

KUTAY BERK SEZGINEL

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EDUCATION

PhD student in Chemical & Petroleum Engineering Sep 2015 – Present
University of Pittsburgh, Swanson School of Engineering Pittsburgh, PA
Adviser: Dr. Christopher E. Wilmer

M.S. in Chemical & Biological Engineering Sep 2013 – June 2015
Koc University, Graduate School of Science and Engineering 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 Sep 2008 – June 2013
Koc University, School of Engineering Istanbul, Turkey
Energy and Environmental Engineering Track

Erasmus Exchange Program Feb 2012 – Aug 2012
Eindhoven University of Technology, School of Engineering Eindhoven, The Netherlands

RESEARCH EXPERIENCE

Graduate Research Assistant Sep 2015 – Present
Hypothetical Materials Lab (WilmerLab), University of Pittsburgh 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 Sep 2013 – June 2015
Nanomaterials, Energy and Molecular Modelling Research Group, Koc University 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 Sep 2013 – June 2015
Koc University Tupras Energy Center (KUTEM) 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 Feb 2012 - July 2012
Energy Materials & Devices Research Group, Eindhoven University of Technology Eindhoven, Netherlands
▪ Designed, fabricated and analyzed enzyme (glucose oxidase) dispersed carbon nanotube electrodes. Measured their glucose oxidation performances using various electrochemical measurements.

PUBLICATIONS

Sezginel, K. B., Asinger P. A., Babaei H. and Wilmer, C.E. (2018). "Thermal transport in interpenetrated metal-organic frameworks." *Chemistry of Materials*, 30, 2281–2286. (featured on front cover)

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: 4497-4504. (featured 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.

❖ 4 conference presentations (3 in USA and 1 in Turkey).

LEADERSHIP 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

- Best Graduate Paper Award (Summer `17), Chemical Engineering Department, University of Pittsburgh
- 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 and BS
- Best Chemical and Biological Engineering Senior Project Award (Biodiesel Production from Algae Oil)

SKILLS

- Language** English (Advanced) TOEFL iBT (110/120), Dutch (Beginner)
- Graphics** Scientific visualization portfolio: <https://kbsezginel.github.io/visualization/portfolio>
- Software** Advanced in Python, Javascript, Matlab and computational chemistry: RASPA, Lammmps, Orca, Materials Studio, Aspen HYSY. Experienced in big data analysis and high-throughput screening.
- 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, microcontrollers, home automation, woodworking
- Favorite Writers: Ray Kurzweil, Eric Drexler, Franz Kafka

REFERENCES

Christopher E. Wilmer

Asst. Professor of Chemical and Petroleum Engineering, University of Pittsburgh
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John A. Keith

Asst. Professor of Chemical and Petroleum Engineering, University of Pittsburgh
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Christopher Brown

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Seda Keskin

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Alper Uzun

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