POLYTECHNIQUE MONTRÉAL
LE GÉNIE EN PREMIÈRE CLASSE

Mohammad Latifi, PhD

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Education

- **The University of Western Ontario, London, ON, Canada** (2012)

Ph.D. Degree, Department of Chemical and Biochemical Engineering
Thesis: "Gasification of Bio-oils to Syngas in Fluidized Bed Reactors"

- **The University of Tehran, Tehran, Iran** (2003)

M.Sc. Degree, Department of Chemical Engineering
Thesis: "Retrofit for Debottlenecking of Heat Exchanger Networks Designed by Pinch Technology Method"

- **The University of Mazandaran, Babolsar, Iran** (2000)

B.Sc. Degree, Department of Chemical Engineering
Thesis: "Simulation of the Tehran's Oil Refinery Atmospheric Distillation Tower by Pro/II"

Research Interests

- Process Design, Development and Optimization
- Chemical Reaction Engineering
- Thermal and Catalytic Fluidized Bed Reactors
- Micro and nanoparticles Characterization/Handling
- Fast Pyrolysis, Gasification, Reforming and Combustion
- Development of Renewable Energy Resources (Biomass/Waste Recycling and Valorization)
- Syngas Production and Application
- Reduction of Polluting Emissions
- Development of Sustainable Processes
- Process Heat Integration
- Development of Modern Micro Reactors
- Carbon Coating
- Mineral Processing
- Rare Earth Elements
- Induction Heating

Work Experience

• **Research Center in Process Engineering (CRIP)**, Polytechnique Montreal, Montreal, QC, Canada	Research Associate	2014-
• **Research Center in Process Engineering (CRIP)**, Polytechnique Montreal, Montreal, QC, Canada	Postdoc	2012-2014
• **Institute for Chemicals and Fuels from Alternative Resources (ICFAR)**, Western University, London, ON, Canada	Research Assistant	2006-2011

• **Research Institute of Petroleum Industry (RIPI)**, Tehran, Iran	Process Research Engineer	2003-2006
• **Tehran Oil Refinery**, Tehran, Iran	Trainee	1999

Expertise

- Process development in lab and pilot scales: experimental and modeling
- Chemical reaction engineering: thermal and catalytic
- Fluidization engineering
- Multiphase reactors and heat & mass transfer unit operations
- Design of micro reactors
- Process operation and troubleshooting
- Experimental design and statistical analysis
- Chemical processes simulation with Pro/II, ASPEN and HYSYS
- Process heat integration with PILOT
- Utilization of Induction heating in extremely high temperature reactors
- Characterization and measurement techniques such as:
  - GC, multi gas FTIR, pressure transducers, optical fiber probes, XRD, SEM/EDX, TEM, Karl Fischer analyzer, Bomb Calorimeter, C-H-O-N-S elemental analyzer and neutron activation analysis (NAA)
- Project management in multi-disciplined teams
- Plan, prioritize and execute multiple concurrent activities
- Award winning proposals

Research Background

- Development of a process for high grade and high recovery production of the rare earth elements
- Gas-phase carbon coating of nano-size cathode material of the lithium ion batteries
- Dry/steam reforming of methane with a novel spinel catalyst for syngas production
- Novel applications of microwave and induction heating in catalytic reactions
- Hydrodynamic characterization of the FCC catalyst powders
- Design of membrane reactors
- High-temperature and high-pressure hydrodynamic evaluations on the fluidized beds
- Coal and ReEF™ (a feedstock derived from municipal waste) co-firing projects aiming at reduction of polluting emissions in coal powered boilers
- Carbon capture projects within Carbon Management Canada network
- Design and commission of the novel and original IHFBR reactor
- Whole Preparation of the later awarded one-million-dollar NSERC-CRD proposal for a multi-disciplinary mineral-processing project to develop a process for “High Grade Rare Earth Elements Production”
- Writing a section of a proposal for the national bio-char network
- Catalytic gasification of bio-oils for syngas production

- Design and commission of the Jiggle Bed Reactor (JBR)
- Solid-liquid interaction studies on the fluid-coking reactors
- Development of a fluid catalytic cracking (FCC) pilot plant
- Kinetic study of catalytic acetic acid synthesis in a bench-scale mixed flow reactor
- Design of a new heat exchanger network for energy saving

Teaching Experience

• **Design of Gas-Solid/Fluidized Bed Reactors**, Polytechnique Montreal, Montreal, QC, Canada	Instructor	2014, 2012
• **Introduction to Plant Design and Safety**, Western University, London, ON, Canada	Teaching Assistant	2006, 2007
• **Particulates Unit Operations**, Western University, London, ON, Canada	Teaching Assistant	2007-2008
• **Process Dynamics and Control**, Western University, London, ON, Canada	Teaching Assistant	2008
• **Design of Multiphase Reactors**, Western University, London, ON, Canada	Teaching Assistant	2009- 2010
• **Thermodynamics**, University of Mazandaran, Babol, Iran	Teaching Assistant	1998-1999

Journal Publications

- Latifi, M; Carrillo G, A; Chaouki, J; "A Review on High Grade Production of the Rare Earth Elements"; submitted to the Mineral Engineering Journal

- Latifi, M; Briens, C; Berruti, F; "Catalytic Activity of Olivine for Bio-oil Gasification to Syngas"; submitted to Chemical Engineering Journal

