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Faculty of Chemical and Materials Engineering,
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Professional Experience

Sep. 2019-present **Assistant Professor in Chemical Engineering**
Shahrood University of Technology, Shahrood, Iran

Education

Sep. 2014-Oct. 2018 **PhD in Chemical Engineering**
Sharif University of Technology, Tehran, Iran.
“Synthesis of metal-organic frameworks (MOFs) nano-hybrids for removal of organic pollutants from petrochemical and colored wastewaters”
Supervisors: Professors Manouchehr Vossoughi, N.M. Mahmoodi and Iran Alemzadeh

Sep. 2011-Jun. 2013 **Master of Science in Chemical Engineering (Separation processes)**
Sharif University of Technology, Tehran, Iran
“Synthesis and Modification of ZnFe₂O₄ Nanoparticles surface for separation of dyes from colored wastewaters”, Supervisors: Professors Dariush Bastani and N.M. Mahmoodi

Jun. 2011-Sep. 2011 **Internship**
Task: Worked as a quality control inspector in polymeric equipment construction group of the manufacturer company in Kurdistan, Iran.

Sep. 2007-Jun. 2011 **Bachelor of Science in Chemical Engineering (Polymer)**
Arak University (AU), Arak, Iran. “Applications of antifouling colors”, Supervisor: Dr. Sadegh Moradi

Research Experience

2017-2018 **Visiting Research Assistant**
Institute of Chemical Sciences and Engineering, EPFL University, Lausanne, Switzerland

2012-2019 **Research Assistant**
Institute for Color Science and Technology, Tehran, Iran

2016-2018 **Research Assistant**
Biochemical and Bioenvironmental Research Center, Sharif University of Technology, Tehran, Iran

Research Interests

- Chemical and Environmental Engineering
- Fabrication, modification and characterization of materials (MOFs, Activated Carbon, Zeolite, Graphene, Magnetic nanoparticles, Polymers, Nanofibers, Electrodes, Nano-biocatalysts)

- Membrane Separation Technology (MMMs, and TFN)
- Wastewater treatment (Organic pollutants, heavy metals)
- Advanced adsorption separation process
- Advanced oxidation processes (AOPs)
- Gas separation (Air pollution)
- Mathematical modelling (Machine learning and intelligent models)

Selected honors and awards

- Distinguished young researcher in Shahrood University of Technology (2022)
- Distinguished Researcher of Chemical Engineering, Department of Chemical & Petroleum Engineering, Sharif University of Technology, Tehran, Iran (2018)
- Research scholarship for research stay in Switzerland (EPFL University-2018)
- Iranian Patent No. : 90050 (Colored wastewater treatment using Laccase immobilized manganese ferrite nanoparticle)
- Ranked 24th among 1987 chemical engineers in nationwide university entrance exam in chemical engineering for PhD degree in Iran (2014)
- Research Fellowship, National Iranian Council of Elites, Tehran, Iran (2013)
- Outstanding Chemical Engineering student, selected by the Iranian Association of Chemical Engineering (IACHE), 7th Iranian Chemical Engineers summit (2011)
- Ranked 1st among B.Sc. students of chemical engineering in Arak University
- First Ranked in pre-collage period among 150 students
- First Ranked in the all years of high school among 300 students

Teaching Experience

• Thesis Supervisor

1. Hannaneh Saveh, M.Sc., Graduated May, 2023

Dissertation Title: “Investigation of the performance of nano-composite ZIF-8 and layered double hydroxide for sono-catalysis removal of pharmaceutical pollutant”.

2. Abdullah Ahmed Faraj, M.Sc., Graduated March, 2023

Dissertation Title: “Modeling of the adsorption of different pollutants over metal organic frameworks: kinetic and isotherm study”.

3. Ali Jaafar Ghafil, M.Sc., Graduated September, 2022

Dissertation Title: “Evaluation of the performance of Mxene for adsorptive Removal of heavy metals ions from waste water”.

• Thesis Advisor

1. Negar Mohammadian, M.Sc., Graduated May, 2023

Dissertation Title: “Evaluation of the efficiency of biochar-iron oxide nanoparticles composite adsorbent (MNP-BC) in the removal of metronidazole antibiotic from aqueous solution”

2. Behnaz Latifian, M.Sc., Graduated April, 2023

Dissertation Title: “Synthesis and experimental study of metal-organic framework (MOF) nano-photocatalysts with antibacterial properties”

3. Ziba Rahmati, M.Sc., Graduated September 16, 2018

Dissertation Title: “Synthesis and experimental study of metal-organic framework (MOF) nano-photocatalysts with antibacterial properties”

