

# Alireza Afsharpour

Faculty Member of Shahrood University of Technology

**Birth Date:** Oct. 19, 1987

**Gender:** Male

**Marital Status:** Single

**Education:** Ph.D. in chemical Engineering

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## Education

- **Ph.D.** in chemical engineering, Major: Design, Modeling, Simulation & Control of Processes, Since fall 2012 (Tarbiat Modares University).

Degree Acceptance: Winter 2016, Passed Courses Cumulative GPA: 17.96/20 Via 14 Credits.

**Thesis:** Experimental measurement and modeling of H<sub>2</sub>S and CO<sub>2</sub> mixture solubility in blends of aqueous alkanolamines and ionic liquids solutions using an associative equation of state (Score: 19.75/20).

- **M.Sc.** in Chemical Engineering, Major: Modeling, Simulation & Control, Since fall 2009.

**Thesis:** Development of an Intelligent System to Predict and Control Blood Glucose Level in Type 1 Diabetic Patients (Score: 19.5/20).

Degree Acceptance: fall 2011, Cumulative GPA: 16.38/20 Via 33 Credits.

- **B.Sc.** in Chemical Engineering, Major: Petroleum Industries Process Design, Since fall 2005.

**Thesis:** Sulfur Recovery Unit Design (Score: 20/20).

Degree Acceptance: Summer 2009, Cumulative GPA: 16.44/20 Via 146 Credits.

## Research Interests

### ➤ **Chemical Engineering, In Particular:**

1. Gas Solubility.
2. Equation of States.
3. Gas sweetening processes.
4. Solution Thermodynamics & phase equilibria.
5. Plant detect design.

### ➤ **Modeling, Simulation & Control, In Particular:**

1. Artificial Intelligence (Fuzzy logic, Neural network, Genetic algorithm, ...)
2. Nonlinear, Optimal and Adaptive Control

### ➤ **Other Fields:**

1. Computational Fluid Dynamics (CFD)
2. Interdisciplinary Works (Specially Biomedical Fields)

## Honors and Successes

1. Membership in Iran's National Elites Foundation.
2. Membership in Young Researchers and Elite Club.
3. Ranked 27<sup>th</sup> among 6273 participants in the National Entrance Exam of M.Sc. of chemical engineering of the public universities of Iran (Konkooor), Iran, 2009.
4. Ranked 129<sup>th</sup> among almost 1000 participants in the National Entrance Exam of M.Sc. of production and transportation of gas engineering of the public universities of Iran (Konkooor), Iran, 2009.
5. Ranked 26<sup>th</sup> among almost 10000 participants in the National Entrance Exam of Ph.D. of chemical engineering of the public universities of Iran (Konkooor), Iran, 2012.
6. Participation in OCM project of Research Institute of Petroleum Industry (RIPI).
7. Novitiate in research of gas sciences unit, RIPI, Tehran, Iran.
8. Ranked 1<sup>st</sup> among participants in the Process Modeling Using Aspen-HYSYS course of FPG Co. (Score: 90/100).
9. National patent registration "Design of processes to produce useful industrial products from the sulfur refinery plant's gas feed components"  
Registration NO: **75419**.

10. Financial support of Ph.D. thesis by National Iranian Gas Company (NIGC).

## **Work Experience**

- 1. Shahrood University of Technology**  
Faculty Member (Aug. 2018- Present)
- 2. University of Garmsar**  
Invited Professor (Dec. 2015- Aug. 2018)
- 3. Islamic Azad University of Mahallat Branch**  
Invited Professor (Aug. 2009- Dec. 2009)

## **Taught Courses**

- ✓ Chemical Engineering Thermodynamics 1&2
- ✓ Process Control (& Process Control Lab)
- ✓ Mass & Energy Balance
- ✓ Fluid Mechanics 2
- ✓ Unit Operation 2
- ✓ Gas Industries Processes
- ✓ Introduction to Chemical Engineering
- ✓ Software application in Chemical Engineering

## **Academic and Industrial Projects**

1. Sulfur recovery unit design, Spring and summer 2009.
2. Catalyst synthesis for Oxidative Coupling of Methane (OCM) reaction, Summer 2008, Research Institute of Petroleum Industry (RIPI).
3. Plasma application in OCM reactions, Summer 2008, RIPI.
4. Fuzzy logic controller design for MMA reaction (vandenvos) Winter 2009, Sharif University of technology.
5. Neural Network Controller Design for MMA reaction (vandenvos) Winter 2009, Sharif University of technology.
6. Modeling and simulation of Convective heat transfer for power law fluids in packed and fluidized beds of spheres, Spring 2010, Sharif University of technology.

