

Curriculum Vitae



Personality

- **Full name:** Mohammad Mohammadi Taghiabadi
- **Date of birth:** August 1986
- **Marital status:** Married, 1 child
- **Address:** Department of chemistry, Tarbiat Modares University, Tehran, Iran
- **Phone:** +98-2182884713
- **E-mail:** mohamad.mta@modares.ac.ir
mohamadi.tech@gmail.com

Education

- **2014-2019**

Ph.D. (Physical chemistry), Isfahan University of Technology, Isfahan, Iran

Thesis title: Influence of Membrane Electrode Assembly Microstructure, Activation Method and Operating Conditions on the Long-Term Performance of PEM Fuel Cells in Flow-through and Dead-ended Anode Modes

GPA: 17.87/20

- **2008-2010**

M.Sc. (Physical chemistry), Tarbiat Modares University, Tehran, Iran

Project title: Synthesis of Platinum nanoparticles in the two phase systems and its application in the catalyst layer of polymer electrolyte membrane fuel cell

GPA: 17.02/20

- **2004-2008**

B.Sc. (Applied chemistry), Tabriz University, Tabriz, Iran

Project title: Elimination of aromatic compounds from mineral oils using catalase enzyme

GPA: 17.88/20

Work experience

March 2021 up to now: Assistant professor of Physical Chemistry- Tarbiat Modares University, Tehran, Iran.

September 2019-September 2020: Visiting professor of Chemistry- Larestan higher education complex, Larestan, Iran.

December 2010-September 2019: R&D manager of AHNS Co., Isfahan, Iran:

Design and construction of PEM fuel cells and DAFCs and their constituents in different size and capacities- Design and construction of Fuel cell tests system, battery tester and hydrogen generator.

Teaching

- Fuel Cells
- Advanced Physical Chemistry
- Chemical Kinetics and Dynamics
- Statistical Thermodynamics
- Physical Chemistry for Engineering
- General Chemistry

Skills

- Design, construction, activation and diagnostics of PEM fuel cell and PEM electrolyser MEAs and electrodes
- Evaluation and performance analysis of fuel cells, electrolyzers and batteries
- Potentiostat & galvanostat methods, EIS
- Team working

Publication

1. H. Gharibi, M. Teimourikhbazi, Banazadeh. S, M. Zhiani, M. M. Taghiabadi, *Optimizing operating conditions and stability evaluation of Fe/Co-NC catalyst in proton exchange membrane fuel cell*. Scientific Reports (2025). <https://doi.org/10.1038/s41598-025-31242-4>.
2. H. Gharibi, Z. Pazhand, M. M. Taghiabadi. *Achieving high capacity by controlling the size of Fe/Co-N-C(t) in the cathode of lithium-oxygen batteries*, Applied Surface Science 680 (2025) 161346, <https://doi.org/10.1016/j.apsusc.2024.161346>.
3. M. Gholamian, M. Zhiani, M. M. Taghiabadi, *Evaluation of an air-breathing anion-exchange membrane fuel cell based on Pd_{0.9}-Cu_{0.1}/rGO anode catalyst for low ethanol sensing*, Fuel 382 (2025) 133357. <https://doi.org/10.1016/j.fuel.2024.133357>.

