Poorandokht I. Kashkouli

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EDUCATION AND TRAINING

Postdoc	Chemical & Biomolecular Engineering, Georgia Institute of Technology, Atlanta, Ga, USA	2021 – 2023
Postdoc	Chemistry and Geochemistry, University of California Davis & Georgia State University, USA	2017 - 2019
PhD	Chemical Engineering, University of KwaZulu-Natal, South Africa	2012-2016
MS	Analytical Chemistry, Shiraz University, Iran	2009-2012
BS	Chemistry, Yasuj University, Iran	2004-2008

RESEARCH EXPERIENCE

R&D Associate Staff Member, Multifunctional Equipment Integration 2023- Present
Energy Science and Technology Directorate, Buildings and Transportation Science Division, Oak Ridge National Laboratory

- Carbon capture from gas-fired equipment
- Regeneration of DAC sorbent
- Building-Integrated Carbon Capture

Postdoctoral Research Fellow, Carbon-Neutral Energy Solutions Laboratory 2021- 2023
Advisor: Christopher W Jones

- Developing a system for Direct CO_2 Capture from ambient air (DAC) and delivery to photobioreactors for lowering the carbon footprint and the cost of algal biofuel production.

Advisor: Christopher W. Jones, Ryan P. Lively

- Carbon Air Capture at Data Center (DAC)-using low-grade heat produced by the data center servers to regenerate DAC sorbent.

Postdoctoral Research Fellow, University of California Davis & Georgia State University 2017- 2019

- Adsorption on metal oxide surfaces and chemical reactions occurring at the interfaces of oxide-aqueous solutions.
- Using custom designed flow adsorption calorimetry instrument to measure thermodynamic properties of interfacial reactions at minerals and 2D nanomaterial interfaces to study the fate and transport of chemical species in aqueous environments.

Graduate Student Researcher, Thermodynamic Research Unit 2012-2016

- CO_2 capture through gas hydrate formation technology-thermodynamic study
  - Investigating the fundamentals of hydrate phenomena with the goal of applying the results to practical aims such as hydrogen storage, kinetic inhibition, and gas recovery.
  - Preventing hydrate blockages by the addition of suitable thermodynamic inhibition chemicals.
  - Promoting the hydrate formation and decomposition cycles for gas storage, transport, and sequestration by applying promotion chemicals.

Master Student Researcher 2009-2012

- Applying machine learning to solve a variety of problems in chemistry, engineering, and environmental science
- Developing quantitative structure-property relationship (QSPR) modeling to predict physicochemical properties of ionic-liquids and organic compounds in the context of computer-aided design of industrial materials.

TEACHING AND MENTORING EXPERIENCE

Undergraduate research mentor, Georgia Institute of Technology, Atlanta, Ga — Summer 2022
Undergraduate research mentor, Senior Georgia State University, Atlanta, Ga — Fall 2017 & Spring 2018-2019
Teaching Assistant, Senior, Instrumental analysis, Shiraz University, Shiraz, Iran — Fall 2010-Fall 2011
Instructor, Senior, Department of Chemistry, Shiraz University, Shiraz, Iran — Spring 2010

PEER REVIEWED PUBLICATIONS

Selected Journal Publications *(among 47 manuscripts)*

Experimental publications:

1. Gao, Q.; Sun, W.; **Ilani-Kashkouli, P.**; Tselev, A.; Kent, P. R. C.; Kabengi, N.; Naguib, M.; Alhabeb, M.; Tsai, W.; Baddorf, A. P.; Huang, J.; Jesse, S.; Gogotsig, Y.; Balke, N., Tracking ion intercalation into layered Ti3C2 MXene films across length scales. *Energy and Environmental Science* 2020, 13, 2549-2558.

2. Ilgen, A.; Kabengi, N.; Leung, K.; **Ilani-Kashkouli, P.**; Knight, A.; Loera, L., Nanoconfinement within mesoporous silica affects the adsorption energetics and coordination environment of lanthanides. *Environmental Science: Nano* 2021, 8, 432-443.
3. Knight, A.; **Ilani-Kashkouli, P.**; Harvey, J.; Greathouse, J.; Ho, T.; Kabengi, N.; Ilgen, A., Interfacial Reactions of Cu (II) Adsorption and Hydrolysis Driven by Nano-scale Confinement. *Environmental Science: Nano* 2020, 7, 68-80.
4. Laudadio, E.; **Ilani-Kashkouli, P.**; Jones, D.; Bennett, J.; Mason, S.; Kabengi, N.; Hamers, R., Interaction of phosphate with lithium cobalt oxide nanoparticles: a combined spectroscopic and calorimetric study. *Langmuir* 2019, 35 (50), 16640-16649.
5. **Ilani-Kashkouli, P.**; Hashemi, H.; Basdeo, A.; Naidoo, P.; Ramjugernath, D., Hydrate Dissociation Data for the Systems (CO_2/CH_4/Ar) + Water with (TBAF/TBAA/TBPB/$TBANO_3$ and Cyclopentane). *Journal of Chemical and Engineering Data* 2019, 64 (6), 2542-2549.
6. **Ilani-Kashkouli, P.**; Mohammadi, A. H.; Naidoo, P.; Ramjugernath, D., Hydrate phase equilibria for CO_2, CH_4, or N_2 + tetrabutylphosphonium bromide (TBPB) aqueous solution. *Fluid Phase Equilibria* 2016, 411, 88-92.
7. **Ilani-Kashkouli, P.**; Hashemi, H.; Gharagheizi, F.; Babaee, S.; Mohammadi, A. H.; Ramjugernath, D., Gas hydrate phase equilibrium in porous media: An assessment test for experimental data. *Fluid Phase Equilibria* 2013, 360, 161-168.
8. **Ilani-Kashkouli, P.**; Babaee, S.; Gharagheizi, F.; Hashemi, H.; Mohammadi, A. H.; Ramjugernath, D., An assessment test for phase equilibrium data of water soluble and insoluble clathrate hydrate formers. *Fluid Phase Equilibria* 2013, 360, 68-76.
9. **Ilani-Kashkouli, P.**; Mohammadi, A. H.; Naidoo, P.; Ramjugernath, D., Thermodynamic stability conditions for semi-clathrate hydrates of CO_2, CH_4, or N_2 with tetrabutyl ammonium nitrate ($TBANO_3$) aqueous solution. *Journal of Chemical Thermodynamics* 2016, 96, 52-56.

Machine learning and modeling:

10. Hemmateenejad, B.; **Ilani-Kashkouli, P*.**, Quantitative Structure-Property Relationship Study to Predict Speed of Sound in Diverse Organic Solvents from Solvent Structural Information. *Industrial & Engineering Chemistry Research* 2012, 51 (45), 14884-14891.
11. Gharagheizi, F.; **Ilani-Kashkouli, P.**; Mohammadi, A. H., Estimation of lower flammability limit temperature of chemical compounds using a corresponding state method. *Fuel* 2013, 103, 899-904.