

# Dr. Mohsen H. Al-Rashed

Associate Professor – Chemical Engineering

PAAET – College of Technological Studies

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## Personal Profile

Current Position: Associate Professor - College of Technological Studies

Date of Appointment at College: October, 2003.

Department: Chemical Engineering Technology

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## Education

- **PhD**, Chemical Engineering, University College London, 1998, London, UK, Sponsored by AEA-Tech. Harwell Labs.
- **BEng**, Chemical Engineering, University College London, First Class with honor 1994, UK.

## Professional Development

- May 26<sup>th</sup>, 2013 – Present: **Associate Professor**, Department of chemical Engineering Technology, College of Technological Studies.
- October 12<sup>th</sup>, 2003 - May 26<sup>th</sup>, 2013: **Assistant Professor**, Department of chemical Engineering Technology, College of Technological Studies.

## Professional & Academic Experience

- Crystallization Processes
- Computational Fluid Dynamics (CFD)
- Chemical Reaction Engineering
- H<sub>2</sub>S Removal from Natural Gas
- Mixing and Separation Processes
- Industrial Safety
- Nanofluids
- Steam Reforming of Hydrocarbon
- Biodiesel Fuels
- Liquid-Liquid Extraction
- Water and Wastewater Treatment Technologies

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## Teaching Courses

### BEng

Intro. to Chemical Eng.  
Transport Phenomena  
Physical Chemistry  
Chem. Reaction Eng.  
Industrial Safety  
Equipment Sizing & Selection  
Catalysis  
Quality Control  
Process Modeling, Simulation and Optimization

### Diploma

Intro. to Computers  
Industrial Safety  
Physical Properties  
Physical Chemistry  
Corrosion  
Transport Phenomena  
Reactors Tech.  
Quality Control  
Polymers  
Comp. App. in Chem Eng.

## Selected Services to Community

### and Industrial Sector

- UNISIM Training Course, April/May 2024, Presenter.
- MOODLE L1 Training course by MEPDC, June 2020, Participant.
- MS TEAMS Training course by MEPDC, May 2020, Participant.
- MS Excel Training Course, November 2018 and November 2019, Presenter.
- Head of Student Scientific Society – Chemical Engineering Tech., 2016/17 and 2017/18.
- 3D MAX course by MEPDC, April 2017, Participant.
- Autodesk course by MEPDC, April 2017, Participant.
- PAAET Scientific Poster Day (2016/17), Organized by PAAET Research Department, March 2017.
- Member of the Judging Committee for the Kuwait Competition for Science and Engineering, Years 2015 and 2016, Organized by Kuwait Science Club.
- Training Course for Engineers in Petroleum Coke Industries Company, “Process Hazards Assessment Using HAZOP Technique”, 2015, Presenter.
- Training course for Researchers in Kuwait Institute for Scientific Research (KISR), “Technical Writing”, in 2014, Presenter.
- Training courses for Employees in Kuwait Industrial Companies, “Advanced Topics in Safety – Levels 1 & 2”, in 2013 with cooperation of Kuwait Industries Union, Presenter.

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## Cooperation with Kuwait National Petroleum Company (KNPC)

Participation in Achieving and Signing the Agreement of the "Refinery Operation Technology" joint program between KNPC and the Public Authority for Applied Education and Training represented by the College of Technological Studies.

## Cooperation with EQUATE Petrochemicals Company

Participation in Achieving and Signing the Agreement of the "Chemical Industries Technology" joint program between EQUATE Petrochemicals Company and the Public Authority for Applied Education and Training represented by the College of Technological Studies.

## Selected Scientific Publications and Conferences

1. M. H. Al-Rashed, M. Abdirakhimov, R. Kubica, A. Kazek-Kesik, R. Turczyn, Preparation of Faujasite-Type Zeolite (13X) from Angren Kaolin for Hydrogen Sulfide Adsorptive Purification of Natural Gas, *Processes*, *In press*
2. G. Dzido, and J. Wojcik, Minimum Solution Shear Stress Preventing  $MgSO_4 \cdot 7H_2O$  Incrustation on Stainless Steel Plates, *Cryst. Growth Des.* 2024, 24, 9, 3691–3698.
3. M. Abdirakhimov, M. H. Al-Rashed and J. Wójcik, Hydrogen Sulfide Adsorption from Natural Gas Using Silver-Modified 13X Molecular Sieve, *Materials*, 17 (1), 165, 2024.
4. M. Abdirakhimov, M. H. Al-Rashed and J. Wójcik, Recent Attempts on the Removal of  $H_2S$  from Various Gas Mixtures Using Zeolites and Waste-Based Adsorbents, *Energies*, 15 (15), 5391, 2022.
5. M. Korpyś, G. Dzido, M. H. Al-Rashed and J. Wojcik, Experimental and Numerical Study on Heat Transfer Intensification in Turbulent Flow of CuO-water Nanofluids in Horizontal Coil, *Chemical Engineering and Processing*, 153, Article 107983, 2020.
6. W. Bogacz, M. Lemanowicz, M. H. Al-Rashed, D. Nakonieczny, T. Piotrowski, and J. Wójcik, Impact of roughness, wettability and hydrodynamic conditions on the incrustation on stainless steel surfaces, *Applied Thermal Engineering*, 112, 352-361, 2017.

