

## **Curriculum Vitae**

### **Sibel Uludag-Demirer, Ph.D**

Michigan State University  
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### ***Professional Experience:***

- **Manager**, ADREC, Michigan State University, Department of Biosystems and Agricultural Engineering, January 2022-present
- **Research Specialist**, Michigan State University, Department of Biosystems and Agricultural Engineering, May 2018-present
- **Visiting research scholar**, Michigan State University, Department of Biosystems and Agricultural Engineering, August 2016-October 2017.
- **Prof. Dr.**, Karabuk University, Department of Environmental Engineering, August 2011-October 2017.
- **Marie Curie Research Fellow**, Villanova University, Department of Civil and Environmental Engineering, July 2009-June 25, 2010.
- **Adjunct Prof.**, Drexel University, Department of Civil, Architectural and Environmental Engineering, PA, U.S.A., Winter 09-10.
- **Assist. Prof.**, Cankaya University, Department of Industrial Engineering, Ankara, Turkey, October 2004-July 2009.
- **Endeavour Research Fellow**, RMIT University, School of Civil, Environmental and Chemical Engineering, Melbourne, Australia, June-October, 2007.
- **Visiting Researcher**, Washington State University, Department of Biosystems Engineering, Pullman, Washington, USA, December, 2003- June, 2004.
- **Assist. Prof.**, Anadolu University, Department of Environmental Engineering, Eskisehir, Turkey, March, 2001-July, 2004.

### ***Education:***

- Ph.D., December 1999, Department of Civil and Environmental Engineering, Vanderbilt University, Nashville, TN, U.S.A.  
"Abiotic Transformation of Trichloroethylene in the Gas Phase by Elemental Iron."
- M. Sci., February 1993, Department of Environmental Engineering, Middle East Technical University, Ankara, Turkey.  
"The Removal of Metals from a Synthetic Metal Finishing Wastewater by Co-precipitation Technique."
- B.Sc., February 1990, Department of Environmental Engineering, Middle East Technical University, Ankara, Turkey

## ***Research Experience:***

### **As a researcher:**

A robust, energy positive wastewater treatment system for forward operating bases, ESTCP (February, 2021-). Funded by Department of Defense.

A Combined Biological and Chemical Flue Gas Utilization System Towards Carbon Dioxide Capture from Coal-Fired Power Plants (October 2017-March 2021). Funded by Department of Energy.

Treatment of Black Water Using Different Packed Treatment Systems: Monitoring, Analyses, and Data Collection (August 2017-). Funded by Department of Defense.

Treatment of Anaerobic Digester Effluent by Electrocoagulation Techniques, (August 2016-June 2017).

Integrated Nutrient Removal, Greenhouse Gas Mitigation and Bio-fuel and Bio-product Generation by Using Microalgal and Anaerobic Microbial Cultures (2012-2015). Funded by the Scientific and Technical Research Council of Turkey.

Nutrient Removal and Value-Added Product Formation from Wastes via Struvite Precipitation (2009-2010). Funded by Seventh Framework Programme, Marie Curie Actions.

Production of Renewable Energy and Bio-based Industrial Chemical Products from Organic Wastes (2005-2007). Funded by DPT (Organization of National Planning) of Turkey.

Organic Acid Production from Municipal and Agro-Industrial Wastes (2005-2008). Funded by the Scientific and Technical Research Council of Turkey.

Removal of TCE in Sequential (Biological/Chemical) Reactors (2002-2003). Funded by the Scientific and Technical Research Council of Turkey.

The Diffusion of Trichloroethylene in the Porous Medium at Varying Moisture Contents (January- June 1997). Funded by the National Science Foundation.

The Degradation of Trichloroethylene by *Methanotrophs* (June-December 1996). Funded by MITRE Co.

The Fermentation of Kudzu (*Pueraria lobata*) and Its Effects on the Fiber Strength. Funded by Vanderbilt University Research Council.

