

Nasibeh Hajilary

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PROFESSIONAL SUMMARY

Expert in the fabrication of polymeric membranes and nanomaterials for separation processes. Knowledge of CO₂ emission evaluation and carbon reduction. Expert in water shut-off with smart gel in hydrocarbon reservoirs. Excellent experience as a senior process engineer in a gas refinery. Innovative with technical vision, records of accomplishment for initiating and delivering successful projects to improve systems and performance, and excels at teamwork

EDUCATION

Ph.D. in Chemical Engineering Sep 2011 – Sep 2015
Tarbiat Modares University, Tehran, Iran

MSc in Chemical Engineering Sep 2005– Sep 2008
Malek Ashtar University, Tehran, Iran

BSc in Chemical Engineering Sep 2001 – Sep 2005
Amirkabir University of Technology (Polytechnic), Tehran, Iran

ACADEMIC EXPERIENCE

Academic vice president Apr 2018 – Oct 2020
Engineering faculty, Golestan University, Gorgan, Iran

- Implemented all educational and research policies
- Managed all programs and projects of the engineering faculty
- Supervised curricular, instructional, and other academic activities in the faculty

Chair of chemical engineering department Dec 2016 –Apr 2018
Chemical Engineering Department, Golestan University, Gorgan, Iran

- Planned the academic and financial aspects of the department
- Monitored professor's and students' educational and research processes
- Developed the department, and conducted seminars and workshops

Assistant professor Sep 2016 – Present
Chemical Engineering Department, Golestan University, Gorgan, Iran

- Supervised more than six Master's theses on the subject of biofuel separation and water purification by MXene membrane; enhancement of oil transfers by MXene nanoparticle; Prediction of CO₂ emissions based on QARDL model
- Supervised postdoc research in biofuel separation

Funded project

- Developed a transformer oil with new feed and process for the first time, by the Vice President of Science and Technology
- Designed and constructed as an industrial unit for the production of transformer oil based on a new process on a pilot scale, by the Organization of industrial estates
- Synthesized new transformer oil, by Science and Technology Park
- Improved transformer oil using MXene nanoparticles, by Science and Technology Park
- Produced commercial MXene membrane, by Science and Technology Park
- Reduced energy consumption in brick factories, by Golestan University
- Optimized ethanol production, by Golestan University

- Optimized injected gas and steam in the gas flare network, by the Fajr-Jam gas refinery
- Designed and implemented a new gas meter, Partnotarh Knowledge enterprise company

Research Assistant

May 2015 – Jan 2016

Chemical Engineering Department, Tarbiat Modares University, Tehran, Iran

- Developed a novel core-flooding test method for determining gel treatment performance
- Synthesized a smart polymer gel to prevent excess formation water in sand and carbonate reservoirs of the National Company of South Oil-rich Regions
- Optimized the operating condition of the polymer gel injection process to reduce the water production in horizontal wells in the Nowruz oil field based on CCD experimental design

SKILLS

- Proficient skills at running a new project and solving problems
- Expert in the fabrication of polymeric membrane
- Knowledgeable in the synthesis of nanomaterials of MAX, MXene, and aluminum
- Expert in the membrane separation process
- Highly skilled in water shut-off of reservoirs
- Expert in gas processing treatment including H₂S/CO₂ absorption, Dehydration, LPG treatment, and Sulphur recovery
- Strong in process simulation, including ASPEN, Dynamic HYSYS, PROMAX, FLARENET, FLARESIM
- Expert in Statistical analysis and design of experiments
- Experts in the analysis including SEM, XRD, GC, XPS, FTIR
- Expert in process engineering design

