REZA GOLHOSSEINI

Assistant Professor of Chemical Engineering

Catalysis & Reaction Engineering

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CV information updated as of October 2026.

PROFESSIONAL PROFILE

Chemical engineering academic and researcher with expertise in heterogeneous and homogeneous catalysis, catalyst development and evaluation, reaction kinetics, and catalytic reactor design and modeling. Experienced in laboratory- and pilot-scale reactor development, catalyst screening and performance evaluation for refining and petrochemical applications, experimental design and optimization, and computational analysis using MATLAB and Aspen HYSYS. Combines academic teaching and graduate student supervision with applied research and industrial project experience.

RESEARCH INTERESTS

- Catalyst synthesis, screening, characterization strategy, and performance evaluation for refining and petrochemical processes
- Reaction kinetics, kinetic network analysis, and intrinsic catalytic evaluation
- Catalytic reactor design, modeling, simulation, and optimization
- Aromatics processing: xylene isomerization, ethylbenzene conversion, toluene disproportionation, and transalkylation
- Methane decomposition and hydrogen-related catalytic processes
- CO_2 capture and absorption using nanoparticle-enhanced solvents
- Design of experiments, statistical modeling, and data-driven optimization

ACADEMIC APPOINTMENTS & PROFESSIONAL EXPERIENCE

- Assistant Professor, Department of Chemical Engineering, University of Kashan, Iran | 2011–present
- Head of the Department of Chemical Engineering, University of Kashan | 2017–2019
- Consultant and project contributor, Exir Novin Farayand Asia, a knowledge-based company | 2011–present
- Project lead and collaborator, Kharazmi Research and Technology Company | 2010–2011
- Project lead and collaborator, Petrochemical Research and Technology Company, Tehran Center | 2004–2011

EDUCATION

- Ph.D. in Chemical Engineering, Amirkabir University of Technology, Tehran, Iran | 2011. Dissertation: "Development of Homogeneous Catalytic Systems and Investigation of Their Effects in Homogeneous Methanol Carbonylation to Acetic Acid." Supervisor: Dr. Abbas Naderifar.
- M.Sc. in Chemical Engineering, Amirkabir University of Technology, Tehran, Iran | 2003. Thesis: "Modeling of a Low-Density Polyethylene Autoclave Reactor and Comparison with Experimental Results for Polymer Property Modification." Supervisor: Dr. Abbas Naderifar.
- B.Sc. in Chemical Engineering, Amirkabir University of Technology, Tehran, Iran | 2001. Thesis: "Study of the Conversion of Natural Gas to Dimethyl Ether as an Oxygenated Fuel." Supervisor: Dr. Morteza Sohrabi.

CORE TECHNICAL EXPERTISE

- Catalyst and process development: catalyst preparation and evaluation, experimental test protocols, screening, and kinetic assessment.
- Reactor engineering: fixed-bed, tubular, fluidized-bed, microreactor, adiabatic, reverse-flow, and autothermal reactor design/modeling.
- Computational tools: MATLAB, Simulink, Optimization Toolbox, Symbolic Math Toolbox, Excel, and Aspen HYSYS.
- Research methods: experimental design, response-surface methodology, kinetic modeling, simulation, and process optimization.

SELECTED INDUSTRIAL & APPLIED RESEARCH PROJECTS

- Modeling and optimization of catalytic reactors for aromatics production and toluene conversion in petrochemical units, including projects associated with Nouri Petrochemical and Bandar Imam Petrochemical.
- Development and evaluation of catalysts for naphtha reforming, pyrolysis gasoline hydrogenation, xylene isomerization/ethylbenzene dealkylation, toluene disproportionation and transalkylation, and aromatics-unit processing.
- Development and evaluation of catalysts for acetylene selective hydrogenation, ethylbenzene production, light paraffin isomerization, isobutene production, and morpholine synthesis.
- Design and modeling of laboratory and pilot-scale fixed-bed, radial-flow, reverse-flow, autothermal, and fluidized-bed catalytic reactors.
- Development of MATLAB-based tools for analysis and optimization of catalytic reaction networks and multiphase catalytic reactors.

TEACHING & STUDENT SUPERVISION

Teaching at the University of Kashan since 2011, including undergraduate and graduate courses.

