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Senior Lecturer, Department of Chemical Engineering and Energy Sustainability, Universiti Malaysia Sarawak (UNIMAS)

Doctor of Philosophy (PhD) in Chemical Engineering



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GOOGLE SCHOLAR: https://scholar.google.com/citations?user=X7yU_qAAAAAJ&hl=en

EDUCATIONAL BACKGROUND

Universiti Malaysia Sarawak (2020-October 2022)

Postgraduate Diploma in Higher Education Teaching & Learning

Universiti Teknologi PETRONAS (2016-March 2019)

Doctor of Philosophy (PhD) in **Chemical Engineering**

Universiti Teknologi PETRONAS (2013-Jan 2016)

Master of Science (MSc) in **Chemical Engineering**

Universiti Teknologi PETRONAS (2009-Sep 2013)

Bachelor of Engineering (Hons) **Chemical Engineering**

WORKING EXPERIENCE

Position: Senior Lecturer

Company: Universiti Malaysia Sarawak, Malaysia

Date of employment: 1st December 2023 - current

Position: Lecturer

Company: Universiti Malaysia Sarawak, Malaysia

Date of employment: 3rd February 2020 - 30th November 2023

Teaching Course: KNC 1482 Engineering Mathematics 1, KNC 1092 Engineering Mathematics 2, KNC 3262 Engineering Economics, KNC 1032 Engineering Drawing, KNC 3533 Unit Operations 2, KNC 3553 Integrated Design Project 1, KNC 4564 Integrated Design Project 2, KNC 4322 Final Year Project 1, KNC 4344 Final Year Project 2

PROFESSIONAL MEMBERSHIPS AND SOFTWARE SKILLS

- Graduate member of Board of Engineers Malaysia (BEM)
- Graduate member of The Institution of Engineers, Malaysia
- Professional Technologist of Malaysia Board of Technologists (MBOT) (Chemical Technology)
- **Chemical Engineering Software:** GaBi (Life Cycle Assessment), iCON, HYSYS, STAR, HINT, COMSOL Multiphysics, Mathworks MATLAB, Autodesk AUTOCAD, Microsoft Visio

AREA OF SPECIALIZATION

Microwave extraction and synthesis, green solvents, biomass pretreatment, process optimization and life cycle assessment

AWARDS AND ACHIEVEMENTS (RECENT 5 YEARS)

Event/Program	Awards and Achievements
SIRIM Invention, Innovation & Technology Expo (Si2te 2018)	Gold Award and Special Award
Peer reviewer for international high-impact Elsevier journal	Outstanding Contribution
Leaders in Innovation Accelerator (LIA) Malaysia 2018 to produce Malaysia's next Tech Unicorn	Finalist
IChemE Malaysia Award 2019 (Young Researcher)	Finalist
Universiti Teknologi PETRONAS (UTP) 19 th Convocation Ceremony	Best Postgraduate Student Award
Vice-Chancellor's Engagement Award – Community Engagement (Swinburne University of Technology Australia)	Highly Commended
UNIMAS Excellent Awards Ceremony 2023	Highest Cumulative Publication Award in High-Impact Journals 2022
UNIMAS Excellent Awards Ceremony 2024	Highest Cumulative Publication Award in High-Impact Journals 2023
2023 Merdeka Award Grant for International Attachment	Semi-Finalist

