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Curriculum Vitae

Dr. Mostafa Dadashi Firouzjaei

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Research Interests

Material Science, Membranes, Water and Wastewater Treatment, MXenes, Environmental Microbiology, Environmental Engineering, Life Cycle Assessment (LCA), Nanotechnology, and Energy Consumption.

Professional Experience

- Visiting Professor, University of Alberta, October 2022-October 2023
- Visiting Research Scientist, Purdue School of Engineering, IUPUI, May 2022-Present
- Assistant Research Professional, University of Alabama, October 2022-Present
- Postdoctoral Research Associate, University of Alabama, May 2022-October 2022
- Graduate Research Assistant, University of Alabama, May 2018-May 2022
- Academic Counselor, Mahan Institute, Education Administration Programs, July 2015-July 2016
- Editorial Board, Khanevadeh Sabz Magazine, Tehran, IRAN, December 2011-February 2015

Education

- Ph.D., Civil and Environmental Engineering, **University of Alabama**, Tuscaloosa, AL, (December 2018-May 2022)-Advisor: **Dr. Mark Elliott**
- M.S., Environmental Engineering, **University of Alabama**, Tuscaloosa, AL, (May 2018-December 2020)
- M.S., Material Science and Engineering, **Sharif University of Technology**, Tehran, IRAN (2015-2017)
- B.S., Material Science and Engineering, **Iran University of Science and Technology**, Tehran, IRAN (2011-2015)

Refereed Journal Articles

First-Authored Articles:

1. **Firouzjaei, M. D**., Nemani, S. K., Sadrzadeh, M., Wujcik, E. K., Elliott, M., & Anasori, B. (2023). Life Cycle Assessment of $Ti_3C_2T_x$ MXene Synthesis. Advanced Materials, 2300422.
2. **Firouzjaei, Mostafa. D**, Ehsan Zolghadr, Ahmad Arabi Shamsabadi, Mohtada Sadrzadeh, Ahmad Rahimpour, Farhad Akbari Afkhami, Evan K. Wujcik, and Mark Elliott. "Clean water recycling through adsorption via heterogeneous nanocomposites: Silver-based metal-organic framework embellished with graphene oxide and MXene." *Case Studies in Chemical and Environmental Engineering* 7: 100296. **2023**
3. **Firouzjaei, M.D**, Mohammadsepehr Karimiziarani, Hamid Moradkhani, Mark Elliott, and Babak Anasori. "MXenes: The two-dimensional influencers." Materials Today Advances 13: 100202, **2022**
4. **Firouzjaei, M. D**., Pejman, M., Gh, M. S., Aktij, S. A., Zolghadr, E., Rahimpour, A., ... & Elliott, M. (2022). Functionalized polyamide membranes yield suppression of biofilm and planktonic bacteria while retaining flux and selectivity. Separation and Purification Technology, 282, 119981. **2022**
5. **Firouzjaei, M.D**, Ehsan Zolghadr, Shahin Ahmadalipour, Nastaran Taghvaei, Farhad Akbari Afkhami, Siamak Nejati, and Mark A. Elliott. "Chemistry, abundance, detection and treatment of per-and polyfluoroalkyl substances in water: a review." Environmental Chemistry Letters: 1-19, **2021**
6. **Firouzjaei, M.D**., Shamsabadi, A.A., Aktij, S.A., Seyedpour, S.F., Sharifian Gh, M., Rahimpour, A., Esfahani, M.R., Ulbricht, M. and Soroush, M., 2018. Exploiting synergetic effects of graphene oxide and a silver-based metal-organic framework to enhance antifouling and anti-biofouling properties of thin-film nanocomposite membranes. ACS applied materials & interfaces, **2018**
7. **Firouzjaei, M.D**., Shamsabadi, A.A., Sharifian Gh, M., Rahimpour, A. and Soroush, M., 2018. A novel nanocomposite with superior antibacterial activity: a silver?based metal organic framework embellished with graphene oxide. Advanced Materials Interfaces, **2018**