7. Non-linear controllers Design for Control of the HIV infection and drug dosage, Spring 2010, Sharif University of technology.
8. Back stepping-based nonlinear adaptive control design for coal-fired utility boiler–turbine units, Winter 2010, Sharif University of technology.
9. Development of an Intelligent System to Predict and Control Blood Glucose Level in Type 1 Diabetic Patients, Spring and Summer 2011, Sharif University of technology.
10. General modeling and simulation of the transient behavior of plug flow reactors, Fall and Winter 2012, Tarbiat Modares University.
11. Glucose optimal control system design in diabetes treatment, Winter 2013, Tarbiat Modares University.
12. Modeling and Simulation of CO<sub>2</sub> removal by AMP alkanolamine using modified Kent- Isenberg model, Winter 2013, Tarbiat Modares University.
13. Development of an associating equation of state and experimental measurement of H<sub>2</sub>S and CO<sub>2</sub> mixture solubility in mixtures of alkanolamines and ionic liquids (Supported by National Iranian Gas Company (NIGC)), Since Winter 2013 up to now, Tarbiat Modares University.
14. Modeling and simulation of catalytic hydrogenation of aromatic hydrocarbon mixtures, Fall and Winter 2014, Tarbiat Modares University.
15. Measurements and Thermodynamic Modeling of the Solubility of Acid Gases (H<sub>2</sub>S & CO<sub>2</sub>) in Ionic Liquid ([bmim][Ac]) and its Application in Natural Gas Sweetening (Supported by National Iranian Gas Company (NIGC)), Winter 2014, Tarbiat Modares University.
16. Experimental measurement and modeling of the acid gas mixture solubility in aqueous mixtures of AEEA and MDEA alkanolamines, Since Winter 2014 up to now, Tarbiat Modares University.

### **Scientific Articles**

#### **ISI Papers:**

1. **A. Afsharpour**, A. Haghtalab., " Correlation and prediction of H<sub>2</sub>S and mixture of CO<sub>2</sub> & H<sub>2</sub>S solubility in aqueous MDEA solutions using electrolyte modified HKM plus association EoS", **Fluid Phase Equilibria**, **494 (2019) 192-200.**

2. **A. Afsharpour.**, " Application of reaction equilibrium thermodynamic model for correlation of H<sub>2</sub>S solubility in ionic liquids [emim][Ace] and [hmim][Ace] using CPA equation of state", **Petroleum Science and Technology**, **37(14) (2017) 1648- 1654.**
3. **A. Afsharpour**, A. Haghtalab., " Implementation of electrolyte CPA EoS to model solubility of CO<sub>2</sub> and CO<sub>2</sub>+ H<sub>2</sub>S mixtures in aqueous MDEA solutions", **Chinese Journal of Chemical Engineering**, <https://doi.org/10.1016/j.cjche.2019.01.007>.
4. **A. Afsharpour.**, "Combination of CPA EoS and RETM for Modeling of H<sub>2</sub>S Solubility in [emim][Lac] and [bmim][Ac] Ionic Liquids", **Petroleum Science and Technology**, **DOI:10.1080/10916466.2019.1599935.**
5. A. Kheiri, **A. Afsharpour.**, " The CPA EoS application to model CO<sub>2</sub> and H<sub>2</sub>S simultaneous solubility in ionic liquid [C<sub>2</sub>mim][PF<sub>6</sub>] ", Published in **Petroleum Science and Technology**, **2018.**
6. **A. Afsharpour**, A. Haghtalab., " Simultaneous measurement absorption of CO<sub>2</sub> and H<sub>2</sub>S mixture into aqueous solutions containing Diisopropanolamine blended with 1-butyl-3-methylimidazolium acetate ionic liquid", **International Journal of Greenhouse Gas Control**, **58 (2017) 71- 80.**
7. **A. Afsharpour**, A. Haghtalab., " Modeling of CO<sub>2</sub> Solubility in aqueous N-methyldiethanolamine Solution Using Electrolyte modified HKM Plus Association Equation of State", **Fluid Phase Equilibria journal**, **433 (2017) 149- 158.**
8. **A. Afsharpour**, A. Kheiri, "The Solubility of Acid Gases in the ionic liquid [C<sub>8</sub>mim][PF<sub>6</sub>]", **Petroleum Science and Technology**, **36 (2017) 232- 238.**
9. **A. Afsharpour**, A. Kheiri, " Implementation of CPA EoS for simultaneous solubility modeling of CO<sub>2</sub> and H<sub>2</sub>S in ionic liquid [OMIM][Tf<sub>2</sub>N] ", **Petroleum Science and Technology**, **36 (2017) 280- 286.**
10. A. Kheiri, **A. Afsharpour**, M-B Zare Talavaki, " Modeling of acid gases solubility in ionic liquid [BMIM][MeSO<sub>4</sub>] using CPA EoS ", **Petroleum Science and Technology**, **36 (2017) 319- 325.**
11. **A. Afsharpour.**, "Modeling of H<sub>2</sub>S Solubility in aqueous MDEA Solution Using Electrolyte SRK Plus Association Equation of State", **Petroleum Science and Technology**, **35 (2017) 299- 305.**
12. **A. Afsharpour**, A. Afsharpour, M. Mohammadi Khanaposhtani., "Correlation of H<sub>2</sub>S Solubility in aqueous MDEA Solutions Using Electrolyte modified Peng- Robinson Plus Association Equation of State", **Petroleum Science and Technology**, **35 (2017) 299- 305.**
13. A. Haghtalab, **A. Afsharpour.**, " Solubility of CO<sub>2</sub> + H<sub>2</sub>S gas mixture into different aqueous N-methyldiethanolamine solutions blended with 1-butyl-3-methylimidazolium acetate ionic liquid", **Fluid Phase Equilibria journal**, **406 (2015) 10- 20.**