### **As a primary investigator:**

The sample collection from the Hood Farm (Paw Paw, MI) for the aeration technology evaluation (August 2022-present); Funded by Newtrient

The standard biochemical methane potential test measurements of samples from clients (January-December 2022)

Nitrogen and Phosphorus Removal and Recovery from Domestic and Agro-Industrial Wastewaters by Struvite Precipitation (2004-2007); *Funded by the Scientific and Technical Research Council of Turkey.*

Reduction of Hexavalent Chromium on Elemental Iron and Effects of Surface Oxide Formation on the Reduction Rate (2002-2003); *Funded by Anadolu University.*

#### **• Theses supervised**

Elker S., "An Integrated/Preventive Production Planning Program with Waste Minimization", A Master of Science Thesis, Cankaya University, Ankara, June, 2008.

Sentoregil S., "The Role of Oxygen and Surface Oxides on the Reduction of Cr(VI) to Cr(III) by Elemental Iron", A Master of Science Thesis, Anadolu University, Eskisehir, January, 2003.

(coadvisor) Tezel, U., "Treatment of Gaseous TCE by Sequential (Biotic and Abiotic) Reduction Reactions", A Master of Science Thesis, METU, Ankara, May, 2003.

#### **• Scholarships**

1) EU, IRSES People Exchange Program, Marie Curie Fellowship, 2009-2010.

2) Australian Government, Endeavour Programme, Endeavour Research Fellowship, 2007.

## **Publications**

### **• Journal Publications**

Smerigan, A., Uludag-Demirer, S., Cutshaw, A., Marks, A. and Liao, W., 2023. High-efficiency carbon dioxide capture using an algal amino acid salt solution. *Journal of CO2 Utilization*, 69, p.102394.

Thomas, B.D., Uludag-Demirer, S., Frost, H., Liu, Y., Dusenbury, J.S. and Liao, W., 2022. Decentralized high-strength wastewater treatment using a compact aerobic baffled bioreactor. *Journal of Environmental Management*, 305, p.114281.

Uludag-Demirer, S. and Demirer, G.N., 2021. Post-anaerobic treatability and residual biogas potential of digestate. *Biomass Conversion and Biorefinery*, pp.1-8.

Claes, A., Melchi, L., Uludag-Demirer, S. and Demirer, G.N., 2021. Supplementation of carbon-based conductive materials and trace metals to improve biogas production from apple pomace. *Sustainability*, 13(17), p.9488.

Xu, M., Uludag-Demirer, S., Fang, D., Zhou, L., Liu, Y. and Liao, W., 2021. Effects of Pyrogenic Carbonaceous Materials on Anaerobic Digestion of a Nitrogen-Rich Organic Waste—Swine Manure. *Energy & Fuels*, 35(3), pp:2282-2292.

Uludag-Demirer, S. and Demirer, G.N., 2021. Post-anaerobic treatability and residual biogas potential of digestate. *Biomass Conversion and Biorefinery*, pp.1-8.

Cutshaw, A., Daiek, C., Zheng, Y., Frost, H., Marks, A., Clements, D., Uludag-Demirer, S., Verhanovitz, N., Pavlik, D., Clary, W. and Liu, Y., 2020. A long-term pilot-scale algal cultivation on power plant flue gas—Cultivation stability and biomass accumulation. *Algal Research*, 52, p.102115.

Uludag-Demirer, S., Olson, N., Ives, R., Nshimyimana, J.P., Rusinek, C.A., Rose, J.B. and Liao, W., 2020. Techno-Economic Analysis of Electrocoagulation on Water Reclamation and Bacterial/Viral Indicator Reductions of a High-Strength Organic Wastewater—Anaerobic Digestion Effluent. *Sustainability*, 12(7), p.2697.

