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- 國立台灣大學　學士，民國九十八年
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- B.S. National Taiwan University, 2009
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主要研究領域

- **碳捕捉技術**

裝置碳捕捉的火力發電廠可大幅減少90%以上之碳排放，被視為低碳排之潔淨能源。本研究目標為測量吸收劑基本性質，利用製程及熱力學模擬方法最適化吸收劑及先進製程，降低碳捕捉製程所需成本。次世代碳捕捉製程將為發電廠及工業界提供永續性低碳能源製程，達到淨零碳排之目標。

- **熱力學模擬**

本項研究計畫目的在於為電解質溶液系統開發新穎熱力學模擬方法，改善模型之準確性及預測性。開發之新模型在與實驗數據相互驗證後，將作為多項化工製程模擬、設計、及最適化的重要基礎。

- **化工製程模擬及設計**

利用電腦輔助化工模擬軟體分析傳統製程之缺點，並以製程整合及最適化方法降低能源消耗及製造成本。最後藉由經濟性分析評估，驗證研發之先進製程之技術上及經濟上之可行性，為未來放大及商業化製程提供重要參考指標。

Main Research Interests

- **Carbon Capture with Amine Scrubbing**

Fossil fuel power plants with carbon capture can be regarded as clean power generation as they reduce over 90% of the carbon emissions. We aim to reduce the cost of amine scrubbing process through molecular thermodynamic modeling, process modeling, and process intensification. Our goal is to simultaneously optimize solvents and processes and provide new guidelines for solvent selections. The solvent property measurements in bench-scale apparatus provide data required for model development. The outcomes will contribute to the next-generation carbon capture process and directly benefit the low-carbon power generation and industry.

- **Molecular Thermodynamic Modeling**

We aim to develop novel modeling frameworks for electrolyte solutions and electrochemical processes to represent the thermodynamic properties with better accuracy and predictability. The developed models after data validation will provide a foundation for process simulation, design, and optimization for various applications including carbon capture process.

- **Process Design and Simulation**

We aim to identify process inefficiencies using exergy analysis and improve the energy performance and capital cost via process intensifications and optimization using commercial process simulators. The feasibility of the resulted process is demonstrated by the technoeconomic analysis that indicates cost efficiency for commercial-scale plants.

代表作 (Selected Publications)

- C.H. Cheng, Y.F. Chen, **<u>Y.J. Lin*</u>** (2025). Enhanced Reaction Kinetics of Sterically Hindered Amines in Semi-Aqueous N-methyl-2-pyrrolidone for CO_2 Capture. Chemical Engineering Journal, In Press. (IF=13.4; ranked 7/170, 4% in Chemical Engineering)
- E. C. Chang, C.A. Chou, **<u>Y.J. Lin*</u>** (2025). Hybrid Solvent Loop CO2 Capture Process for Zero-Emission Hydrogen Production. Separation and Purification Technology, 357, 130120. (IF=8.2; ranked 15/170, 9% in Chemical Engineering)
- Y.M. Chen, H.J. Hsu, **<u>Y.J. Lin*</u>** (2025). Improving CO2 Capture Efficiency for High-Capacity Solvents: Addressing Temperature-Induced Mass Transfer Limitations. Industrial Engineering & Chemistry Research, 64, 4, 2283-2293. (IF=3.8; ranked 55/170, 32% in Chemical Engineering)
- S.F. Chang, H.H. Chiu, H.S. Jao, J. Shang*, **<u>Y.J. Lin*</u>**, B.Y. Yu* (2024). Comprehensive Evaluation of Various CO2 Capture Technologies through Rigorous Simulation: Economic, Equipment Footprint, and Environmental Analysis. Carbon Capture Science & Technology, 14, 100342. (IF=10.4; ranked 10/170, 6% in Chemical Engineering)
- M.S. Hsieh, **<u>Y.J. Lin*</u>** (2024). Solvent Concentration Effect on Mass Transfer Pinch in CO2 Absorber using Aqueous Monoethanolamine. Journal of the Taiwan Institute of Chemical Engineers, 105397. (IF=5.5; ranked 31/170, 18% in Chemical Engineering)