8. **Firouzjaei, M.D**., Seyedpour, S.F., Aktij, S.A., Giagnorio, M., Bazrafshan, N., Mollahosseini, A., Samadi, F., Ahmadalipour, S., Firouzjaei, F.D., Esfahani, M.R. and Tiraferri, A., 2020. Recent advances in functionalized polymer membranes for biofouling control and mitigation in forward osmosis. Journal of Membrane Science, **2020**
9. **Firouzjaei, M.D**., Afkhami, F.A., Esfahani, M.R., Turner, C.H. and Nejati, S., 2020. Experimental and molecular dynamics study on dye removal from water by a graphene oxide-copper-metal organic framework nanocomposite. Journal of Water Process Engineering, **2020**
10. Pejman, M.[+], **Firouzjaei, M.D**.[+], Aktij, S.A., Das, P., Zolghadr, E., Jafarian, H., Shamsabadi, A.A., Elliott, M., Esfahani, M.R., Sangermano, M. and Sadrzadeh, M., Improved antifouling and antibacterial properties of forward osmosis membranes through surface modification with zwitterions and silver-based metal organic frameworks. Journal of Membrane Science, **2020** ([+]Same Contribution as First Author)
11. Pejman, Mehdi, **Firouzjaei, M.D**, Sadegh Aghapour Aktij, Ehsan Zolghadr, Parnab Das, Mark Elliott, Mohtada Sadrzadeh, Marco Sangermano, Ahmad Rahimpour, and Alberto Tiraferri. "Effective strategy for UV-mediated grafting of biocidal Ag-MOFs on polymeric membranes aimed at enhanced water ultrafiltration." Chemical Engineering Journal (2021): 130704. ([+]Same Contribution as First Author)
12. Seyedpour, S.F. [+], **Firouzjaei, M.D.[+]**, Rahimpour, A., Zolghadr, E., Arabi Shamsabadi, A., Das, P., Afkhami, F., Sadrzadeh, M., Tiraferri, A. and Elliott, M., 2020. Toward Sustainable Tackling of Biofouling Implications and Improved Performance of TFC FO Membranes Modified by Ag-MOF Nanorods. ACS Applied Materials & Interfaces, **2020** ([+]Same Contribution as First Author)
13. Pejman, M.[+], **Firouzjaei, M.D[+]**, Aktij, S., Das, P., Zolghadr, E., Jafarian, H., Arabi Shamsabadi, A., Elliott, M., Sadrzadeh, M., Sangermano, M. and Rahimpour, A., 2020. In Situ Ag-MOF Growth on Pre-Grafted Zwitterions Imparts Outstanding Antifouling Properties to Forward Osmosis Membranes. ACS Applied Materials & Interfaces, **2020** ([+]Same Contribution as First Author)
14. Seyedpour, S.F. [+], Arabi Shamsabadi[+], A., Salestan, S. [+], **Firouzjaei, M.D[+]**, Sharifian Gh, M., Rahimpour, A., Afkhami, F., Kebria, M.R., Elliott, M.A., Tiraferri, A. and Sangermano, M., 2020. Tailoring the Biocidal Activity of Novel Silver-Based Metal Azolate Frameworks. ACS Sustainable Chemistry & Engineering, 8(20), **2020** ([+]Same Contribution as First Author)
15. Esfahani, M.R. [+], Aktij, S.A. [+], Dabaghian, Z. [+], **Firouzjaei, M.D.** [+], Rahimpour, A. [+], Eke, J. [+], Escobar, I.C., Abolhassani, M., Greenlee, L.F., Esfahani, A.R. and Sadmani, A., 2019. Nanocomposite membranes for water separation and purification: Fabrication, modification, and applications. Separation and Purification Technology, **2019** ([+]Same Contribution as First Author)

Corresponding-Authored Articles:

1. Jafarian, H., **Firouzjaei, M. D**., Aktij, S. A., Aghaei, A., Khomami, M. P., Elliott, M., ... & Rahimpour, A. (2023). Synthesis of heterogeneous metal-organic Framework-Graphene oxide nanocomposite membranes for water treatment. Chemical Engineering Journal, 455, 140851. ([+]Corresponding Author)
2. Zolghadr, E., **M. Dadashi Firouzjaei**, S. Aghapour Aktij, A. Aghaei, E. K. Wujcik, M. Sadrzadeh, A. Rahimpour, F. A. Afkhami, P. LeClair, and M. Elliott. "An ultrasonic-assisted rapid approach for sustainable fabrication of antibacterial and anti-biofouling membranes via metal-organic frameworks." Materials Today Chemistry 26: 101044, **2022** ([+]Corresponding Author)
3. Bazrafshan, Nasim, **Firouzjaei, M.D**, Mark Elliott, Amitis Moradkhani, and Ahmad Rahimpour. "Preparation and modification of low-fouling ultrafiltration membranes for cheese whey treatment by membrane bioreactor." Case Studies in Chemical and Environmental Engineering 4: 100137, **2021** ([+]Corresponding Author)
4. Zolghadr, Ehsan, **Firouzjaei, M.D**, Ghoncheh Amouzandeh, Patrick LeClair, and Mark Elliott. "The Role of Membrane-Based Technologies in Environmental Treatment and Reuse of Produced Water." Frontiers in Environmental Science 9: 71. **2021** ([+]Corresponding Author)
5. Rezaeipour, Yashar, Ehsan Zolghadr, Parvin Alizadeh, Ghazal Sadri, Evan K. Wujcik, Farhad Akbari Afkhami, Mark Elliott, and **Mostafa Dadashi Firouzjaei**. "The anticancer properties of metal-organic frameworks and their heterogeneous nanocomposites." Biomaterials Advances 139: 213013, **2022** ([+]Corresponding Author)

Other co-Authored Articles:

