

Naeimeh Sadat Peighambardoust

Personal Information

- **Address:** Koc University Boron and Advanced Materials Applications and Research Center (KUBAM), Rumelifeneri Yolu, Sariyer, Istanbul-34450, Türkiye
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Scientific Motivation

My primary motivation in science is to conduct groundbreaking interdisciplinary research by combining basic and applied concepts of chemistry, physics, and materials science.

Education

- **Ph.D. in Materials Science and Engineering**

University of Tabriz, Tabriz, Iran (2014-2018)

GPA: 3.63/4 (Dissertation grade is not included)

Dissertation: “Fabrication and optimization of TiO₂ nanotube electrodes for use in photoelectrochemical cells”

Advisor: Dr. Shahin Khameneh asl

- **M.Sc. in Materials Science and Engineering**

Sahand University of Technology, Tabriz, Iran (2009-2011)

GPA: 3.74/4 (Dissertation grade is not included)

Thesis: “Investigation on the effects of multi-step anodic oxidation on the geometry, surface, and morphological properties of titanium oxide nanotube arrays.”

Advisor: Prof. Dr. Farzad Nasirpouri

- **B.Sc. in Materials Science and Engineering**

Sahand University of Technology, Tabriz, Iran (2005-2009)

GPA: 3.5/4

Thesis: “Chemical analysis in extractive metallurgy by wet chemistry.”

Advisor: Dr. Javad Moghaddam

Professional Experiences

- **Research Associate**

Koc University Boron and Advanced Materials Applications and Research Center (KUBAM), Istanbul, Türkiye (2019 – Present)

Research on “Electrochemical and Photoelectrochemical Cells”

- **Postdoctoral Researcher**

Koc University Surface and Technology Center (KUYTAM), Istanbul, Türkiye (2018 – 2019)

Research on “Electrochemical Studies of High Entropy Alloys”

Fellowships and Awards

- **2022:** Recipient of the TÜBİTAK 3501 Research Fund as Principal Investigator
- **2021:** Recipient of the Koc University Seed Research Fund as Principal Investigator
- **2018:** TÜBİTAK 2216 Postdoctoral Grant
- **2014:** Full scholarship for Ph.D. study at University of Tabriz
- **2011:** 1st Rank among Material Science graduates at Sahand University of Technology

- **2009:** 1st Rank among Material Science graduates and Full scholarship for M.Sc. study at Sahand University of Technology.

Teaching Experiences

- Teaching assistant, Corrosion, Undergraduate course, University of Tabriz, (2016-2018)
- Instructor, Powder Metallurgy, Surface and Coating, Metallurgy science and Heat treatment, Undergraduate course, Payame Noor University, Tabriz (2015-2018)
- Teaching assistant, Metal forming, Undergraduate course, Sahand University of Technology, (2010-2012)

Research Experiences

- Coating and Surface Engineering
- Nanomaterials and Quantum Dots
- Perovskites, MOFs, and 2D materials
- Electrochemical and Photoelectrochemical Cells

Publications Summary

- **Number of citations:** 856 (808)
- h-index:** 16 (21), Source: Google Scholar, [Naeimeh Sadat Peighambaroust](#)

Publications

1. Foroughi, M., Peighambaroust, S.J.*, Ramavandi, B., Foroutan, R., **Peighambaroust, N.S.** (2024): Simultaneous degradation of methyl orange and indigo carmine dyes from an aqueous solution using nanostructured WO₃ and CuO supported on Zeolite 4A. In: Separation and Purification Technology, 344, 127265.
2. Sadeghi, E., Chamani, S., Yildirim, I.D., Erdem, E., **Peighambaroust, N.S.**, Aydemir, U.* (2024): In Situ Design of a Nanostructured Interface between NiMo and CuO Derived from Metal–Organic Framework for Enhanced Hydrogen Evolution in Alkaline Solutions. In: ACS Applied Materials & Interfaces, 16, 10078–10092.
3. **Peighambaroust, N.S.**, Akbari, S.S., Lomlu, R., Aydemir, U. *, Karadas, F. * (2023): Tunable Photocatalytic Activity of CoFe Prussian Blue Analogue Modified SrTiO₃ Core–Shell Structures for Solar-Driven Water Oxidation. In: ACS Mater. Au, December 18.
4. Sadeghi, E., Chamani, S., Erdem, E., **Peighambaroust, N.S.**, Aydemir, U.* (2023): NiMo/CoMoO₄ Heterostructure with Confined Oxygen Vacancy for Active and Durable Alkaline Hydrogen Evolution Reaction. In: ACS Applied Energy Materials, 6 (14), 7658-7671.
5. Chamani, S., Sadeghi, E., Unal, U., **Peighambaroust, N.S.**, Aydemir, U.* (2023): Tuning Electrochemical Hydrogen-Evolution Activity of CoMoO₄ through Zn Incorporation. In: Catalysts, 13, 798.
6. Babaie-Aghdam, S., **Peighambaroust, N.S.**, Nasirpouri, F.* (2023): Morphological evolution of sol-electrophoretic deposited ZnO nanostructures on anodic TiO₂ nanotubes for back-side illuminated dye-sensitised solar cells. In: Materials Research Bulletin, 160, 112134.
7. Mokhtari, A., Yavari, A., Khatamian, M.*, Sadeghi, E., **Peighambaroust, N.S.**, Aydemir, U. (2023): Facile synthesis of graphene quantum dots/ZSM-5 type metalosilicate composites and evaluating their performance in photocatalytic degradation of methylene blue and electrochemical water splitting. In: Advanced Powder Technology, 34, 103892.