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7. W. Bogacz, M. H. Al-Rashed, M. Lemanowicz, and J. Wójcik, A Simple Densimetric Method to Determine Saturation Temperature of Aqueous Potassium Chloride Solution, *Journal of Solution Chemistry*, 45 (7), 1071-1076, 2016.
8. M. H. Al-Rashed, G. Dzido, M. Korpyś, J. Smolka, and J. Wójcik, Investigation on the CPU nanofluid cooling, *Microelectronics Reliability*, 63, 159-165, 2016.
9. A. S. Al-Jimaz, Khaled H. A. E. Alkhaldi, M. H. Al-Rashed, M. S. Fandary, M. S. AlTuwaim, Study on the Separation of Propylbenzene from Alkanes Using Two Methylsulfate-based Ionic Liquids at (313 and 333) K, *Fluid Phase Equilibria*, 354, 29 – 37, 2013.
10. M. H. Al-Rashed, J. Wójcik, R. Plewik, P. Synowiec, A. Kuś, Multiphase CFD modeling: Fluid dynamics aspects in scale-up of a fluidized-bed crystallizer, *Chemical Engineering and Processing*, 63, 7 – 15, 2013.
11. M. H. Al-Rashed, G. Dzido and J. Wójcik, Influence of shear stress on the  $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$  incrustation on stainless steel surfaces, *22<sup>nd</sup> International Symposium on Industrial Crystallization*, Glasgow, UK, 2023.
12. M. H. Al-Rashed, A. F. Alenzi, A. A. Mohammad and J. Wójcik, Controlled Crystallization Process of Potassium Nitrate Solution: Incrustation Phenomenon, *20<sup>th</sup> International Symposium on Industrial Crystallization*, Potsdam, Germany, 2021.
13. M. H. Al-Rashed, G. Dzido and J. Wojcik, Radius of Critical Nucleus, *20<sup>th</sup> International Symposium on Industrial Crystallization*, Dublin, Ireland, 2017.
14. W. Bogacz, M. H. Al-Rashed, T. Piotrowski and J. Wojcik, Dispersion of nucleation Point and Metastable Zone of Potassium Chloride Aqueous Solutions, *19<sup>th</sup> International Symposium on Industrial Crystallization*, Toulouse, France, 2014.
15. J. Wojcik, P. Synowiec and M. H. Al-Rashed, New Solution of Crystal Discharge from FL Crystallizer, *19<sup>th</sup> International Symposium on Industrial Crystallization*, Toulouse, France, 2014.

