

KUTAY BERK SEZGINEL

University of Pittsburgh, Pittsburgh, PA
+1 (619) 576 64 78 | kbs37@pitt.edu

EDUCATION

PhD candidate in Chemical & Petroleum Engineering

University of Pittsburgh, Swanson School of Engineering
Adviser: Dr. Christopher E. Wilmer

Sep 2015 – Present
Pittsburgh, PA

M.S. in Chemical & Biological Engineering

Koc University, Graduate School of Science and Engineering

Sep 2013 – June 2015
Istanbul, Turkey

- Dissertation Title: “Computational and Experimental Investigation of Methane Adsorption in Pure and Ionic Liquid Modified Metal-Organic Frameworks”
- Advisers: Dr. Seda Keskin & Dr. Alper Uzun

B.S. in Chemical & Biological Engineering

Koc University, School of Engineering
Energy and Environmental Engineering Track

Sep 2008 – June 2013
Istanbul, Turkey

Erasmus Exchange Program

Eindhoven University of Technology, School of Engineering

Feb 2012 – Aug 2012
Eindhoven, The Netherlands

RESEARCH EXPERIENCE

Graduate Research Assistant

Hypothetical Materials Lab (WilmerLab), University of Pittsburgh

Sep 2015 – Present
Pittsburgh, PA

- Working on several projects to develop new computational methods for the discovery of novel materials, focusing on supramolecular structures and metal-organic frameworks.
- Collaborating with faculty and fellow graduate students across departments to pursue experimental synthesis of *hypothetical* structures discovered by these computational tools.

Graduate Research Assistant

Nanomaterials, Energy and Molecular Modelling Research Group, Koc University

Sep 2013 – June 2015
Istanbul, Turkey

- Performed grand canonical Monte Carlo (GCMC) and Molecular Dynamics (MD) simulations of Metal-Organic Frameworks (MOFs) to screen these materials for gas storage and separation applications.
- Investigated the structural and thermodynamic properties of MOFs to understand methane adsorption mechanism and constructed models to predict methane storage of MOFs at various temperature and pressures.

Graduate Research Assistant

Koc University Tupras Energy Center (KUTEM)

Sep 2013 – June 2015
Istanbul, Turkey

- Investigated post-synthetic modifications of MOFs and zeolites using ionic liquids to enhance gas storage/selectivity performances concentrating on flue gas separation. Prepared and characterized composite materials by TGA, XRD, FT-IR, surface area, pore volume, and various gas adsorption measurements.

Visiting Research Assistant

Energy Materials & Devices Research Group, Eindhoven University of Technology

Feb 2012 - July 2012
Eindhoven, Netherlands

- Designed, fabricated and analyzed enzyme (glucose oxidase) dispersed carbon nanotube electrodes. Measured their glucose oxidation performances using various electrochemical measurements.

Undergraduate Research Assistant

Koç University Inorganic Chemistry Laboratory

Oct 2010 – Feb 2012
Istanbul, Turkey

- Investigated high temperature solid state synthesis of various nitride compounds.

PUBLICATIONS

Sezginel, K.B., Feng T., Wilmer, C.E. (2017). Discovery of Hypothetical Hetero-Interpenetrated MOFs with Arbitrarily Dissimilar Topologies and Unit Cell Shapes. *CrystEngComm* 19.31 (2017): 4497-4504. (futures on front cover)

Sezginel, K. B., Keskin, S., & Uzun, A. (2016). Tuning the Gas Separation Performance of CuBTC by Ionic Liquid Incorporation. *Langmuir*, 32(4), 1139-1147.

Basdogan, Y., **Sezginel, K. B.**, & Keskin, S. (2015). Identifying highly selective metal organic frameworks for CH₄/H₂ separations using computational tools. *Industrial & Engineering Chemistry Research*, 54(34)

Sezginel, K. B., Uzun, A., & Keskin, S. (2015). Multivariable linear models of structural parameters to predict methane uptake in metal-organic frameworks. *Chemical Engineering Science*, 124, 125-134.

CONFERENCE PRESENTATIONS (ORAL)

Sezginel, K.B., Feng T., Wilmer, C.E., "Theoretical Prediction of Interpenetrating Metal-Organic Frameworks", AIChE Annual Meeting, San Francisco, CA, Nov. 15, 2016.

