Curriculum vitae

Sina Rahimi (he/ him/ his)

[redacted]

SUMMARY

Key Skills and Achievements

- Experienced in **microstructural, mechanical, and corrosion characterization of metallic alloys**, combining hands-on expertise with strong theoretical knowledge to evaluate and enhance material performance across applications.
- Specialized in **hydrogen embrittlement of pipeline steels,** and **plasma electrolytic coating** of Al and Mg alloys for corrosion resistance.
- Passionate about **corrosion and degradation of metallic materials** and **fracture/ failure analysis** using advanced techniques such as PPT, EIS, SEM, EDS, and XRD.
- Proficient in **data analysis, processing, and plotting** using various software, with a proven track record of **interpreting experimental results and publishing in high-quality journals**.
- Strong teamwork skills with experience in diverse, multicultural research environments across **Italy and Belgium.**

RESEARCH INTERESTS

Hydrogen Embrittlement

Corrosion and Degradation of Metallic Materials

Microstructural and Mechanical Characterization

Failure and Fracture Analysis

Coatings and Surface Engineering of Metals

EDUCATION AND TRAINING

[03/11/2021 – Current] **PhD in Engineering and Chemistry of Materials and Constructions**

University of Messina (UniMe)

Country: Italy **Thesis:** Investigation of gaseous hydrogen embrittlement of X65 pipeline steel

[01/04/2024 – 30/09/2024] **Visting Scholar**

Gent University (UGent)

Country: Belgium

Training and conducting XRD and EBSD measurments to study the HE of pipeline steel

[30/09/2015 – 21/09/2018] **MSc in Materials Engineering - Design and Selection of Engineering Materials**

Materials and Energy Research Center (MERC)

Country: Iran **Thesis:** Preparation of nanostructured protective coating on Al-Si alloy by plasma electrolytic oxidation and investigation the effect of SiC nanoparticles on wear and corrosion properties

[30/09/2010 – 08/02/2015] **BSc in Materials Engineering - Industrial Metallurgy**

Shahid Bahonar University of Kerman (SBUK)

Country: Iran **Thesis:** Effect of Cu on structural properties of nanostructured (Fe85Ni15)98.5Cu1.5 alloy prepared by mechanical alloying

LANGUAGES

English: Advanced | Persian: Native and/or Mother Tongue | Italian: Basic

LAB SKILLS

Microstructural, Morphological, Phase and Elemental Composition Analyses

SEM, EDS, XRD, OM, Thickness and Roughness Measurements.

Electrochemical and Mechanical Properties Testing Methods

Corrosion Tests: Potentiodynamic Polarisation Test (PPT), Electrochemical Impedance Spectroscopy (EIS)

Electrochemical Hydrogen Charging and Discharging: By Cathodic and Anodic Currents

Mechanical properties: Tensile Tests, Micro and Nano Hardness Measurement, Wear Resistance Tests

Coating Techniques

Plasma Electrolytic Oxidation (PEO), Anodizing, Electrophoretic Deposition (EPD)

SOFTWARE

Data Analysis, Processing and Plotting

Microsoft Office / Origin software / X'pert HighScore (X-ray analysis) / CorrView / ZView

CAD software

SolidWorks

PUBLICATIONS

S. Rahimi, K. Verbeken, T. Depover, E. Proverbio, Hydrogen embrittlement of pipeline steels under gaseous and electrochemical charging: A comparative review on tensile properties, Engineering Failure Analysis, Volume 167, Part A, January 2025, 108956

https://doi.org/10.1016/j.engfailanal.2024.108956

S. Rahimi, G. Scionti, E. Piperopoulos, E. Proverbio, Coupled slow strain rate and acoustic emission tests for gaseous hydrogen embrittlement assessment of API X65 pipeline steel, Materials Letters, Volume 367, 15 July 2024, 136598

https://doi.org/10.1016/j.matlet.2024.136598

E. Piperopoulos, M. F. Milazzo, S. Rahimi, P. Bruzzaniti, E. Proverbio, Definition of an Experimental Set-up for Studying the Safety of Hydrogen Transport Systems, Chemical Engineering Transactions, 105, 109-114, 2023

https://doi.org/10.3303/CET23105019

S. Rahimi, B. Yarmand, A. Kolahi, Effects of process parameters on structure and corrosion behavior of PEO coated A356 alloy, Surface Topography: Metrology and Properties, 8 045020, 2020

https://doi.org/10.1088/2051-672X/abc736

A. Bordbar Khiabani, S. Rahimi, B. Yarmand, M. Mozafari, Electrophoretic deposition of graphene oxide on plasma electrolytic oxidized-magnesium implants for bone tissue engineering applications, Materials Today: Proceedings, Volume 5, Issue 7, Part 3, Pages 15603-15612, 2018

https://doi.org/10.1016/j.matpr.2018.04.169

S. Rahimi, A. Bordbar Khiabani, B. Yarmand, A. Kolahi, Comparison of corrosion and antibacterial properties of Al alloy treated by plasma electrolytic oxidation and anodizing methods, Materials Today: Proceedings, Volume 5, Issue 7, Part 3, Pages 15667-15676, 2018

https://doi.org/10.1016/j.matpr.2018.04.177

CONFERENCES AND SEMINARS

S. Rahimi, T. Depover, K. Verbeken, E. Piperopoulos, E. Proverbio, Effect of hydrogen gas blending ratios with methane on hydrogen embrittlement behavior of X65 pipeline steel

European Conference on Fracture 2024 (ECF24), 2024, Zagreb, Croatia, Oral presentation

S. Rahimi, E. Piperopoulos,P. Bruzzaniti, E. Proverbio, Evaluation of hydrogen embrittlement of X65 pipeline steel in high pressure hydrogen gas using tubular samples

EUROCORR 2023, 2023, Brussels, Belgium, Poster

S. Rahimi, A. Bordbar Khiabani, B. Yarmand, A. Kolahi, Comparison of corrosion and antibacterial properties of Al alloy treated by plasma electrolytic oxidation and anodizing methods

INN International Conference/Workshop on Nanotechnology and Nanomedicine, 2017, Karaj, Iran, Poster

S. Rahimi, B. Yarmand, A. Kolahi, Effect of current density, duty cycle and duration time on corrosion behavior of Al alloy treated by plasma electrolytic oxidation

2nd International Conference of the Iranian Ceramic Society, 2017, Tehran, Iran, Poster

S. Rahimi, B. Yarmand, A. Kolahi, Coating of automotive Al-Si based cylinders by plasma electrolytic oxidation (text in Persian)

2nd National Conference of Mechanics-Materials and Advanced Technology, 2016, North Khorasan, Iran, Oral presentation

12/11/2024