

Research Interests

- Gas hydrates
- Gas and Energy
- Gas separation
- Thermodynamics
- CO₂ capture
- PVT
- Waste water treatment
- Aqueous solution of mixed salts and alcohols
- Properties of reservoir fluids
- Phase equilibria

Academic Employment

- 2016– 2017 **Post-doctoral**, University of Kwazulu-Natal (UKZN, Durban).
2015– 2016 **Research Assistance**, University of Kwazulu-Natal (UKZN, Durban).
2014–2015 **Teaching Assistance**, Department of Chemical Engineering, University of Kwazulu-Natal.
2013– 2014 **Teaching Assistance**, Department of Chemical Engineering, University of Kwazulu-Natal.
2008–2009 **Teaching Assistance**, Department of Computer Engineering, Shiraz Univ. of Technology.

Education

- 2013-2016 **University of Kwazulu Natal**, Ph.D. in Chemical Engineering.
 Supervisor: Prof. Deresh Ramjugernath.
 Co-supervisors: Prof. Amir H. Mohammadi, Prof. Paramespri Naidoo.
 Thesis: *Hydrate Phase Equilibrium Studies for Xe, Ar, Kr and CF₄ in the Presence of TBAB Aqueous Solutions.*
- 2007–2010 **Shiraz University of Technology**, M.Sc. in Chemical Engineering.
 Supervisor: Prof. Jafar Javanmardi
 Thesis: *Experimental Study and Thermodynamic Modelling of Methane Hydrate Formation Conditions in the Aqueous Solutions of Methanol and Ethylene glycol.*
- 2002–2006 **Bahonar University of Kerman**, B.Sc. in Chemical Engineering.
 Advisor: Dr. Ali Mohebbi
 Thesis: *Investigation of cement plant emissions*

Honors and Awards

- 2014 Receiving an award from UKZN as a first time full time registered PhD student who has made satisfactory progress in the first year of registration.
- 2012 Selected as one of the Best Chemical Engineers from Iranian Chemical Engineering Society.
- 2006 **Ranked 306th** in “Nationwide University Entrance Examination for M.Sc. Program” among more than 10’000 participants, Iran.
- 2002 **Ranked 4000th** in “Nationwide University Entrance Examination for B.Sc. Program” among more than 400’000 high school students, Iran

Industrial Experience

- 2011-2012 Working at Mahabsamen Consulting Engineers Company in Mashhad/Iran.
- 2011-2012 Designing and Marketing of Gas Pipeline in Mashhad/Iran.
- 2011 Certificate in Gas distribution network design course organized by Mashhad Gas Company in Iran.
- 2010 Certificate in “Conventional & Deep Offshore Structures, Pipelines and Floating Systems, course” organised by TPA and TOTAL E&P Iran in Shiraz.
- 2008 Certificate in CMG (Computer Control Group) course, Proceedings of the 7th Conference on Chemical Engineering, Department of Chemical Engineering, Shiraz University.
- 2007 Certificate in Business skills training course organized by labor institute, Iran.

Teaching Experience

- 2015-2016 **Advanced Mass Transfer**, Teaching assistance, University of Kwazulu-Natal.
- 2015-2016 **Thermodynamic II**, Teaching assistance University of Kwazulu-Natal.
- 2015-2016 **Thermodynamic I**, University of Kwazulu-Natal.
- 2010-2012 **Tutoring Mathematic, chemistry, and physics** to under graduate student, Mashhad, Iran.
- 2008-2009 **Advanced Thermodynamic**, Teaching assistance, Shiraz University of Technology.
- 2008-2009 **Gas Hydrates**, Teaching assistance, Shiraz University of Technology.
- 2008-2009 **Matlab**, Teaching to chemical Engineering students at girls residential building, Shiraz University of Technology.

Professional Services

I have been the reviewer for the following conferences and journals:

Journal of Molecular Liquids (Elsevier)

International Journal of Ambient Energy

Neural Computing and Applications (NCA)

