

Hilal Ezgi Toraman

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Dr. Hilal Ezgi Toraman, Virginia S. and Philip L. Walker Jr. Faculty Fellow is an Assistant Professor of Energy Engineering and Chemical Engineering at The Pennsylvania State University. Toraman's research is in the field of chemical reaction engineering with a focus on developing new processes, materials and technologies for efficient and sustainable use of energy resources such as shale gas, biomass and plastic waste.

Professional Experience

Assistant professor <i>Virginia S. and Philip L. Walker Faculty Fellow</i> <i>John and Willie Leone Family Department of Energy and Mineral Engineering</i> <i>Department of Chemical Engineering, Penn State University, USA</i>	2019-present
Post-doctoral researcher <i>Prof. Dr. Dion Vlachos' Group</i> <i>Delaware Energy Institute, Department of Chemical and Biomolecular Engineering</i> <i>University of Delaware, USA</i>	2017-2019
PhD researcher <i>Laboratory for Chemical Technology, Department of Chemical Engineering, Ghent University, Belgium</i>	2012-2016
Research and teaching assistant <i>Department of Chemical Engineering and Graduate School of Natural and Applied Sciences, Middle East Technical University, Turkey</i>	2010-2012

Education

Ph.D. in Chemical Engineering <i>Ghent University, Belgium</i> <u>Advisors</u> : Prof. Dr. Kevin M. Van Geem and Prof. Dr. Guy B. Marin <u>Thesis title</u> : Fast pyrolysis for the circular economy: from plastic waste to genetically engineered poplar	2012-2016
M.Sc. in Chemical Engineering <i>Middle East Technical University, Turkey</i> <u>Advisors</u> : Prof. Dr. Ufuk Bölükbaşı and Prof. Dr. Necati Özkan <u>Thesis title</u> : Investigation of alkaline pretreatment parameters on a multi-product basis for the co-production of glucose and hemicellulose based films from corn cobs	2012-2010
B.Sc. in Chemical Engineering <i>Middle East Technical University, Turkey</i>	2005-2010

Honors and Awards

- Virginia S. and Philip L. Walker, Jr. Faculty Fellowship
- North American Symposium for Chemical Reaction Engineering (NASCRE) 4 Travel Award
- Ghent University Graduate Research Fellow, Belgium
- Scientific and Technological Research Council of Turkey (TUBITAK) personal scholarship for M.Sc. study
- 3rd Ranking Undergraduate Student (Among 129 students), Department of Chemical Engineering, Middle East Technical University, Turkey

Teaching Experience

- Instructor for EGEE 464: Energy Design Project at Penn State University (2020)
- Guest lecturer for Applied Chemical Kinetics (2018) and Special Topics in Energy (2019) at University of Delaware
- Mentoring and coaching 5 Master thesis students and 3 Undergraduate students at Ghent University (2012-2016)
- Teaching assistant for Chemistry Laboratory (2012) and Introduction to Computers and Fortran Programming (2012) at Middle East Technical University
- Mentoring and tutoring high school students

Publications

Summary: 11 A1 publications (google scholar sum of times cited: 214 and h-index: 8) and 20 oral/poster presentations and invited talks at national/international conferences/universities.

A1 Publications

1. SriBala, G., **Toraman, H.E.**, Symoens, S., Déjardin, A., Pilate, G., Boerjan, W., Ronsse, F., Van Geem, K.M. and Marin, G.B., 2019. Analytical Py-GC/MS of Genetically Modified Poplar for the Increased Production of Bio-aromatics. Computational and Structural Biotechnology Journal, 17, pp.599-610.
2. **Toraman, H.E.**, Abrahamsson, V., Vanholme, R., Van Acker, R., Ronsse, F., Pilate, G., Boerjan, W., Van Geem, K.M. and Marin, G.B., 2018. Application of Py-GC/MS coupled with PARAFAC2 and PLS-DA to study fast pyrolysis of genetically engineered poplars. Journal of Analytical and Applied Pyrolysis, 129, pp.101-111.
3. **Toraman, H.E.**, Franz, K., Ronsse, F., Van Geem, K.M. and Marin, G.B., 2016. Quantitative analysis of nitrogen containing compounds in microalgae based bio-oils using comprehensive two-dimensional

gas-chromatography coupled to nitrogen chemiluminescence detector and time of flight mass spectrometer. *Journal of Chromatography A*, 1460, pp.135-146.

