Mohammadali (Amir) Beheshti

Postdoctoral researcher in Electrochemistry field
Sharif University of Technology

Email: mohammadali.beheshti@sharif.edu, amirbeheshti@ut.ac.ir

Homepages: https://scholar.google.com/citations?user=vrVDa-UAAAAJ&hl=en
https://www.linkedin.com/in/amir-beheshti-84b6b95b/

Phone: (+98-911)3213554

Address: Materials Science & Engineering Department, Sharif University of Technology, Tehran, Iran

Research Interests:

- Electrocatalysts, Photoelectrocatalysts & Catalysts for CO_2RR and water splitting
- Composites
- Coatings
- Electrochemical reduction reaction for batteries and fuel cells
- Alloy/bimetallic/composite materials

TERTIARY EDUCATION

PhD (UTP Malaysia) Mechanical Engineering Department	**2016 –2020**
Major	Materials Science and Engineering (Electrochemistry & electrocatalysis)
Topic of research	The electrochemical carbon dioxide conversion to Synthesis Gas (SYNGAS) by Zinc-Nickel bimetallic electrocatalysts
Focus of Research	Investigation of bimetallic material coatings and electrocatalysts
Outputs	10 refereed journal papers + 1 chapter book +2 papers under processing+3 conference certificates + 1poster presentation+ Approved 3 funding grants +1 grant under processing.
Master of Science (Tehran University, Tehran, Iran)	**2007 - 2010**
Major	Materials Science and Engineering (Electrochemistry)
Cumulative GPA	75.5% (Distinction)
Thesis	Design and Implementation of Scanning Open Circuit Potential System on Smooth Surfaces by SRET
Focus of Thesis	Investigation of corrosion, quality of coating and reaction of surface by inspection of double layer voltage
Outputs	1 refereed journal paper, 1 patent, 4 conferences, 2posters, 1 silver medal, 1 cup best presentation
Bachelor of Science (Bu-Ali Sina University, Iran)	**2003 - 2007**
Major	Materials Science and Engineering (Ceramics and composites)
Cumulative GPA	76.2% (Credit)
Thesis	Reinforcement of Portland Cement, SiC-Si_3N_4 composites
Outputs	Firs rank in bachelor's degree. Rank 34 in Master entrance exam (in country)

TEACHING EXPERIENCE

Courses	University
Corrosion, Electrochemistry, and basic material Science (Corrosion, Solidification, Mechanical properties, Physical properties of materials)	F.Z.A University -Amol-IRAN (2009-2016)
Corrosion, Electrochemistry, and basic material Science (Corrosion, Solidification, Mechanical properties, Physical properties of materials)	Azad university, Amol, IRAN (2013-2015)
Engineering materials, Introduction material science, Thermodynamic	Universiti Teknologi Petronas (UTP) 2016-2020

PROFESSIONAL WORK/RESEARCH EXPERIENCE

Sharif University of Technology **2021-now**
Postdoctoral researcher

Focus of study

- Investigation of photo/electrocatalyst for CO_2 reduction reaction by NiCoS, MOFs, AgZIF67, AuZIF67 and Au-AgZIF67 catalysts.
- Investigation and study for CO_2 capture from the Air
- Natural gas purification by simultaneously adsorption and conversion of CO_2 and H_2S based on photoelectrocatalytic methods using solar energy

Universiti Teknologi PETRONAS (UTP) **2016-2020**
PhD student in Centre for Corrosion Research (CCR)

Focus of study

- Investigation of bimetallic materials as electrocatalyst for CO_2 reduction reaction
- Investigation of Impressed Current Cathodic Protection in seawater reinforced concrete
- A Study on organic/inorganic Zn-rich coatings
- A Study on water splitting by photo-electrocatalysts
- Design and implementation of Nano/Micro composite of SiC/Si_3N_4 by using SiC/Si powders

Research works

- Provision for preferential weld corrosion (PWC) in inhibited environment using flow loop (**2020**)
- Improvement of cathodic protection and mechanical properties of zinc-rich paints by addition of zinc and nickel nanoparticles (**2020**)
- Enhanced Photocatalytic Performance for Water Splitting (Hydrogen Generation) using Novel Materials as Photo-electrocatalysts (**2020**)
- Investigation of Top of Line Corrosion at various temperature in CO_2 -saturated solution with and without inhibitors (**2019**)
- A Study on Impressed Current Cathodic Protection method for Critical SEAWATER Concrete Structures with simulated pore solution in autoclave (**2018-2020**)
- Design and implementation of Nano/Micro composite of SiC/Si_3N_4 by using SiC/Si powders in N_2 atmospheric furnace and Investigation of rheological and mechanical properties for Nano/Micro composite SiC/Si_3N_4 (**2018-2020**).
- Design and Implementation of H-shaped electrochemical cell for doing CO_2RR with an acceptable efficiency (**2018-2019**)
- Investigation of different kind of Electrocatalysts to convert CO_2 to value added chemical (SYNGAS: $CO+H_2$). (**2016- 2020**).
- Investigation of electrochemical parameters (Solutions, pH, potential, etc.) to convert CO_2 to SYNGAS (**2016- 2020**).