Sezginel, K.B., Feng T., Wilmer, C.E., "Theoretical Prediction of Interpenetrating Metal-Organic Frameworks", Simulators Meeting, Carnegie Mellon University, Pittsburgh, PA, May 25, 2016.

Sezginel K.B., Uzun A., Keskin S., "Prediction of CH₄ Storage Performance of Metal-Organic Frameworks", AIChE Annual Meeting, Atlanta, GA, Nov. 17, 2014.

Sezginel K.B., Uzun A., Keskin S., "Prediction of CH₄ Storage Properties of Metal-Organic Frameworks", NanoTR 2014, Yeditepe University Istanbul, Turkey, June 21, 2014.

TEACHING AND MENTORING EXPERIENCE

Graduate Mentor

Hypothetical Materials Lab (WilmerLab)

Spring 2016 – Present

University of Pittsburgh, PA

- Mentored three undergraduate and two master students in data collection and analysis for various projects.
- Guided the students in preparation and presentation of research findings.

Teaching Assistant

ENG 0712 (Honors Engineering Analysis and Computing)

Spring 2017

University of Pittsburgh, PA

- Attended lectures to help students with the assignments and graded assignments.

Teaching Assistant

CHBI 403 (Process and Product Design)

Fall 2013 & Fall 2014

Koc University, Istanbul, Turkey

- Instructed weekly lab sessions for teaching Aspen HYSYS software. Prepared and graded quizzes for lab sessions, assigned four design projects and evaluated them, proctored the midterms and finals.

Teaching Assistant

CHBI 491 (Chemical and Biological Engineering Senior Project)

Spring 2015

Koc University, Istanbul, Turkey

- Held weekly meetings with project group members and Prof. Can Erkey to discuss the project, assisted the project group members by providing them supportive articles for their project and giving ideas.

Teaching Assistant

CHEM 103 (General Chemistry)

Spring 2014

Koc University, Istanbul, Turkey

- Attended weekly lab sessions of freshman students, graded quizzes, lab reports and midterm questions, proctored the midterms and finals.

HONORS & AWARDS

- Attended Foresight Institute 2017 Workshop: *Artificial Intelligence for Molecular Machines*
- Innocentive challenge entitled *Chemical Sorbents for Fixed Bed Mercury (Hg⁰) Control* (\$5000 prize)
- Full Merit Scholarship – Koc University, MS
- Full Merit Scholarship – Koc University, BS
- Best Chemical and Biological Engineering Senior Project Award (Biodiesel Production from Algae Oil)
- Vehbi Koç Scholar Award (SPA above 3.5) - Fall 2012
- Dean's Honor Roll (Spring 2013)

SKILLS

Language English (Advanced) TOEFL iBT (110/120), Dutch (Beginner)
Software Python (Advanced), Javascript (Advanced), Bash (Intermediate), Matlab (Advanced)
RASPA, LAMMPS, Orca, Materials Studio, Aspen HYSYS, GitHub (<https://github.com/kbsezginel>)
Lab FT-IR (Thermo Scientific Nicolet iS10), XRD (Bruker D2 Phaser), High Pressure Volumetric Analyzer (Micromeritics HPVA II), Chemisorption Analyzer (Micromeritics Auto Chem II), TGA, Glovebox

PERSONAL

- Interested in electronic and jazz music (https://soundcloud.com/kbs_music)
- 3-D printing, Raspberry Pi, woodworking, running
- Favorite Writers: Ray Kurzweil, Eric Drexler, Franz Kafka

REFERENCES

Christopher E. Wilmer

Asst. Professor of Chemical and Petroleum Engineering, University of Pittsburgh
+1 (412) 624-9639, wilmer@pitt.edu

John A. Keith

Asst. Professor of Chemical and Petroleum Engineering, University of Pittsburgh
+1 (412) 624-7016, jakeith@pitt.edu

Christopher Brown

Asst. Professor, School of Health and Rehabilitation Sciences, University of Pittsburgh
+1 (412) 383-6546, cbrown1@pitt.edu

Seda Keskin

Assoc. Professor of Chemical and Biological Engineering, Koc University, Istanbul, Turkey
+90 (212) 338-1362, skeskin@ku.edu.tr

Alper Uzun

Asst. Professor of Chemical and Biological Engineering, Koc University, Istanbul, Turkey
+90 (212) 338-1754, auzun@ku.edu.tr