

Shaik Afzal

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OBJECTIVE

PhD graduate in Chemical Engineering, seeking a full-time position in catalysis or process engineering areas.

SUMMARY OF QUALIFICATIONS

- Research interests: catalyst testing and development, process simulation and optimization.
- Two years' work experience in oil refinery operations and process safety engineering.

EDUCATION

Texas A&M University, College Station, TX

Ph.D., Chemical Engineering, GPA 4.0

Aug 2020

Dissertation: Design of ALD-based catalysts and processes for Dry Reforming of Methane

Texas A&M University at Qatar, Doha, Qatar

M.S., Chemical Engineering, GPA 4.0

Aug 2015

Thesis: Modeling Fischer-Tropsch Product Distribution of a Cobalt Catalyst in Different Reaction Media

RV College of Engineering, Bangalore, India

B.E., Chemical Engineering, GPA 3.65

May 2011

RESEARCH EXPERIENCE

Texas A&M University, College Station, TX

Sep 2015 – present

Research Assistant, Advisors: Dr. Nimir Elbashir and Dr. Mahmoud El-Halwagi

- Utilized chemisorption technique to estimate catalyst dispersion for nickel catalysts prepared by Atomic Layer Deposition (ALD) to improve coking and sintering resistance for Dry Reforming of Methane process.
- Investigated spent catalyst samples by SEM, TEM, Raman and used Mass Spectrometry for analysis of gas products.
- Used LINGO Optimization and ASPEN Plus to synthesize a process for syngas production using CO₂, with lower carbon footprint (65% reduction) and lower operating costs (20% reduction) under certain conditions.

Texas A&M University at Qatar, Doha, Qatar

Sep 2012 – Jun 2014

Graduate Research Assistant, Advisor: Dr. Nimir Elbashir

- Generated kinetic data for cobalt catalyst in Fischer-Tropsch reaction by utilizing high pressure reactor system for 380 h time-on-stream, using Gas Chromatography for analysis of gas products.
- Developed MATLAB code, based on genetic algorithm, for estimation of kinetic parameters in a rate-based model to predict Fischer-Tropsch hydrocarbon product distribution for various process conditions.

INDUSTRIAL EXPERIENCE

Chiyoda Almana Engineering, Doha, Qatar

Jul 2014 – Jul 2015

Loss Prevention Engineer

- Coordinated process safety studies like HAZOP, HAZID for brownfield projects in Shell's Pearl GTL plant.
- Designed fire and gas detection systems, firewater networks and loss prevention philosophy for process facilities.

Mangalore Refinery and Petrochemicals Ltd., Mangalore, India

Jul 2011 – Jul 2012

Graduate Apprentice Engineer

- Inspected process equipment for commissioning and start-up of 3 million tonnes per annum crude distillation unit.
- Performed hydraulic calculations for modified piping of thermo-siphon reboiler, simulation of control block for Advanced Process Control modules like Pass Control Philosophy for crude oil furnace.

PEER-REVIEWED JOURNAL PUBLICATIONS

1. **Shaik Afzal**, Anuj Prakash, Patrick Littlewood, Tobin Marks, Eric Weitz, Peter Stair, Nimir Elbashir, *Controlling rate of change of Ni dispersion on commercial catalyst by ALD overcoat during dry reforming of methane*, International Journal of Hydrogen Energy 45 (2020) 12835-12848, DOI: [10.1016/j.ijhydene.2020.03.008](https://doi.org/10.1016/j.ijhydene.2020.03.008) (IF – 4.9)