8. Sadeghi, E., **Peighambardoust, N.S.**, Chamani, S., Aydemir, U.* (2023): Designing In Situ Grown Ternary Oxide/2D Ni-BDC MOF Nanocomposites on Nickel Foam as Efficient Electrocatalysts for Electrochemical Water Splitting. In: ACS Materials Au, 3, 143-163.
9. Hasan, I., Tarık, S., Öztürk, U., **Peighambardoust, N.S.**, Duygulu, Ö., Işık-Gülsaç, I., Altun, M., Ateş, M.N.* (2022): Deciphering the effect of the heat treatment on the electrodeposited silicon anode for Li-ion batteries. In: Journal of Energy Storage, 55, 105817.
10. **Peighambardoust, N.S.**, Hatipoglu, E., Aydemir, U.* (2022): Structure-Induced Catalytic Activity of Nickel- and Cobalt-Substituted Layered MoB₂ toward Hydrogen Evolution. In: ACS Sustainable Chem. Eng., 10, 15909.
11. **Peighambardoust, N.S.**, Sadeghi, E., Aydemir, U.* (2022): Lead Halide Perovskite Quantum Dots for Photovoltaics and Photocatalysis: A Review. In: ACS Applied Nano Materials, 10, 14092-14132.
12. Chamani, S., Sadeghi, E., **Peighambardoust, N.S.**, Doganay, F., Yanalak, G., Eroglu, Z., Aslan, E., Asghari, E., Metin, O., Patir, I.*, Khatamian, M.*, Aydemir, U.* (2022): Photocatalytic Hydrogen Evolution Performance of Metal Ferrites/Polypyrrole Nanocomposites. In: International Journal of Hydrogen Energy, 77, 32940-32954.
13. Hatipoglu, E., **Peighambardoust, N.S.**, Aydemir, U.* (2022): Design of metal-substituted tungsten diboride as an efficient bifunctional electrocatalyst for hydrogen and oxygen evolution. In: International Journal of Energy Research, 1-16.
14. Foroutan, R., Peighambardoust, S.J.*, Amarzadeh, M., Korri, A.K., **Peighambardoust, N.S.**, Ahmad, A.*, Ramavandi, B.* (2022): Nickel ions abatement from aqueous solutions and shipbuilding industry wastewater using ZIF-8-chicken beak hydroxyapatite. In: Journal of Molecular Liquids, 356, 119003.
15. **Peighambardoust, N.S.**, Sadeghi, E., Mete, B., Yagci, M.B., Aydemir, U.* (2022): Evaluating Electrocatalytic Activity of Metal-Substituted Hafnium Diboride (Hf_{1-x}TM_xB₂; TM = Ni and Co) toward Water Splitting. In: Journal of Alloys and Compounds, 905, 164148.
16. Sadeghi, E., **Peighambardoust, N.S.**, Aydemir, U.* (2021): Tailoring the Morphology of Cost-Effective Vanadium Diboride Through Cobalt Substitution for Highly Efficient Alkaline Water Oxidation. In: Inorganic Chemistry, 60, 19457-19466.
17. Chamani, S., Khatamian, M.*, **Peighambardoust, N.S.**, Aydemir, U.* (2021): Microwave-assisted auto-combustion synthesis of binary/ternary Co_xNi_{1-x}Ferrite for electrochemical hydrogen and oxygen evolution. In: ACS Omega, 6, 33024-33032.
18. Mete, B., **Peighambardoust, N.S.**, Aydin, S., Sadeghi, E., Aydemir, U.* (2021): Metal-Substituted Zirconium Diboride (Zr_{1-x}TM_xB₂; TM = Ni, Co, and Fe) as Cheap and High-Performance Bifunctional Electrocatalyst for Water Splitting. In: Electrochimica Acta, 389, 138789.
19. **Peighambardoust, N.S.**, Alamdari, A.A., Unal, U., Motallebzadeh, A.* (2021): In vitro biocompatibility evaluation of Ti_{1.5}ZrTa_{0.5}Nb_{0.5}Hf_{0.5} refractory high-entropy alloy film for orthopedic implants: microstructural, mechanical properties, and corrosion behavior. In: Journal of Alloys and Compounds, 883, 160786.
20. **Peighambardoust, N.S.**, Aydemir, U.* (2021): Electrophoretic deposition and characterization of self-doped SrTiO₃ thin films. In: Turkish Journal of Chemistry, 45, 323-332.

