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Research interests

As a process engineer specializing in biorefinery, biofuels, and carbon capture and utilization, I am dedicated to pioneering innovative solutions in these domains. My expertise lies in harnessing the principles of equipment and process design inherent in chemical engineering. My research spans both experimental and mathematical modelling, with a distinct focus on constructing innovative processes from the ground up.

Research areas

Biochemical Engineering, Biorefinery, Power-to-X, Bioprocess Engineering, Carbon Capture and Utilization.

Journal Articles (peer reviewed)

Iron limitation effect on H₂/CO₂ biomethanation: Experimental and model analysis

Ebrahimian, F., Lovato, G., Alvarado-Morales, M., Ashraf, M. T., Rodrigues, J. A. D., Tsapekos, P. & Angelidaki, I., Apr 2023, In: Journal of Environmental Chemical Engineering. 11, 2, 9 p., 109529.

Enhanced short-chain carboxylic acids yield in dark fermentation by cyclic product removal

Ashraf, M. T., Bastidas Oyanedel, J-R., Ahmad, A., Hai, A., AlBlooshi, H. T., Schmidt, J. E. & Banat, F., Jan 2023, In: Biomass Conversion and Biorefinery. 13, 1, p. 51-59

Pilot-scale study of biomethanation in biological trickle bed reactors converting impure CO₂ from a Full-scale biogas plant

Jønson, B. D., Tsapekos, P., Tahir Ashraf, M., Jeppesen, M., Ejbye Schmidt, J. & Bastidas-Oyanedel, J. R., Dec 2022, In: Bioresource Technology. 365, 10 p., 128160.

Optimizing the dosing and trickling of nutrient media for thermophilic biomethanation in a biotrickling filter

Ashraf, M. T., Yde, L., Triolo, J. M. & Wenzel, H., Dec 2021, In: Biochemical Engineering Journal. 176, 9 p., 108220.

Direct inoculation of a biotrickling filter for hydrogenotrophic methanogenesis

Jønson, B. D., Sieborg, M. U., Ashraf, M. T., Yde, L., Shin, J., Shin, S. G. & Triolo, J. M., Dec 2020, In: Bioresource Technology. 318, 8 p., 124098.

Biomethanation in a thermophilic biotrickling filter — pH control and lessons from long-term operation

Ashraf, M. T., Sieborg, M. U., Yde, L., Rhee, C., Shin, S. G. & Triolo, J. M., Sept 2020, In: Bioresource Technology Reports. 11, 100525.

Techno-Economic Assessment of Whey Protein-Based Plastic Production from a Co-Polymerization Process

Chalermthai, B., Ashraf, M. T., Bastidas Oyanedel, J-R., Olsen, B., Schmidt, J. E. & Taher, H., 7. Apr 2020, In: Polymers. 12, 4, 21 p., 847.

Systematic production and characterization of pyrolysis-oil from date tree wastes for bio-fuel applications

Bharath, G., Hai, A., Rambabu, K., Banat, F., Jayaraman, R., Taher, H., Bastidas-Oyanedel, J. R., Ashraf, M. T. & Schmidt, J. E., Apr 2020, In: Biomass and Bioenergy. 135, 11 p., 105523.

Biomethanation in a thermophilic biotrickling filter using cattle manure as nutrient media

Sieborg, M. U., Jønson, B. D., Ashraf, M. T., Yde, L. & Triolo, J. M., Feb 2020, In: Bioresource Technology Reports. 9, 8 p., 100391.

Process Simulation and Economic Assessment of Hydrothermal Pretreatment and Enzymatic Hydrolysis of Multi-feedstock Lignocellulose - Separate vs Combined Processing
Ashraf, M. T. & Schmidt, J. E., 2018, In: *Bioresource Technology*. 249, p. 835-843

Hydrothermal pretreatment and enzymatic hydrolysis of mixed green and woody lignocellulosics from arid regions
Ashraf, M. T., Thomsen, M. H. & Schmidt, J. E., Aug 2017, In: *Bioresource Technology*. 238, p. 369-378

One-dimensional modeling of pervaporation systems using a semi-empirical flux model
Ashraf, M. T., Schmidt, J. E., Kujawa, J., Kujawski, W. & Arafat, H. A., Mar 2017, In: *Separation and Purification Technology*. 174, p. 502-512