4. Sahar Sakhaei, Maede Yahyanejad, B.Sc., Undergraduate August 26, 2018

Dissertation Title: "Investigation of photo degradation of dyes in textile industries effluent using metal-organic framework (MOF)"

- **Teaching at the Payame Noor University (P.N.U), Sanandaj Center, Iran (2014-2016).**
(Thermodynamic, Fluid Mechanics, Chemical Reaction Engineering, Unit Operation, Heat Transfer and Fluid Mechanics Laboratory)
- **Teaching assistant (TA), (2016-2017)**
Water and Wastewater Treatment, Department of Chemical & Petroleum Engineering, Sharif University of Technology, Tehran, Iran

Publications

❖ Publication in refereed ISI journals

1. **J. Abdi**, T. Pirhoushyaran, F. Hadavimoghaddam, S. A. Madani, A.H. Hemmati-Sarapardeh, S. H. Esmaeili-Faraj. "Modeling of capacitance for carbon-based supercapacitors using Super Learner algorithm", *Journal of Energy Storage* 66 (2023): 107376.
2. **J. Abdi**, G. Mazloom. "Machine learning approaches for predicting arsenic adsorption from water using porous metal-organic frameworks." *Scientific Reports* 12.1 (2022): 1-13.
3. M. Shahmirzaee, **J. Abdi**, A.H. Hemmati-Sarapardeh, M. Schaffie, M. Ranjbar, & A. Khataee, Metal-organic frameworks as advanced sorbents for oil/water separation. *Journal of Molecular Liquids*, (2022), 119900.
4. **J. Abdi**, M. Izadi, M. Bozorg, Improvement of anti-corrosion performance of an epoxy coating using hybrid UiO-66-NH₂/carbon nanotubes nanocomposite. *Scientific reports* 12.1 (2022) 1-14.
5. **J. Abdi**, M.N. Amar, M. Hadipoor, T. Gentzis, A.H. Hemmati-Sarapardeh, M. Ostadhassan, Modeling of brine/CO₂/mineral wettability using gene expression programming: Application to carbon geo-sequestration, *Minerals* 12.6 (2022): 760
6. **J. Abdi**, M. Hadipoor, S.H. Esmaeili-Faraj, B. Vaferi, A modeling approach for estimating hydrogen sulfide solubility in fifteen different imidazole-based ionic liquids. *Scientific reports*, 12(1) (2022) 1-18.
7. A. Khataee, H. Sohrabi, M. Ehsani, M. Agaei, A.J. Sisi, **J. Abdi**, Y. Yoon, State-of-the-art progress of metal-organic framework-based electrochemical and optical sensing platforms for determination of bisphenol A as an endocrine disruptor. *Environmental Research*, (2022) 113536.
8. **J. Abdi**, A.J. Sisi, M. Hadipoor, A.R. Khataee, State of the art on the ultrasonic-assisted removal of environmental pollutants using metal-organic frameworks, *Journal of Hazardous Materials* 424 (2022): 127558.
9. **J. Abdi**, M. Hadipoor, F. Hadavimoghaddam, A.H. Hemmati-Sarapardeh, Estimation of tetracycline antibiotic photodegradation from wastewater by heterogeneous metal-organic frameworks photocatalysts." *Chemosphere* 287 (2022): 132135.
10. **J. Abdi**, F. Hadavimoghaddam, M. Hadipoor, A.H. Hemmati-Sarapardeh, Modeling of CO₂ adsorption capacity by porous metal organic frameworks using advanced decision tree-based models. *Scientific Reports* 11.1 (2021).
11. Gh. Moghadam, **J. Abdi**, F. Banisharif, A.R. Khataee, M.R. Kosari, Nanoarchitecturing hybridized metal-organic framework/graphene nanosheet for removal of an organic pollutant." *Journal of Molecular Liquids* 341 (2021): 117323.
12. **J. Abdi**, F. Banisharif, A.R. Khataee, Amine-functionalized Zr-MOF/CNTs nanocomposite as an efficient and reusable photocatalyst for removing organic contaminants, *Journal of Molecular Liquids* 334 (2021): 116129.