PUBLICATIONS

PAPERS

- Sadidi, M., **Hajilary, N.**, The development of high performance PES /PEI Mxene membrane for ethanol dehydration via pervaporation (under review)
- Abbasi, F., **Hajilary, N.**, Pervaporation performance of a new two-dimensional MXene/PSF composite membrane for dehydration of ethanol (under review)
- **Hajilary, N.**, S. Hashemi, M. Hajiabadi, 2022, CFD Modeling of the Dehydration of Biofuels with the 2D MXene Membrane using the Pervaporation Process, Iranian Journal of Chemical Engineering, 19 (1), pp.76-88.
- Maroufi, N. and **Hajilary, N.**, 2022. The impacts of economic growth, foreign direct investments, and gas consumption on the environmental Kuznets curve hypothesis CO₂ emission in Iran. *Environmental Science and Pollution Research*, pp.1-14.
- Abbasi, F., **Hajilary, N.** and Rezakazemi, M., 2022. Antibacterial properties of MXene-based nanomaterials: A review. *Materials Express*, 12(1), pp.34-48.
- Hashemi, S., Abbasi, F., **Hajilary, N.**, 2021. Applications of MXenes nanomaterials in water and wastewater treatment, *Journal of Environmental Research and Technology*, 6(9), PP. 61-73.
- Rezakazemi, M. and **Hajilary, N.**, 2021. Laboratory Study and Mathematical Modeling of 1-butanol Adsorption on Activated Carbon. *Journal of Petroleum Research*, 30(99-6), pp.92-101.
- Raji, M., Dashti, A., Rezakazemi, M. and **Hajilary, N.**, 2020. Prediction of Desulfurization from Diesel of Isfahan Refinery by Membrane Method Using Intelligent Approach. *Nashrieh Shimi va Mohandesi Shimi Iran*, 39(3), pp.237-246.
- **Hajilary, N.**, Rezakazemi, M. and Shahi, A., 2020. CO₂ emission reduction by zero flaring startup in gas refinery. *Materials Science for Energy Technologies*, 3, pp.218-224.

- Babanezhad, M., Rezakazemi, M., **Hajilary, N.** and Shirazian, S., 2019. Liquid-phase chemical reactors: Development of 3D hybrid model based on CFD-adaptive network-based fuzzy inference system. *The Canadian Journal of Chemical Engineering*, 97, pp.1676-1684.
- **Hajilary, N.** and Rezakazemi, M., 2019. Optimization of Combustion Burner at Hoffman Brick Factories. *Modares Mechanical Engineering*, 19(5), pp.1095-1101.
- Zare, M.H., Hajilary, N. and Rezakazemi, M., 2019. Microstructural modifications of polyethylene glycol powder binder in the processing of sintered alpha alumina under different conditions of preparation. *Materials Science for Energy Technologies*, 2(1), pp.89-95.
- Shahi, A., **Hajilary, N.** and Rezakazemi, M., 2019. CFD Simulation of Anode Solid Oxide Fuel Cell. *Journal of Solid and Fluid Mechanics*, 9(1), pp.217-235.
- Soroush, E., Mesbah, M., Hajilary, N. and Rezakazemi, M., 2019. ANFIS modeling for prediction of CO₂ solubility in potassium and sodium based amino acid Salt solutions. *Journal of Environmental Chemical Engineering*, 7(1), p.102925.
- **Hajilary, N.**, Rezakazemi, M. and Shirazian, S., 2019. Biofuel types and membrane separation. *Environmental Chemistry Letters*, 17(1), pp.1-18.
- Rezakazemi, M., Dashti, A., **Hajilary, N.** and Shirazian, S., 2019. Organic/silica nanocomposite membranes applicable to green chemistry. In *Sustainable Polymer Composites and Nanocomposites* (pp. 629-652). Springer, Cham.
- **Hajilary, N.** and Rezakazemi, M., 2018. Ethylene glycol elimination in amine loop for more efficient gas conditioning. *Chemistry Central Journal*, 12(1), pp.1-15.
- **Hajilary, N.** and Rezakazemi, M., 2018. CFD modeling of CO₂ capture by water-based nanofluids using hollow fiber membrane contactor. *International Journal of Greenhouse Gas Control*, 77, pp.88-95.
- Rezakazemi, M., Dashti, A., Riasat Harami, H. and **Hajilary, N.**, 2018. Fouling-resistant membranes for water reuse. *Environmental Chemistry Letters*, 16(3), pp.715-763.
- **Hajilary, N.**, Shahi, A. and Rezakazemi, M., 2018. Evaluation of socio-economic factors on CO₂ emissions in Iran: factorial design and multivariable methods. *Journal of Cleaner Production*, 189, pp.108-115.
- **Hajilary, N.** and Shahmohammadi, A., 2018. New permeability model for gel coated porous media with radial flow. *Journal of Applied Fluid Mechanics*, 11(2), pp.397-404.
- **Hajilary, N.**, Sefti, M.V. and Koochi, A.D., 2015. Experimental study of water shutoff gel system field parameters in multi-zone unfractured gas-condensate reservoirs. *Journal of Natural Gas Science and Engineering*, 27, pp.926-933.
- **Hajilary, N.**, Sefti, M.V., Shahmohammadi, A., Koochi, A.D. and Mohajeri, A., 2015. Development of a novel water shut-off test method: Experimental study of polymer gel in porous media with radial flow. *The Canadian Journal of Chemical Engineering*, 93(11), pp.1957-1964.
- **Hajilary, N.**, EHSANI, N.A., Sheikhaei, S. and Foroughipour, H., 2011. Amine gas sweetening system problems arising from amine replacement and solutions to improve system performance.

