# KUTAY BERK SEZGINEL

University of Pittsburgh, Pittsburgh, PA

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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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| ***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

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| ***B.S. in Chemical & Biological Engineering*** | Sep 2008 – June 2013 |
| Koc University, School of Engineering | Istanbul, Turkey |
| *Energy and Environmental Engineering Track* |  |

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

## 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.

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| ***Undergraduate Research Assistant*** | Oct 2010 – Feb 2012 |
| Koç University Inorganic Chemistry Laboratory | 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. (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.

## TEACHING AND MENTORING EXPERIENCE

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| ***Graduate Mentor*** | Spring 2016 – Present |
| Hypothetical Materials Lab (WilmerLab) | 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.

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| ***Teaching Assistant*** | Spring 2017 |
| ENG 0712 (Honors Engineering Analysis and Computing) | University of Pittsburgh, PA |

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

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| ***Teaching Assistant*** | Fall 2013 & Fall 2014 |
| CHBI 403 (Process and Product Design) | 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.

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| ***Teaching Assistant*** | Spring 2015 |
| CHBI 491 (Chemical and Biological Engineering Senior Project) | 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.

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| ***Teaching Assistant*** | Spring 2014 |
| CHEM 103 (General Chemistry) | 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 (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

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**John A. Keith**

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**Christopher Brown**

Asst. Professor, School of Health and Rehabilitation Sciences, University of Pittsburgh

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**Seda Keskin**

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**Alper Uzun**

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