

Ping-Han (Bing) Wu

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“Materials Scientist and Chemical Engineer with 4+ years of research experience and 3 peer-reviewed publications. Hands-on expertise in electrochemical systems, redox processes, and membrane separation technologies, with a focus on system optimization and performance improvement. Strong background in experimental design, data-driven analysis, and translating laboratory results into actionable insights using Python-based data analysis and visualization.”

**Authorized to work in the US as permanent resident, citizenship in Taiwan.*

Education

Stony Brook University

Stony Brook, NY

PhD in Material Science and Chemical Engineering

Sep. 2023 - Dec. 2027

Thesis: Electrochemical Carbon Capture Enabled by Molecular Redox Mediators: Optimization Strategies

Chung Yuan Christian University

Taoyuan, Taiwan

BS in Material and Chemical Engineering

Sep. 2018 - June 2022

Thesis: High-Performance Thin-Film Composite Membrane for Dye/Salt Separation

Professional Experience

Electrochemical Decarbonization Engineering Lab

Stony Brook, NY

Redox Mediator Carbon Capture in Aqueous Electrochemical Systems

Jan. 2024 - Present

- Designed and prototyped an end-to-end system from scratch, resulting in a peer-reviewed publication.
- Designed and fabricated electrochemical cells, from CAD modeling to 3D printing and system assembly.
- Led project successfully funded by Hyundai/KIA motor group.
- Achieved a 30.8% reduction in cell voltage in an aqueous electrolyte system by optimized parameters, mitigating parasitic side reactions.
- Engineered porous electrodes to improve interfacial transport and optimize overall system performance. Optimized operating parameters through transport-limited system analysis to establish a robust process operating window.
- Validated diffusion-kinetics models against experimental datasets, confirming predictive accuracy under practical operating conditions.

R&D Center for Membrane Technology

Taoyuan, Taiwan

Membrane Engineering for High Performance Waste Water Treatment

Aug. 2020 - June 2022

- Led an independent undergraduate research project resulting in a peer-reviewed publication.
- Collaborate with teammates to finish the experiment and publish as co-author.
- Fabricated TFC membranes, from substrate preparation to formation of a well-coated selective layer.

- Achieved 99% organic dye rejection with higher pure water flux than commercial nanofiltration membranes.
- Performed a fundamental study of how substrate properties influence polyamide active layer performance.
- Measured membrane flux, rejection, and resistance under wastewater test protocols.
- Validated results using SEM, AFM, FTIR, TGA, DSC, rheometry, and contact angle measurements.

Skills Summary

Wet Chemistry

- HPLC TOC UV

Characterization

- SEM XPS AFM

Thermal Analysis

- TGA DSC

Data Process

- Python

Publications

- **PH Wu**; TA Hatton; H Seo, “Pulsed Chronopotentiometry for Electrochemical CO₂ Capture with Molecular Redox Mediators” *ACS energy letters* (*Accepted*).
- **PH Wu**; MR Gallardo; MBMY Ang; JC Millare; SH Huang; HA Tsai; KR Lee, “Assessing the impact of membrane support and different amine monomer structures on the efficacy of thin-film composite nanofiltration membrane for dye/salt separation” *Journal of Polymer Research* 29, 270(2022).
- MBMY Ang ; YL Wu; MY Chu; **PH Wu**; YH Chiao; JC Millare; SH Huang; HA Tsai; KR Lee, “Nanofiltration Membranes Formed through Interfacial Polymerization Involving Cycloalkane Amine Monomer and Trimesoyl Chloride Showing Some Tolerance to Chlorine during Dye Desalination” *Membranes* 2022, 12(3):333.

Conferences

- AIChE Annual Meeting, Boston, MA, USA *Nov. 2025*
- Electrochemical Society (ECS) Meeting 247, Montreal, CA *July. 2025*
- Annual Meeting of Polymer Society, Taichung, Taiwan *April 2022*
- International Membrane Conference, Taoyuan, Taiwan *June, 2021*