## National and International Conferences:

1. **A. Afsharpour**, " Utilizing CPA EoS Together with the RETM for H<sub>2</sub>S Solubility Modeling in 1-ethyl-3-methylimidazolium Lactate Ionic Liquid", **The 16<sup>th</sup> Iranian National Congress of Chemical Engineering, 2019.**
2. **A. Afsharpour**, " Modeling of H<sub>2</sub>S solubility in ionic liquid 1-Ethyl-3-methylimidazolium acetate using mHKM-CPA EoS combined with RETM", **The 16<sup>th</sup> Iranian National Congress of Chemical Engineering, 2019.**
3. **A. Afsharpour**, A. Haghtalab., " Modeling of H<sub>2</sub>S Solubility in aqueous N-methyldiethanolamine Solution Using Electrolyte Modified HKM Plus Association Equation of State", **4<sup>rd</sup> International Conference on Recent Innovations in Chemistry and Chemical Engineering, 2017.**
4. **A. Afsharpour**, A. Haghtalab., " Modeling of H<sub>2</sub>S Solubility in aqueous N-methyldiethanolamine Solution Using Electrolyte SRK Plus Association Equation of State", **3<sup>rd</sup> International Conference on New Achievements in Chemistry and Chemical Engineering, 2016.**
5. **A. Afsharpour**, A. Haghtalab., " Solubility of CO<sub>2</sub>+ H<sub>2</sub>S gas mixture into aqueous N-Methyldiethanolamine solution blended with 1-butyl-3-methylimidazolium acetate ionic liquid", Presented in **The 9<sup>th</sup> International Chemical Engineering Congress and Exhibition (IChEC), 2015.**
6. A. Haghtalab, **A. Afsharpour.**, " Simultaneous solubility of CO<sub>2</sub>+H<sub>2</sub>S mixture into aqueous Diisopropanolamine solutions blended with 1-butyl-3-methylimidazolium acetate ionic liquid at high pressures", Presented in **The 9<sup>th</sup> International Chemical Engineering Congress and Exhibition (IChEC), 2015.**
7. **A. Afsharpour** and R.Bozorgmehry., " Developement of an intelligent system to predict and control blood glucose level in type 1 diabetic patients", Accepted **5<sup>th</sup> International Conference on Biomedical Engineering and Informatics (BMEI), 2012.**
8. M.Ghods, **A. Afsharpour** and R.Bozorgmehry., " A novel method representation for HIV-1 control regarding to operable restrictions", Presented in **2<sup>nd</sup> International Conference on Control, Instrumentation and Automation (ICCIA), 2011.**

## Computer and programming Skills

- Programing language: VB.
- Professional Chemical Process Simulation Software's such as Hysys, Aspen Plus.
- Mathematical Software's: MATLAB (Proficient), Maple.
- Office Software's: Word, Excel, PowerPoint, Visio.
- Graphical Software's: Photoshop, Flash, Cool 3D.