



Seminar Announcement

UNIVERSITY OF
SOUTH ALABAMA
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Education
Hub on Plastics
Circularity

presents

Interdisciplinary Center for
Sustainable Engineering (ICSE)

Advanced Nanofibrous Membrane for Concurrent Removal of Microplastics and Lead from Water

Dr. Maryam Salehi

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Dr. Salehi specializes in water chemistry, polymers, and surface sciences to investigate plastic pollutants' fate within the environment and examines the contaminant transport within potable water plumbing systems. She also conducts research to develop advanced nanofibrous filters for removing contaminants from water and wastewater. Her research has been supported by NSF, USDA, State agencies, and private firms. She received her NSF Early CAREER award in 2021 for investigating the plastic pollutant fate and heavy metals transport in stormwater.

Abstract: This study presents the development of an innovative nanofibrous membrane to remove microplastics (MPs) from drinking water. This membrane exhibits additional functionality in removing lead (Pb), highlighting its promising potential for utilization as a point-of-use (POU) device. The polyvinyl alcohol (PVA) nanofibrous membranes are crosslinked using glutaraldehyde (GA), and their efficiencies in the removal of MPs are evaluated. Surface chemistry analysis confirmed the crosslinking process and formation of acetal bonds between the aldehyde group of GA and the hydroxyl group of PVA. This crosslinking provides stability to the nanofibrous membranes in aqueous media, making it possible to use them for water treatment applications. The average diameter of nanofibers increased by raising the concentration of the polymeric solution and crosslinking process. The efficiency of the innovative nanofibrous membrane in the removal of two different size ranges of representative MPs was examined. While this membrane revealed remarkable removal efficiency for larger polyethylene (PE) MPs, it exhibited a lower efficiency for smaller polystyrene (PS) MPs. A promising performance recovery was found after five cycles of PE MP filtration and backwashing, emphasizing this filtration system's potential durability and reusability. Additionally, the nanofibrous membrane revealed a pH-dependent lead removal efficiency with a maximum of 69%.

Friday, September 26, 2025

12:00 PM noon – 1:00 PM (Central Time)

Zoom: <https://southalabama.zoom.us/j/99479389246>

Any questions, please contact Mrs. Lind (Email: mlind@southalabama.edu)