CHEMICAL AND ENVIRONMENTAL ENGINEERING
COLLEGE OF ENGINEERING AND APPLIED SCIENCE

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

FOR APPLICATION YEAR: 2024

PROJECT TITLE: Novel Polymer-Zeolite Composite Membranes for High-Performance Redox Flow Batteries and Water Electrolyzer

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Project Description

Redox flow batteries (RFBs), fuel cells (FCs), and water electrolyzers (WEs) are expected to play critical roles in expanding renewable energy utilization and achieving environmental sustainability. Ion exchange membranes (IEMs) are a key component determining the performance of FCs, RFBs, and WEs. The objectives of this proposed project are (i) to synthesize 2-dimensional zeolite nanosheets (ZNS) of very large areas; ii) to fabricate ZNS-laminated membranes on polymer substrates; and iii) to demonstrate the ZNS-laminated membranes as IEMs for enhancing the RFB and WE performances.
Training provided:
- Ethical and safety rules in laboratory research
- Chemical and material synthesis
- Techniques for general characterizations of membrane materials
- Lab tests of membrane performances in RFB and WE