



## Education

- **University of Chinese Academy of Sciences, Beijing, China** 2017  
Ph.D. Degree, Institute of Process Engineering  
Dissertation: Process integration and analysis of liquid fuels and hydrogen production by oil shale
- **University of the Punjab, Lahore, Pakistan** 2009  
M.Sc. Chemical Engineering Department  
Thesis: Design philosophy of natural gas processing facility and trunk line isolation
- **University of Engineering and Technology, Lahore, Pakistan** 2007  
B.Sc. Degree, Department of Chemical Engineering

## Research Interests

- Process design and simulation
- Techno-economic analysis and optimization
- Process scale up analysis
- Life Cycle Assessment (LCA)
- Energy, environment, economy, and Policy Development
- Computational Fluid Dynamics (CFD)
- Artificial Intelligence (AI)

## Work Experience

- **Process Engineering Advanced Research Lab (PERAL),  
Polytechnique Montreal, Canada** Postdoc Fellow 2020-Present
- **School of Environment, Tsinghua University, Beijing, China** Postdoc Fellow 2018-2020
- **School of Chemical & Material Engineering, National  
University of Sciences and Technology Islamabad, Pakistan** Visiting Lecturer 2013
- **Pakistan Oilfields Ltd. Rawalpindi, Pakistan** Process Safety Engineer 2011-2013
- **Descon Integrated Projects Ltd., Lahore, Pakistan** Process Safety Engineer 2008-2011



- **Ittehad Chemicals Ltd. Lahore, Pakistan**

Trainee                      2008  
Production  
Engineer

## Expertise

- I can handle tools Ansys Fluent, Aspen plus, Aspen Hysys, Gambit, Solidworks, RETScreen Expert, Simapro, MathType, Graph digitizer, Origin, Visio, MS Office (Excel, Word & Power Point).
- Project OPEX and CAPEX estimation and optimization
- Techno-economic Analysis and assessments for commercialization of technologies
- Process design, simulations, scale up and optimization
- Process Safety Management
- Renewable/sustainable energy project design
- Accredited Instructor for RETScreen Expert Software

## Fellowships / Achievements / Honours and Awards

- Postdoc fellowship Montreal University, Canada (2020-Continued)
- Postdoctoral Fellowship Tsinghua University (2018-2020)
- CAS-TWAS President's PhD fellowship winner (2013-2017)
- Talented Young Scientist Program (TYSP) winner (2017-2018)
- Certified RETScreen Software Expert (2019)
- Accredited Trainer by Natural Resources Canada (NRCan) and Canadian Institute of Energy Trainings (CIET) for RETScreen Expert Software

## Journal Publications

- Raja MA, Chen H, Wang H, Zhao Y, Shi C, Zhang S, Zhang X. Process Analysis for the Production of Hydrogen and Liquid Fuels from Oil Shale. Energy Technology. 2017 Nov;5(11):1963-78.
- Raja MA, Zhao Y, Zhang X, Li C, Zhang S. Practices for modeling oil shale pyrolysis and kinetics. Reviews in Chemical Engineering. 2017 Dec 20;34(1):21-42.
- Raja MA, Chen H, Zhao Y, Zhang X, Zhang S. Process simulation and assessment of hydrogen and high valued hydrocarbon fuels products from oil shale. International Journal of Hydrogen Energy. 2017 Feb 23;42(8):4922-34.
- Zhao Y, Gani R, Afzal RM, Zhang X, Zhang S. Ionic liquids for absorption and separation of gases: An extensive database and a systematic screening method. AIChE Journal. 2017 Apr;63(4):1353-67.



- Zhao Y, Gao J, Huang Y, Afzal RM, Zhang X, Zhang S. Predicting H<sub>2</sub>S solubility in ionic liquids by the quantitative structure–property relationship method using S  $\sigma$ -profile molecular descriptors. *RSC Advances*. 2016;6(74):70405-13.
- Zhao Y, Zeng S, Huang Y, Afzal RM, Zhang X. Estimation of heat capacity of ionic liquids using S  $\sigma$ -profile molecular descriptors. *Industrial & Engineering Chemistry Research*. 2015 Dec 16;54(51):12987-92.
- Kang X, Zhao Z, Qian J, Muhammad Afzal R. Predicting the Viscosity of Ionic Liquids by the ELM Intelligence Algorithm. *Industrial & Engineering Chemistry Research*. 2017 Sep 19;56(39):11344-51.
- Iqra Ashraf, Shi Yong, Raja Muhammad Afzal, Guo Kun., Empirical analysis of foreign direct investment and economic growth in Pakistan using VECM model. *African Journal of Business Management* (Accepted on 16 September 2019).

### **Conference / Presentations / Abstracts**

- Raja MA., Application of RETScreen Expert Software for Energy Conservation and Management. Beijing, September 03, 2020.
- Raja MA., Renewable Energy Technologies and application of RETScreen Expert Software. Beijing, January 11, 2020.
- Raja MA., Sustainable eco-environmental and eco-economical solutions for the development of decertified areas of China. Eco-Economical Summit in Alxa Inner Mongolia, September 27-29, 2019.
- Raja MA, Process Integration and Analysis for Multi-Products Production by Oil Shale. Continuing Development Program, Pakistan Engineering Council, University of Wah, Pakistan, 27-02-2018
- Raja MA, Zhang XP, Zhang SJ. Integrated oil shale refinery (OSR) with systemized use of retorting gas (RG). Integrated Industrial and Energy Processes Conference, University of Gujarat, Pakistan from June16-17 2015
- Raja MA, Zhang XP, Zhang SJ. Integrated oil shale refinery (OSR) with systemized use of retorting gas (RG). Integrated Industrial and Energy Processes Conference, University of Gujarat, Pakistan from June16-17 2015
- Raja MA, Zhao YS, Zhang XP, Zhang SJ, High valued hydrocarbon fuels production from New Albany oil shale retorting. CAS-TWAS Symposium on Green Chemistry and Engineering for Sustainable Development (GCE 2016) August 28-31, 2016 Beijing, China.
- Raja MA, Replacement of fossil fuels with sustainable alternative energy resources. CAS-TWAS Training Workshop on Frontier of Green Technology Sep. 28-02 Oct. 2013 Beijing, China.
- Raja MA, Zhang XP, Zhang SJ. Process Integration and assessment of Shale oil production and Retorting gas utilization. CAS-TWAS Symposium on Green Technology for Sustainable Development (2015 Green Tech) July 23-25, 2015 Beijing, China