4. Negahdar, L., Gonzalez-Quiroga, A., Otyuskaya, D., **Toraman, H.E.**, Liu, L., Jastrzebski, J.T., Van Geem, K.M., Marin, G.B., Thybaut, J.W. and Weckhuysen, B.M., 2016. Characterization and comparison of fast pyrolysis bio-oils from pinewood, rapeseed cake, and wheat straw using 13C NMR and comprehensive GCx GC. *ACS sustainable chemistry & engineering*, 4(9), pp.4974-4985.
5. **Toraman, H.E.**, Vanholme, R., Borén, E., Vanwonterghem, Y., Djokic, M.R., Yildiz, G., Ronsse, F., Prins, W., Boerjan, W., Van Geem, K.M. and Marin, G.B., 2016. Potential of genetically engineered hybrid poplar for pyrolytic production of bio-based phenolic compounds. *Bioresource technology*, 207, pp.229-236.
6. Yildiz, G., Ronsse, F., Vercruyssen, J., Daels, J., **Toraman, H.E.**, van Geem, K.M., Marin, G.B., Van Duren, R. and Prins, W., 2016. In situ performance of various metal doped catalysts in micro-pyrolysis and continuous fast pyrolysis. *Fuel Processing Technology*, 144, pp.312-322.
7. **Toraman, H.E.**, Dijkmans, T., Djokic, M.R., Van Geem, K.M. and Marin, G.B., 2014. Detailed compositional characterization of plastic waste pyrolysis oil by comprehensive two-dimensional gas-chromatography coupled to multiple detectors. *Journal of Chromatography A*, 1359, pp.237-246.
8. Yildiz, G., Lathouwers, T., **Toraman, H.E.**, van Geem, K.M., Marin, G.B., Ronsse, F., van Duren, R., Kersten, S.R. and Prins, W., 2014. Catalytic fast pyrolysis of pine wood: effect of successive catalyst regeneration. *Energy & fuels*, 28(7), pp.4560-4572.
9. Bahcegul, E., **Toraman, H.E.**, Erdemir, D., Akinalan, B., Ozkan, N. and Bakir, U., 2014. An unconventional approach for improving the integrity and mechanical properties of xylan type hemicellulose based films. *RSC Advances*, 4(64), pp.34117-34126.
10. Bahcegul, E., Akinalan, B., **Toraman, H.E.**, Erdemir, D., Ozkan, N. and Bakir, U., 2013. Extrusion of xylans extracted from corn cobs into biodegradable polymeric materials. *Bioresource technology*, 149, pp.582-585.
11. Bahcegul, E., **Toraman, H.E.**, Ozkan, N. and Bakir, U., 2012. Evaluation of alkaline pretreatment temperature on a multi-product basis for the co-production of glucose and hemicellulose based films from lignocellulosic biomass. *Bioresource technology*, 103(1), pp.440-445.

Oral presentations

1. **Toraman, H. E.**, Alexopoulos, K., Vlachos, D. G, Multiscale modeling for non-oxidative methane coupling over earth abundant catalysts, NASCRE-4, March 10-13, 2019, Houston Texas, USA.
2. **Toraman, H. E.**, Alexopoulos, K., Vlachos, D. G, Multiscale modeling for non-oxidative methane coupling over an iron/silica catalyst, Catalysis Club of Philadelphia (CCP) Meeting, January 17, 2019, Wilmington, USA. **(Invited talk)**
3. **Toraman, H. E.**, Alexopoulos, K., Oh, S. C., Liu, D., Vlachos, D. G, Microkinetic modeling of direct, non-oxidative conversion of methane to value-added chemicals over iron/silica catalyst, Annual AIChE Meeting, October 28-November 2, 2018, Pittsburgh, USA.