21. **Peighambardoust, N.S.***, Cevik, C., Assar, T., Jung, S., Lee, S.Y., Cha, J.H.* (2021): Pulsed electric current sintering of TiB₂ based ceramics using nitride additives. In: *Synthesis and Sintering*, 1, 28-33.
22. Sadeghi, E., **Peighambardoust, N.S.**, Khatamian, M., Unal, U., Aydemir, U.* (2021): Metal doped layered MgB₂ nanoparticles as novel electrocatalysts for water splitting. In: *Scientific Reports*, 11, 3337.
23. Moravcik, I.* , **Peighambardoust, N.S.**, Motallebzadeh, A., Moravcikova-Gouvea, L., Dlouhy, I., Raabe, D., Li, Z. (2021): Nitrogen increases corrosion resistance of CoCrNi medium entropy alloy in sulfuric acid solution. In: *Materials Characterization*, 172, 110869.
24. Saei Fard, L.* , Peighambardoust, N.S., Jang, H.W., Dehghan, A., Nehzat Khosh Saligheh, N., Iranpour, M., Isvand Rajabi, M. (2020): The rechargeable aluminum-ion battery with different composite cathodes: A review. In: *Journal of Composites and Compounds*, 2, 138-146.
25. **Peighambardoust, N.S.**, Aydemir, U.* (2020): Blue TiO₂ Nanotube Arrays as Semi-Metallic Materials with Enhanced Photoelectrochemical Activity towards Water Splitting. In: *Turkish Journal of Chemistry*, 44, 1642-1654.
26. Aghajani, H.* , Hadavand, E., **Peighambardoust, N.S.**, Khameneh-asl, S. (2020): Electro spark deposition of WC–TiC–Co–Ni cermet coatings on St52 steel. In: *Surfaces and Interfaces*, 18, 100392.
27. Motallebzadeh, A.* , **Peighambardoust, N.S.**, Sheikh, S., Murakami, H., Guo, S., Canadinc, D. (2019): Microstructural mechanical and electrochemical characterization of TiZrTaHfNb and Ti_{1.5}ZrTa_{0.5}Hf_{0.5}Nb_{0.5} refractory high-entropy alloys for biomedical applications. In: *Intermetallics*, 113, 106572.
28. **Peighambardoust, N.S.**, Khameneh-asl, S.* , Maghsoudi, M. (2019): The effect of doping concentration of TiO₂ nanotubes on energy levels and its direct correlation with photocatalytic activity. In: *Thin Solid Films*, 690, 137558.
29. **Peighambardoust, N.S.**, Khameneh-asl, S.* , Mohammadpour, R., Khameneh-asl, S.* (2019): Improved efficiency in front-side illuminated dye sensitized solar cells based on free standing one-dimensional TiO₂ nanotube array electrodes. In: *Solar Energy*, 184, 115-126.
30. **Peighambardoust, N.S.**, Khameneh-asl, S.* , Khademi, A. (2018): Fabrication of doped TiO₂ nanotube array films with enhanced photo-catalytic activity. In: *AIP Conference Proceedings*, 1920, 020004.
31. **Peighambardoust, N.S.**, Khameneh-asl, S.* , Mohammadpour, R., Khameneh-asl, S. (2018): Band-gap Narrowing and Electrochemical Properties in N-doped and Reduced Anodic TiO₂ Nanotube Arrays. In: *Electrochem. Acta*, 270, 245-255.
32. **Peighambardoust, N.S.**, Khameneh-Asl, S.* , Azimi, H. (2017): Improved performance of anodic titanium oxide nanotube arrays synthesized by sonoelectrochemical anodization method for dyesensitized solar cells. In: *Appl. Phys. A*, 123.5, 345-355.
33. Nasirpouri, F.* , **Peighambardoust, N.S.**, Samardak, A., Ognev, A., Korochentsev, V., Osmushko, I., Binions, R. (2017): Structural defect-induced band-gap narrowing in dopant-free anodic TiO₂ nanotubes. In: *Chem. Electro. Chem.*, 4, 1227-1235.
34. **Peighambardoust, N.-S.**, Nasirpouri, F.* (2014): Electropolishing behavior of pure titanium in perchloric acid–methanol–ethylene glycol mixed solution. In: *Transactions of the IMF*, 92, 132-139.

35. **Peighambardoust, N.-S.**, Nasirpouri, F.* (2013): Manipulating morphology, pore geometry, and ordering degree of TiO₂ nanotube arrays by anodic oxidation. In: Surface & Coatings Technology, 235, 727–734.

Ph.D. Thesis Co-advisors

1. Synthesis and Characterization of Electrocatalysts based on Boron and Earth-abundant Transition Metals for Electrochemical Water splitting, Ebrahim Sadeghi, 2019-2023
2. Metal Ion Doping in Cesium Lead Halide Perovskite Quantum Dots for Efficient and Stable Solar Cells, Pouriya Naziri, 2022-Ongoing

Languages

- **English, Turkish:** Advanced
- **Azerbaijani, Persian:** Native

Skills

- **Software:** Clemex Vision, ZView, Xpert-XRD, WinXPOW, WINCSD (XRD LS and Rietveld refinement), XPS Advantage
- **Analysis apparatus:** BET, XPS, UV/Vis and PLQY spectrophotometer, AFM, XRD, FTIR, TEM