Ülgüdür, N., Ergüder, T.H., Uludağ-Demirer, S. and Demirer, G.N., 2019. High-rate anaerobic treatment of digestate using fixed film reactors. *Environmental Pollution*, 252, pp.1622-1632.

Çaylı, D., Uludag-Demirer, S. and Demirer, G.N., 2018. Coupled nutrient removal from the wastewater and CO2 biofixation from the flue gas of iron and steel manufacturing. *International Journal of Global Warming*, 16(2), pp.148-161.

Uludag-Demirer S. and Demirer G., 2017. Determination of regional industrial symbiosis opportunities by using relationship mimicking with ESOTA®, *Progress in Industrial Ecology – An International Journal*, Vol. 11, No. 4, pp.343–360.

Uludag-Demirer S., Taskin B., Demirer G.N., Duran M. 2013. The effect of managing nutrients in the performance of anaerobic digesters of municipal wastewater treatment plants, *Applied Microbiology and Biotechnology*, Vol: 97, 7899-7907.

Othman M.Z., Uludag-Demirer S., Demirer G.N. 2010. Enhanced nutrients removal in conventional anaerobic digestion process, *International Journal of Civil and Environmental Engineering*, Vol.4, 203-209.

Uludag-Demirer S., Duran J., Tanner R.D. 2009. Estimating the turnover number in enzyme kinetic reactions using transient and stationary data, *Brazilian Journal of Pharmaceutical Sciences*, Vol. 45, 635-642.

Uludag-Demirer S., Demirer G.N., Othman M., 2009. Modification of a conventional anaerobic digester for improving the effluent and sludge characteristics, *Water Environment Research*, Vol. 81, 2447-2454.

Alkaya E., Ozkan L., Kaptan S., Uludag-Demirer S., Demirer G.N., 2009. Recovery of acids from anaerobic acidification broth by liquid-liquid extraction, *Chemosphere*, Vol. 77, 1137-1142.

Uludag-Demirer S., Othman M., 2009. Removal of ammonium and phosphate from the supernatant of anaerobically digested waste activated sludge by chemical precipitation. *Bioresource Technology*, Vol. 100, 3236-3244.

Uludag-Demirer S. 2008. Optimization of nutrient removal from the municipal wastewater by struvite formation using Taguchi's design of experiments. *Environmental Engineering Science*, Vol. 25, 1-10.

Uludag-Demirer S., Demirer G.N., Frear C. and Chen S. 2008. Anaerobic digestion of dairy manure with enhanced ammonia removal. *Journal of Environmental Management*, Vol. 86, 193-200.

Tepe N., Uludag-Demirer S. 2007. Identification of eco-efficiency opportunities in a small enterprise producing vegetable oil in Eskisehir, Turkey. *Progress in Industrial Ecology-An International Journal*, Vol. 4, 91-102.

Uludag-Demirer S., Demirer G. N., Chen, S. 2005. Ammonia removal from anaerobically digested dairy manure by struvite precipitation. *Process Biochemistry*, Vol. 40, 3667-3674.

Tezel U., Demirer G.N., Uludag-Demirer S. 2005. Control of trichloroethylene emissions from sparging systems by horizontal bio- and chemo-barriers. *Environmental Technology*, Vol.26, No:2, 171-178.

Demirer G. N., Uludag-Demirer S., Arıkan Y. 2003. Integrated-preventive environmental management training for municipalities: A Case Study from Turkey. *Environmental Quality Management*. Vol. 13, No:2, 67-75.

Uludag-Demirer S., Bowers A.R. 2003. Effects of surface oxidation and oxygen on the removal of trichloroethylene from the gas phase using elemental iron. *Water, Air, and Soil Pollution*, Vol. 142, 229-242.

Uludag-Demirer S., Bowers A.R. 2001. Gas phase reduction of chlorinated VOCs by zero valent iron. *Journal of Environmental Science and Health, Part A-Toxic/Hazardous Substances & Environmental Engineering*, Vol. 36, No: 8, 1535-1547.

