



## Education

- **Polytechnique Montreal, Montreal, QC, Canada** (2015)

*Ph.D. Degree, Department of Chemical Engineering*

Thesis: “Hydrodynamics of Bubble Column Reactors Operating with Non-Newtonian Liquids”

- **The University of Tehran, Tehran, Iran** (2009)

*M.Sc. Degree, Department of Chemical Engineering*

Thesis: “Effects of Surfactants on the Performance of Packed Bed Liquid-Liquid Extraction Columns”

- **The University of Tehran, Tehran, Iran** (2007)

*B.Sc. Degree, Department of Chemical Engineering*

Thesis: “Hydrodynamic Studies on the Pulsed Sieve Plate Columns”

## Research Interests

- Design, Scale-up and Optimization of Multiphase Reactors
- Multiphase Flow Characterization
- Catalytic Reactors
- Chemical Reaction Engineering
- Hydroconversion of Heavy Oil and Petroleum Residues
- Renewable Energy Resources and Production
- Liquid-Liquid Extraction
- Pulp and Paper

## Work Experience

### Industrial Postdoctoral Researcher

**TOTAL S.A. – Multiphase Reactors Unit at Polytechnique Montreal, Canada**

May 2015-

- Led a part of a (\$9M) multidisciplinary & multi-organization project to develop and scale-up a novel process for the hydroconversion of heavy oil and petroleum residues
- Supervised and trained two graduate students with the preparation and execution of their research activities
- Investigated the hydrodynamics of bubble column reactor operating at high-pressure and high-temperature conditions
- Designed experiments, generated experimental data, analyzed the results and prepared technical reports
- Drafted a successful proposal to TOTAL S.A. for an extensive investigation of multiphase reactors operating at extreme conditions.

present

### R&D Research Engineer

**Chemical Engineering R&D Lab at Polytechnique Montreal, Canada**

2010-2015

- Investigated the hydrodynamics and performance of bubble column reactors operating with non-Newtonian fluids
- Developed several novel empirical models for predicting the bubble size and gas hold-up in bubble column reactors using MATLAB
- Designed and led the construction, installation and troubleshooting of two bubble columns

reactors operating in different conditions

- Characterized the non-Newtonian liquids and hydrodynamics of bubble column reactors via different methods such as rheometry, tensiometry, dynamic pressure transducers, optical fiber probes and RPT
- Contacted and discussed with several international companies for various purposes, including purchasing chemicals, designing process equipment and automated control systems, developing measurement techniques applied in multiphase systems
- Supervised two summer students as they conducted their internship projects

#### Chemical Researcher

2007-2009

##### Process Design and Optimization Center, Separation Proc Res Grp, Tehran, Iran

- Studied the effect of surface active agents on the performance of liquid-liquid pulsed packed extraction columns
- Designed and installed a laboratory-scale liquid-liquid extraction column
- Analyzed the experimental data via Image Processing & MATLAB

## Research Background

- Over six years experience in chemical and mechanical engineering, including the hydrodynamics of multiphase reactors, non-Newtonian fluids, and the design and development of chemical processes
- Professional technical and scientific writer with several articles published in reputable, peer-reviewed journals on investigating the hydrodynamics of bubble column reactors operating with complex fluids at industrial conditions, resulting in better design, operation and scale-up of such reactors
- Extensive experience with the design and installation of various chemical reactors and the development of advanced process measurement and monitoring techniques
- Significant knowledge of and experience with a wide variety of material characterization instruments, such as rheometers, tensiometers and multiphase flow characterization techniques including dynamic pressure transducers, optical fiber probes and radioactive particle tracking (RPT)

## Teaching Experience

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|---|-----------------------|-------------|
| <ul style="list-style-type: none"> <li>• <b>Design of Gas-Solid/Fluidized Bed Reactors,</b><br/>Polytechnique Montreal, Montreal, QC, Canada</li> </ul> | Teaching<br>Assistant | Winter 2015 |
| <ul style="list-style-type: none"> <li>• <b>Process Control,</b><br/>University of Tehran, Tehran, Iran</li> </ul>                                      | Teaching<br>Assistant | Winter 2008 |

## Journal Publications

- “The Effects of Liquid Phase Rheology on the Hydrodynamics of a Gas-Liquid Bubble Column Reactor,” **Chemical Engineering Science** 2015
- “Local Hydrodynamics of Bubble Column Reactors Operating with non-Newtonian Liquids: Experiments and Models Development,” **AIChE Journal** 2015

- “Effects of Elevated Pressure on the Hydrodynamics of a Pilot-Scale Bubble Column Reactor Operating with Non-Newtonian Liquids,” **Chemical Engineering Journal** 2015

### **Conference Publications**

- “Developing Correlations for Prediction of Hydrodynamic Parameters in Bubble Column Reactors Operating with Non-Newtonian Liquids,” **12<sup>th</sup> International Conference on Gas-Liquid & Gas-Liquid-Solid Reactor Engineering, USA** 2015
- “Experimental Characterization of a Gas-Liquid Bubble Column Reactor by Considering the Rheological Behavior of the Liquid Phase,” **CHISA 2014, Czech Republic** 2014
- “Effects of Liquid Phase Rheology on the Hydrodynamics of a Bubble Column Reactor,” **9<sup>th</sup> World Congress of Chemical Engineering, South Korea** 2013