# KUTAY BERK SEZGINEL

University of Pittsburgh, Pittsburgh, PA

+1 (619) 576 64 78 | kbs37@pitt.edu

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| **EDUCATION** |  |

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| ***PhD candidate in Chemical & Petroleum Engineering*** | Sep 2015 – Present |
| University of Pittsburgh, Swanson School of Engineering | Pittsburgh, PA |
| Adviser: Dr. Christopher E. Wilmer |  |
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| ***B.S. and M.S. in Chemical & Biological Engineering*** | Sep 2008 – June 2015 |
| Koc University, School of Engineering | Istanbul, Turkey |

* Dissertation Title: “Computational and Experimental Investigation of Methane Adsorption in Pure and Ionic Liquid Modified Metal-Organic Frameworks”

## RESEARCH EXPERIENCE

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| ***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.

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| ***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.

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| ***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.

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| ***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., 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. (futured 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.

## 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 (Intermedidate), Matlab (Advanced)

RASPA, Lammps, Orca, Materials Studio, Aspen HYSY, 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, Rasberry 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](mailto: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