Uludag-Demirer S., Demirer G.N., Bowers, A.R. 2001. Comparison of methods for estimating carbonaceous BOD parameters, *Environmental Technology*, Vol. 22, No: 8, 915-926.

Uludag-Demirer S., Bowers A.R. 2000. Adsorption/reduction reactions of trichloroethylene on elemental iron surface: The Role of Water. *Environmental Science and Technology*, Vol.34, 4407-4412.

Uludag S., Prokop A., Tanner R.D. 1996. A kinetic study of the kudzu (*Pueraria lobata*) retting process. *Journal of Scientific and Industrial Research, Special Issue on Solid State Fermentation*, A. Pandey, ed. Vol.55, Nos. 5-6, pp.381-387.

- **Books**

Integrated Wastewater Management and Valorization using Algal Cultures. Editor(s): G.N. Demirer and S. Uludag-Demirer, 2022, Elsevier. Paperback ISBN: 9780323858595 eBook ISBN: 9780323858601.

- **Book Chapters**

Uludag-Demirer S., Bustamante M., Liu Y.S., and Liao W., 2022. Techno-economic analysis and life-cycle assessment of algal cultivation on liquid anaerobic digestion effluent for algal biomass production and wastewater treatment in Integrated Wastewater Management and Valorization using Algal Cultures, G.N. Demirer and S. Uludag-Demirer (Eds), Elsevier, 1st Ed., ISBN: 9780323858595.

Uludag-Demirer, S., Liao, W. and Demirer, G.N., 2019. Volatile Fatty Acid Production from Anaerobic Digestion of Organic Residues. In *Microbial Lipid Production* (pp. 357-367). Humana, New York, NY.

Mitchell D. A., Stuart D., Uludag-Demirer S., Tanner R.D. "Solid-state fermentation, Microbial Growth Kinetics" in *Encyclopedia of Industrial Biotechnology*, pages: 1-23, Wiley Online Library, 2014.

Kasap S, Uludag-Demirer S, Elker S. "An Environmentally Integrated Manufacturing Analysis Combined with Waste Management in a Car Battery Manufacturing Plant" in *Green Finance and Sustainability: Environmentally-Aware Business Models and Technologies*, Ed. Zongwei Luo, IGI Global, 2011.

- **Conferences**

Uludag-Demirer, S., Blake Smerigan, Benjamin D. Thomas, Yurui Zheng, Yan Liu, James S. Dusenbury, Wei Liao. Two-phase anaerobic digestion of food waste with sludge produced from the

electrocoagulation of black water. Sustainable Energy for a Sustainable Future: An ASABE Global Initiative Conference October 24-27, 2022 San Pedro, Costa Rica Technical Session IV: Innovative Renewable Energy Production Technologies-1

Smerigan A, Uludag-Demirer S, Hsiao PJ, Cutshaw A, Marks A, Smith M, Verhanovitz N, Liu Y, Liao W. 2021 High-Efficiency Capture and Utilization of CO<sub>2</sub> from Flue Gas Using Algae-Based Amino Acid Salt Solution, 2021 AIChE Annual Meeting, Boston, MA

Uludag-Demirer, Nathan Olson, Rebecca Ives, Jean Pierre Nshimiyimana, Cory Rusinek, Joan Rose, Yan Liu, Wei Liao. 2018. Techno-Economic Analysis of Electrocoagulation on Water Reclamation And Pathogen Reduction Of A High-Strength Organic Wastewater. 2018 ASABE Annual International Meeting, July 29-August 1, 2018 - Detroit, Michigan USA.

Uludag-Demirer S. 2016. Integrated nutrient removal and biogas production by using microalgal and anaerobic cultures, Microalgae Involving Applications in Water Quality and Environmental Technologies Workshop, , Bosphorus University, Istanbul, Turkey, 30 May 2016.

