

# MATIN MOHEBI

## Current address

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## RESEARCH INTERESTS

- **Batteries (metal-ion, metal-air)**
- **Electrocatalysts and Photocatalysts**
- **Biosensors**
- Additive manufacturing of metal alloys and polymers
- Polymer and composite materials

## EDUCATION

- **Sharif University of Technology**, Tehran, Iran  
B.Sc. in Material Science and Engineering, 2018-present.  
Last year's GPA: **3.6/4**, GPA till now: **16.37/20 (The top 15% of our entries)**
- **Allameh Tabatabai High School**, Tehran, Iran  
Diploma in Mathematics and Physics, 2014 – 2018 GPA: **19.67/20 (4/4)**

## PUBLICATION

- **Synthesis a novel  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub> /Ni MOF nanocomposite anode for lithium-ion batteries**, Under Preparation
- **Topological insulator Bi<sub>2</sub>Te<sub>3</sub> co-catalyst on Ternary NiFeCo-metal-organic framework for overall water splitting**, submitted

## RESEARCH EXPERIENCES

- **B.Sc. Project at Sharif University of Technology**, April 2021 - present.  
Studying different types of lithium-ion battery anodes, first synthesis hard - carbon (intercalation anode) from the source of Lignin and its composite with graphene oxide to increase reversible capacity, then synthesis Fe<sub>2</sub>O<sub>3</sub> Nano Cube (conversion anode) coated with Ni MOF as a high capacity anode material for Li-ion batteries. (under preparation article) Advised by Prof. A. Simchi, Department of Material Science and Engineering
- **Voluntary Project at Sharif University of Technology**, June 2022 - present.  
Working on assembling Gas Metal Arc Welding (GMAW/MIG) machine which moves in 4 axes. Moreover, working on producing Al alloys with Friction Stir Additive Manufacturing. Advised by Prof. M. Movahedi, Department of Material Science and Engineering

- **Project at Tose'e Paidar Group**, July 2021 - October 2021  
Working on possible methods of increasing copper concentration for a special copper solution
- **Internship at Tose'e Paidar Group**, Tehran, July 2021 – September 2021  
Research on lithium extraction from brine and sea for manufacturing lithium-ion battery Industries such as electrical devices and hybrid vehicles product line.

## TEACHING EXPERIENCE

### Teaching Assistant (Allameh Tabatabai High School)

- Physics, Dr. Ebrahim Bazghandi, Jan 2019 - Jan 2020
- Mathematics, Dr. Mojtaba Ansari, Jan 2019 - May 2019

## HONORS AND AWARDS

- **600th place out of 300,000** competitors in National University Entrance Exam of mathematics and physics, Summer 2018  
Admission to Sharif University of Technology B.Sc. program and Full scholarship
- Acceptance of **stages 1 and 2** of the **National Physics Olympiad** out of 25000 competitors
- Top student Award, Ranked 1st among about 120 students of the major Mathematics and Physics, **Allameh Tabatabai High School**, Tehran, Iran

## SKILLS

- **Technical**
  - Languages and Tools: Python, Matlab (coding)
  - Software: AutoCAD, Origin, ProCast, COMSOL (battery), Adobe Photoshop, ZView, Nova, HSC
  - Image Processing: image j, VMTK
  - Typesetting: Microsoft Office (working fluently)
- **Social**
  - Teamwork, Leadership, Fast Learner, Problem Solving, Creativity, Public Speaking

## PROJECTS

- Using Hard – Carbon and its Composite with Graphene Oxide as Anode Material for Lithium-ion and Potassium-ion Batteries-Dr. Simchi
- Producing Fe<sub>2</sub>O<sub>3</sub> Nano Cube (conversion anode) coated with Ni MOF as an anode material for Li-ion Batteries-Dr. Simchi, bachelor project
- Synthesis of Graphene Oxide by modified Hummers Method-Dr. Simchi
- Producing Bi<sub>2</sub>Te<sub>3</sub>/Ni, Co, Fe MOF Structure as Electrocatalyst for Water Splitting-Dr. Simchi (submitted article)
- Producing Al alloys with Friction Stir Additive Manufacturing (FSAM)-Dr. Movahedi
- Research on Corrosion behavior of Aluminum alloys in the Sea Water-Corrosion Lab, May 2021
- Research on MXene as an anode material for Li-ion batteries-Dr.Maddah Hosseini, May 2022
- Research on function of Pattern in Casting-Dr. Tavakoli, December 2020

- Research on Metal Matrix Composites - Dr. Pircheraghi, Mar 2021
- Tests for Measurement of Interfacial Strength of Composite - Dr. Pircheraghi, Apr 2021
- Using the thermoforming method for producing HIPS - Dr. Pircheraghi, Apr 2021

## **CERTIFICATIONS**

- **Transmission Electron Microscopy (TEM) for materials science**, provided by Ecole Polytechnique Fédérale de Lausanne, Coursera Platform
- **Introduction to Battery – Management Systems**, provided by University of Colorado Boulder, Coursera Platform
- **Density Functional Theory (DFT)**, provided by Ecole Polytechnique, Coursera Platform
- **Advance Scanning Electron Microscope (SEM)**, provided by Yazd University
- **UV-Vis FTIR spectroscopy**, provided by Nano Education Portal
- **X-Ray Diffraction Analysis (XRD)**, provided by Nano Education Portal
- **ZView Software for Electrochemical Studies**, provided by Nano Education Portal
- **Sharif lithium battery one-day webinar**, provided by physic department at Sharif University of Technology
- **Additive Technologies in Metallurgy and Mechanical Engineering**, provided by Petersburg Polytechnic University, Coursera Platform
- **3D Printing Applications**, provided by the University of Illinois at Urbana-Champaign
- **COMSOL Multiphysics**, provided by Nano Education Portal

## **Laboratory, Experimental, and Characterization Experience**

- **Characterization**
  - XRD, TEM, SEM, UV-VIS absorption spectroscopy
- **Mechanical Properties Lab**
  - Tensile, Fatigue, Creep, Izod and Charpy impact, Hardness indentation, Bending, K1C and Compression tests
- **Quality Control and Non-Destructive Tests**
  - Liquid penetration, Magnetic particle, Eddy – current, Industrial radiography, Ultrasonic and inspection method

## **LANGUAGES**

- Persian – Native
- English – Full professional proficiency