



Milad MOLAEE

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## SUMMARY

Milad Molaee is a dedicated PhD student in Chemical Engineering with a robust background in the construction industry. He holds a Bachelor's degree in Polymer Engineering from Amirkabir University of Technology (Tehran Polytechnic) and a Master's degree in Chemical Engineering from Iran University of Science and Technology (IUST). Milad has extensive experience working with materials such as concrete, adhesives, grout, and detergents. He previously served as the Manager of the Research and Development Center at Dinokoll, where he led innovative projects and contributed significantly to the company's advancements. Currently, he focuses on the synthesis and production of various chemical raw materials, with a particular emphasis on hydrogel materials for the oil and gas industry. His PhD project is centered on the usage of hydrogels for corrosion protection, aiming to drive progress and innovation in this critical sector.

## EDUCATION

### TEHRAN POLYTECHNIC

2013-2018

B.SC. IN POLYMER ENGINEERING

- Modeling of Low-Temperature Water-Gas Shift Reaction in Pd/Ag Membrane Reactor

### IRAN UNIVERSITY OF SCIENCE AND TECHNOLOGY

2019-2022

M.SC. IN CHEMICAL ENGINEERING

- Molecular Simulation of Gas Adsorption on Single-Wall Carbon Nanotubes

### CHEMISTRY AND CHEMICAL RESEARCH CENTER OF IRAN

2022-Present

PHD IN CHEMICAL ENGINEERING

- Self-Healing Nanocomposite Hydrogel Loaded with Corrosion Inhibitor for Protection of Q235 Carbon Steel

## WORK EXPERIENCE

### DINOKOLL INC.

September 2021 - June 2024 / Tehran

R&D MANAGER

- At Dinokoll, I was employed for nearly three years, during which time I held the positions of both R&D unit manager and laboratory manager.

### CHEMISTRY & CHEMICAL ENGINEERING RESEARCH CENTER OF IRAN (CCERCI)

September 2022 - Present / Tehran

RESEARCHER

- At CCERCI, I have conducted research for nearly two years, with a focus on synthesizing and developing smart hydrogels for various applications. These applications include their use in anti-corrosion methods and materials within the oil and gas industry.

## SKILLS

**SCIENTIFIC** Hydrogels | Supramolecular Networks | Polymer Characterization | Polymer Chemistry  
Molecular Simulation | Molecular Dynamics | Monte Carlo | Design of experiments  
Chemical Process Design | Reactor Design | Deep Learning | Artificial Neural Network

**COMPUTER SKILLS** Aspen Plus | Hysys | Material Studio | Matlab | Mathematica | OriginPro | Design Expert  
Comsol Multiphysics | SolidWorks | 3dsMax | Python | C, C++ | MS Office |  $\text{\LaTeX}$

**LANGUAGES** *Native:* Persian *Fluent:* English *Beginner:* German

## PROJECTS

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### SCIENTIFIC PROJECTS

- Cellulose Derivatives: Synthesis and Characterization.
- Synthesis and Characterization of pH-sensitive Hydrogels.
- Synthesis and Characterization of Hydrogel-based Anticorrosion Coating.
- Monte Carlo Molecular Simulation of Coordination Polymerization (by C++).
- Monte Carlo Molecular Simulation of Gas adsorption on Multi-Wall Carbon Nanotube by Materials Studio.
- Modeling and Optimization of Water-Gas Shift Membrane Reactors by Matlab.
- Mathematical Modeling of Steam Reforming Membrane Reactors (Mathematica).
- NetHub: Deep Learning Package Design and Development (by Python).

### INDUSTRIAL PROJECTS

- Synthesis and Characterization of Calcium Formate (Industrial-Scale).
- High-Tech Formulations for Concrete, Grout, and Tile Adhesive (Industrial-Scale).
- Detergent Formulation and Development (Industrial-Scale).

## SCIENTIFIC ARTICLES

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### JOURNAL PAPERS

- F. Bahmanzadgan, A. Ghaemi, M. Qasemnazhand, and M. Molaee, "Simulation of gas adsorption on single-walled carbon nanotubes", Sci. Rep., vol. 15, no. 1, p. 15595, May 2025, doi:[10.1038/s41598-025-99988-5](https://doi.org/10.1038/s41598-025-99988-5).
- A. Ghaemi, A. Hemmati, M. Asadollahzadeh, and M. Molaee, "Hydrodynamic behavior of standard liquid-liquid systems in Oldshue–Rushton extraction column; RSM and ANN modeling", Chem. Eng. Process. - Process Intensif., vol. 168, 2021, doi:[10.1016/j.cep.2021.108559](https://doi.org/10.1016/j.cep.2021.108559).

### CONFERENCE PROCEEDINGS

- M. Molaee, E. Jalali, M. Moshtagh, H. Farahani, "Modeling of Water-Gas shift Membrane Reactor: Investigating the Effect of Design and Operational Parameters on Reactor Performance", 4th International Conference on Oil, Gas, and Petrochemical, Tehran, Iran, 2017, url:[civilica.com/doc/640789](http://civilica.com/doc/640789).
  - M. Molaee, M. Moshtagh, F. Bateni, "Generation and Purification Modeling of Hydrogen by Water-Gas Shift Reaction in Low-Temperature for Fuel Cell Utilization", 4th National Hydrogen and Fuel Cell Conference, Tehran, Iran, 2017, url:[civilica.com/doc/641999](http://civilica.com/doc/641999).
  - M. Moshtagh, M. Molaee, M. Moshtagh, "Modeling of low temperature gas-water shift reaction in packed bed membrane reactor", 4th National Conference on Chemical, Petrochemical, and Nanotechnology, Tehtan, Iran, 2016, url:[civilica.com/doc/587258](http://civilica.com/doc/587258).
  - M. Moshtagh, M. Molaee, M. Moshtagh, "Investigation of Parameters Affecting the Low-Temperature Water-Gas Shift Reaction in a Packed-Bed Membrane Reactor", 2nd International Conference on Green Engineering and Technologies for a Sustainable Future, Tehtan, Iran, 2016, url:[civilica.com/doc/596266](http://civilica.com/doc/596266).
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