



Wolfson Department of Chemical Engineering Seminar

Monday, September 7th, 2026 at 13:30

Room 6

Dually Selective Polymeric Membrane for Charge-Specific and Solvent Transport

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MSc Seminar

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Polymeric membranes play a central role in separation and transport processes across a wide range of applications, including electrochemical devices, water purification, and energy systems. Conventional membrane designs are typically limited to the selective transport of a single species in one direction, while trying to block all others. In contrast, the design of understanding of membranes capable of simultaneous and selective transport of different species, particularly in opposite directions, remains largely unexplored.

In this study, we investigate this targeting ion transport in one direction while facilitating the transport of an organic molecule in the opposite direction. This concept is realized through the use of self-assembly in block copolymers (BCPs), which form well-defined microphase-separated domains that can be tailored to support distinct transport pathways. By controlling the chemical composition, architecture, and self-assembled morphology of the BCPs, we aim to decouple and regulate ion and solvent transport within separate domains.

This work seeks to establish a fundamental understanding of how BCP structure influences bidirectional ionic conductivity, transport kinetics, and selectivity. The development of such dually selective membranes offers a promising strategy to address key challenges in fuel cells, energy storage systems, and water management technologies.

Refreshments will be served at 13:15.