Estimation of Bioenergy Potential for Local Biomass in the United Arab Emirates
Tahir Ashraf, M., Fang, C., Bochenski, T., Cybulska, I., Alassali, A., Sowunmi, A., Farzanah, R., Brudecki, G., Chaturvedi, T., Haris, S., Schmidt, J. E. & Thomsen, M. H., Nov 2016, In: *Emirates Journal of Food and Agriculture*. 28, 2, p. 99-106

Optimization and Cost-Oriented Comparison of Ammonia- and Propane-Compression Refrigeration for the Recovery of Natural Gas Liquids
Chebbi, R., Qasim, M., Darwish, N. A. & Ashraf, M. T., 1. Oct 2013, In: *Energy Technology*. 1, 10, p. 573-580

Process of p-Xylene Production by Highly Selective Methylation of Toluene
Ashraf, M. T., Chebbi, R. & Darwish, N. A., 25. Sept 2013, In: *Industrial & Engineering Chemistry Research*. 52, 38, p. 13730-13737

Book Chapter

Analysis and Optimization of Multi-actor Biorefineries

Ashraf, M. T., Torres, A. I., Schmidt, J. E. & Stephanopoulos, G., 2019, *Biorefinery: Integrated Sustainable Processes for Biomass Conversion to Biomaterials, Biofuels, and Fertilizers*. Bastidas-Oyanedel, J-R. & Ejbye Schmidt, J. (eds.). Springer, p. 49-75

Hydrothermal Pretreatment: Process Modeling and Economic Assessment within the Framework of Biorefinery Processes
Torres, A. I., Ashraf, M. T., Chaturvedi, T., Schmidt, J. E. & Stephanopoulos, G., 2017, *Hydrothermal Processing in Biorefineries: Production of Bioethanol and High Added-Value Compounds of Second and Third Generation Biomass*. Springer, p. 207-235

Optimization of Lignocellulosic Waste Biorefinery using Multi-Actor Multi-Objective Mathematical Framework: 26 European Symposium on Computer Aided Process Engineering

Ashraf, M. T., Torres, A. I., Cybulska, I., Fang, C., Thomsen, M. H., Schmidt, J. E. & Stephanopoulos, G., 25. Jun 2016, *26 European Symposium on Computer Aided Process Engineering, 2016*. Kravanja, Z. & Bogataj, M. (eds.). Elsevier Editora, Vol. 38. p. 1317-1322 6 p.

Evaluation of the production of lipids for fuels and proteins from microalgae by decomposition of the processing network: 26 European Symposium on Computer Aided Process Engineering

Bocheński, T., Torres, A. I., Ashraf, M. T., Schmidt, J. E. & Stephanopoulos, G., 2016, *Computer Aided Chemical Engineering*. Kravanja, Z. & Bogataj, M. (eds.). Elsevier Editora, Vol. 38. p. 1635-1640 6 p.

Conference Proceedings and Abstracts

Anaerobic conversion of carbon monoxide by different inoculum sources

Ali, R., Yde, L. & Ashraf, M. T., 2. Jun 2024, *18th IWA World Conference On Anaerobic Digestion*. Ersahin, M. E., Ozgun, H., Guven, H., Kinaci, C., Ozturk, I., Koyuncu, I., Isik, O., Kaya, R., Yesir, B. E., Cicekalan, B., Aras, M. F. & Shitreh, S. (eds.). Istanbul, Vol. 1. p. 449-456 421

Assay for Testing Packing Materials for Ex-situ Bio-methanation

Ashraf, M. T., Triolo, J. M. & Yde, L., 2020, *28th European Biomass Conference: Bioeconomy's role in the post-pandemic economic recovery*. p. 317-321 (European Biomass Conference and Exhibition Proceedings).

Thermophilic BioMethanation in a Trickle Bed Reactor using Cattle Manure as Nutrient Media

Triolo, J. M., Ashraf, M. T., Sieborg, M. U., Jønson, B. D., Yde, L. & Schmidt, J. E., 2019.

Conversion Efficiency of Biogas to Liquids Fuels through Fischer-Tropsch Process

Ashraf, M. T., Schmidt, J. E. & Bastidas Oyanedel, J-R., 3. Jun 2015, *23rd European Biomass Conference and Exhibition*.

Biogas potential of Bermuda grass and Clerodendrum inerme from the Emirate of Abu Dhabi

Ashraf, M. T., Al-Boainain, S., Belasri, D., Bastidas Oyanedel, J-R. & Schmidt, J. E., 2014, *XI Latin American Symposium of Anaerobic Digestion*.