4. M. Zhiani; P. Yani; M. M. Taghiabadi, *DC high resistance measurement as a simple technique for in situ corrosion-monitoring of epoxy/glass flake coated carbon steel*, Physical chemistry research (2025). <https://doi.org/10.22036/pcr.2025.489853.2595>
5. H. Karami Chamgordani, M. M. Taghiabadi, H. Gharibi, *Titanium-based-supported Pt nanoparticles as highly stable cathode catalyst for low Pt-loading proton exchange membrane fuel cell*, Int. J. Hydrogen Energy 88 (2024) 120-131, <https://doi.org/10.1016/j.ijhydene.2024.09.187>.
6. M. M. Taghiabadi, *Analysis of performance degradation in the dead-ended anode proton exchange membrane fuel cell under different load profiles*, Fuel 357 (2024) 129879, <https://doi.org/10.1016/j.fuel.2023.129879>
7. M. M. Zhiani, M. M. Taghiabadi, M. H. Bagherabadi, *Optimization of Ni-Mo-Coated Stainless Steel as a High-Performance Cathode in Alkaline Water Electrolysis*, Electrocatalysis 14 (2023) 473-483, <https://doi.org/10.1007/s12678-023-00810-5>
8. M. M. Taghiabadi, M. Zhiani, *Degradation analysis of dead-ended anode PEM fuel cell at the low and high thermal and pressure conditions*, Int. J. Hydrogen Energy 44 (2019) 4985-4995, <https://doi.org/10.1016/j.ijhydene.2019.01.040>
9. M. M. Taghiabadi, M. Zhiani, V. Silvab, *Effect of MEA activation method on the long-term performance of PEM fuel cell*, j. Applied Energy 242 (2019) 602–611, <https://doi.org/10.1016/j.apenergy.2019.03.157>.
10. M. M. Taghiabadi, M. Zhiani, M. Shafiei. *Influence of the Cathode Catalyst Layer Void Volume on the Short-term and Long-term Performance of PEM Fuel Cell*, Fuel Cells, 18 (2018) 731-41, <https://doi.org/10.1002/fuce.201800023>.
11. M. Zhiani, S. Majidi, H. Rostami, M. M. Taghiabadi. *Comparative study of aliphatic alcohols electrooxidation on zero-valent palladium complex for direct alcohol fuel cells*, International Journal of Hydrogen Energy, 40 (2015) 568-576, <https://doi.org/10.1016/j.ijhydene.2014.10.144>.
12. M. Zhiani, S. Majidi, M. M. Taghiabadi. *Comparative study of on-line membrane electrode assembly activation procedures in proton exchange membrane fuel cell*, Fuel Cells, 13 (2013) 946-955, <https://doi.org/10.1002/fuce.201200139>.
13. M. Zhiani, J. Jalili, B. Rezaei, M. M. Taghiabadi. *Methanol electrooxidation on synthesized PtRu nanocatalyst supported on acetylene black in half cell and in direct methanol fuel cell*, International Journal of Hydrogen Energy, 38 (2013) 5419-5424, <https://doi.org/10.1016/j.ijhydene.2012.12.088>.
14. H. Gharibi, K. Kakaei, M. Zhiani, M. M. Taghiabadi. *Effect of polyaniline-doped trifluoromethane sulfonic acid nanofiber composite film thickness on electrode for methanol oxidation*, International Journal of Hydrogen Energy, 36 (2011) 13301-13309, <https://doi.org/10.1016/j.ijhydene.2010.09.080>.

Innovation

- 1- Design and construction of high performance membrane electrode assembly without using hot press**
No.: 76039
Country: Iran
- 2- A new electrochemical method of MEA conditioning at the shortest time**
No.: 76041
Country: Iran
- 3- Procedure of gas leak elimination from PEM fuel cell bipolar plates**
No.: 81883
Country: Iran
- 4- Air breathing direct borohydrid fuel cell**
No.: 70572
Country: Iran
- 5- Air breathing direct Isopropyl alcohol fuel cell**
No.: 71975
Country: Iran

Conference Papers

- 1- The Effect of Electrochemical Exfoliation of Carbon Paper Based Cathodes on the EIS Response of Direct Liquid Fuel Cells**, 24th Iranian Inorganic Chemistry Conference, 2026, Iran.
- 2- Enhancing the Electrocatalytic Activity of Carbon Paper Based Cathodes via Electrochemical Exfoliation: A Cost-Effective and Catalyst-Free Approach for Direct Liquid Fuel Cells**, 24th Iranian Inorganic Chemistry Conference, 2026, Iran.
- 3- Optimization of pH and Sodium formate concentration for formate oxidation reaction**, 18th annual electrochemistry seminar of Iran, 2024, Iran.
- 4- Activity evaluation of commercial Pd/C for formate oxidation reaction**, 18th annual electrochemistry seminar of Iran, 2024, Iran.
- 5- Reactants pressure effect on PEMFC performance with nonprecious metal catalyst for cathode**, 18th annual electrochemistry seminar of Iran, 2024, Iran.

