

Chuan-Pin (Pin) Chen, Ph. D.

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Summary

Materials scientist with a Ph.D. in Chemistry and postdoctoral experience at Argonne National Laboratory, focused on polymer membranes for electrochemical applications including fuel cells. Skilled in multimodal spectroscopy (NMR, FTIR, Raman), APS synchrotron (SAXS/GISAXS), and electrochemical characterization (CV, EIS, conductivity). Proven ability to resolve complex mechanistic questions, deliver characterized samples to industrial partners, and contribute to a pending patent. 13 peer-reviewed publications, including first author work in *J. Am. Chem. Soc.*, *Inorg. Chem.*, and *ACS Appl. Mater. Interfaces*.

Skills

Characterization: NMR (multinuclear: ^1H , ^{13}C , ^{15}N , ^{19}F , ^{31}P ; variable-temperature; 2D); FTIR; Raman; UV-Vis; fluorescence spectroscopy; APS synchrotron (SAXS/GISAXS); DLS; GPC

Electrochemical Methods: CV; EIS; conductivity measurements

Materials Synthesis: Polymer membrane synthesis/fabrication; thin-film preparation; transition metal complex synthesis; inert-atmosphere synthesis

Research & Data Tools: Scientific data analysis and visualization; Mnova; Origin; Python

Laboratory Operations: SOP development; EHS protocol implementation; lab setup

Professional Experience

Postdoctoral Appointee – Argonne National Laboratory Jan 2025 – Present

- Synthesized polymer membranes with varied functional groups; implemented GPC-monitored protocols to achieve controlled molecular weight, resolving batch-to-batch variability and enabling reliable sample delivery to industrial collaborators
- Correlated membrane composition, ionic conductivity, and nanoscale morphology through EIS and APS SAXS/GISAXS characterization to guide material optimization.
- Established EHS workflows and lab setup for membrane synthesis operations
- Contributed to patent application (pending) on polymer membrane technology for fuel cell applications

Organic Chemist (Intern) – KLA May – Aug 2024

- Synthesized rhodamine-based photoswitchable dyes for inspection technology development and characterized optical properties using UV-Vis and fluorescence spectroscopy.

Graduate Teaching/Research Assistant – Michigan State University Sep 2018 – Dec 2024

- Resolved a disputed catalytic mechanism for Ru-catalyzed ammonia oxidation by designing a targeted NMR/spectroscopic investigation (variable-temperature, ^{15}N isotopic labeling, Raman); identified a previously uncharacterized dinitrogen-bridged intermediate, published as first author in *J. Am. Chem. Soc.* **2023**.
- Led NMR-based mechanistic characterization of Ru-catalyzed ammonia oxidation in a collaborative study with electrochemical methods; published as first author in *Inorg. Chem.* **2025**.
- Trained junior researchers on experimental procedures and characterization techniques; served as teaching assistant for General and Organic Chemistry

Education

Ph.D. in Chemistry, Michigan State University, USA 2018 – 2024

M.S. in Chemistry, National Sun Yat-Sen University, Taiwan 2012 – 2014

B.S. in Chemistry, Chung Yuan Christian University, Taiwan 2008 – 2012

Publications & Presentations

13 peer-reviewed publications; 1 patent application pending. (full list on [Google Scholar](#))

Selected Publications: *J. Am. Chem. Soc.* **2023**, 145, 26339; *Inorg. Chem.* **2025**, 64, 13599.

Selected Oral Presentations: 249th ECS Meeting 2026, ACS Fall 2023