- Latifi, M; Ferrante, L; Briens, C; Berruti, F; "Thermal Cracking of Bio-oil for Syngas Production"; submitted to Chemical Engineering and Processing: Process Intensification

- Latifi, M; Chaouki J; "A novel Induction Heating Fluidized Bed Reactor: Its Design and Applications in High Temperature Screening Tests with Solid Feedstocks and Prediction of Defluidization State"; AIChE Journal, 61(5), 1507-1523, 2015

- Latifi, M; Briens, C; Berruti, F; "Thermal and Catalytic Gasification of Bio-oils in the Jiggle Bed Reactor for Syngas Production"; International Journal of Hydrogen Energy, 40, 5856-5868, 2015

- Latifi, M; Berruti, F; Briens, C; "A Novel Fluidized and Induction Heated Micro Reactor for Catalyst Testing"; AIChE Journal, 60(9), 3107-3122, 2014

- Latifi, M; Briens, C; Berruti, F; "Non-catalytic and Catalytic Steam Reforming of Acetic Acid in the Jiggle Bed Reactor"; Fuel, 129, 278-291, 2014

- Farkhondeh, M; Soleimani, M; Latifi, M; Briens, C ; Berruti, F; MacMillan, J; "Characterization of Moisture Distribution in a Fluidized bed"; Measurement, 47,150-60, 2014

- Latifi, M; Panjeshahi, M; Tahuni, N; "Debottlenecking of the Heat Exchanger Networks Designed Using Pinch Design Method to Reduce Energy Consumption"; Iranian Journal of ENERGY, 9(20), 14-26, 2004

Conference Publications

- Latifi, M; Berruti, F; Briens, C; "The Jiggled Bed Reactor, A New Fluidized Bed Reactor for Catalyst Testing"; Fluidization XIV: from Fundamentals to Products; Noordwijkerhout, The Netherlands; May 26-31, 2013

- Latifi, M; Chaouki, J; "A new inductively heated mini reactor for biomass pyrolysis and gasification tests"; Bioenergy IV: Innovations in Biomass Conversion for Heat & Power, Fuels and Chemicals; Basiliani Resort, Otranto, Italy; June 9-14, 2013

- Laviolette, J-P; Latifi, M; Rakib, A; Sauriol, P; Chaouki, J; Bai, D; Jafari, R; Calabresce, P; Bohlig, J; "Emissions Reduction From the Co-Firing or Re-Engineered Feedstocktm With Caol"; BIT's 1st Annual International Symposium of Clean Coal Technology; China; September 24-26, 2012

- Latifi, M; Ferrante, L; Briens, C; Berruti, F; "Development of a Novel Vibrating Reactor for Testing Bio-oil Gasification Catalysts"; Bioenergy III: Present and New Perspectives on Biorefineries; Lanzarote, Canary Islands, Spain; May 22-27, 2011

- Fotovat, F; Chaouki, J; Bergthorson, J; Latifi, M; " The influence of Biomass Properties on the Fluidization Hydrodynamics of Solid Mixtures Containing Biomass"; Bioenergy III: Present and New Perspectives on Biorefineries; Lanzarote, Canary Islands, Spain; May 22-27, 2011

- Latifi, M; Ferrante, L; Briens, C; Berruti, F; "Effect of Residence Time and Temperature on Thermal Cracking of Bio-oil for Syngas Production"; Bioenergy- II: Fuels and Chemical from Renewable Resources; Rio de Janeiro, Brazil; March 8-13, 2009

- Latifi, M; Briens, C; Berruti, F; "Thermal Cracking of Bio-oil for Syngas Production"; 8th World Congress of Chemical Engineering (WCCE8); Montreal, Quebec, Canada; August 23-27, 2009

- Rohani, S; Latifi, M; Briens, C; Berruti, F; "Development and Testing of a Novel Induction Micro Reactor to Test Catalysts for Bio-oil Gasification"; 8th World Congress of Chemical Engineering (WCCE8); Montreal, Quebec, Canada; August 23-27, 2009

- Rohani, S; Latifi, M; Briens, C; Berruti, F; "A Novel Induction Heating Micro Reactor for Gasification Catalyst-Testing"; GPE-EPIC congress; Venice, Italy; June 14-17, 2009

- Latifi, M; Panjeshahi, M; Tahuni, N; "Debottlenecking of Heat Exchanger Networks, already Designed by Pinch Design Method"; 17th International Congress of Chemical and Process Engineering (CHISA congress); Prague, Czech Republic; August 27-31, 2006

- Latifi, M; Panjeshahi, M; "Technology Transfer in Transportation Sector Regarding Climate Change Mitigation and Reduction"; 10th National Congress of Iranian Chemical Engineers (in Persian); Zahedan, Iran; 2005

- Latifi, M; Jafari Nasr, M.R.; Masoumi, M; "Study of Mass Transfer and its Effect on the Rate of Gas-Liquid Reactions with Homogeneous Catalysts"; 10th National Congress of Iranian Chemical Engineers (in Persian); Zahedan, Iran; 2005

- Latifi, M; Panjeshahi, M; Tahuni, N; "Investigation of Heat Exchanger Networks with Increased Flow Rates"; National Congress of Energy (in Persian); Tehran, Iran; 2005

- Latifi, M; Sotudeh, R; Mostoufi, N; "Simulation of Melamine Plant in Low Pressure Processes"; 8th National Congress of Iranian Chemical Engineers (in Persian); Mashhad, Iran; 2003