6- Performance stability of a bimetallic ORR catalyst (Fe,Co-N-C) in PEMFC under different relative humidities, 18th annual electrochemistry seminar of Iran, 2024, Iran.

7- Study of oxygen reduction reaction activity drop of Pt/C catalyst during aging cycles, 17th annual electrochemistry seminar of Iran, 2023, Iran.

8- Investigation of aging procedure on electrochemical impedance spectroscopy response of commercial 20 wt% Pt/C catalyst, 17th annual electrochemistry seminar of Iran, 2023, Iran.

9- Analysis of PEM fuel cell Catalyst degradation process using cyclic voltammetry, 12th Iranian fuel cell seminar, 2023, Iran.

10- Activity evaluation of Pt/C catalyst for oxygen evaluation reaction in regenerative PEM fuel cell, 12th Iranian fuel cell seminar, 2023, Iran.

11- Optimizing the operating temperature of PEMFC with MOF-based cathode, 17th annual electrochemistry seminar of Iran, 2023, Iran.

12- Fe-NC-S,N-CNT as the cathode of Single PEMFC, 17th annual electrochemistry seminar of Iran, 2023, Iran.

13- Investigating the application of Fe,Co-N-C as the cathode of Single PEMFC, 12th Iranian fuel cell seminar, 2023, Iran.

14- Effects of the cathode relative humidity on the performance of PEMFC with platinum group metal-free cathode, 12th Iranian fuel cell seminar, 2023, Iran.

15- The investigation of Fe/Mn-N-C performance as an oxygen reduction reaction (ORR) electrocatalyst in PEM fuel cell, 5th national Congress of Chemistry and Nanochemistry from Research to Technology, 2023, Iran.

16- Nitrogen-coordinated Fe/Mn electrocatalyst derived from MOF for efficient ORR in PEMFC, 5th national Congress of Chemistry and Nanochemistry from Research to Technology, 2023, Iran.

17- The effect of atmospheric CO₂ on the cathode catalyst activity of zinc-air battery, 16th annual electrochemistry seminar of Iran, 2022, Iran.

18- Investigation of ZnO Impurity Formation on the Cathode Performance of Zinc-Air Battery, 16th annual electrochemistry seminar of Iran, 2022, Iran.

19- *Fe/Co-based metal-organic framework as electrocatalysts for lithium-oxygen batteries*, 16th annual electrochemistry seminar of Iran, 2022, Iran.

20- *Graphite as an electrode additive for inhibition of hydrogen evolution in the anode of zinc-air battery*, 16th annual electrochemistry seminar of Iran, 2022, Iran.

21- *Influence of copper addition to the anode on the performance of zinc-air battery*, 16th annual electrochemistry seminar of Iran, 2022, Iran.

22- *Evaluation of PEMFC performance with nonprecious metal electrocatalysts toward oxygen reduction reaction*, 16th annual electrochemistry seminar of Iran, 2022, Iran.

23- *The investigation of Fe-NC-S,CNT durability as an oxygen reduction reaction electrocatalyst*, 16th annual electrochemistry seminar of Iran, 2022, Iran.

24- *Corrosion behavior analysis of glass-flake/epoxy coated carbon steel under dry and immersion condition using DC high resistance measurement*, 16th annual electrochemistry seminar of Iran, 2022, Iran.

25- *Corrosion resistance evaluation of a carbon steel disk coated with primer and glass-flake/epoxy paint received from the Esfahan Oil Refinery Company using electrochemical impedance spectroscopy*, 16th annual electrochemistry seminar of Iran, 2022, Iran.

26- *Comparison of Chemically Synthesized TiO₂ Nanotube in Different Base Concentration for Oxygen Evolution Reaction (OER) application*, 16th annual electrochemistry seminar of Iran, 2022, Iran.

27- *Synthesis and electrochemical evaluation of a Ir-Ru binary oxide for the O₂ evolution reaction in acidic media*, 16th annual electrochemistry seminar of Iran, 2022, Iran.