13. **J. Abdi**, H. Abedini, MOF-based polymeric nanocomposite beads as an efficient adsorbent for wastewater treatment in batch and continuous systems: Modelling and experiment, *Chemical Engineering Journal*, (2020): 125862.
14. M. Zarezadeh Mehrizi, **J. Abdi**, M. Rezakazemi, E. Salehi, A Review on Recent Advances in Hollow Spheres for Hydrogen Storage, *International Journal of Hydrogen Energy*, 45 (2020) 17583-17604.
15. **J. Abdi**, Cu- Zeolitic Imidazolate Framework-8 Loaded on Magnetic Nanofiber as a High-efficient Antimicrobial Scaffold, *Journal of Nanostructures*, 10.4 (2020): 817-824.
16. **J. Abdi**, Synthesis of Ag-doped ZIF-8 photocatalyst with excellent performance for dye degradation and antibacterial activity, *Colloids and Surfaces A: Physicochemical and Engineering Aspects* (2020), 125330.
17. Z. Rahmati, **J. Abdi**, M. Vossoughi, I. Alemzadeh, Ag-doped magnetic metal organic framework as a novel nanostructured material for highly efficient antibacterial activity, *Environmental Research*, (2020) 109555.
18. N.M. Mahmoodi, **J. Abdi**, Metal-organic framework as a platform of enzyme to prepare novel environmentally friendly nanobiocatalyst for degrading pollutant in water, *Journal of Industrial and Engineering Chemistry*, 80 (2019) 606-613.
19. N.M. Mahmoodi, M. Taghizadeh, A. Taghizadeh, **J. Abdi**, In situ deposition and photo-reduction of Ag/AgCl on the surface of magnetic metal-organic framework nanocomposite (CoFe₂O₄/NH₂-MIL-125(Ti)): Clarification of synthetic rout and photocatalytic dye degradation under LED visible-light, *Journal of Hazardous Materials*, 378 (2019) 120741.
20. **J. Abdi**, M. Vossoughi, N.M. Mahmoodi, I. Alemzadeh, Synthesis of magnetic metal-organic framework nanocomposite (ZIF-8@SiO₂@MnFe₂O₄) as a novel adsorbent for selective dye removal from multicomponent systems, *Microporous & Mesoporous Materials*, 273 (2019) 177-188.
21. N.M. Mahmoodi, **J. Abdi**, M. Taghizadeh, A. Taghizadeh, M. Vossoughi, Activated carbon/metal-organic framework nanocomposite: Preparation and photocatalytic dye degradation mathematical modelling from wastewater by least squares support vector machine, *Journal of Environmental Management*, 233 (2019), 660-672.
22. N.M. Mahmoodi, **J. Abdi**, Nanoporous metal-organic framework (MOF-199): Synthesis, characterization and photocatalytic degradation of Basic Blue 41, *Microchemical Journal*, 144 (2019), 436-442.
23. N.M. Mahmoodi, M. Taghizadeh, A. Taghizadeh, **J. Abdi**, B. Hayati, A.A. Shekarchi, Bio-based magnetic nanocomposite (eggshell membrane/zeolitic imidazolate framework): Ultrasound-assisted synthesis and pollutant (heavy metal and dye) removal from aqueous media, *Applied Surface Science*, 480 (2019), 288-299.
24. **J. Abdi**, M. Yahyanejad, S. Sakhaei, M. Vossoughi, I. Alemzadeh, Synthesis of porous TiO₂/ZrO₂ photocatalyst derived from zirconium metal organic framework for degradation of organic pollutants under visible light, *Journal of Environmental Chemical Engineering*, 7 (2019), 103096.
25. N.M. Mahmoodi, **J. Abdi**, Surface modified cobalt ferrite nanoparticles with cationic surfactant: Synthesis, multicomponent dye removal modeling and selectivity analysis, *Progress in Color, Colorants and Coatings*, Just accepted, (2019).
26. N.M. Mahmoodi, **J. Abdi**, M. Oveisi, M. Alinia Asli, M. Vossoughi, Metal-organic framework (MIL-100 (Fe)): Synthesis, detailed photocatalytic dye degradation ability in colored textile wastewater and recycling, *Materials Research Bulletin*, 100 (2018) 357-366.
27. N.M. Mahmoodi, Z. M-Shourijeh, **J. Abdi**, Preparation of mesoporous PVA/Chitosan/SiO₂ composite nanofiber and dye removal from wastewater, *Environmental Progress & Sustainable Energy*, (2018), <https://doi.org/10.1002/ep.12933>.
28. **J. Abdi**, M. Vossoughi, N.M. Mahmoodi, I. Alemzadeh, Synthesis of metal-organic framework hybrid nanocomposites based on GO and CNT with high adsorption capacity for dye removal, *Chemical Engineering Journal*, 326 (2017) 1145-1158.

