

Curriculum Vitae



Personality

- **Full name:** Mohammad Mohammadi Taghiabadi
- **Date of birth:** August 1986 (37 years old)
- **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

- Advanced Physical Chemistry
- Chemical Kinetics and Dynamics
- Statistical Thermodynamics
- Physical Chemistry for Engineering
- General Chemistry
- Electrochemistry and Corrosion

Skills

- Design, construction, activation and diagnostics of PEM fuel cell and PEM electrolyser MEA and electrode
- Performance evaluation and analysis of fuel cell, electrolyser and battery
- Potentiostat & galvanostat methods, EIS
- Team working

Publication

1. 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>
2. 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>

3. 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>
4. 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>.
5. 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>.
6. 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>.
7. 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>.
8. 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>.
9. 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- Air breathing direct borohydrid fuel cell

No.: 70572

Country: Iran

2- Air breathing direct Isopropyl alcohol fuel cell

No.: 71975

Country: Iran

3- Design and construction of high performance membrane electrode assembly without using hot press

No.: 76039

Country: Iran

4- A new electrochemical method of MEA conditioning at the shortest time

No.: 76041

Country: Iran

- 5- *Procedure of gas leak elimination from PEM fuel cell bipolar plates*
No.: 81883
Country: Iran

Conference Papers

- 1- *Optimization of pH and Sodium formate concentration for formate oxidation reaction*, 18th annual electrochemistry seminar of Iran, 2024, Iran.
- 2- *Activity evaluation of commercial Pd/C for formate oxidation reaction*, 18th annual electrochemistry seminar of Iran, 2024, Iran.
- 3- *Reactants pressure effect on PEMFC performance with nonprecious metal catalyst for cathode*, 18th annual electrochemistry seminar of Iran, 2024, Iran.
- 4- *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.
- 5- *Study of oxygen reduction reaction activity drop of Pt/C catalyst during aging cycles*, 17th annual electrochemistry seminar of Iran, 2023, Iran.
- 6- *Investigation of aging procedure on electrochemical impedance spectroscopy response of commercial 20 wt% Pt/C catalyst*, 17th annual electrochemistry seminar of Iran, 2023, Iran.
- 7- *Analysis of PEM fuel cell Catalyst degradation process using cyclic voltammetry*, 12th Iranian fuel cell seminar, 2023, Iran.
- 8- *Activity evaluation of Pt/C catalyst for oxygen evaluation reaction in regenerative PEM fuel cell*, 12th Iranian fuel cell seminar, 2023, Iran.
- 9- *Optimizing the operating temperature of PEMFC with MOF-based cathode*, 17th annual electrochemistry seminar of Iran, 2023, Iran.
- 10- *Fe-NC_S,N-CNT as the cathode of Single PEMFC*, 17th annual electrochemistry seminar of Iran, 2023, Iran.
- 11- *Investigating the application of Fe,Co-N-C as the cathode of Single PEMFC*, 12th Iranian fuel cell seminar, 2023, Iran.
- 12- *Effects of the cathode relative humidity on the performance of PEMFC with platinum group metal-free cathode*, 12th Iranian fuel cell seminar, 2023, Iran.

- 13- *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.
- 14- *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.
- 15- *The effect of atmospheric CO₂ on the cathode catalyst activity of zinc-air battery***, 16th annual electrochemistry seminar of Iran, 2022, Iran.
- 16- *Investigation of ZnO Impurity Formation on the Cathode Performance of Zinc-Air Battery***, 16th annual electrochemistry seminar of Iran, 2022, Iran.
- 17- *Fe/Co-based metal-organic framework as electrocatalysts for lithium-oxygen batteries***, 16th annual electrochemistry seminar of Iran, 2022, Iran.
- 18- *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.
- 19- *Influence of copper addition to the anode on the performance of zinc-air battery***, 16th annual electrochemistry seminar of Iran, 2022, Iran.
- 20- *Evaluation of PEMFC performance with nonprecious metal electrocatalysts toward oxygen reduction reaction***, 16th annual electrochemistry seminar of Iran, 2022, Iran.
- 21- *The investigation of Fe-NC_S,CNT durability as an oxygen reduction reaction electrocatalyst***, 16th annual electrochemistry seminar of Iran, 2022, Iran.
- 22- *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.
- 23- *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.

- 24- Comparison of Chemically Synthesized TiO₂ Nanotube in Different Base Concentration for Oxygen Evolution Reaction (OER) application**, 16th annual electrochemistry seminar of Iran, 2022, Iran.
- 25- 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.
- 26- 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.
- 27- 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.
- 28- 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.
- 29- 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.
- 30- Durability study of activated membrane electrode assembly using accelerated degradation technique**, 13th annual electrochemistry seminar of Iran, 2018, Iran.
- 31- 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.
- 32- 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.
- 33- Effect of potential cyclic and external humidity injection on proton exchange membrane fuel cell performance**, 8th Iranian fuel cell seminar, 2015.
- 34- Electrochemical analysis of anodic catalysts in direct borohydride fuel cell**, 8th Iranian fuel cell seminar, 2015.
- 35- Performance comparison of the two commercial PEMFC electrode substrates: Toray and Ballard carbon paper**, 8th Iranian fuel cell seminar, 2015.

- 36- AC impedance characteristics of a PEM fuel cell under different gas feed modes**, 2nd Iranian analytical chemistry seminar, 2014.
- 37- Electrochemical analysis of a PEMFC under different operation condition**, 2nd Iranian analytical chemistry seminar, 2014.
- 38- Comparison of PEMFC cathodes performance made by Commercial Pt/C with different Pt percentage**, 5th Iranian fuel cell seminar, 2013.
- 39- Evaluation of air breathing Direct Alcohol Fuel Cell with different Alcoholic fuels in alkaline media**, 7th annual electrochemistry seminar of Iran, 2013, Iran.
- 40- Thermal batteries and their application in ejection seats**, 7th annual electrochemistry seminar of Iran, 2013, Iran.
- 41- 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.
- 42- 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.