Patents

- **Nasibeh Hajilary**, SPO Motor oil Company, Golestan University, Insulating oil for transformers class I and II, Iran Patent No.106180, January 2022.
- Invent a saffron the harvesting machine that increases efficiency by more than 800%, TRL:6
- Invent a placer robot, TRL:7

Books

- Organic/silica nanocomposite membranes applicable to green chemistry, Mashallah Rezakazemi, Amir Dashti, **Nasibeh Hajilary**, Saeed Shirazian, **Inamuddin, Thomas, S., Kumar Mishra, R., Asiri, A.M.** (Eds.) *Sustainable Polymer Composites and Nanocomposites*, Springer International Publishing, Cham, 2019 (Book chapter).
- Recycling of used oils, Nasibeh Hajilary and Aref Shahi, Golestan University Publications, 2017

Selected Conference Papers

- Investigating the synthesis of MXene nanoparticles using Ti_3AlC_2 , The 6th Iran Applied Chemistry Conference, 2022, Malayer.
- Fabrication and characterization of polyether sulfone/polyetherimide polymer membrane, The 6th Iran Applied Chemistry Conference, 2022, Malayer.
- Synthesis of Max Ti_3AlC_2 nanostructure by high temperature self-propagating method , International Conference on Science and Nanotechnology, 2021, Tehran.
- Solutions for prevention of reduction in gas treating unit during summer, National conference of interdisciplinary research in engineering sciences, 2017, Tehran.
- Optimization of glycol injection in heater of city gas station, The first national conference of gas and petrochemical processes, 2017, Bojnord.
- Investigating the effect of type and amount of glycols on natural gas dehumidification, National conference of interdisciplinary research in engineering sciences, 2017, Teheran.
- Experimental study of Cr (III)-Acetate-HPAM gels in reservoir model with radial flow, The 8th International Chemical Engineering Congress & Exhibition, Kish, 2014.
- Experimental and Theoretical Investigation of Water Flow Through Elastic Polymer Gel , The 8th International Chemical Engineering Congress & Exhibition, Kish, 2014.
- A new approach for gas flares reducing: Theoretical and practical surveys for zero flaring start up in South Pars gas refinery, International Gas Union Research Conference, 2014, Copenhagen.
- Switching from MEG to LDHI injection in gas plant, gas hydrate 2014, Dubai.
- Identification and solutions for flow assurance problems in dew pointing and mercaptans removal unit in phase 2&3, 7th International Gas Hydrates Conference, 2010, Edinburgh.
- Amine gas sweetening system problems arising from amine replacement, 14th, intl. Oil, gas & petrochemical congress, 2010, Tehran.
- Optimization by swarm intelligence algorithms in refinery plants, 14th, intl. Oil, gas & petrochemical congress, 2010, Tehran.
- Optimization of process parameters in LPG treatment unit, 14th, intl. Oil, gas & petrochemical congress, 2010, Tehran.
- Optimizing of modified Claus sulphur plant with objective of maximum BTX destruction and higher reactor performance, International Gas Union Research Conferenc, 2011, Seoul.
- Environmental issue challenging in the sulphur recovery plant: BTEX removal, Sulphur Safety Seminar, 2011, Texas.
- Increase GT#3 capacity from 110% to 125% over design in SPGC-Ph#2&3, 2013, Shiraz.

