

PERSONAL INFORMATION



Mohammad Hossein Karimi Darvanjooghi

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RESEARCH SCOPES

- AI and Machine learning, Modeling, Optimization and CFD
- Process engineering and optimization, separation techniques
- Biooxidation, bioleaching and Bio-hydrometallurgy process
- Bio-nanotechnology in water/wastewater treatment

EDUCATION AND TRAINING

- 2020–current **PhD in Civil & Environmental Engineering**
York University, North York (Canada)
Research: Metal extraction and recovery, bioleaching and biooxidation of refractory gold ores, Bio-catalysts
- 2012–2015 **Master of Science in Chemical Engineering (Process Engineering)**
Isfahan University of Technology, Isfahan (Iran)
Major: Separation Process
Cumulative GPA: 18.23 of 20.00 (4.00/4.00).
Thesis title: Investigation of the effect of SiO₂ nanoparticles size on the thermal conductivity of silica-ethanol nanofluid
- 2008–2012 **Bachelor of Science in Chemical Engineering**
Isfahan University of Technology, Isfahan (Iran)
Major: Polymer Science
Cumulative GPA: 16.52 of 20.00 (3.55/4.00)
Thesis title: Study on Rheological behavior of smart polymers with shape-memory properties, and their application in membrane-separation process

WORK EXPERIENCE

- 2021–Current **Internship**
Mitacs Accelerate, York University with cooperation of Technological Center for Industrial Residues (CTRI)
Titles: Development of innovative approaches for the extraction and recovery of resources from gold-bearing materials
- Complete literature reviews,
 - Bacterial adaptation to the ore/concentration,
 - Handling the biooxidation experiments in shaking flasks,
 - Handling the biooxidation tests in bioreactor and column,
 - Analyzing the data obtained from experiments.

2019–2020 Internship

Tehran University, Tehran (Iran)

Titles:

- Reviewing previous researches related to topics (complete literature reviews),
- Isolating and screening the local bacteria,
- Bacterial adaptation to the ore/concentration,
- Mineralogical studies and diagnostic leaching,
- Cyanidation in standard condition,
- Handling the biooxidation experiments in shaking flasks,
- Handling the biooxidation tests in bioreactor,
- Cyanidation after biooxidation pre-treatment,
- Analyzing the data obtained from experiments.

2016–2019 Researcher

Young Researcher and Elite Club, Azad University, Najafabad Branch (YREC), Najafabad (Iran)

projects:

- 1-Synthesis, characterization, and preparation of nano-sized materials and their stability in nano and microfluids
- 2-Determination of thermo-physical properties and solid-liquid interaction of nanoparticles in nanofluids
- 3-Pollutant removal from environment by using magnetic field combined with nanotechnology
- 4-Heat and mass transfer enhancement by using nano and micro-fluids

2015–2017 Research Assistance

Frayand Pouyan Spadana Co. with cooperation of WASTE WATER TREATMENT Co. Industrial project, Isfahan, Iran, Isfahan (Iran)

Projects:

- 1-the separation of hydrogen sulfide from biogas by using nanofluids.
- 2-optimization and design of bubble flow absorber
- 3-design and operation of bio-scrubbing process for removal of dissolved hydrogen sulfide by using microorganisms.

2013–2014 Research and development, (Part Time)

Parsian Advanced Industries Co., Isfahan (Iran)

Project:

- 1-Modelling and analysis of mass transport within the solvent circulation for production of electro-dialysis membrane and polysulfone membrane for water treatment

Lecturer, Simulation of steady state process by HYSYS for chemical engineering students

Isfahan University of Applied Science and Technology (IUAST), Isfahan (Iran)

Lecturer, Numerical method by using MATLAB programming (two sections)

Lecturer, Isfahan University of Technology, Isfahan (Iran)

Teaching Assistant, Polymers' Chemical and Physics laboratory for undergraduate students (two sections)

Isfahan University of Technology, Isfahan (Iran)