Doğan-Subaşı E., Çaylı D., Ergüder-Bayramoğlu T.H., Uludağ-Demirer S., Demirer G.N. 2015. Coupled CO<sub>2</sub> mitigation and renewable energy generation by microalgal and anaerobic cultures, Global Warming Politics in Turkey Workshop, Istanbul, Turkey, April 17, 2015.

Çaylı D., Ergüder T.H., Demirer G. N., Uludag-Demirer S. 2015. CO<sub>2</sub> mitigation from the flue gas of the iron-steel making industry by microalgal cultures, International Conference on Environmental and Materials Engineering (ICEME), Berlin, Germany, June 14th, 2015

Çaylı D., Ergüder T.H., Kaymak B., Demirer G.N., Uludağ-Demirer S. The CO<sub>2</sub> Sequestration by Microalgal Biomass, MedCLIVAR 2014 Conference Understanding Climate Evolution and Effects on Environment and Societies in the Old World Region, Middle East Technical University (METU) Ankara, Turkey, 23-25 June 2014.

Çakırlar B., Oğüt G.C., Ergüder T.H., Kaymak B., Demirer G.N., Uludag-Demirer S. Parallel nutrient removal and biomitigation of CO<sub>2</sub> by pure (*Chlorella vulgaris*) and mixed algal cultures, International Conference on Environment and Renewable Energy, Paris, France, 7-8 May, 2014.

Ogut G.C., Cakirlar S.B., Kaymak B., Erguder T.H., Uludag-Demirer S., Kaya D., and Demirer G.N., 2013. Nutrient removal from domestic wastewater by pure (*Chlorella vulgaris*) and mixed algal cultures, III International Conference ECOLOGY OF URBAN AREAS 2013, Ecka, Republic of Serbia, October 11 2013.

Ogut G.C., Konakli B, Calicioglu O, Erguder T.H., Uludag-Demirer S., Kaymak B, Demirer G. 2013. Biogas generation from microalgal biomass and the effect of pretreatment, ICOEST'2013, June 18-21, Cappadocia, Nevsehir, Turkey.

Uludag-Demirer S., Demirer G.N., Duran M. 2013. Integrating the removal of nutrients with anaerobic digestion of primary and waste activated sludge mixture, ICOEST'2013, June 18-21, Cappadocia, Nevsehir, Turkey.

Uludag-Demirer S., Duran M., Demirer G.N. 2013. Nutrient enrichment of the anaerobic sludge by co-precipitating N and P in the mesophilic anaerobic digester. 17th Conference on Environment and Mineral Processing and Exhibition, pp:103-108, June 6-8, Ostrava, Czech Republic.

Uludag-Demirer S., Taskin B., Duran M., Demirer G.N. 2012. Management of nutrients combining recovery and removal with the anaerobic digestion. Netherlands Biotechnology Congress 14, Netherlands Biotechnology Society, April 16-17, Ede, the Netherlands.

Alkaya E., Kaptan S., Ozkan L., Uludag-Demirer S. Demirer G.N. 2011. Biorefining of wastes by anaerobic biotechnology for bioenergy and bioproduct formation: A case study from sugar beet processing industry, Microbial Biotechnology, 9th Ankara Biotechnology Days, 17-18 October 2011, Institute of Biotechnology, Ankara University, Ankara, Turkey.

Uludag-Demirer S., Demirer G.N., Othman M., 2008. Fixing Ammonium and Phosphate Ions during Anaerobic Digestion of Waste Activated Sludge, Symposium of Environmental Problems, Kocaeli University, May 14-17, 2008, Kocaeli, Turkey.

Elker S., Uludag-Demirer S., Kasap S. 2008. An Environmentally Integrated Manufacturing System Analysis in a Car Battery Manufacturing Plant. SAU IMS'2008 6<sup>th</sup> International Symposium on Intelligent Manufacturing Systems, pp: 210-219, Sakarya University, October 14-16, 2008, Sakarya, Turkey.