RESEARCH GRANT

- 1. National Level: Fundamental Research Grant Scheme (Principal Investigator) (1st November 2020 - 31st October 2023)**
Title: Reaction mechanisms and kinetics of bio-based fuels production from hydrothermal liquefaction of oil palm-derived lignin via low-transition-temperature mixtures (LTTMs). **(Completed)**
Amount: RM 134,100
- 2. International Level: Kurita Water and Environment Foundation (KWEF) Overseas Research Grant Program (Principal Investigator) (1st October 2022 - 30th September 2023) (Completed)**
Title: Development of Synergistic and Sustainable Hydrophobic Based Green Solvents as Water-Immiscible Extractants for Removal of Contaminants in Wastewater
Amount: 400,000 JPY
- 3. International Level: Japan-ASEAN Science, Technology and Innovation Platform (JASTIP)-Net 2022 Collaborative Research (Co-Investigator) (1st April 2023 - 31st March 2024) (Completed)**
Title: Sustainable Production of Value-Added Products and Energies from Oil Palm Residues and Plastic Waste Mixtures in the ASEAN Region
Amount: 5,000 USD
- 4. International Level: Japan-ASEAN Science, Technology and Innovation Platform (JASTIP)-Net 2022 Collaborative Research (Co-Investigator) (1st April 2022 - 31st March 2023)**
Title: Techno-economics/Environmental/Societal/Governmental (TESG) evaluation of thermochemical conversion of oil palm residues to alternative energies for ASEAN region.
Amount: 5,000 USD
- 5. International Level: Japan-ASEAN Science, Technology and Innovation Platform (JASTIP)-Net 2021 Collaborative Research (Co-Investigator) (1st April 2021 - 31st March 2022)**
Title: Upgrading of Bio-oil Targeting Sustainable Jet Fuel Range and Its Implementation Study in ASEAN Region.
Amount: 5,000 USD
- 6. International Level: Japan-ASEAN Science, Technology and Innovation Platform (JASTIP)-Net 2020 Collaborative Research (Co-Investigator) (1st April 2020 - 31st March 2021)**
Title: Sustainable Production of High-Quality Bio-Oil from Different Agriculture Wastes in the ASEAN Region through Catalytic Fast Pyrolysis.
Amount: 5,000 USD
- 7. National Level: Yayasan UTP (Co-Investigator) (1st February 2023 - 31st January 2026) (On-going)**
Title: Molecular design of ionic liquid decorated mixed matrix membrane for enhanced CO₂/CH₄ and H₂S/CH₄ separation
Amount: RM 128,390
- 8. National Level: Yayasan UTP (Co-Investigator) (14th February 2022 - 16th February 2025) (On-going)**
Title: Technoeconomic and Life Cycle Assessment of CO₂ Utilization Using Multiscale Simulation Approach
Amount: RM 199,650
- 9. National Level: Yayasan Hasanah (Co-Investigator) (1st March 2023 - 28th February 2025) (On-going)**
Title: Empowering Community-Based Plastic Waste Management in Kampung Bako, Kuching, Sarawak
Amount: RM 180,000
- 10. National Level: SHELL Industry Grant (Co-Investigator) (1st September 2023 - 30th September 2024) (Completed)**
Title: Scientific Study and Consolidation of Historical Marine Environmental Data as Environmental Indicators
Amount: RM 50,000
- 11. University Level: PILOT Research Grant Scheme (Co-Investigator) (1st June 2023 - 31st May 2025) (On-going)**
Title: Adsorption Mechanism of Lead (Pb) Removal using Nypa Frutican Shell Adsorbent
Amount: RM 25,000
- 12. University Level: Tun Openg Chair (Sago Chair) (Co-Investigator) (1st December 2023 - 30th November 2025) (On-going)**
Title: Durability and Performance of Sago Waste Reinforced Recycled Expanded Polystyrene (rEPS) Composite
Amount: RM 54,000
- 13. University Level: Small Grant Scheme (Principal Investigator) (1st October 2020 - 30th April 2023) (Completed)**
Title: High purity lignin extraction from oil palm empty fruit bunch (EFB) using low-transition-temperature mixtures (LTTMs): A potential source of lignin valorization
Amount: RM 25,000

PUBLICATIONS (RECENT 5 YEARS)

