



Environmental Engineering & Sciences

Department of Civil and Environmental Engineering

CEE 595EWS Seminar

Monday, April 29, 2024 | 12:00 – 12:50 p.m. CST | 1310 Yeh Center

Ammonia Recovery from Animal Manure Using Membrane and Electrochemical Systems

Livestock systems face a challenging future with increasing conflict between food production and the environment. Many of the environmental issues stem from livestock manure as it can lose manure constituents, including nutrients, pathogens, and organic matter, to the environment, degrading both surface and ground water quality, contributing to climate change, causing nuisance odors, and creating human health issues. Processing manure to recover embedded nutrients such as ammonium nitrogen and phosphorus can mitigate these impacts by increasing nutrient density, making a more manageable fertilizer that has a greater economically feasible transport distance. My research focuses on the development of membrane and electrochemical systems to separate ammonium ions from ammonia-rich wastewater towards recovery. First, I will discuss the previously overlooked organic nitrogen mineralization kinetics during biodegradation of animal manure. This discovery leads to effective ammonia recovery from manure using bioelectrochemical systems. Next, I will introduce the mechanisms of ammonia transport across cation exchange membranes to enhance their selectivity for ammonium ions. Additionally, I will discuss other membrane and electrochemical processes and our insights into the critical factors influencing ammonia recovery from livestock manure.

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Biography

Mohan Qin is an assistant professor in the Department of Civil and Environmental Engineering at the University of Wisconsin–Madison. She received her B.S. from Shandong University and M.S. from Peking University, both in Environmental Engineering, and a Ph.D. from Virginia Tech in Civil Engineering. Before joining the UW faculty, Mohan completed her postdoctoral training in Environmental Engineering at Yale University. Her research group works on the development of novel approaches for resource recovery from waste streams and the concentration and detection of microplastics in the Great Lakes.