2. **Shaik Afzal**, Debalina Sengupta, Amitava Sarkar, Mahmoud El-Halwagi, Nimir Elbashir, *Optimization Approach to the Reduction of CO₂ Emissions for Syngas Production Involving Dry Reforming*, ACS Sustainable Chemistry & Engineering 6 (2018) 7532-7544, DOI: [10.1021/acssuschemeng.8b00235](https://doi.org/10.1021/acssuschemeng.8b00235) (IF – 7.6)
3. Minhaj M. Ghouri, **Shaik Afzal**, Rehan Hussain, Jan Blank, Dragomir B. Bukur, Nimir O. Elbashir, *Multi-scale modeling of fixed-bed Fischer Tropsch reactor*, Computers & Chemical Engineering 91 (2016) 38-48, DOI: [10.1016/j.compchemeng.2016.03.035](https://doi.org/10.1016/j.compchemeng.2016.03.035) (IF – 4.0)
4. Alsuhaibani AS, **Afzal S**, Challiwala M, Elbashir NO, El-Halwagi MM, *The impact of the development of catalyst and reaction system of the methanol synthesis stage on the overall profitability of the entire plant: A techno-economic study*, Catalysis Today (2019), DOI: [10.1016/j.cattod.2019.03.070](https://doi.org/10.1016/j.cattod.2019.03.070) (IF – 5.8)
5. H.A. Choudhury, X. Cheng, **S. Afzal**, A.V. Prakash, B.J. Tatarchuk, N.O. Elbashir, *Understanding the deactivation process of a microfibrinous entrapped cobalt catalyst in supercritical fluid Fischer-Tropsch Synthesis*, Catalysis Today (2019), DOI: [10.1016/j.cattod.2019.01.031](https://doi.org/10.1016/j.cattod.2019.01.031) (IF – 5.8)

PATENT APPLICATION

1. Elbashir, N. O.; **Afzal S.**; El-Halwagi M. E.; Sengupta D., *Processing methane for syngas production with reduced CO₂ emissions*, WIPO (PCT) WO/2019/194694A2

BOOK CHAPTERS

1. Mohamed S. Challiwala, **Shaik Afzal**, Hanif A. Choudhary, Debalina Sengupta, Mahmoud M. El-Halwagi, Nimir O. Elbashir, *Alternative Pathways for CO₂ utilization via Dry Reforming of Methane*, in Subhas Sikdar, Frank Princiotta (2020) Advances in Carbon Management Technologies, CRC Press, Boca Rton, FL, USA, 251-270
2. Mostafa Shahin, **Shaik Afzal**, Nimir Elbashir, *Fractionation of the Gas-to-Liquid Diesel Fuels for Production of On-Specification Diesel and Value-Added Chemicals*, in Nimir Elbashir, Mahmoud M. El-Halwagi, Ioannis G. Economou, Kenneth R. Hall (2019) Natural Gas Processing from Midstream to Downstream, Wiley, West Sussex, UK, 413-438

SELECTED CONFERENCE PRESENTATIONS

1. **Shaik Afzal**, Patrick Littlewood, Dingdi Wang, Peter Stair, Tobin Marks, Eric Weitz, Nimir Elbashir, *Nickel-Based Dry Reforming Catalysts Modified by Atomic Layer Deposition: Effect of Reaction Conditions on ALD Films*, 2019 AIChE Annual Meeting, November 2019, Orlando, FL, USA
2. **Shaik Afzal**, Debalina Sengupta, Mahmoud El-Halwagi, Nimir Elbashir, *Techno-Economic Analysis of DRM+COSORB Process for High H₂/CO Syngas Production*, 12th Natural Gas Conversion Symposium, June 2019, San Antonio, TX, USA

TEACHING EXPERIENCE

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| Texas A&M University , College Station, TX, USA | Fall 2019 |
| Graduate Teaching Fellow for CHEN 425 – Process Integration, Simulation and Economics | |
| Texas A&M University , College Station, TX, USA | Spring 2016 |
| Teaching Assistant for CHEN 461 – Process Dynamics and Control | |
| Texas A&M University at Qatar , Doha, Qatar | Fall 2016 |
| Teaching Assistant for CHEN 464 – Chemical Engineering Kinetics | |

COMPUTER SKILLS

- ASPEN Plus, BRE ProMax, ASPEN Energy Analyzer, LINGO, MATLAB, JMP

LEADERSHIP EXPERIENCE

- Involved with Wah'ab – an NGO aimed at reducing food wastage in Doha, Qatar. Managed volunteers for food collection from hotels with surplus food to be handed over to governmental agency. (Sep 2016 – Jan 2019)
- Led a team of 4 engineers from Engineers without Borders-Qatar (EWB-Q) to a village in North India, in association with an Indian NGO to address sanitation problems of remote villages. (Jan 2014)

WORK AUTHORIZATION

Eligible to work in the U.S. for 3 years with Optional Practical Training (OPT) and STEM extension.