

Dr. Samira Mehravar

Dr. in Nanotechnology-chemical Engineering

Personal Information

- **Full Name:** Samira Mehravar
- **Date of Birth:** 19th June 1985
- **Place of Birth:** Larestan, Iran
- **Living Place:** Tehran, Iran
- **Citizenship:** Iranian
- **Gender:** Female
- **Marital Status:** Married

Contact Information

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Education

Doctor of Philosophy

Field: Nano-chemical Engineering

Major: Nanocatalysis

School: University of Tehran, Tehran, Iran.

Ph.D. GPA: 18.84/20

Ph.D. Thesis: H₂ production from reforming of propane over Ni-noble metal nanocatalyst supported on reduced graphene oxide.

Supervisor: Prof. Shohreh Fatemi, School of Chemical Engineering, College of Engineering, University of Tehran, Tehran, Iran.

Master of Science

Field: Nano-chemical Engineering

Major: Nano phase change materials

School: University of Shiraz, Shiraz, Iran.

M.Sc. GPA: 18.40/20

M.Sc. Thesis: Modeling of nanoPCM slurry flow in microchannel microheat exchangers (MEMS).

Supervisor: Prof. Samad Sabbaghi, Department of Nanochemical Engineering, Faculty of Advanced Technologies, Shiraz University, Shiraz, Iran.

Postdoctoral Research Project

1. Postdoctoral Researcher

Title: Synthesis and modification of bimetallic nanocatalysts based on boron nitride via selective chemical vapor deposition and their application in methane reforming processes.

Supervisor: Prof. Shohreh Fatemi. Adsorption, Modeling and Nanomaterials Research Center, School of Chemical Engineering, University of Tehran, (Jul. 2023 – Apr. 2025)

- Postdoctoral research project funded by the Iran National Science Foundation (INSF), Grant No. 4020825.
- Successfully passed peer review and fulfilled all commitments of the grant Sensors. (<https://rtms.insf.org/ProposalCertificate.php?ID=EA5N8FSV32SQQTCQ>)

2. Postdoctoral Researcher

Title: A nanotechnology platform based on quartz crystal microbalance arrays with nanostructured coatings (metal-organic frameworks and polymers) for non-invasive detection and monitoring of volatile organic compounds in medical and industrial applications using multivariate pattern analysis

Supervisor: Prof. Shohreh Fatemi. Adsorption, Modeling and Nanomaterials Research Center, School of Chemical Engineering, University of Tehran, (Jan 2027 – present)

- Postdoctoral research project funded by the Iran National Science Foundation (INSF), Grant No. 4048993.

Research Interests

- Nanomaterials science and heterogeneous catalysis
- Electrocatalysis and photocatalysis with focus on reaction mechanisms and surface processes
- Catalytic process design and development for energy and environmental applications
- Quartz Crystal Microbalance (QCM)-based sensing platforms for detection of trace gases and volatile organic compounds (VOCs)
- Vapor-phase synthesis of nanostructured materials via CVD and ALD techniques
- Design, operation, and optimization of CVD systems for advanced material fabrication
- Interactions of nanostructured materials with gas-phase molecules relevant to sensing and catalytic processes

Publications

Published:

Journal papers:

- Benyamin M. Garnejani, Samira Mehravar, Shohreh Fatemi & Juan M. Coronado, CVD-Engineered Ni and FeNi Catalysts on Hexagonal Boron Nitride for Efficient CO₂-Methane Co-Conversion to Syngas: High-Performance Alternatives to Traditional Alumina-Supported Catalysts, *Int. J. of Energy Res*, **2026**, 1-21. (<https://onlinelibrary.wiley.com/doi/epdf/10.1155/er/5520777>)
- Samira Mehravar, Abbas Ali Khodadadi, Shohreh Fatemi, and Yadollah Mortazavi. “Thermally Optimized Chemical Vapor Deposition of Iron and Cobalt on Pd-Decorated Reduced Graphene Oxide for Atomic-Scale Catalytic Interface Engineering.” *Scientia Iranica*, **2025**. <https://doi.org/10.24200/sci.2025.67398.10594>.
- Samira Mehravar, Ben. Mohammadian, Shohreh Fatemi: Nickel-deposited hexagonal boron nitride composites synthesized via chemical vapor deposition: unlocking enhanced magnetic properties for advanced technologies. *J. Mater. Chem. C*, **2025**, 13, 6823-6830. (<https://doi.org/10.1039/D4TC05281A>)
- Samira Mehravar, Rahim Mirzabeiki Naeinia, Shohreh Fatemi, Farnoush Faridbod: Leveraging Chemical Vapor Deposition to Develop Ni-Ceria/Graphene Oxide Nanocatalysts for Electrochemical CO₂ Reduction. *The Canadian J. Chemical Eng.* **2025**, (<https://doi.org/10.1002/cjce.70023>)
- Samira Mehravar, Shohreh Fatemi, Masaharu Komiyama: Highly Selective Hydrogen Production from Propane by Ru–Ni Core–Shell Nanocatalyst Deposited on Reduced Graphene Oxide by Sequential Chemical Vapor Deposition. *Int. J. Energy Res.* **2020**, 44, 8000–8013. (<https://doi.org/10.1002/er.5541>)
- Samira Mehravar, Shohreh Fatemi, Masaharu Komiyama: The Role of Cerium Intercalation in the Efficient Dry Exfoliation of Graphene Layers at a Low Temperature. *Diam. Relat. Mater.* **2020**, 101, 107615. (<https://doi.org/10.1016/j.diamond.2019.107615>)
- Samira Mehravar, Shohreh Fatemi, Masaharu Komiyama: Magnetic Property and Structural Study of Nickel Supported on Reduced Graphene Oxide Prepared by Chemical Vapor Deposition. *Surf. Interface Anal.* **2020**, 52 (9), 547–552. (<https://doi.org/10.1002/sia.6784>)

- Samira Mehravar, Samad Sabbaghi: Effect of Using Nano Encapsulated Phase Chang Material on Thermal Performance of Micro Heat Sink. *Int. J. Nanosci. Nanotechnol* **2015**, 11, 33–38. (http://www.ijnnonline.net/article_12360.html)
- Samira Mehravar, Samad Sabbaghi: Thermal Performance of MEMS-Based Heat Exchanger with Micro-Encapsulated PCM Slurry. *J. Power Energy Eng.* **2014**, 02, 15–22. (<https://doi.org/10.4236/jpee.2014.29003>)

Conference papers:

- Samira Mehravar, Samad Sabbaghi: Thermal Behavior of Nano Encapsulated PCM Slurry with Octadecane Core and PMMA Shell in Circular Micro Heat Sink. In *International Conference of Nanotech France*; Paris, Franch, **2015**.
- Samira Mehravar, Samad Sabbaghi: Numerical Investigation the Thermal Effect of Nano-Encapsulated PCM and SiC Nanofluid on Rectangular Micro Heat Sink. In *Asian Nano Forum Conference*; Kish, Iran, **2015**.
- Samira Mehravar, Samad Sabbaghi: Thermal Behavior of Nano-Encapsulated Phase Change Material Slurry In the Circular Micro Heat Sink As Working Fluid. In *International Conference of Applied Mechanics and Materials*; Singapore, Singapore, **2014**.
- Samira Mehravar, Samad Sabbaghi: Thermal Performance of Microheat Sink with Nano-Encapsulated PCM Slurry, In *5th International Congress on Nanoscience & Nanotechnology*; Tehran, Iran, **2014**.

Patents

Title: “Synthesis of Nickel Nanoparticles on Boron Nitride Nanoribbons via Chemical Vapor Deposition for Hydrogen Production from Simultaneous Methane and Carbon Dioxide Conversion”

Patent No.: 112113, Iranian Intellectual Property Office, 2025-01-28 (Application No.: 140350140003003252, Date: 2024-08-04).

- Developed an innovative nanocatalyst technology for clean hydrogen production, with applications in energy industries and greenhouse gas reduction.

Honors and Awards

- A six-month scholarship to conduct research on catalytic steam reforming process at The Center of Biofuel and Biochemical Resource (CBBR), Universiti Teknologi PETRONAS (UTP), Malaysia under the supervision of Prof. Masaharu Komiyama, (2019).
- Research grant on “Hydrogen production as a clean fuel by the steam reforming process over the promoted catalysts” from The Iran National Science Foundation (INSF), Project No. 960099770, (2017-2019).
- Research grant on “Process of Vacuum bottom conversion to the light fuels in the presence of CO₂ and plastic wastes; comparison of the catalytic and noncatalytic conditions” from The Iran National Science Foundation (INSF), Project No. 4026894, (2024- present).
- Highest ranking student of Nano-chemical engineering, Department of Novel Technologies, University of Shiraz, (2012-2014).