AWARDS

- Two Bronze medals at Khayyam International invention and innovation festival, 2021
- The best technologist of Golestan university, 2018 & 2020
- The best young specialist in the Iran oil industry, 2012
- "Primer Award" for Shell company "Idea & Credit competition", 2002
- Reviewer of several ISI-indexed journals: Journal of Natural Gas Science & Engineering, International Journal of Hydrogen Energy, Materials Science for Energy Technologies, Environmental Chemistry Letters, Chemical Engineering Communications, Journal of CO₂ Utilization
- Chief evaluator of the Iranian National Energy Management Award

TEACHING

- **Golestan University, Iran:** Advanced thermodynamics, Advanced fluid mechanics, Gas treatment process, Heat Transfer, Unit operations
- **UCLouvain university, Belgium:** Experimental design course, conceptual design
- **Petrochemical centers, Asaluyeh:** HYSYS and PROMAX software, CO₂ absorption by Amine
- **South Pars Gas refinery, Asaluyeh:** Distillation, CO₂ absorption, Dehydration

INDUSTRIAL EXPERIENCE

Senior process engineer

Sep 2012 – Sep 2016

Engineering department, South Pars Gas Refinery, Asaluyeh, Iran

- Evaluated the process, solved operational problems, optimized the process, management of overhaul and, researched new technology
- Engineered zero flaring startup in gas treatment unit leads to saving \$20 million a year and reducing greenhouse gas emissions by 700%; all process units were simulated, the bottlenecks were identified, operational solution was determined and field tests were conducted
- Engineered 125% over design in train 3 of gas treatment units
- Engineered 133% over design in the Sulphur recovery unit

Process engineer

Feb 2009 – Sep 2012

Engineering department, South Pars Gas Refinery, Asaluyeh, Iran

- Solved the corrosion problems in H₂S/CO₂ absorption unit
- Conducted amine replacement in gas sweetening unit and Improved system performance
- Evaluated flow assurance and gas hydrate problem in dew pointing unit
- Optimized modified Claus sulfur Removed BTEX in the sulfur recovery unit
- Evaluated the switch from MEG to LDHI as a hydrate inhibitor
- Optimized operational parameters in the condensate stabilization unit

Field and Control panel operator

Jan 2008 – Feb 2009

Gas treatment units, South Pars Gas Refinery, Asaluyeh, Iran

- Controlled and monitored gas sweetening, dehydration, dew pointing, mercaptan removal, refrigerant, LPG treatment, SRU, and condensate stabilization units
- Start up and stop compressors and pumps, take operational parameters, compute and record data, adjust valves/pressures
- Conducted scheduled overhaul and maintenance of gas process units

Lab assistant

Aug 2007 – Jan 2008

Quality control laboratory, South Pars Gas Refinery, Asaluyeh, Iran

- Gas analysis including gas chromatograph, total sulfur meter
- Condensate analysis: RVP Condensate, Automatic distillation,
- Utility analysis: coulometer, volumetric KF, spectrophotometer, NDIR, BOD, COD

ACTIVITIES AND MEMBERSHIP

- Head of Carbon-Golestan startup incubator
- Head of Energy-Mine startup incubator
- Member of the American chemical society
- Member of the Iranian chemical society

GOOGLE SCHOLAR LINK: <https://scholar.google.com/citations?hl=en&user=12OjvocAAAAJ>