Othman M.Z., Uludag-Demirer S., Demirer G.N. 2008. Enhanced nutrients removal in conventional anaerobic digestion processes. Vth International Symposium on Anaerobic Digestion of Solids Wastes and Energy Crops, May 25-28, 2008, Hammamet, Tunisia.

Elker S., Uludag-Demirer S. 2007. An Integrated Preventive Production Planning Program with Waste Minimization, 18<sup>th</sup> Annual Conference of the Production and Operations Management Society (POMS), May 4-7, 2007, Dallas, Texas.

Kerimoglu O., Demirer G.N., Uludag-Demirer S. 2006. An Example for Sustainable Removal of Ammonia from Anaerobically Digested Cheese Whey. 9th Annual Conference of Environmental Management Accounting and Cleaner Production, Graz University of Technology, April 26-27, 2006, Graz, Austria.

Tepe N., Uludag-Demirer S. 2005. The Practice of Ecoefficiency in a Small Enterprise: Demircanlar Oil Industry (Eskişehir, Turkey). 11<sup>th</sup> Annual International Sustainable Development Research Conference, ERP Environment and University of Tampere, June 6-8, 2005, Helsinki, Finland.

Tepe N., Uludag-Demirer S., 2005. Application of Ecoefficiency Principles in Small Enterprises, VI. National Congress of Environmental Engineering, UCTEA, CEE, 24-26 November, Istanbul, Turkey, 159-169.

Tezel U., Demirer G.N., Uludag-Demirer S. 2004. Control of trichloroethylene emissions from air sparging systems by horizontal bio- and chemo- barriers. Fourth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, May 24-27, Monterey, California.

Uludag-Demirer S., Demirer G.N., Chen S. 2004. Ammonia removal from anaerobically digested dairy manure by struvite precipitation, V. National Congress on Ecology and the Environment, Association of Biologists and Izzet Baysal University, 5-8 October 2004, Bolu, Turkey.

Tezel U., Demirer G.N., Uludag-Demirer S., 2003. Treatment of Hazardous Trichloroethylene in Gaseous Phase by Sequential (Biological/Chemical) Reactor System, II. National Symposium of Environmental Pollution Control, METU Department of Environmental Engineering, 22-24 October 2003, Ankara, Turkey, 322-330.

Uludag-Demirer S., Bowers A.R. 2001. The Effect of Surface Oxidation and Oxygen on Gas-Phase Reduction of Trichloroethylene. XV<sup>th</sup> National Chemistry Congress, Bosphorus University, 4-7 September, Istanbul, Turkey.

Uludag-Demirer S., Demirer G.N., Bowers A.R. 2000. Comparison of methods for estimating carbonaceous BOD parameters. Proceedings of the 4<sup>th</sup> International Symposium on Environmental Biotechnology, 10-12 April, Noordwijkerhout, The Netherlands.

Uludag S., Bowers A.R. 1999. Gas Phase Reduction of Trichloroethylene by Zero Valent Iron. Remediation of Soil and Groundwater Symposium: Emerging Approaches to Remediation of Hazardous Wastes-Advances in the Field, WEFTEC'99. October 9-13, New Orleans, Louisiana.

Uludag S., Bowers A.R. 1997. Gas Phase Reduction of Chlorinated VOCs by Zero Valent Iron. Fifth Chemical Congress of North America, November 11-15, 1997 Cancun International Congress, Mexico.

Uludag S., Loha V., Prokop A., Tanner R.D. 1996. The Effect of Fermentation (Retting) Time and Harvest Time on Kudzu (*Pueraria lobata*) Fiber Strength, Proceedings of the Seventeenth Symposium on Biotechnology for Fuels and Chemicals, C.E. Wyman and B.H. Davison, eds.: Applied Biochemistry and Biotechnology, Vol 57/58 (Spring 1996), 75-84.