- Investigation and fabrication copper-Graphene Oxide coating by chronopotentiometry and Cyclic voltammetry method (**2018**).
- Investigation of synthesized Honey by electrochemical reaction methods (**2018**).
- Investigation and fabrication Zinc-Nickel-Cobalt coatings by chronopotentiometry method at different voltage (**2018**).
- Investigation and fabrication Zinc-Nickel bimetallic coating by chronopotentiometry and cyclic voltammetry methods at different temperatures and pH (**2016-2017**).
- Investigation and fabrication Zinc-Nickel-Phosphate coating by electroless method (**2017**)

Fouladin Zob Amol Industries (F.Z.A) **2009 -2011 and 2013- 2015**
Imamzade Abdolla Industrial Zone, Amol, Mazandaran, Iran

Focus of study

- Investigation of additives and compositions of metallic and ceramic materials

Research works

- Investigation of mechanical properties of materials such as tensile, impact and hardness and non-destructive test such as eddy current, magnetic particle, acoustic and ultra-sonic tests by changing experimental conditions.
- Investigation of casting parameters (pouring temperature- type, size, method and amount of inoculations-type and properties of mould such as green sand moulding)
- Investigation of type of materials defects such as shrinkage, pinhole, gas porosity, …

Research institute, Freydonkenar, IRAN **2011 - 2012**
Fish square, Freydonkenar, Mazandaran, Iran

Focus of study

- Shaping, Coating and Corrosion behaviour of material in PEM fuel cell(bipolar)

Research works

- Investigation of type, material and shape of anode and cathode in PEM fuel cell (composite graphite, Stainless steel 316 L...
- Investigation of gold coating upon stainless steel 316L as cathode and anode for PEM fuel cell.
- Investigation of shaping method for stainless steel 316L with 0.1 mm thickness as cathode and anode for PEM fuel cell.
- Investigation of types of gasket for PEM fuel cell.
- Study on types of batteries specially Lithium batteries.
- Study on types of Scanning Probe Microscopy such as SECM, AFM, MFM, STM.

ANALYTICAL AND SIMULATION SKILLS

Techniques	**Acronym**
Transmission and Scanning Mode of Transmission Electron Microscopy	**TEM and STEM**
Convergent Beam Electron Diffraction and Selected Area Electron Diffraction	**CBED and SAED**
Electron Backscattered Diffraction	**EBSD**
Electron Probe Microanalysis	**EPMA**
Scanning Electron Microscopy	**SEM**
X-Ray Diffraction Analysis	**XRD**
Fourier Transform Infrared Spectroscopy	**FTIR**
Atomic Force Microscopy	**AFM**
Scanning ElectroChemical Microscopy	**SECM**
Potentiostate (AutoLab & ACM) & EIS	

Drawchem, Matlab, Catia & Solid work,
Microsoft Office, Photoshop, Minitab, SPSS & DOE