Publications

JOURNAL PAPERS

1. J. Kondori, H. Hashemi, **S. Babaee**, J. Javanmardi, A. H. Mohammadi, D. Ramjugernath: *A Thermodynamic Consistency Test for Experimental Isobaric Data of Wax Solubility in Gaseous Systems*. Fluid Phase Equilibria **2015**, 388, pp 182-187.
2. **S. Babaee**, H. Hashemi, A.H. Mohammadi, P.Naidoo, D. Ramjugernath: *Kinetic and Thermodynamic Behavior of the CF₄ Clathrate Hydrate*. The Journal of Chemical Thermodynamics, **2015**, 81, pp 52-59.
3. H. Hashemi, **S. Babaee**, A. H. Mohammadi, P. Naidoo, D. Ramjugernath: *Experimental study and Modeling of the Kinetics of Refrigerant Hydrate Formation*. The Journal of Chemical Thermodynamics, **2015**; 82: pp 47–52.
4. H. Hashemi, **S. Babaee**, A. H. Mohammadi, P. Naidoo, D. Ramjugernath: *Experimental Measurements and Thermodynamic Modeling of Dissociation Conditions of Refrigerant Clathrate Hydrates*. The Journal of Chemical Thermodynamics, **2015**, 80, pp 30-40.
5. **S. Babaee**, H. Hashemi, A.H Mohammadi., P. Naidoo, D. Ramjugernath: *Experimental Measurement and Thermodynamic Modeling of Hydrate Dissociation Conditions for the Argon + TBAB + Water System*. Journal of Chemical & Engineering Data, **2014**, 59(11), pp 3900–3906.
6. H. Hashemi, **S. Babaee**, A. H. Mohammadi, P. Naidoo, D. Ramjugernath: *Experimental Measurements and Thermodynamic Modeling of Clathrate Hydrate Dissociation Conditions for Refrigerants R116, R23, and their mixture R508B*. Journal of Chemical & Engineering Data, **2014**, 59(11), pp 3907–3911.
7. K. Tumba, **S. Babaee**, P. Naidoo, A.H. Mohammadi, D. Ramjugernath: *Phase Equilibria of Clathrate Hydrates of Ethyne + Propane*. Journal of Chemical & Engineering Data, **2014**, 59(9), pp 2914–2919.
8. P. Ilani-Kashkouli, H. Hashemi, F. Gharagheizi, **S. Babaee**, A. H. Mohammadi, D. Ramjugernath: *Gas hydrate phase equilibrium in porous media: An assessment test for experimental data*. Fluid Phase Equilibria **2013**, 360, pp 161-168.
9. P. Ilani-Kashkouli, **S. Babaee**, F. Gharagheizi, H. Hashemi, A. H. Mohammadi, D. Ramjugernath: *An assessment test for phase equilibrium data of water soluble and insoluble clathrate hydrate formers*. Fluid Phase Equilibria, **2013**; 360, pp 68-76.
10. A. Eslamimanesh, **S. Babaee**, F. Gharagheizi, J. Javanmardi, A. H. Mohammadi, D. Richon: *Assessment of Clathrate Hydrate Phase Equilibrium Data for CO₂ + CH₄/N₂ + Water System*. Fluid Phase Equilibria, 2013, **349**, pp 71–82.
11. **S. Babaee**, H. Hashemi, J. Javanmardi, A. Eslamimanesh, A. H. Mohammadi: *Thermodynamic model for prediction of phase equilibria of clathrate hydrates of hydrogen with different alkanes, alkenes, alkynes, cycloalkanes or cycloalkene*. Fluid Phase Equilibria, **2012**, 336, pp 71-78.

12. J. Javanmardi, **S. Babaee**, A. Eslamimanesh, A. H. Mohammadi: *Experimental Measurements and Predictions of Gas Hydrate Dissociation Conditions in the Presence of Methanol and Ethane-1,2-diol Aqueous Solutions*. Journal of Chemical & Engineering Data, **2012**, 57(5), pp 1474–1479.
13. A. Eslamimanesh, **S. Babaee**, A. H. Mohammadi, J. Javanmardi, D. Richon: *Experimental Data Assessment Test for Composition of Vapor Phase in Equilibrium with Gas Hydrate and Liquid Water for Carbon Dioxide + Methane or Nitrogen + Water System*. Industrial & Engineering Chemistry Research, **2012**, 51(9), pp 3819–3825.
14. A. H. Mohammadi, A. Eslamimanesh, D. Richon, F. Gharagheizi, M. Yazdizadeh, J. Javanmardi, H. Hashemi, M. Zarifi, **S. Babaee**: *Gas hydrate phase equilibrium in porous media: Mathematical modeling and correlation*. Industrial & Engineering Chemistry Research, **2012**, 51(2), pp 1062-1072.
15. H. Hashemi, **S. Babaee**, F. Sabzi, J. Javanmardi, Kh. Nasrifar: *Prediction of Liquid-Liquid Equilibria of Binary Systems Containing Alcohols Using EoS-G E Models*. IACHe journal, 2010, 7 (4), pp 12-21.
16. **S. Babaee**, H. Hashemi, A.H. Mohammadi, P. Naidoo, D. Ramjugernath: *Experimental Measurements and Thermodynamic Modeling of Hydrate Dissociation Conditions for the Xenon + TBAB + Water System*, J. Chem. Eng. Data, **2015**, 60 (5), pp 1324–1330.
17. **S. Babaee**, H. Hashemi, A.H. Mohammadi, P Naidoo, D Ramjugernath: *Hydrate Phase Equilibrium for Krypton + Tetra-n-Butyl Ammonium Bromide Aqueous Solution: Experimental Measurement and Thermodynamic Modeling*, The Journal of Supercritical Fluids, **2016**, 107, pp 676–681.
18. A.Strydom, **S. Babaee**, A. H. Mohammadi, P. Naidoo, D. Ramjugernath: *Clathrate Hydrate Dissociation Conditions for Refrigerant + Sucrose Aqueous Solution: Experimental Measurement and Thermodynamic Modelling*. Fluid Phase Equilibria, **2016**, 413, 99-109.
19. H.Hashemi, **S. Babaee**, A. H. Mohammadi, P. Naidoo, D. Ramjugernath: *Clathrate Hydrate Dissociation Conditions of Refrigerants R404A, R406A, R408A and R427A: Experimental Measurements and Thermodynamic Modeling*. The Journal of Chemical Thermodynamics, **2015**, 90:193–198.