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16. M. Korpys, M. H. Al-Rashed, G. Dzido and J. Wojcik, CFD Heat Sink Cooled by Nanofluids and Water: Experimental and Numerical Study, *23<sup>rd</sup> European Symposium on Computer Aided Process Engineering: ESCAPE-23*, Lappeenranta, Finland, 409-414, 2013.
17. M. H. Al-Rashed, Khaled H. A. E. Alkhaldi, M. S. Al-Tuwaim, M. S. Fandary and A. S. Al-Jimaz, Extraction of Butylbenzene from Dodecane Using Hexafluorophosphate-Based Ionic Liquids: Effect of Cation Change, *Journal of Chemical & Engineering Data*, 57 (11), 2907–2914, 2012.
18. M. S. Fandary, K. H.A.E. Alkhaldi, A. S. Al-Jimaz, M. H. Al-Rashed, M. S. AlTuwaim, Evaluation of  $[\text{bmim}][\text{PF}_6]$  as an ionic solvent for the extraction of propylbenzene from aliphatic compounds, *Journal of Chemical Thermodynamics*, (54), 322-329, 2012.
19. M. H. Al-Rashed M. Lemanowicz and A. T. Gierczycki, Employment of Polymer Degradation Models in Population Balance Equations Describing Flocculation with Sonicated Polymers, *International Journal of Mineral Processing*, (104-105), 1-10, 2012.
20. M. Lemanowicz, A. T. Gierczycki and M. H. Al-Rashed, Dual-polymer Flocculation with Unmodified and Ultrasonically Conditioned Flocculant, *Chemical Engineering and Processing*, (50), 128-138, 2011.
21. M. H. Al-Rashed and J. Wójcik, Crystals Sedimentation Velocity Formulae Revisited, 18<sup>th</sup> International Symposium on Industrial Crystallization, Zurich, Switzerland, 2011.
22. K. A. Mahdi, M. H. Al-Rashed, A. A. Alsairafi and J. Wójcik, CFD Simulation of a Conical Cylindrical Crystallization Unit Multi-Phase Eulerian Model, *Kuwait Journal of Sciences and Engineering* (37) 2B, 145-160, 2010.
23. M. Lemanowicz, M. H. Al-Rashed, A. T. Gierczycki, and J. Kocurek, Application of the QMOM in Research on the Behavior of Solid-liquid Suspensions, *Chemical and Biochemical Engineering Quarterly (CABEQ) Journal* (23) 2,143-151, 2009.
24. M. H. Al-Rashed, J. Wojcik, R. Plewik, P. Synowiec and A. Kus, Multiphase CFD Modeling Scale-Up of Fluidized-Bed Crystallizer, 19<sup>th</sup> European Symposium on Computer Aided Process Engineering; ESCAPE-19, Krakow, Poland, 695-700, 2009.

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25. K. A. Mahdi, M. H. Al-Rashed, A. A. Al-Sairafi and J. Wójcik, CFD Simulation of a Conical-Cylindrical Crystallization Unit Using Multi-Phase Eulerian Model, *7<sup>th</sup> International Conference on CFD in the Minerals and Process Industries*, CSIRO, Melbourne, Australia, 2009.
26. A. T. Gierczycki and M. H. Al-Rashed, Aggregation and Breakage of Solid Particles in Suspensions Agitated in a Vibrating Mixer: a Fractal Approach, *Chemical Engineering Communications*, (195), 427 – 434, 2008.
27. M. Lemanowicz, M. H. Al-Rashed and A.T. Gierczycki, Application of QMOM in Mathcad Software for Research on the Behavior of Solid-Liquid Suspensions, *17<sup>th</sup> International Symposium on Industrial Crystallization*, Maastricht, Netherland, 2008.
28. A. El-Khars and M. H. Al-Rashed, Chemical Kinetics and Precipitation Process CFD Simulation, *Conference on Catalysis in the GCC Countries*, Kuwait, 2006.
29. M. H. Al-Rashed, Influence of Hydrodynamics on Reactive Precipitation, *19<sup>th</sup> North American Catalysis Society Meeting*, Philadelphia, Pennsylvania U.S.A, 2005.
30. J. A. Wójcik, P. M. Synowiec, K. Opaczyńska and M. H. Al-Rashed, Modeling of Crystal Attrition, *16<sup>th</sup> International Symposium on Industrial Crystallization*, Dresden Germany, 2005.
31. J. A. Wójcik, M. H. Al-Rashed and K. A. Mahdi, Theoretical and Experimental Analysis of Radial Thickener, *7<sup>th</sup> Gulf Water Conference*, Kuwait, 2005.
32. M. H. Al-Rashed and A. G. Jones, CFD Modelling of Gas-Liquid Reactive Precipitation, *Chemical Engineering Science*, 54(21), 4779-4784, 1999.
33. M. H. Al-Rashed and A. G. Jones, Validation of a CFD Model of a Gas-Liquid Precipitation System, *14<sup>th</sup> International Symposium on Industrial Crystallization*, Paper 157, Cambridge, UK, 1999.
34. M. H. Al-Rashed, A study of reactive precipitation processes using computational fluid dynamics, *Ph.D. Thesis*, University of London, UK, 1998.

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35. M. H. Al-Rashed, A. G. Jones, M. Hannan and C. Price, CFD Modelling of a Precipitation Mixing Vessel with Experimental Validation, *CFX International*, Maidenhead, UK, 1996.
  
36. M. H. Al-Rashed, A. G. Jones, M. Hannan and C. Price, CFD Modelling of a Precipitation Mixing Vessel I, *13<sup>th</sup> International Symposium on Industrial Crystallization*, Paper 69, 419-424, Toulouse, France, 1996.