28- *Optimization of effective parameters in preparation of IrO₂ and RuO₂ catalyst inks for use in the oxygen evolution reaction in acidic media*, 16th annual electrochemistry seminar of Iran, 2022, Iran.

29- *Investigating the oxygen evolution reaction of TiO₂ nano tube synthesized chemically in acidic medium using electrochemical impedance spectroscopy*, 16th annual electrochemistry seminar of Iran, 2022, Iran.

30- *Preparation of Non-Precious Metal Electrocatalysts Based on Metal Organic Framework for Oxygen Reduction Reaction in Direct Methanol Fuel Cells*, 16th annual electrochemistry seminar of Iran, 2022, Iran.

31- In-situ analysis of dead end anode PEMFC catalyst layer degradation at the low and high thermal and pressure conditions, 15th annual electrochemistry seminar of Iran, 2020, Iran.

32- Durability study of activated membrane electrode assembly using accelerated degradation technique, 13th annual electrochemistry seminar of Iran, 2018, Iran.

33- Optimization of catalyst layer Nafion content in PEMFC cathode electrode made by Ballard carbon paper as electrode substrate, 19th Iranian physical chemistry conference, 2017, Iran.

34- Preparation and evaluation of Copper particles on reduced graphene oxide as an efficient electrocatalyst for enhancing electrochemical performance of the Lithium-Thionyl Chloride Batteries, Graphene seminar, 2016, Malaysia.

35- Effect of potential cyclic and external humidity injection on proton exchange membrane fuel cell performance, 8th Iranian fuel cell seminar, 2015.

36- Electrochemical analysis of anodic catalysts in direct borohydride fuel cell, 8th Iranian fuel cell seminar, 2015.

37- Performance comparison of the two commercial PEMFC electrode substrates: Toray and Ballard carbon paper, 8th Iranian fuel cell seminar, 2015.

38- AC impedance characteristics of a PEM fuel cell under different gas feed modes, 2nd Iranian analytical chemistry seminar, 2014.

39- Electrochemical analysis of a PEMFC under different operation condition, 2nd Iranian analytical chemistry seminar, 2014.

40- Comparison of PEMFC cathodes performance made by Commercial Pt/C with different Pt percentage, 5th Iranian fuel cell seminar, 2013.

41- Evaluation of air breathing Direct Alcohol Fuel Cell with different Alcoholic fuels in alkaline media, 7th annual electrochemistry seminar of Iran, 2013, Iran.

42- Thermal batteries and their application in ejection seats, 7th annual electrochemistry seminar of Iran, 2013, Iran.

43- Synthesis of Platinum nanoparticles in the two phase systems and its application in the catalyst layer of Polymer electrolyte membrane fuel cell, 6th annual electrochemistry seminar of Iran, 2011, Iran.

44- Platinum on the Vulcan Polyaniline doped tri fluoro methane sulfonic acid composite as a new electrocatalyst for DMFC, 4th annual electrochemistry seminar of Iran, 2010, Iran.

External research projects

- 1- Construction and activity evaluation of Platinum/metal oxide nanocatalysts for oxygen reduction reaction to be used in dead-ended anode polymer electrolyte membrane fuel cell**, 2024, Iran National Science Foundation (INSF).
- 2- Production of a high-purity hydrogen generator using proton exchange membrane technology**, 2021, Iran Nanotechnology Innovation Council, Iran.
- 3- Design and construction of a prototype non-rechargeable Zinc-Air battery**, 2021, Isfahan Science and Technology Town, Iran.
- 4- Design and construction of a prototype multi fuel fuel cell**, 2018, Isfahan University of Technology, Iran.
- 5- Feasibility study to build Li-SOCl₂ battery and construction of a prototype Li-SOCl₂ battery**, 2016, National Iranian Gas Company, Iran.
- 6- Design and construction of high performance MEA**, 2015, Iran National Science Foundation (INSF).
- 7- Feasibility study of fuel cell-based air independent propulsion system**, 2013, Isfahan Science and Technology Town.