1. Aktij, Sadegh Aghapour, Milad Hosseininejad, **Mostafa Dadashi Firouzjaei**, Saeed Farhadi, Mark Elliott, Ahmad Rahimpour, João BP Soares, Mohtada Sadrzadeh, and Yaghoub Mansourpanah. "High perm-selectivity and performance of tuned nanofiltration membranes by merging carbon nitride derivatives as interphase layer for efficient water treatment." *Journal of Water Process Engineering* 56: 104432, **2023**.
2. Grube, Alyssa, Ahmad Arabi Shamsabadi, **Mostafa Dadashi Firouzjaei**, Syed Ibrahim Gnani Peer Mohamed, Laurel Hilger, Mark Elliott, Kaitlin McKenzie, and Mona Bavarian. "Emperor's new clothes: Novel textile-based supercapacitors using sheep wool fiber as electrode substrate." *Nano Trends* 3: 100014. **2023**
3. Gnani Peer Mohamed, S. I., Arabi Shamsabadi, A., Kavousi, S., **Dadashi Firouzjaei, M**., Elliott, M., Yazdanparast, S., ... & Bavarian, M. (2023). Metal Ions Removal from Organic Solvents using MXene-Based Membranes. *ACS Applied Engineering Materials*. **2023**
4. Seidi, F., Arabi Shamsabadi, A., **Dadashi Firouzjaei, M**., Elliott, M., Saeb, M. R., Huang, Y., ... & Anasori, B. (2023). MXenes Antibacterial Properties and Applications: A Review and Perspective. Small, 2206716. **2023**
5. Aghaei, Amir, **Mostafa Dadashi Firouzjaei**, Pooria Karami, Sadegh Aghapour Aktij, Mark Elliott, Yaghoub Mansourpanah, Ahmad Rahimpour, João BP Soares, and Mohtada Sadrzadeh. "The implications of 3 D-printed

membranes for water and wastewater treatment and resource recovery." The Canadian Journal of Chemical Engineering 100, no. 9: 2309-2321, **2022**

6. Mozafari, M., Seyedpour, S.F., Salestan, S.K., Rahimpour, A., Shamsabadi, A.A., **Firouzjaei, M.D**., Esfahani, M.R., Tiraferri, A., Mohsenian, H., Sangermano, M. and Soroush, M., 2019. Facile Cu-BTC surface modification of thin chitosan film coated polyethersulfone membranes with improved antifouling properties for sustainable removal of manganese. Journal of Membrane Science, **2019**
7. Esfahani, M.R., Koutahzadeh, N., Esfahani, A.R., **Firouzjaei, M.D**., Anderson, B. and Peck, L., 2019. A novel gold nanocomposite membrane with enhanced permeation, rejection and self-cleaning ability. Journal of Membrane Science, **2019**
8. Rahimpour, A., Seyedpour, S.F., Aktij, S., **Firouzjaei, M.D**, Zirehpour, A., Arabi Shamsabadi, A., Salestan, S., Jabbari, M. and Soroush, M., 2018. Simultaneous improvement of antimicrobial, antifouling, and transport properties of forward osmosis membranes with immobilized highly compatible polyrhodanine nanoparticles. Environmental science & technology, **2018**
9. Zirehpour, A., Rahimpour, A., Khoshhal, S., **Firouzjaei, M.D.** and Ghoreyshi, A.A., 2016. The impact of MOF feasibility to improve the desalination performance and antifouling properties of FO membranes. RSC advances, **2016**
10. Karami, Pooria, Sadegh Aghapour Aktij, Behnam Khorshidi, **Firouzjaei, M.D**, Asad Asad, Mark Elliott, Ahmad Rahimpour, João BP Soares, and Mohtada Sadrzadeh. "Nanodiamond-decorated thin film composite membranes with antifouling and antibacterial properties." Desalination 522: 115436, **2022**
11. Nejad, S. Mohammad, S. F. Seyedpour, S. Aghapour Aktij, **M. Dadashi Firouzjaei**, M. Elliott, A. Tiraferri, M. Sadrzadeh, and A. Rahimpour. "Loose nanofiltration membranes functionalized with in situ-synthesized metal organic framework for water treatment." Materials Today Chemistry 24, **2022**

Book Chapter

1. Aghaei, A., Suresh, K., **Firouzjaei, M. D**., Elliott, M., Rahimpour, A., & Sadrzadeh, M. (2023). Hybrid/integrated treatment technologies for oily wastewater treatment. In Advanced Technologies in Wastewater Treatment (pp. 377-419). Elsevier, **2023**.

Honors & Awards

- Recipient of "**Outstanding Research by Ph.D."** award, Civil Engineering, University of Alabama, **2022**
- **"Graduate Student of the Year",** Civil Engineering, Engineering Council of Birmingham, **2021**
- Recipient of "**Graduate Council Fellowship (GCF)"**, Total value of $52,000, University of Alabama, **2020**
- Ranked **10th** among more than **7'000** contestants in the Master of Science and Engineering National Entrance Exam-Material Science and Engineering, **2015**
- Ranked **1st** among the Material Science and Engineering class of 2011 at the Iran University of Science and Technology, National University Entrance Exam, **2011**

On the Covers