BOOK CHAPTERS

- P. Ilani-Kashkouli, **S. Babaee**, F. Gharagheizi, H. Hashemi, A. H. Mohammadi, D. Ramjugernath.: *Evaluation of the Experimental data for Gas Solubility in Liquid Water in Equilibrium with the Gas Hydrates.. Advances in Chemistry Research (Volume 24).*, Edited by James C. Taylor, 03/2015; Nova Science Publishers, Inc., NY, USA., ISBN: 978-1-63463-846-3
- **S. Babaee**, H. Hashemi, J. Kondori, J. Javanmardi, A.H. Mohammadi, D. Ramjugernath: *A Thermodynamic Consistency Test for Experimental Data of Salt Deposition in Saline Water.. Advances in Chemistry Research (Volume 25), 01/2014; Nova Science Publishers, Inc., NY, USA.*

CONFERENCE PAPERS

- N. Croeser, **S. Babaee**, A. H. Mohammadi, P. Naidoo, D. Ramjugernath: *The use of SF₆ in the application of gas hydrates for water desalination..* The Fluoro-Chemical Expansion Initiative Conference, Cape Town, South Africa; 02/2016.
- H. Hashemi, **S. Babaee**, A.H. Mohammadi, P. Naidoo, D. Ramjugernath: *Application of the clathrate hydrate of fluorinated carbons in cold storage systems..* The Fluoro-Chemical Expansion Initiative Conference, Cape Town, South Africa; 02/2016.
- **S. Babaee**, H. Hashemi, A.H. Mohammadi, P. Naidoo, D. Ramjugernath: *Hydrate Phase Equilibrium Studies for Ar/ Kr/ Xe + TBAB Aqueous Solution.* The Fluoro-Chemical Expansion Initiative Conference, Cape Town, South Africa; 02/2016.
- H. Hashemi, **S. Babaee**, K. Tumba, A.H. Mohammadi, P. Naidoo, D. Ramjugernath: *Experimental Study and Modeling of the Kinetics of Hydrate Formation of Acetylene, Ethylene, Propane and Propylene in the Presence and Absence of SDS..* The 6th International Chemical and Environmental Engineering Conference (ICEEC-2015), Kuala Lumpur, Malaysia; 12/2015.
- **S. Babaee**, H. Hashemi, A.H. Mohammadi, P. Naidoo, D. Ramjugernath: *Kinetic Behavior of Argon Hydrate in the presence of TBAB and SDS Aqueous Solutions.* The 6th International Chemical and Environmental Engineering Conference (ICEEC-2015), Kuala Lumpur, Malaysia; 12/2015.
- H. Hashemi, J. Kondori, **S. Babaee**, J. Javanmardi, A.H. Mohammadi, D. Ramjugernath: *A Thermodynamic Consistency Test for Experimental Isobaric Wax Solubility Data in Gaseous Systems..* The International Conference on Chemical Thermodynamics (ICCT), Durban, South Africa; 07/2014.
- H. Hashemi, **S. Babaee**, K. Tumba, A.H. Mohammadi, P. Naidoo, D. Ramjugernath: *Experimental Measurements and Thermodynamic Modeling of Refrigerant Hydrates Dissociation Conditions..* The International Conference on Chemical Thermodynamics (ICCT), Durban, South Africa; 07/2014.
- K. Tumba, **S. Babaee**, P. Naidoo, A.H. Mohammadi, D. Ramjugernath: *Phase Equilibria of Clathrate Hydrates of Ethyne + Propane.* The International Conference on Chemical Thermodynamics (ICCT), Durban, South Africa; 07/2014.
- H. Hashemi, **S. Babaee**, A.H. Mohammadi, P. Naidoo, D. Ramjugernath: *Gas hydrates application in Air-Conditioning systems: Experimental study and modeling.* The International Conference on Chemical Thermodynamics (ICCT), Durban, South Africa; 07/2014.
- **S. Babaee**, H. Hashemi, J. Kondori, J. Javanmardi, A.H. Mohammadi, D. Ramjugernath: *Thermodynamic Consistency Test for Experimental Data of Salt Deposition from Brine..* The International Conference on Chemical Thermodynamics (ICCT), Durban, South Africa; 07/2014.
- **S. Babaee**, H. Hashemi, A.H. Mohammadi, P. Naidoo, D. Ramjugernath: *Phase Equilibria of Semi clathrate Hydrates of Ar + Tetra-n-butylammonium Bromide Aqueous Solution..* The International Conference on Chemical Thermodynamics (ICCT), Durban, South Africa; 07/2014.