REFEREED JOURNAL PUBLICATIONS

In Print/Online	Citation
1. Investigation of Electrochemical Parameters on Cost-Effective Zn/Ni-Based Electrocatalysts for Electrochemical CO_2 Reduction Reaction to SYNGAS (H_2+ CO), **Journal of The Electrochemical Society**,**2022**, https://doi.org/10.1149/1945-7111/ac645a	0
2. Investigation of Zn/Ni-based electrocatalysts for electrochemical conversion of CO_2 to SYNGAS, Electrocatalysis and Electrocatalysts for a Cleaner Environment: Fundamentals and Applications,**2022/7/6**	1
3. A review of the coating variables impacting corrosion resistance of electroless Ni-based coatings and the recent electrochemical corrosion testing methods, **journal of Corrosion Review. 2022** https://doi.org/10.1515/corrrev-2020-0091	3
4. Modelling and optimization of microhardness of electroless Ni-P-TiO2 composite coating based on machine learning approaches and RSM, **Journal of Materials Research and Technology.** 12, pp 1010-1025, **2021,** https://doi.org/10.1016/j.jmrt.2021.03.063	21
5. Investigation of Zn/Ni-Based Electrocatalysts for Electrochemical Conversion of CO_2 to SYNGAS**, IntechOpen publisher**, Open Access book publishing, the book project under the working title "**Electrocatalysis**", ISBN 978-1-83968-128-8, Published: January 11th, **2021**. DOI: https://doi.org/10.5772/intechopen.95626	0
6. Microstructure, phase compositions and mechanical properties of slip cast sintered SiC/Si_3N_4 composites, **Ceramics International journal,** Volume 47, Issue 9, 1 May **2021,** Pages 13173-13180 https://doi.org/10.1016/j.ceramint.2021.01.182	2
7. Investigation of CO_2 electrochemical reduction to Syngas on Zn/Ni-based electrocatalysts using the cyclic voltammetry method, **Electrochimica Acta journal**, Available online 27 February **2020**, Volume 341, 1 May **2020**, 135976, DOI: https://doi.org/10.1016/j.electacta.2020.135976.	8
8. Influence of temperature and potential range on Zn-Ni deposition properties formed by cyclic voltammetry electrodeposition in chloride bath solution, **journal of corrosion reviews**, 38(2), **2020,** 127-136 ,DOI: https://doi.org/10.1515/corrrev-2019-0086	5
9. Effect of additives on slip casting rheology, microstructure and mechanical properties of Si_3N_4/SiC composites, **Ceramics international journal**, 46(5), **2020**, pp. 6182-6190. https://www.sciencedirect.com/science/article/pii/S0272884219332742	6
10. Influence of Deposition Temperature on the Corrosion Resistance of Electrodeposited Zinc-Nickel Alloy Coatings, **Materialwissenschaft und Werkstofftechnik** 49 (4), **2018**, 472-482 **.**https://onlinelibrary.wiley.com/doi/abs/10.1002/mawe.201700284	13
11. Investigation on simultaneous effects of shot-peen and austenitizing time and temperature on grain size and microstructure of austenitic manganese steel (HADFIELD), **Materials Science and Engineering** 328 (1), **2018**, 012006**.** https://iopscience.iop.org/article/10.1088/1757-899X/328/1/012006/meta	3
12. Iridium Oxide pH Sensor Based on Stainless Steel Wire for pH Mapping on Metal Surface, **Materials Science and Engineering** 328 (1), **2018,** 012014. https://iopscience.iop.org/article/10.1088/1757-899X/328/1/012014/meta	6
13. Design and Implementation of Scanning ElectroChemical Microscopy (SECM) for Scanning Open Circuit Potential System on Damaged Coated Surfaces, **ARPN Journal of Engineering and Applied Sciences** 11 (24), **2016**, 14299-14302**.** http://www.arpnjournals.org/jeas/research_papers/rp_2016/jeas_1216_5538.pdf	4

BOOKs

Investigation of Zn/Ni-Based Electrocatalysts for Electrochemical Conversion of CO_2 to SYNGAS, IntechOpen publisher, Open Access book publishing, the book project under the working title "Electrocatalysis", ISBN 978-1-83968-128-8, Published: January 11th, 2021.
DOI: 10.5772/intechopen.95626.

PATENTs

"*Design and production of Scanning ElectroChemical Microscopy*", 2010, Iranian Patent, Serial Number A/85-013823 Series, Patent Registration Book No. 64216, Granted 11 April 2010

CONFERENCES

1-Investigation of surface and coating by **S**canning **E**lectro**C**hemical **M**icroscopy, 11nd International Conference on Surface Engineering (**2010**)", Olympic Hotel, Iran **(as presenter and designer)**.
2-Investigation on Simultaneous Effects of shot peen and austenitizing time and temperature on Grain size and Microstructure of Austenitic Manganese Steel (Hadfield), **2015** 5th International Conference on Key Engineering Materials (ICKEM 2015) **(as presenter and designer)**.
3- Design and Implementation of Scanning ElectroChemical Microscopy (SECM) for Scanning Open Circuit Potential System on Damaged Coated Surfaces, Twin Tower in Malaysia, (ICPER **2016**) **(as presenter and designer)**.
4-Participate as member in 2ND ICONTES CONGRESS 27-29 July 2016 in Malaysia (ICONTES **2016**).
5- Influence of Deposition Temperature on the Corrosion Resistance of Electrodeposited Zinc-Nickel Alloy Coatings, ICMMPE **2017 (as presenter and designer)**
6- Investigation on simultaneous effects of shot peen and austenitizing time and temperature on grain size and microstructure of austenitic manganese steel (hadfield), **ICMMPE 2017 (as presenter)**
7- Iridium Oxide pH Sensor Based on Stainless Steel Wire for pH Mapping on Metal Surface, **ICMMPE 2017 (as presenter)**

POSTERS

1- Design and Implementation of Scanning pH System on Smooth Surface, SEDEX 37, 03-04 Aug **2016** (Malaysia)**.**
2- Design and Implementation of Scanning electrochemical microscopy for investigation of corrosion in Smooth Surface, SEDEX 38, 03-04 Nov **2016** (Malaysia)**.**
3- Influence of deposition temperature on the corrosion resistance of electrodeposited zinc-nickel alloy coatings, SEDEX 39, 09-10 August **2017** (Malaysia)**.**