4. Avanesian, T., Wittreich, G., **Toraman, H.E.**, Vlachos, D. G, Ethane dehydrogenation on Pt-based catalysts, Annual AIChE Meeting, October 28-November 2, 2018, Pittsburgh, USA.
5. **Toraman, H. E.**, Nothing goes to waste: sustainable utilization of complex feedstocks for the circular economy, Materials Science and Nanotechnology Engineering, TOBB ETU, January 11, 2017, Ankara, Turkey. **(Invited talk)**
6. **Toraman, H. E.**, Nothing goes to waste: fast pyrolysis of complex feedstocks for the circular economy, Department of Chemical Engineering, Izmir Institute of Technology, August 29, 2016, Izmir, Turkey. **(Invited talk)**
7. **Toraman, H.E.**, Franz, K., Priharto, N., Yildiz, G., Ronsse, F., Prins, W., Van Geem, K.M., Marin, G.B., Quantitative analysis of nitrogen containing compounds in micro-algae based bio-oil using GC × GC – NCD/TOF-MS, 14th International Symposium on Hyphenated Techniques in Chromatography and Separation Technology, January 27-29, 2016, Ghent, Belgium.
8. Mihailof C., Iliopoulou E.F., Lappas A.A., **Toraman H.E.**, Thybaut J.W., Van Geem K.M., Marin G., Characterization studies of waste bio-derived feedstock, 3rd International Conference Catalysis for Renewable sources: fuel, energy, chemicals, September 6 - 11, 2015, Catania, Sicily, Italy.
9. Yildiz, G., Lathouwers, T., **Toraman, H.E.**, Van Geem, K.M., Ronsse, F., Van Duren, R., Kersten, S.R.A., Prins, W., Effect of sequential catalyst regeneration in catalytic fast pyrolysis of biomass, 20th International symposium on Analytical and Applied Pyrolysis (PYRO 2014), June 2-6, 2014, Birmingham, UK.
10. **Toraman, H.E.**, Vanholme, R., Djokic, M.R., Yildiz, G., Ronsse, F., Prins, W., Boerjan, W., Van Geem, K.M., Marin, G.B., Fast pyrolysis of genetically modified biomass, 10th International Conference on Renewable Resources and Biorefineries (RRB-10), June 4-6, 2014, Valladolid, Spain.
11. **Toraman, H.E.**, Dijkmans, T., Djokic, M.R., Van Geem, K.M., Marin, G.B., Trace Impurity Analysis in Complex Hydrocarbon Matrices with SIFT-MS and LowoxMS, European Symposium on Advances in SIFT-MS, February 3-4, 2014, Breda, The Netherlands **(Invited talk)**
12. **Toraman, H.E.**, Dijkmans, T., Djokic, M.R., Van Geem, K.M., Marin, G.B., Assessing the clean character of plastic waste pyrolysis oils by comprehensive 2D GC, 13th International Symposium on Hyphenated Techniques in Chromatography and Separation Technology (HTC-13), January 29-31, 2014, Bruges, Belgium.
13. Van Geem, K.M., **Toraman, H.E.**, Schietse, M., Boren, E., Vanholme, R., Gerber, L., Djokic, M., Yildiz, G., Ronsse, F., Prins, W., Sundberg, B., Boerjan, W., Marin, G.B. Biomass reaction engineering driving genetic modification, Annual AIChE Meeting, November 3-8, 2013, San Francisco, USA.

Poster presentations

14. **Toraman, H.E.**, Franz, K., Priharto, N., Yildiz, G., Ronsse, F., Prins, W., Van Geem, K.M., Marin, G.B., Quantitative analysis of nitrogen containing compounds in micro-algae based bio-oil using GC × GC – NCD/TOF-MS, 14th International Symposium on Hyphenated Techniques in Chromatography and Separation Technology, January 27-29, 2016, Ghent, Belgium.

15. Vargas, D.C., **Toraman, H.E.**, Carstensen, H.H., Streitwieser, D.A., Van Geem, K.M., Marin, G.B., Experimental study on the initial thermal decomposition of resorcinol, 21st International Symposium on Analytical and Applied Pyrolysis (PYRO 2016), May 9-12, 2016, Nancy, France.
16. **Toraman, H.E.**, Carstensen, H.-H., Van Geem, K.M., Marin, G.B., Fast pyrolysis of lignocellulosic biomass: design and construction of a micro-pyrolysis setup for intrinsic kinetic measurements, 9th International Conference on Chemical Kinetics (ICCK), June 28-July 2, 2015, Ghent, Belgium.
17. **Toraman, H.E.**, Dijkmans, T., Djokic, M.R., Van Geem, K.M., Marin, G.B., Assessing the clean character of plastic waste pyrolysis oil by comprehensive 2D-GC, IAP P7/05 annual meeting, September 19, 2014, Louvain-La-Neuve, Belgium.
18. **Toraman, H.E.**, Van Geem, K.M., Marin, G.B., Fast pyrolysis of lignocellulosic biomass, IAP P7/05 annual meeting, September 18, 2013, Ghent, Belgium.
19. **Toraman, H.E.**, Van Geem, K.M., Marin, G.B., Gasification and fast pyrolysis of lignocellulosic biomass, Ghent Biobased Economy Summer School, August 19 – 22, 2013, Ghent, Belgium.
20. **Toraman, H.E.**, Van Geem, K.M., Marin, G.B., Gasification and Fast Pyrolysis of Lignocellulosic Biomass, Methusalem International Advisory Board Meeting (M2dcR2), June 24, 2013, Ghent, Belgium.