29. **J. Abdi**, M. Vossoughi, N.M. Mahmoodi, I. Alemzadeh, Synthesis of amine-modified zeolitic imidazolate framework-8, ultrasound-assisted dye removal and modeling, *Ultrasonics- Sonochemistry*, 39 (2017) 550–564.
30. E. Salehi, **J. Abdi**, M. Aliei, Assessment of Cu (II) adsorption from water on modified membrane adsorbents using an intelligent approach, *Journal of Saudi Chemical Society*, 20 (2016) 213-219.
31. N.M. Mahmoodi, **J. Abdi**, Z. Afshar-Bakeshloo, J. Abdi, Synthesis and characterization of the functionalized nanoparticle and dye removal modeling, *Desalination and Water Treatment*, 57.50 (2016) 24035-24046.
32. N.M. Mahmoodi, M. Arabloo, **J. Abdi**, Laccase immobilized manganese ferrite nanoparticle: Synthesis and LSSVM intelligent modeling of decolorization, *Water Research*, 67 (2014) 216-226.
33. **J. Abdi**, D. Bastani, J. Abdi, N.M. Mahmoodi, A. Shokrollahi, A. H. Mohammadi, Assessment of competitive dye removal using a reliable method, *Journal of Environmental Chemical Engineering*, 2 (2014) 1672-1683.
34. N.M. Mahmoodi, **J. Abdi**, D. Bastani, Direct dyes removal using modified magnetic ferrite nanoparticle, *Journal of Environmental Health Science and Engineering*, 12 (2014) 96.
35. N.M. Mahmoodi, **J. Abdi**, F. Najafi, Synthesis of urethane polycarboxylate as a novel adsorbent and its binary system dye removal ability from aqueous solution, *Fibers Polymers*, 15 (2014) 446-456.
36. N.M. Mahmoodi, **J. Abdi**, F. Najafi, Gemini polymeric Nano architecture as a novel adsorbent: Synthesis and dye removal from multicomponent system, *Journal of Colloid and Interface Science*, 400 (2013) 88-96.

❖ **Paper submitted for publication in ISI journals**

37. **J. Abdi**, G. Mazloom, A.H. Hemmati-Sarapardeh, Estimation of the main product flow rates of the olefin unit at industrial scale using intelligent models, (Revised in *Scientific Reports*).
38. A. Fahimi Bandpey, **J. Abdi**, T. Taghizade-Firozjaee, Improved estimation of dark fermentation biohydrogen production utilizing a robust CatBoost machine-learning algorithm, (Revised in *Bioresource Technology*).
39. A. J. Ghafil, G. Mazloom, **J. Abdi**, M. Tamtaji, F. Banisharif, Ti₃C₂T_x/ZIF-67 hybrid nanocomposite as a highly effective adsorbent for Pb (II) removal from water: Synthesis and DFT calculations, (Submitted to *Chemical Engineering Journal*).
40. H. Abedini, A. Rozhenko, F. Hadavimoghaddam, **J. Abdi**, A comparative study of the machine learning methods for estimating water-based nanofluids viscosity, (Submitted to *International Communications in Heat and Mass Transfer*).
41. B. Latifian, T. Taghizadeh Firozjaee, **J. Abdi**, Removal of heavy metals from aqueous solution by magnetic composite biochar-iron oxide nanoparticles (MNP-BC), (Submitted to *International Journal of Environmental and Analytical Chemistry*).
42. **J. Abdi**, G. Mazloom, Sonocatalytic degradation of tetracycline hydrochloride using SnO₂ nanofiber decorated with zirconium based metal-organic framework, (Under preparation).
43. **J. Abdi**, B. Latifian, T. Taghizade Firozjaee, B. Hayati, Synthesis of magnetic Fe₃O₄@PPAC/MOF heterojunction catalyst with enhanced photo-Fenton removal of metronidazole antibiotic under visible light, (Under preparation).
44. H. Abedini, **J. Abdi**, Preparation of magnetic layered double hydroxide@metal-organic framework (CuCr-LDH@Fe-BTC) nanocomposite for boosting sono-adsorption of tetracycline from wastewater, (Under preparation).
45. **J. Abdi**, M. Darabi, A.H. Hemmati-Sarapardeh, Modeling of CO₂ absorption capabilities of amino acid solutions using intelligent paradigms, (Under preparation).
46. **J. Abdi**, F. Hadavimoghaddam, Prediction of CO₂ loading in Imidazole based ionic liquids using intelligent models, (Under preparation).