Teaching Assistant, Unit operation laboratory for undergraduate students (five sections)

Isfahan University of Technology, Isfahan (Iran)

COMPUTER SKILLS

- Programming: C, C++
- Professional experience: MATLAB, Python, R-studio, GMDH Shell DS, ANSYS Fluent, COMSOL Multiphysics
- Computer literacy: Microsoft office, Photoshop

LABORATORY SKILLS

- Laboratory devices analysis: UV-Visible, Dynamic Light Scattering, Transmission Electron Microscopy, GC Mass Spectroscopy, Atomic Force Microscopy, Confocal Laser Scanning Microscopy, Atomic Absorption AES.
- Ultrasonic-assisted methods for nanoparticle preparation, microchannels

PUBLICATIONS

Published articles:

- A New Correlation for Estimating the Thermal Conductivity and Dynamic Viscosity of CuO/Liquid Paraffin Nanofluid Using Neural Network Method, Arash Karimipour, Samad Ghasemi, Mohammad Hossein Karimi Darvanjooghi, Ali Abdollahi, International Communications in Heat and Mass Transfer, 92-3 (2018): 90-99. **(Impact Factor: 3.97)**
- Application of Treated Waste Eggplant Peel as a Low-Cost Adsorbent for Water Treatment toward Elimination of Pb²⁺ : Kinetic Modeling and Isotherm Study, Mohammad Hossein Karimi Darvanjooghi, Seyyed Mohammadreza Davoodi, Arzu Yadigar Dursun, published online, Adsorption Science and Technology. **(Impact Factor: 2.43)**
- Investigation of the Effects of Nanoparticle Size on CO₂ Absorption by Silica/Water Nanofluid, Mohammad Hossein Karimi Darvanjooghi, Hamid Esmaeili-Faraj, Mohsen Nasr Esfahany, Separation and Purification Journal, 195 (2018) 208–215. **(Impact Factor: 5.77)**
- Effect of temperature and mass fraction on viscosity of crude oil-based nanofluids containing oxide nanoparticles, Attari, Hassan, Fahimeh Derakhshanfard, Mohammad Hossein Karimi Darvanjooghi, International Communications in Heat and Mass Transfer, 82 (2017): 103-113. **(Impact Factor: 3.97)**
- Investigation of the Effect of Magnetic Field on Mass Transfer Parameters of CO₂ Absorption Using Fe₃O₄-Water Nanofluid, Mohammad Hossein Karimi Darvanjooghi, Maedeh Pahlevaninejada, Ali Abdollahi, Seyyed Mohammadreza Davoodi, AIChE Journal, 63-6 (2017) 2176-2186. **(Impact Factor: 3.52)**
- Experimental investigation of the effect of nanoparticle size on thermal conductivity of in-situ prepared silica – ethanol nanofluid, Mohammad Hossein Karimi Darvanjooghi, Mohsen Nasr Esfahany, International Communications in Heat and Mass Transfer, 77 (2016) 148 –154. **(Impact Factor: 3.97)**
- Electrospinning of Cellulose Nanofibers Mat for Laminated Epoxy Composite Production, Abdol Rasool Jahanbaani, Tayebeh Behzad, Sedigheh Borhani, Mohammad Hossein Karimi Darvanjooghi, Fibers and Polymers, 17-9 (2016): 1438-1448. **(Impact Factor: 1.8)**
- Experimental study to obtain the viscosity of CuO-loaded nanofluid: effects of nanoparticles' mass fraction, temperature and basefluid's types to develop a correlation. Ali Abdollahi, Mohammad Hossein Karimi Darvanjooghi, Arash Krimipour, Mohammad Reza Safaei. published online. *Journal of Meccanica*. **(Impact Factor: 2.15)**
- Providing a model for Csf according to pool boiling convection heat transfer of water/ferrous oxide nanofluid using sensitivity analysis. Mohammad Reza Salimpour, Mohammad Hossein Karimi Darvanjooghi, Ali Abdollahi, Arash Karimipour, Marjan Goodarzi. *International Journal of Numerical Methods for Heat & Fluid Flow* (2019). **(Impact Factor: 2.87)**
- Application of Water Based Nanofluids in Bioscrubber for Improvement of Biogas Sweetening in a Pilot Scale, Seyyed Hamid Esmaeili-Faraj, Mohsen Nasr Esfahany, Mohammad Hossein Karimi

