

Seyedmohsen Hosseini

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INDUSTRIAL RESEARCH PROJECTS:

- Design of heat exchanger for metal hydride storages, 2014
Design and optimization of fins and the temperature and velocity of heating fluid to reach a constant rate of hydrogen desorption from a metal hydride storage to feed a fuel cell. The process was modelled using a computer program written in Fortran 90. OpenFOAM was also applied to estimate the effect of fluid flow on heat transfer rate.
 - Simulation of metal hydride heat pumps, 2015.
A metal hydride heat pump was modelled to study the potential of using cooling effect of endothermic reaction of hydrogen desorption from metal hydride reactors. The heat pump was designed to cool down a room and the effect of different parameters was investigated to achieve the best design. A Fortran code was also provided to simulate the adsorption and desorption reactors.
 - Optimal design of flow distributors at inlets of Claus and TGT Reactors using CFD, 2017.
Gas distribution in chemical reactors was simulation using CFD method. Ansys Fluent was used to simulate turbulent gas flow in a perforated plate gas distributor and the design parameters of the distributor was effectively changed to achieve a uniform gas distribution on the catalytic porous bed.
 - Modification of operating conditions and design of the refinery flare for increasing flame stability and flare flashback prevention using CFD analysis, 2020.
Gas combustion in an industrial flare was simulated using Ansys Fluent and effect of different parameters on the flame stability was investigated. The flare design was improved to achieve a stable flame particularly against the strong winds.
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RESEARCH INTERESTS:

- Design and optimization of chemical processes.
 - Computational Fluid Dynamics (CFD)
 - Numerical investigation of multiphase flow with heat and mass transfer
 - Numerical investigation of reacting and turbulent flows
 - Numerical investigation of transport phenomena in porous media
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PUBLICATIONS:

Journal Papers

- S.M. Hosseini, R. Alizadeh, E. Fatehifar, A. Alizadehdakhel, Simulation of gas absorption into string-of-beads liquid flow with chemical reaction, Heat and Mass Transfer, 2014, 50, 1393-1403.
- S.M. Hosseini, R. Alizadeh, H. Targholizadeh, Simulation of hydrogen desorption from large metal hydride storages and investigation of efficiency enhancement using metal fins, Modares Mechanical Engineering, 2015, 15, 63-72, in Persian.

- S.M. Hosseini, R. Alizadeh, H. Targholizadeh, Investigation of compressor driven metal hydride heat pumps (CDMHHP) using numerical simulation, Mechanical Engineering Journal of Tabriz University, 2016, 46, in Persian.
- S.M. Hosseini, R. Alizadeh, A. Alizadehdakhel, Y. Behjat, P. Nooriasl, Enhancement of gas distribution uniformity in a Claus Process catalytic reactor using computational fluid dynamics, Chemical Engineering & Processing: Process Intensification, 2019, 144, 107653.

Conference papers

- S.M. Hosseini, Simulation of hydrogen desorption from metal hydride storages and investigation of heat transfer enhancement effect, 5th National CFD Applications Conference in Chemical Industries and Petroleum, Iran, 2014, in Persian.
 - Seyedmohsen Hosseini, Renzo Di Felice, Intensification of a gas absorber to capture CO₂ from ship exhaust gases, 8th European Process Intensification Conference, Poland, 2023.
 - Seyedmohsen Hosseini, Renzo Di Felice, CFD simulation of high gas flow rate in a large-scale rotating packed bed, 27th International Congress of Chemical and Process Engineering, Prague, Czech Republic, 2024.
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EDUCATION:

- **PhD student in Chemical Engineering**
Department of Civil, Chemical and Environmental Engineering, University of Genova, Genova, Italy (From January 2022)
 - **Master of Science in Chemical Engineering**
Faculty of Chemical Engineering, Sahand University of Technology, Tabriz, Iran (2010-2012)
Thesis Title: Hydrodynamic simulation of fluid flow in wetted wire column
 - **Bachelor of Science in Chemical Engineering**
Faculty of Chemical and Petroleum Engineering, Islamic Azad University, Quchan branch, Quchan, Iran, (2004-2009)
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COMPUTER SKILLS:

Programming Languages:

- MATLAB
- Fortran
- Python

Software:

- Ansys Fluent
- OpenFOAM
- Microsoft Office
- Libre Office
- LaTeX

Operating Systems:

- Linux (Ubuntu)
 - Microsoft Windows
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LANGUAGES:

- **Persian:** Mother Tongue
 - **English:** Advanced
 - **Italian:** A2
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