1. Foong, S. Y., Chin, B. L. F., Lock, S. S. M., **Yiin, C. L.**, Tan, Y. H., Zheng, G., Ge, S., Liew, R.K. & Lam, S. S. (2024). Enhancing wastewater treatment with engineered biochar from microwave-assisted approach-A comprehensive review. *Environmental Technology & Innovation*, 103835.
2. **Yiin, C. L.**, Lai, Z. Y., Chin, B. L. F., Lock, S. S. M., Cheah, K. W., Taylor, M. J., Al-Gailani, A., Kolosz, B.W. & Chan, Y. H. (2024). Green Pathways for Biomass Transformation: A Holistic Evaluation of Deep Eutectic Solvents (DESs) through Life Cycle and Techno-economic Assessment. *Journal of Cleaner Production*, 143248.
3. Foong, S. Y., Chan, Y. H., Yek, P. N. Y., Lock, S. S. M., Chin, B. L. F., **Yiin, C. L.**, Lan, J.C.W. & Lam, S. S. (2024). Microwave-assisted pyrolysis in biomass and waste valorisation: Insights into the life-cycle assessment (LCA) and techno-economic analysis (TEA). *Chemical Engineering Journal*, 151942.
4. Darban, M. A., Lock, S. S. M., Ilyas, S. U., Kang, D. Y., Dzarfan Othman, M. H., **Yiin, C. L.**, Waqas, S., & Bashir, Z. (2024). Molecular simulation of [P8883][Tf2N] ionic liquid decorated silica in 6FDA-ODA based mixed matrix membrane for enhanced CO₂/CH₄ separation. *RSC Advances*, 14(32), 22894-22915.
5. Bashir, Z., Lock, S. S. M., Hira, N., Ilyas, S. U., Lim, Lam Ghai, Lock, I. S. M., **Yiin, C. L.**, & Darban, M. A. (2024). A review on recent advances of cellulose acetate membranes for gas separation. *RSC Advances*, 14(27), 19560-19580.
6. Chee, A. L. K., Chin, B. L. F., Sulaiman, S. A., Chai, Y. H., Saptoro, A., Umar, H. A., Lock, S. S. M. & **Yiin, C. L.** (2024). Syngas-Enriched hydrogen production via catalytic gasification of water hyacinth using renewable palm kernel shell hydrochar. *Fuel*, 362, 13048.
7. Hira, N. E., Lock, S. S. M., Arshad, U., Asif, K., Ullah, F., Farooqi, A. S., **Yiin, C. L.**, Chin, B. L. F., & Huma, Z. E. (2023). Screening of Metal Oxides and Hydroxides for Arsenic Removal from Water Using Molecular Dynamics Simulations. *ACS Omega*, 1(1), 1-15.
8. Chan, Y. H., Chan, Z. P., Lock, S. S. M., **Yiin, C. L.**, Foong, S. Y., Wong, M. K., Ishak, M.A., Quek, V.C., Ge, S. & Lam, S. S. (2023). Thermal pyrolysis conversion of methane to hydrogen (H₂): A review on process parameters, reaction kinetics and techno-economic analysis. *Chinese Chemical Letters*, 109329.
9. Loy, A.C.M., Teng, S.Y., How, B.S., Zhang, X., Cheah, K.W., Butera, V., Leong, W.D., Chin, B.L.F., **Yiin, C.L.**, Taylor, M. and Georgios K. (2023). Elucidation of single atom catalysts for energy and sustainable chemical production: Synthesis, characterization and frontier science. *Progress in Energy and Combustion Science*, 96(101074), 1-55.
10. Osman, A. I., Lai, Z. Y., Farghali, M., **Yiin, C. L.**, Elgarahy, A. M., Hammad, A., Ihara, I., Al-Fatesh, A. S., Rooney, D. W. & Yap, P. S. (2023). Optimizing biomass pathways to bioenergy and biochar application in electricity generation, biodiesel production, and biohydrogen production. *Environmental Chemistry Letters*, 1-67.
11. Foong, S. Y., Chan, Y. H., **Yiin, C. L.**, Lock, S. S. M., Loy, A. C. M., Lim, J. Y., Yek, P.N.Y., Mahari, W.W., Liew, R.K., Peng, W., Tabatabaei, M., & Lam, S. S. (2023). Sustainable CO₂ capture via adsorption by chitosan-based functional biomaterial: A review on recent advances, challenges, and future directions. *Renewable and Sustainable Energy Reviews*, 181, 113342.