Darvanjooghi, *Journal of Chemical Engineering & Processing: Process Intensification*, 143 (2019): 107603. (Impact Factor: 3.73)

- Modelling of Water Absorption Kinetics and Biocompatibility Study of Synthesized Cellulose Nanofiber-Assisted Starch-Graft-Poly(Acrylic Acid) Hydrogel Nanocomposites, Nooshin Bahadoran Baghbadorani, Tayebah Behzad, Mohammad Hossein Karimi Darvanjooghi, Nasrin Etesami, *Cellulose Journal*, 27, 9927–9945 (2020): 1-19. (Impact Factor: 4.21)
- Optimization and sensitivity analysis of rheological properties of high concentration γ - alumina/water suspension, Mohammad Javad Nouri, Mohammad Hossein Karimi Darvanjooghi, Ahmad Moheb, *International Journal of Applied Ceramic Technology*, 18 (2021), 369-383. (Impact Factor: 1.76)
- Superadsorbent Fe₃O₄-coated carbon black nanocomposite for separation of light rare earth elements from aqueous solution: GMDH-based Neural Network and sensitivity analysis, Hadi Abdollahi, Soudabeh Maleki, Hani Sayahi, Mahdi Gharabaghi, Mohammad Hossein Karimi Darvanjooghi, Sara Magdoulia, Satinder Kaur Brar. *Journal of Journal of Hazardous Materials*, 416, 125655 (2021). (Impact Factor: 9.04)
- Precision modelling of co-metabolic biodegradation of recalcitrant aromatic hydrocarbons in conjunction with experimental data, Saba Miri, Seyyed Mohammadreza Davoodi, Mohammad Hossein Karimi Darvanjooghi, Satinder Kaur Brar, Tarek Rouissi, Richard Martel. *105 (2021): 113-127. (Impact Factor: 2.95)*
- Bio-oxidation of gold from refractory sulphide ores: a journey ahead, Mohammad Hossein Karimi Darvanjooghi, Sara Magdoulia, Satinder Kaur Brar, Hadi Abdollahi, Mehdi Zolfaghari. *Geomicrobiology Journal*, 1-17. (Impact Factor: 1.99)
- Ethylene and cyclohexane co-production in the fixed-bed catalytic membrane reactor: experimental study and modeling optimization, Mohammad Hossein Karimi Darvanjooghi, Mohammad Malakootikhah, Sara Magdoulia, Satinder Kaur Brara, *Journal of Membrane Science. Accepted. (Impact Factor: 8.42)*

Conferences:

- Experimental Investigation of the Thermal conductivity of silica nanofluids as a function of nanoparticles size, MH.Karimi.D, MN.Esfahany. International Conference on Nanoscience & Nanotechnology (ICNN2014). Tehran. Iran.
- Effect of temperature and ore sample analysis on gold recovery from refractory gold ores by using optimized biooxidation process in water-based environment, Mohammad Hossein Karimi Darvanjooghi, Satinder Kaur Brar, Sara Magdoulia, Zeinab Ganji, International Water Association - Young Water Professional Canada Conference 2021, Toronto, Canada.