- Courses: Fluid Mechanics I, Heat Transfer I, Petrochemical Processes, MATLAB Software Workshop, Advanced Fluid Mechanics, Advanced Mathematics, Advanced Reactor Design, and Industrial and Specialized Reactor Design.
- Supervised/co-supervised more than 40 undergraduate projects, more than 30 M.Sc. theses, and 6 Ph.D. dissertations.

HONORS & AWARDS

- Exemplary Teaching Faculty, University of Kashan | 2014 and 2017
- Exemplary Technology Project Leader, University of Kashan | 2016
- Exemplary Researcher, University of Kashan | 2022 and 2025

PUBLICATIONS

Title | Citations | Year

- Enhanced CO2 absorption and reduced regeneration energy in Si-ZIF-8/Sulfinol-M nanofluid: experimental and thermodynamic evaluation with data-driven modeling
  MK Bahadori, M Shokouhi, R Golhosseini, AT Zoghi | 2026
  Scientific Reports
  http://dx.doi.org/10.1038/s41598-026-76785-2

- Response Surface Optimization of Toluene Disproportionation over Mordenite Catalyst under Hydrogen Atmosphere
  R Golhosseini, A Oudi, A Mohammadrezaei | 2026
  Results in Engineering, 113333
  https://doi.org/10.1016/j.rineng.2026.113333

- Solar-driven biomass polygeneration with hierarchical thermal cascading for integrated water–energy–fuel production
  M Amini, R Golhosseini, M Imandoust, STK Alghorayshi | 2026
  Separation and Purification Technology, 139964
  http://dx.doi.org/10.1016/j.seppur.2026.139964

- Y-Cu Synergistic Promotion in Ni/SiO2 Catalysts: Controlling Metal Dispersion and Carbon Diffusion toward Enhanced Stability in Methane Decomposition
  M Karaminejad, R Golhosseini, F Meshkani, P Da Costa | 2026
  Energy & Fuels 40 (32), 17823-17837
  https://doi.org/10.1021/acs.energyfuels.6c03146

- A comparative study of ultrasound-assisted and stirred impregnation methods for alumina-supported palladium catalysts in acetylene hydrogenation
  M Roostaiy Ghalehnooiy, R Golhosseini, A Mohammadrezaei | 2026
  Chemical Engineering Communications, 1-12
  https://www.scopus.com/inward/record.url?eid=2-s2.0-105037522123&partnerID=MN8TOARS

- CO2-to-methanol conversion through catalytic hydrogenation: Mechanistic insights and microkinetic modeling on zirconia-promoted Cu/ZnO/Al2O3 catalyst
  MS Arabahmadi, R Golhosseini, MS Yazd, S Sahebdelfar, F Meshkani | 6 | 2026
  International Journal of Hydrogen Energy 217, 153830
  https://doi.org/10.1016/j.ijhydene.2026.153830

- Techno-economic and environmental assessment of a hybrid bioenergy system optimized via NSGA-II: biomass pyrolysis, Fischer–Tropsch synthesis, and solar-enhanced power generation
  M Amini, R Golhosseini, M Imandoust, STK Alghorayshi | 8 | 2025
  Energy Conversion and Management: X, 101408
  https://doi.org/10.1016/j.ecmx.2025.101408

- CO2-to-methanol conversion over promoted Cu/ZnO/Al2O3 catalysts by Ga, Zr, and Co: A comprehensive DFT and experimental study
  MS Arabahmadi, R Golhosseini, S Sahebdelfar, F Meshkani | 12 | 2025
  Energy Conversion and Management: X, 101291
  https://doi.org/10.1016/j.ecmx.2025.101291

- Catalytic performance and hydrogen spillover in Cu/ZnO/Al2O3: Insights from DFT calculations on alkali and alkaline earth oxides promoters for CO2 hydrogenation
  MS Arabahmadi, R Golhosseini, MS Yazd, F Meshkani — 25 | 2025
  Journal of CO2 Utilization 99, 103162
  https://doi.org/10.1016/j.jcou.2025.103162

- Insight into the moderate interaction between the metal and support and reinforcing of Ni/SiO2-based catalysts efficiency with the manganese integration in thermal catalytic methane decomposition
  M Karaminejad, R Golhosseini, F Meshkani, P Da Costa — 25 | 2025
  Energy Conversion and Management 323, 119229
  https://www.sciencedirect.com/science/article/pii/S0196890424011701?dgcid=coauthor