Thesis Advising Experience

M.Sc. Theses Advisor – Department of Chemical Engineering, University of Tehran.

- **Benyamin Mohammadian Garmejani**

“Study of Dry Methane Reforming over Ni Nanocatalyst Synthesized by Chemical Vapor Deposition Supported by Boron Nitride”

Supervisor: Dr. Shohreh Fatemi | Advisor: Dr. Samira Mehravar

Defended: September 2024

- **Rahim Mirzabeyki Naeini**

“Investigation and Experimental Study of CO₂ Reduction to Valuable Products by Nanoelectrocatalysts”

Supervisors: Dr. Shohreh Fatemi, Dr. Farnoush Faridbod | Advisor: Dr. Samira Mehravar

Defended: February 2024

- **Seyed Mohammadreza Khatami**

“Study of Catalytic Process of Light Olefins Production from Oxidative Dehydrogenation of Gaseous Paraffins in the Presence of CO₂”

Supervisor: Dr. Shohreh Fatemi | Advisor: Dr. Samira Mehravar

Proposal Approved: December 2025

Work Experience

- Research on synthesis of catalysts for hydrogenation reactions under supervision of prof. A. Khodadadi and Prof. Y. Mortazavi for 2 years (2015-2017), at Catalyst and Nanostructured Materials Research Center, university of Tehran, Iran.
- Technical Assistant at disposable utensils production of Hazrati to quality control, Larestan, Iran, (2014).
- Internship of Larestan Cement including chemistry, physics and X-ray labs, Larestan, Iran, (2011).

Software Skills

- Originlab
- ChemDraw
- Design-Expert
- X'Pert HighScore Plus
- Image J
- Gwyddion
- Casa XPS
- Gatan Digital Micrograph
- OPUS
- ASPEN Plus
- HYSYS
- COMSOL Multiphysics
- Microsoft Office (Word, Excel, PowerPoint)

Characterization Skills

- FTIR
- Raman
- TGA
- XRD
- SEM
- HR-TEM
- UV-Vis
- Elemental analysis
- Raman Spectroscopy

- XPS
- BET
- VSM

Certificates

- Research attachment program in catalysis over metal nanoparticles supported on reduced graphene oxide, Universiti Teknologi PETRONAS, Malaysia.
- Applicant of HYSIS in Petrochemical Engineering Analysis, ANCCP international certification.
- Applicant of ASPEN PLUS in Petrochemical Engineering Analysis, ANCCP international certification.
- Applicant of FLUENT in Petrochemical Engineering Analysis, ANCCP international certification.
- Applicant of COMSOL Multiphysics in Petrochemical Engineering Analysis, ANCCP international certification.
- International computer driving license (ICDL) core, ICDL Foundation of Iran.
- English language, Fazel department of foreign languages, Shiraz, Iran.

Language Skills

Persian (Farsi): Native
English: Advanced
Arabic: Familiar

Other Professional Skills

- Nano-fabrication: CVD, ALD, catalyst synthesis, chemical process setups
- Strong communication and teamwork skills
- Intrinsic motivation
- Self-starting
- Paying attention to details
- Ability to work under pressure on multiple projects
- Expert in PC Software and Hardware repair

Personal Interests and Activities

- Lifelong learning of new languages
- Problem-solving through puzzles and logical games
- Traveling to explore cultures and gain inspiration for scientific innovation
- Bodybuilding to maintain physical and mental vitality
- Cooking and baking as a creative and relaxing outlet
- Listening to music to nurture creativity and balance

References

1. Prof. Shohreh Fatemi, School of Chemical Engineering, College of Engineering, University of Tehran, Tehran, Iran. (Email address: shfatemi@ut.ac.ir)
2. Prof. Masaharu Komiyama, Chemical Engineering Department, HICoE–Center for Biofuel and Biochemical Research, Universiti Teknologi PETRONAS, Seri Iskandar, Malaysia. (Email address: masaharu@yamanashi.ac.jp)

Citations

- [Google Scholar](#)