CUPs & MEDALs

1- **Silver medal** in SEDEX 37 (03-04 Aug 2016) in Malaysia (Design and Implement of Scanning ElectroChemical Microscopy" (Malaysia).
2- **Cup of best poster** in SEDEX 37 (03-04 Aug 2016) in Malaysia (Design and Implement of Scanning ElectroChemical Microscopy" (Malaysia).
3- **Gold Medal** in volleyball tournament at international student sports carnival (ISSC) 2017" (Malaysia).
4- **Best unranked** chess player in chess champions in Malaysia 2017.
5- **Two Gold medals** for Basketball tournament in state (Iran2004)
6- **One Gold** and **one Silver** medals for chess champions (Iran2005)

REVIEWING ACTIVITIES

Journal of Applied electrochemistry
Journal of Materialwissenschaft und Werkstofftechnik
Journal of RSC Advances

Certificates

- ✓ Certificate of participation in Short course "introduction to composite materials" 2 days 11th and 12th July (**2018**).
- ✓ Certificate of participation in the corrosion CAMP, 3 days, 23rd -25th January (**2018**).
- ✓ Best unranked chess player in chess champions in Malaysia (**2017**).
- ✓ Presenter certificate for poster in SEDEX 39 (invention festival in Malaysia) (Aug **2017**)
- ✓ Certificate for having successfully completed the lecture of "Drilling activities and technics" organised by TOTAL company 4 days 22nd to 25th Nov (**2016**).
- ✓ Certificate of participation in Short course "Gas Chromatography" Fundamentals, Applications and Practical Approach" 2 days 29th and 30th Nov (**2016**).
- ✓ Presenter certificate for poster in SEDEX 38 (invention festival in Malaysia) (Nov **2016**)
- ✓ Presenter certificate for poster in SEDEX 37 (invention festival in Malaysia) (June **2016**).
- ✓ Members participate certificate in 2ND ICONTES (**2016**).
- ✓ Best poster certificate in SEDEX 37 (invention festival in Malaysia) (June **2016**).
- ✓ Silver medal certificate in SEDEX 37 (invention festival in Malaysia) (June **2016**).
- ✓ Presenter certificate in ICPER conference (**2016**).
- ✓ Honourable Mention as Outstanding Researcher (**2014-2015**)
- ✓ Honourable mention as Outstanding Rescuer (**2014**)
- ✓ Human Resource Development component course (**2014**)
- ✓ In the course of induction furnaces (**2013**)
- ✓ Continuous Casting Moulding (**2013**)
- ✓ SPC training (**2013**)
- ✓ Defects of castings (**2012**)
- ✓ Course quality requirements SAPCO (**2012**)
- ✓ The design of the runner system in casting materials (**2011**)
- ✓ Training of SQA (**2011**)
- ✓ Patent Registration Certificate (**2010**)
- ✓ Identification and selection of steel-on-steel key (**2010**)
- ✓ Festival of National Elite Foundation Damavand (for SECM) (**2010**)
- ✓ Certificate of attendance at the workshop elite festival Damavand (**2010**)
- ✓ Specialized courses Crescent (**2008**).
- ✓ Red Crescent relief and rescue road course (**2008**).
- ✓ Red Crescent first aid training (**2007**).
- ✓ Certificate of First Rank in Bu Ali Sina University (Bachelor) (**2007**)
- ✓ Rank 7 and 10 in Marathon Championships (**2006**).
- ✓ First place inside the university certificate volleyball tournament (**2005**)
- ✓ Chess champions in city and state (silver and gold medals) (**2005**).
- ✓ Basketball Tournament in state and city (gold medal) (**2004**).
- ✓ First place inside the University Futsal Championship certificate (**2004**)

Grants

- ✓ Iran National Science Foundation (INSF) and Chinese Academy of Sciences (CAS)(**2021-now)**
- ✓ PETRONAS RESEARCH SDN. BHD. (PRSB) 164,300 RM, (**2020-2021**).
- ✓ YUTP-FUNDAMENTAL RESEARCH GRANT (YUTP-FRG) (15LC0-165) UTP, Malaysia 166,000 RM, (**2018-2021**)
- ✓ URIF GRANT (0153AA-B96) UTP, Malaysia, 50,000 RM (**2016-2018**).

Others

- ✓ First rank in bachelor's degree
- ✓ Rank 34 in Master entrance exam (In the country, out of ~20,000 applicants)
- ✓ Supervision of 12 student (Undergraduate and master students) in PhD (2016-2020)
- ✓ Supervision of 2 PhD, 2 master and 3 undergraduate students (2021-now)