- Measurements of density and viscosity of carbon dioxide-loaded and-unloaded nano-fluids: experimental, genetic programming and physical interpretation approaches
  MK Bahadori, M Shokouhi, R Golhosseini — 11 | 2024
  Chemical Engineering Journal Advances 18, 100600
  http://dx.doi.org/10.1016/j.ceja.2024.100600

- Mixing γ-Al2O3, silica-ZIF-8 and activated carbon nanoparticles in aqueous N-methyldiethanolamine+ sulfolane as a nanofluid for application on CO2 absorption
  MK Bahadori, R Golhosseini, M Shokouhi, AT Zoghi — 14 | 2024
  Journal of CO2 Utilization 79, 102650
  https://doi.org/10.1016/j.jcou.2023.102650

- Trimetallic catalyst, prepared by ultrasonic-impregnation method for selective hydrogenation of acetylene: investigation of potassium addition to Fe-Pd/α-Al2O3 catalyst
  M Roostaiy Ghalehnooiy, R Golhosseini, A Mohammadrezaei — 1 | 2023
  Reaction Kinetics, Mechanisms and Catalysis 136 (4), 2003-2020
  https://www.scopus.com/inward/record.url?eid=2-s2.0-85168227927&partnerID=MN8TOARS

- Optimization of the homogeneous rhodium-catalyzed methanol carbonylation reactor to reduce CO2 emissions
  AH Oudi, R Golhosseini — 1 | 2022
  Iranian Journal of Chemical Engineering (IJChE) 19 (3), 50-68
  https://doi.org/10.22034/ijche.2023.364482.1459

- Non-isothermal DSC curing kinetics study of silicone-modified epoxy/ABS/GO nanocomposite
  F Gholinezhad, R Golhosseini, O Moini Jazani — 33 | 2022
  Polymer Composites 43 (6), 3794-3808
  http://www.scopus.com/inward/record.url?eid=2-s2.0-85128499455&partnerID=MN8TOARS

- Synthesis, characterization, and properties of silicone grafted epoxy/acrylonitrile butadiene styrene/graphene oxide nanocomposite with high adhesion strength and thermal stability
  F Gholinezhad, R Golhosseini, O Moini Jazani — 20 | 2022
  Polymer composites 43 (3), 1665-1684
  https://doi.org/10.1002/pc.26487

- Effect of Rhenium on Ag/SrTiO3 Catalyst in Ethylene Epoxidation Reaction: Synthesize, Characterization and Evaluation — | 2020
  S Darake, R Golhosseini, A Mohammadrezaei, M Asghari

Gas Processing Journal 8 (2), 13-22
https://gpj.ui.ac.ir/article_24748.html

- Substrate optimization in baby hamster kidney cell culture for foot and mouth disease virus vaccine using the Taguchi method
  M Hasani, R Golhosseini, SM Azimi, M Ardjmand, H Mahravani, SS Parizi
  Journal of Medicine and Life 13 (2), 241
  http://www.scopus.com/inward/record.url?eid=2-s2.0-85088908888&partnerID=MN8TOARS
  3 | 2020

- Modeling Studies on Fixed Bed Membrane Reactor for WGSR-based Hydrogen Production: PEM Fuel Cell Applications
  R Golhosseini, AC Roshan, M Mahmoudi
  American Journal of Oil and Chemical Technologies 2, 71-85
  https://ajoct.petrotex.us/article_45007.html
  1 | 2014

- The joint reaction of methanol and i-butane over the HZSM-5 zeolite
  G Roohollahi, M Kazemeini, A Mohammadrezaee, R Golhosseini
  Journal of Industrial and Engineering Chemistry 19 (3), 915-919
  http://www.scopus.com/inward/record.url?eid=2-s2.0-84875252087&partnerID=MN8TOARS
  15 | 2013

- Kinetic Modeling of i-Butane Cracking on an HZSM-5 Zeolite Catalyst
  GHR ROOHOLLAHI, M Kazemeini, RAR MOHAMMAD, R Golhoseini
  PETROLEUM RESEARCH 23 (73), 3-13
  https://www.sid.ir/paper/114884/en
  | 2013

- Methanol to propylene: the effect of iridium and iron incorporation on the HZSM-5 catalyst
  A Mohammadrezaei, S Papari, M Asadi, A Naderifar, R Golhosseini
  Frontiers of Chemical Science and Engineering 6 (3), 253-258
  http://www.scopus.com/inward/record.url?eid=2-s2.0-84865553647&partnerID=MN8TOARS
  29 | 2012