- **S. Babaee**, H. Hashemi, A.H. Mohammadi, P. Naidoo, D. Ramjugernath: *Kinetic Study of the CF₄ Clathrate Hydrate*.. The International Conference on Chemical Thermodynamics (ICCT), Durban, South Africa; 07/2014.
- **S. Babaee**, H. Hashemi, A.H. Mohammadi, P. Naidoo, D. Ramjugernath: *Kinetic Study of the CF₄ Clathrate Hydrate*. The International Conference on Chemical Thermodynamics (ICCT), Durban, South Africa, 27 July – 1 August 2014; 01/2014.
- H. Hashemi, **S. Babaee**, A.H. Mohammadi, P. Naidoo, D. Ramjugernath: *Gas hydrates application in Air-Conditioning systems: Experimental study and modeling*.. The International Conference on Chemical Thermodynamics (ICCT), Durban, South Africa, 27 July – 1 August 2014.; 01/2014.
- **S. Babaee**, P. Naidoo, A.H. Mohammadi, D. Ramjugernath: *Experimental Measurements and Predictions of Tetrafluoromethane (CF₄) and Nitrogen trifluoride (NF₃) Hydrate Dissociation Conditions*.. The 41st National Convention of the South African Chemical institute (SACI), East London, South Africa; 12/2013.
- **S. Babaee**, H. Hashemi , J. Javanmardi, A. Eslamimanesh, A.H. Mohammadi : *Prediction of hydrogen sH hydrate phase boundary in the presence of alkanes, alkenes, alkynes and cycloalkanes promoters*.. 25th European Symposium on Applied Thermodynamics (ESAT), Saint-Petersburg, Russia; 01/2011.
- **Babaee, S.**, Hashemi, H., and Javanmardi, J., "Thermodynamic Modeling of Equilibrium Conditions of Structure H Clathrate Hydrates of Hydrogen in the Presence of Hydrocarbon Promoters", the First Iranian Gas Hydrate Congress, Sharif University, 18-19 May, 2011, Tehran, Iran.
- **Babaee, S.**, and Javanmardi, J., "Experimental measurement and prediction of gas hydrates dissociation conditions in the presence of methanol and ethylene glycol", 13th International Chemical Engineering Congress of Kermanshah, Iran, 25-28 October, 2010, Kermanshah, Iran.
- Javanmardi, J., Hashemi, H., **Babaee, S.**, and sabzi, s., "Thermodynamic modeling of hydrogen and methane H-structure hydrate phase equilibria in the presence of methylcyclohexane promoter", 13th International Chemical Engineering Congress of Kermanshah, 25-28 October, 2010, Kermanshah, Iran
- **Babaee, S.**, and Javanmardi, J., "Thermodynamic modeling of methane hydrate formation conditions in aqueous solutions of methanol and NaCl, KCl and CaCl₂", the 13th Iranian Physical Chemistry Seminar, 12 April, 2010, Shiraz, Iran.
- Hashemi, H., Reshadi, P., **Babaee, S.**, and Sabzi, F, "Phase Equilibria of Hydrocarbon-Methanol Systems from Equation of State Excess Gibbs Energy (EoS-G^E)", the 13th Iranian Physical Chemistry Seminar, 12 April, 2010, Shiraz, Iran.
- Hashemi, H., **Babaee, S.**, Sabzi, F. and Javanmardi, J., "Prediction of Liquid_ Liquid Equilibria of Binary Systems Containing Alcohols using EoS-G^E Models", the 6th International Chemical Engineering Congress & Exhibition 16-20 November, 2009, Kish Island, Iran.

Technical Skills

Programming Matlab, C++

Soft wares Hysis, Aspen, Auto Cad , Solid Works