12. Wee, M. X., Chin, B. L., Saptoro, A., **Yiin, C. L.**, Chew, J. J., Sunarso, J., Yusup, S. & Sharma, A. (2023). A review on co-pyrolysis of agriculture biomass and disposable medical face mask waste for green fuel production: recent advances and thermo-kinetic models. *Frontiers of Chemical Science and Engineering*, 1-21.
13. Lim, H. Y., Yusup, S., Acda, M. N., Chin, B. L. F., Rianawati, E., Unrean, P., **Yiin, C.L.**, Quitain, A.T. & Assabumrungrat, S. (2023). Investigation of Calcium Oxide-Impregnated Zeolite Catalyst Toward Catalytic Pyrolysis of Oil Palm Empty Fruit Bunch: Bio-oil Yields, Characterizations, and Kinetic Study. *BioEnergy Research*, 1-15.
14. Loy, A. C. M., Lim, J. Y., How, B. S., **Yiin, C. L.**, Lock, S. S. M., Lim, L. G., Alhamzi, H. & Yoo, C. (2023). Rethinking of the future sustainable paradigm roadmap for plastic waste management: A multi-nation scale outlook compendium. *Science of The Total Environment*, 881, 163458.
15. Chan, Y. H., Lock, S. S. M., Chin, B. L. F., Wong, M. K., Loy, A. C. M., Foong, S. Y., **Yiin, C. L.** & Lam, S. S. (2023). Progress in thermochemical co-processing of biomass and sludge for sustainable energy, value-added products and circular economy. *Bioresource Technology*, 129061.
16. Lai, Z.Y., **Yiin, C.L.**, Lock, S.S.M., Chin, B.L.F., Zauzi, N.S.A. & Sar-ee, S. (2023). A review on natural based deep eutectic solvents (NADESs): fundamentals and potential applications in removing heavy metals from soil. *Environ Sci Pollut Res* (2023), 1(1), 1-28.
17. Chee, A. L. K., Chin, B. L. F., Goh, S. M. X., Chai, Y. H., Loy, A. C. M., Cheah, K. W., **Yiin, C.L.** & Lock, S. S. M. (2023). Thermo-catalytic co-pyrolysis of palm kernel shell and plastic waste mixtures using bifunctional HZSM-5/limestone catalyst: Kinetic and thermodynamic insights. *Journal of the Energy Institute*, 101194.
18. Hira, N., Lock, S. S. M., Shoparwe, N. F., Lock, I. S. M., Lim, L. G., **Yiin, C. L.**, Chan, Y. H., Hassam, M. (2023). Review of Adsorption Studies for Contaminant Removal from Wastewater Using Molecular Simulation. *Sustainability*, 15(2), 1-33.
19. Chan, Y. H., Loy, A. C. M., Cheah, K. W., Chai, S. Y. W., Ngu, L. H., How, B. S., Li, C., Lock, S.S.M., Wong, M.K., **Yiin, C.L.**, Chin, B.L.F., & Lam, S. S. (2023). Hydrogen sulfide (H₂S) conversion to hydrogen (H₂) and value-added chemicals: Progress, challenges and outlook. *Chemical Engineering Journal*, 141398.
20. Liu, T., Aniagor, C. O., Ejimofor, M. I., Menkiti, M. C., Tang, K. H. D., Chin, B. L. F., Chan, Y.H., **Yiin, C.L.**, Cheah, K.W., Chai, Y.H., Lock, S.S.M & Yap, P. S. (2022). Technologies for removing pharmaceuticals and personal care products (PPCPs) from aqueous solutions: Recent advances, performances, challenges and recommendations for improvements. *Journal of Molecular Liquids*, 121144.
21. Foong, S. Y., Chan, Y. H., Lock, S. S. M., Chin, B. L. F., **Yiin, C. L.**, Cheah, K. W., Loy, A.C.M., Yek, P.N.Y., Chong, W.W.F. & Lam, S. S. (2023). Microwave processing of oil palm wastes for bioenergy production and circular economy: Recent advancements, challenges, and future prospects. *Bioresource Technology*, 128478.
22. **Yiin, C. L.**, Yap, K. L., Chin, B. L. F. and Lock, S. S. M. (2023). Insights into the Lignin Dissolution Mechanism of Water Content Tailored-choline Chloride (ChCl) Based Green Solvents for Biomass Pretreatment. *Physical Chemistry Research*, 11 (3), 605-614.