❖ Publications in refereed Scopus journals

- N. Mohammadian, T. Taghizade Firozjaee, **J. Abdi**, A Review of Biochar as a Stable Adsorbent for Removing Antibiotics from Wastewater, *Journal of Water and Wastewater*, (2023) 33, 6, 20-33.
- S. H. Esmaeili-Faraj, M. Rezazadeh, **J. Abdi**, Simulation of Biosynthesis Gas Process from Palm Oil Mill Effluent Sewage by Aspen HYSYS and SuperPro Designer, *Journal of Water and Wastewater*, (2023) 33, 6, 34-43.
- **J. Abdi**, S.H. Esmaeili-Faraj, M. Nasr Esfahany, Evaluation of the performance of an activated sludge bioreactor for the sulfide removal in the presence of nanoparticles: Kinetic study and Respirometry test, *Journal of Nanostructures*, 13.1 (2023): 37-47.
- **J. Abdi**, "Prediction of the adsorption amount of azo dyes pollutants from wastewater using porous metal-organic framework adsorbents." *Journal of Color Science and Technology (in Persian)* 16.3 (2022): 267-280.
- **J. Abdi**, "Kinetic and mass transfer modelling of adsorption process of ketorolactromethamine drug onto the porous UiO-66 metal organic framework adsorbent." *Journal of Separation Science and Engineering (in Persian)* 13.2 (2022): 13-26.
- **J. Abdi**, S. H. Esmaeili-Faraj, and E. Naghdbishi. "Kinetic Modeling of the Sulfide Pollutant Removal in the Activated Sludge Bioreactor in the Presence of Silica Nanoparticles and Graphene Oxide." *Journal of Water and Wastewater (in Persian)* 33.1 (2022): 65-76.
- **J. Abdi**, "Synthesis of Zeolitic imidazolate framework-8 based magnetic nanocomposite incorporated with silver nanoparticles for efficient removal of organic pollutants from wastewater." *Journal of Separation Science and Engineering (in Persian)* 12.2 (2021): 81-93.
- **J. Abdi**, Cu-Zeolitic Imidazolate Framework-8 Loaded on Magnetic Nanofiber as a High-efficient Antimicrobial Scaffold, *Journal of Nanostructures*, 10.4 (2020): 817-824.
- N.M. Mahmoodi, **J. Abdi**, Surface modified cobalt ferrite nanoparticles with cationic surfactant: Synthesis, multicomponent dye removal modeling and selectivity analysis, *Progress in Color, Colorants and Coatings*, 12.3 (2019): 163-177).

❖ Publications in refereed conference proceedings

- 6th International Congress of Developing Agriculture, Natural Resources, Environment and Tourism of Iran, 2023, Tabriz, Iran (Poster presentation).
- 4th Iran water and wastewater science and engineering congress, November 2022, Qom, Iran.
- The 1st National Conference on Environmental Challenges: Green Industry and Mining, April 2022, Tehran, Iran
- National congress of environmental and sustainable development, 2018, Tehran, Iran (Oral presentation).
- Proceedings of the 7th International Conference on Nanostructures (ICNS7), February 2018, Tehran, Iran (Poster presentation).
- 21st International Congress of Chemical and Process Engineering, CHISA 2014 and 17th Conference on Process Integration, Modelling and Optimization for Energy Saving and Pollution Reduction, PRES 2014 (Oral presentation).
- 13th Conference of Nanotechnology, Iranian Society of Nano medicine, April 2013, Tehran, Iran (Oral presentation).
- Fourth International Conference on Technology Development in Chemical Engineering, September 2021, Tehran, Iran (Oral presentation).
- The 1st National Conference on Environmental Challenges: Green Industry and Mining, May 2022, Tehran, Iran

❖ Book

- Book chapter, “Water Recycling, Reuse, and Sustainable Development Goals”, Publisher: Elsevier, 2023.
- Book chapter, “Metal-organic frameworks for remediation of noxious pollutants”, Publisher: Elsevier, 2020.
- Book chapter, “Membrane technology: Fundamental of membrane and classification”, Publisher: Elsevier, 2020.
- Translation, “INTRODUCTION TO ADSORPTION; Basics, Analysis, and Applications”, Publisher: Shahrood University of Technology, 2020
- “Metal-Organic Framework Engineering; Principles and Application”. Publisher: Amirkabir University of Technology, 2019.

Technical & soft skills

- **Analytical techniques:** Experience with SEM, XRD, FT-IR, TGA, MS and UV-Vis Absorption
- **Other techniques:** Electrospinning, Electrochemical, Polymerization, Crystallization
- **Information technology:** Competence in the necessary software to process and present experimental data clearly (MATLAB, Comsol Multiphysics, Aspen Hysys, Origin, EndNote, ImageJ, Microsoft Office).
- **Project management:** Designing and planning projects (in teams/independently), Results analysis, Writing progress reports, protocols, articles and grants, Giving oral presentations and posters, Leading workshops and management of staff, students and junior researchers, Teaching assistant
- **Language:** English: Advanced, Arabic: Beginner, Persian: Native language