PERSONAL INFORMATION

Alireza Karimi

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Date of birth August 11th 1995

EDUCATION

2017 - 2020

M.Sc. in Materials Engineering

***Iran University of Science and Technology (IUST)**, Tehran, Iran*

- ***Thesis Title**: Investigating the parameters affecting the **joining** of tungsten carbide to low-alloy steel using **sustainable combustion synthesis** reactions of Nickel Titanium (**NiTi**) as an interlayer.*
- ***CGPA**: 15.16/20 (Iranian Scale)*
- *Supervisors: Prof. Mandana Adeli and Prof. Mansour Soltanieh*

2013 - 2017

B.Sc. in Metallurgy and Materials Engineering

***Isfahan University of Technology (IUT)**, Isfahan, Iran*

- ***Thesis Title**: Production of amorphous **Fe-Ni-Cr coatings** by electric deposition process*
- ***CGPA**: = 15.17/20, **last two years =** 17.17/20*
- ***Supervisor**: Prof. Seyed Mahdi Rafiaei*

RESEARCH EXPERIENCE

2021 - present

Machine Learning-Assisted Study on the Effect of Mechanical Activation Duration (MAD) on Microstructure and Corrosion Behavior of TiAl Intermetallic Compounds

School of Materials and Metallurgy Engineering, IUST

- ***Fabricated** TiAl alloys with various MADs using Self Propagating High-temperature Synthesis (**SHS**).*
- ***Investigated** the effect of MAD on corrosion behaviour (**EIS**) and microstructure (**SEM**) of TiAl.*
- ***Developed** a novel α2/γ lamellar microstructure to enhance toughness in TiAl alloys.*
- ***Utilized** Artificial Neural Networks **(ANN)** Machine Learning (**ML**) models to study **corrosion** behavior and **microstructure** in TiAl with different MADs.*

2020 - 2023

Investigation of Wear Behavior in NiAl-TiC-TiB_2 Composites Synthesized via Eco-Friendly Combustion Synthesis: Experimental Analysis and Predictive Modeling

School of Materials and Metallurgy Engineering, IUST

- ***Fabricated NiAl / TiC-TiB_2 composites** using a combustion synthesis process.*
- ***Demonstrated** superior wear resistance in composites with higher TiC-TiB_2 using **Sliding wear** test.*
- ***Trained** an **ANN** Machine learning model to **predict** the **wear** properties of composite.*

2018 - 2020

Sustainable Combustion Joining of Tungsten Carbide to Low-Alloy Steel Using NiTi Interlayers: Fabrication, Microstructure, and Mechanical Characterization

School of Materials and Metallurgy Engineering, IUST

- ***Designed** and **fabricated** a **novel** set-up for **Creating** WC-Co / VCN-150 dissimilar joints via **combustion synthesis** within **Ni-Ti** compound.*
- ***Enhanced** joint strength by reducing interlayer **porosity** and optimizing Ni+Ti **particle size**.*
- ***Performed** microstructural and mechanical characterization of joints (**SEM, XRD, Shear strength**).*

2018 - 2019

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

School of Materials and Metallurgy Engineering, IUST

- ***Evaluated** space holder impact on porosity **distribution** and **size (SEM, XRD)***

2015 - 2017

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

Department of Materials Engineering, IUT

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

PUBLICATIONS

- A. Karimi, M. Adeli, M. Kobashi, **Investigating the effect of Mechanical Activation Duration (MAD) on microstructure and corrosion behavior of TiAl intermetallic compounds**, Advanced Powder Technology, (Under Review)
- F. Soleimani, M. Adeli, M. Soltanieh, H. Saghafian, A. Karimi, **Fabrication and wear behavior of TiC/TiB2-reinforced NiAl intermetallic matrix composites**, Journal of Materials Research and Technology, https://doi.org/10.1016/j.jmrt.2024.05.025
- 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**, imat, Oct. 2019, https://civilica.com/doc/963690/

HONORS AND AWARDS

Patent (In process): Intelligent atmosphere (H, Ar) supply system for sinter furnace

- ***Designed*** *and* ***implemented*** *atmosphere control for box furnaces.*
- ***Created*** *a* ***Python-based*** *Arduino system for intelligent* ***hydrogen*** *flow monitoring to ensure safety.*

Awarded governmental scholarship (Tuition Waiver) and 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)*

WORK EXPERIENCE

Sep 2021- Present

Metallurgical Laboratory Manager

SEPAHAN FOOLAD ATASHGAH (STEEL CASTING)

- ***Led*** *a team of* ***14 professionals*** *(lab technicians, quality control analysts, and research assistants)*
- ***Achieved ISO/IEC 17025*** *Certification.*
- ***Collaborate*** *with external partners (academia, lab equipment providers, and material suppliers).*

Sep 2018 - Present

Research Assistant (part-time from Sep 2021)

IRAN UNIVERSITY OF SCIENCE AND TECHNOLOGY

- ***Played*** *a key role in* ***data analysis*** *and interpretation as a research assistant.*
- ***Assisted*** *with* ***literature reviews****, experiment design, and research documentation.*

2021 (Feb - Aug)

Metallurgical Laboratory Specialist

HAMIRAN STEEL (REFERENCE LABORATORY)

- ***Gained*** *hands-on experience with* ***SEM, OM, mechanical testing,*** *Optical Emission Spectroscopy* ***(OES), furnaces, metallography,*** *and* ***NDT*** *techniques.*
- ***Provided*** *scientific* ***consultation*** *to customers.*

2016 (Apr - Sep)

Engineering Internship

ESFAHAN STEEL COMPANY

- *Conducted* ***mechanical*** *and* ***microstructural*** *tests, with hands-on experience in* ***OES*** *and Continuous Casting Machine* ***(CCM).***

SKILLS

Native Language: *Persian*

Other language

	READING	LISTENING	SPEAKING	WRITING
English	C1	B2	C1	B2
German	A1	A1	A1	A1

Communication skills

- ***Gained*** *through roles in materials selection* ***consulting****,* ***tutoring****, graduate* ***teaching*** *assistance, and laboratory* ***management****.*

Managerial skills

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

Technical skills

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

Computer skills
- ***ANSYS***, ***Numerical Simulation*** *(Finite Element Method), Tecplot,* ***Python****, SOLIDWORKS, HighScore (XRD), Origin, Minitab, ZsimpWin, EC-Lab*

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

REFERENCES

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