- Chemical kinetic modeling of i-butane and n-butane catalytic cracking reactions over HZSM-5 zeolite
  G Roohollahi, M Kazemeini, A Mohammadrezaee, R Golhosseini
  AIChE journal 58 (8), 2456-2465
  http://www.scopus.com/inward/record.url?eid=2-s2.0-84863569150&partnerID=MN8TOARS
  17 | 2012

- Kinetic Study, Modeling and Simulation of Homogeneous Rhodium-Catalyzed Methanol arbonylation to Acetic Acid
  R Golhosseini Bidgoli, A Naderifar, AR Mohammadrezaei, MR Jafari Nasr
  Iranian Journal of Chemistry and Chemical Engineering 31 (1), 57-73
  http://www.scopus.com/inward/record.url?eid=2-s2.0-84863543339&partnerID=MN8TOARS
  10 | 2012

- Reaction engineering studies of homogeneous rhodium-catalyzed methanol carbonylation in a laboratory semi-batch reactor
  R Golhosseini, A Naderifar, A Mohammadrezaei, M Jafari Nasr
  International Journal of Chemical Reactor Engineering 10 (1)
  http://www.scopus.com/inward/record.url?eid=2-s2.0-84857713173&partnerID=MN8TOARS
  4 | 2012

- Application of a simple lumped kinetic model for the catalytic cracking reaction of n-butane over the HZSM-5 zeolite
  G Roohollahi, M Kazemeini, A Mohammadrezaee, R Golhoseini
  6 | 2012

Procedia Engineering 42, 140-147
https://doi.org/10.1016/j.proeng.2012.07.404

- KINETIC STUDY AND INVESTIGATION OF MECHANISMS CHANGES IN ISO AND NORMAL BUTANE CRACKING OVER HZSM ZEOLITE
  GHR ROOHOLLAHI, M KAZEMEINI, RAR MOHAMMAD, R GOLHOSSEINI | 2012
  Journal of Iranian Chemical Engineering (Farsi Edition) 11 (63), 44-60
  https://www.sid.ir/paper/150644/en

- Comparison of two methods of iridium impregnation into HZSM-5 in the methanol to propylene reaction
  S Papari, A Mohammadrezaei, M Asadi, R Golhosseini, A Naderifar
  37 | 2011
  Catalysis Communications 16 (1), 150-154
  http://www.scopus.com/inward/record.url?eid=2-s2.0-80054695363&partnerID=MN8TOARS

- The solubility effect of rhodium salt on kinetic study of homogeneous rhodium-catalyzed methanol carbonylation to acetic acid
  R Golhosseini, A Naderifar, AM Rezaee, MJ Nasr | 2008
  CHISA 2008 - 18th International Congress of Chemical and Process Engineering
  http://www.scopus.com/inward/record.url?eid=2-s2.0-84867409611&partnerID=MN8TOARS

BOOK

Introduction to Software for Chemical Engineers. Translator: Shiva Darkeh and Reza Golhosseini. Sokhanvaran Publishing. ISBN: 978-622-215-301-4.

SELECTED CONFERENCE CONTRIBUTIONS

"Study of promoting effect of ruthenium on homogeneous iridium-catalyzed methanol carbonylation process." 5th International Congress on Chemical Engineering, Kish Island, Iran, 2008.

"A new method for the kinetic study of homogeneous methanol carbonylation to acetic acid." International Catalysis Conference, Tehran, Iran, 2008.

Additional national conference contributions on methanol carbonylation kinetics and catalytic reaction engineering.

PEER REVIEW

Peer reviewer for 21 publications/grants, including reviews for Applied Surface Science, Biomass & Bioenergy, Energy Conversion and Management: X, Fuel, International Journal of Hydrogen Energy, Journal of CO_2 Utilization, Journal of Applied Polymer Science, Separation and Purification Technology, International Journal of Chemical Reactor Engineering, Journal of Dispersion Science and Technology, Greensusmater, Bentham Science Publisher, Catalysis Research, Journal of Catalysis Letters, Journal of Frontiers in Heat and Mass Transfer, Journal of Sol-Gel Science and Technology, Journal of Modeling in Engineering , Journal of Iranian Chemical Engineering, Nashrieh Shimi va Mohandesi Shimi Iran (NSMSI), Iranian Journal of Chemistry and Chemical Engineering (IJCCE), Journal of Farayandno.

REFERENCES

Available upon request.