM, OM), mechanical (tensile, micro-hardness), Optical Emission Spectroscopy (OES), Box and Inductive Furnaces, and NDT characterization techniques.
- Provided scientific consultation to customers

Patent Engineer

2020 (Jan-Oct)

IDI COMPANY

 Drafted and submitted patent applications, conducting thorough research to verify the uniqueness of inventions.

Engineering Internship

2016 (Apr-Sep)

ESFAHAN STEEL COMPANY

- **Conducted** standardized mechanical and microstructural quality assurance tests in accordance with **ASTM**, **ISO**, and **DIN** standards.
- Acquired hands-on experience with OES and Continuous Casting Machines (CCM).

LANGUAGE SKILLS

Persian: Native Language

English: Fluent, TOEFL (iBT): On February 2024

PERSONAL SKILLS

Technical Skills

• Materials characterization techniques (TEM, SEM, OM, RAMAN), XRD, EDS, OES, ICP, XRF, EIS (corrosion), SLIDING WEAR TEST, NDT (UT, PT, MT), and MECHANICAL testing equipment.

Communication skills

• Gained through my experience as a materials selection **consulting specialist**, teaching experience as a **tutor** and graduate **teacher assistant**, and **management** experience in a laboratory.

Managerial skills

• **Head** of metallurgical laboratory (currently responsible for a team of **14 people**)

Computer skills

• ANSYS, HighScore (plus), SOLIDWORKS, Origin, Minitab, ZsimpWin, EC-Lab, Microsoft Office, Python programming language

Certificates

• TEM (EPFL), Python (University of Michigan), Data Science (IBM, Georgia Tech), Conference **Presentation** (Int. Imat Conference)

REFERENCES

Mandana Adeli Assistant Professor School of Materials Engineering, Iran University of Science and Technology, Tehran, Iran

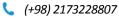


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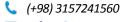
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Seyed Mahdi Rafiaei Associate Professor Department of Materials Science, Isfahan University of Technology, Isfahan, Iran



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