HONOURS AND AWARDS

- Peer-reviewing of research articles in ISI journal (**Chemical Engineering Journal, Journal of Chemical Engineering & Processing: Process Intensification, Journal of Composites Part b: Engineering, Journal of Catalysts Letter, Journal of Thermal Analysis and Calorimetry, Journal of Energy and Fuels**)
- Admitted to National Elites Foundation, Iran
- Awarded scholarship of Duisburg-Essen University Summer Academy from DAAD, Germany
- Awarded research grant from Iran Nanotechnology Initiative Council, Tehran, Iran
- Awarded research grant from Young researcher and elite club, Azad University, Najafabad branch, Iran
- Awarded scholarship of Ostfalia University of Applied Science's Summer Academy from DAAD, Germany
- Honoured as top student at Isfahan University of Technology in the field of art, culture, and engineering, Isfahan University of Technology, Isfahan, Iran
- Awarded academic scholarship as top student in Master of Science period, Isfahan University of Technology, Isfahan, Iran
- Honoured as top student in Master of Science period by chemical engineering faculty members and presidential members of Isfahan University of Technology, Isfahan, Iran
- Ranked A student in master academic period among 80 students.

- Ranked as 4% in Master of Science nationwide university entrance among applicants for Chemical Engineering Program
- Ranked first in 5th Iranian ChemCar competition
- Nominated for participation in chem-e-car competition in Germany-Barlin

CERTIFICATIONS

- Summer academy of Enhanced Technologies for Water and Wastewater Treatment in Urban Systems, Duisburg-Essen University, Germany
- Summer academy of Water and Environment in time of Global Change, Ostfalia University of Applied Science, Germany
- Certificate of attendance in 5th International Congress on Nanoscience and Nanotechnology, Tarbiat Modares University, Tehran, Iran
- Certificate of participation in Third Iranian Workshop on Rheology, with cooperation of Isfahan University of Technology and The University of Michigan, Isfahan, Iran
- Certificate of participation in 5th International Color and Coating Congress as executive committee, Isfahan University of Technology, Isfahan, Iran

MEMBERSHIPS

- Membership of Young Researcher group, Azad University, Najafabaad branch
- Membership of Iran Nanotechnology Initiative Council, Tehran, Iran
- Membership of Iran National Elites Foundation
- Membership of Iranian Association of Chemical Engineering
- German Water Association (DWA)

PROJECTS

- Advisor of M.Sc. theses in the field of nanoparticles and nanofibers production, Isfahan University of Technology, Department of Chemical Engineering, Azad University of Najafabad, Department of Mechanical Engineering, and Tarbiat Modares University, Department of Chemical Engineering
- Application of novel fluid and nanofluid in absorption of hydrogen sulfide from biogas production process within Water Treatment Company of Isfahan city, Iran
- Feasibility study of economical plant of electrical power station using biogas production of Water Treatment Company in Shahin-Shahr city, Iran
- Preparation of alumina nanofluid as polishing liquid in metallography laboratory, Material and Science Engineering Department, IUT
- One dimensional simulation of syngas production by membrane reactor from methane, under supervision of Dr. K.Karmi, Chemical Engineering Department, IUT
- Study on mass transfer in polymeric membrane, under supervision of Prof. M.Nasr.Esfahany, Chemical Engineering Department, IUT
- Study on behavior of smart actuator polymers, conductive polymers and their application on membrane separation process, under supervision of Dr. K.Shams, Chemical Engineering Department, IUT
- Study of mechanical properties of polymer carbon nanotube (CNT) composite, under supervision of Dr. T.Behzad, Chemical Engineering Department, IUT
- Determination of concentration profile in plug flow reactor by finite differences method in MATLAB, under supervision of Prof. S.M.Ghoreishi, Chemical Engineering Department, IUT
- Study on rheological behavior of smart polymer, under supervision of Dr. K.Shams, Chemical Engineering Department, IUT
- Study on mass transfer in packed tower, under supervision of Prof. M.R.Ehssani, Chemical Engineering Department, IUT

REFERENCES

- Satinder Kaur Brar

Title: Professor of Civil and Environmental Engineering

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- Sara Magdouli

Title: PhD, Project Manager

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Institute: Le centre technologique des résidus industriels (CTRI)

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