23. **Yiin, C. L.**, bin Odita, E., Lock, S. S. M., Cheah, K. W., Chan, Y. H., Wong, M. K., Chin, B.L.F., Quitain, A.T., Loh, S.K. & Yusup, S. (2022). A review on potential of green solvents in hydrothermal liquefaction (HTL) of lignin. *Bioresource Technology*, 128075.
24. Khadija, A., Mun, L. S. S., Taqvi, S. A. A., Jusoh, N., **Yiin, C. L.**, & Chin, B. L. F. (2022). A molecular simulation study on amine-functionalized silica/polysulfone mixed matrix membrane for mixed gas separation. *Chemosphere*, 136936.
25. Chan, Y. H., Lock, S. S. M., Wong, M. K., **Yiin, C. L.**, Loy, A. C. M., Cheah, K. W., ... & Lam, S. S. (2022). A state-of-the-art review on capture and separation of hazardous hydrogen sulfide (H₂S): Recent advances, challenges and outlook. *Environmental Pollution*, 120219.
26. Yee, C. Y., Lim, L. G., Lock, S. S. M., Jusoh, N., **Yiin, C. L.**, Chin, B. L. F., Chan, Y. H., Loy, A. C. M., Mubashir, M. (2022). A systematic review of the molecular simulation of hybrid membranes for performance enhancements and contaminant removals. *Chemosphere*, 135844.
27. Foong, S. Y., Chan, Y. H., Chin, B. L. F., Lock, S. S. M., Yee, C. Y., **Yiin, C. L.**, ... & Lam, S. S. (2022). Production of biochar from rice straw and its application for wastewater remediation– An overview. *Bioresource Technology*, 127588.
28. Tang, K. H. D., Lock, S. S. M., Yap, P. S., Cheah, K. W., Chan, Y. H., **Yiin, C. L.**, Ku, A. Z. E., Loy, A. C. M., Chin, B. L. F. & Chai, Y. H. (2022). Immobilized enzyme/microorganism complexes for degradation of microplastics: A review of recent advances, feasibility and future prospects. *Science of The Total Environment*, 154868.
29. Yap, T. L., Loy, A. C. M., Chin, B. L. F., Lim, J. Y., Alhamzi, H., Chai, Y. H., **Yiin, C. L.**, Cheah, K.W., Wee, M. X. J., Lam, M. K., Jawad, Z. A., Yusup, & Lock, S. S. M. (2022). Synergistic effects of catalytic co-pyrolysis *Chlorella vulgaris* and polyethylene mixtures using artificial neuron network: Thermodynamic and empirical kinetic analyses. *Journal of Environmental Chemical Engineering*, 10(3), 107391.
30. Soh, M., Khaerudini, D. S., **Yiin, C. L.**, Chew, J. J., & Sunarso, J. (2022). Physicochemical and structural characterisation of oil palm trunks (OPT) hydrochar made via wet torrefaction. *Cleaner Engineering and Technology*, 8, 100467.
31. Loy, A. C. M., Alhazmi, H., Lock, S. S. M., **Yiin, C. L.**, Cheah, K. W., Chin, B. L. F., ... & Yusup, S. (2021). Life-cycle assessment of hydrogen production via catalytic gasification of wheat straw in the presence of straw derived biochar catalyst. *Bioresource technology*, 341, 125796.
32. Asif, K., Lock, S. S. M., Taqvi, S. A. A., Jusoh, N., **Yiin, C. L.**, Chin, B. L. F., & Loy, A. C. M. (2021). A molecular simulation study of silica/polysulfone mixed matrix membrane for mixed gas separation. *Polymers*, 13(13), 2199.
33. **Yiin, C. L.**, Yap, K. L., Ku, A. Z. E., Chin, B. L. F., Lock, S. S. M., Cheah, K. W., ... & Chan, Y. H. (2021). Recent advances in green solvents for lignocellulosic biomass pretreatment: Potential of choline chloride (ChCl) based solvents. *Bioresource technology*, 333, 125195.
34. Chai, Y. H., Mohamed, M., Cheng, Y. W., Chin, B. L. F., **Yiin, C. L.**, Yusup, S., & Lam, M. K. (2021). A review on potential of biohydrogen generation through waste decomposition technologies. *Biomass Conversion and Biorefinery*, 1-26.
35. Lock, S. S. M., Lau, K. K., Jusoh, N., Shariff, A. M., Gan, C. H., & **Yiin, C. L.** (2020). An atomistic simulation towards molecular design of silica polymorphs nanoparticles in polysulfone based mixed matrix membranes for CO₂/CH₄ gas separation. *Polymer Engineering & Science*, 60(12), 3197-3215.29. Chan, Y. H., Loh, S. K., Chin, B. L. F., **Yiin, C. L.**, How, B. S., Cheah, K. W., ... & Lam, S. S. (2020). Fractionation and extraction of bio-oil for production of greener fuel and value-added chemicals: Recent advances and future prospects. *Chemical Engineering Journal*, 397, 125406.
36. **Yiin, C. L.**, Ho, S., Yusup, S., Quitain, A. T., Chan, Y. H., Loy, A. C. M., & Gwee, Y. L. (2019). Recovery of cellulose fibers from oil palm empty fruit bunch for pulp and paper using green delignification approach. *Bioresource technology*, 290, 121797.
37. **Yiin, C. L.**, Yap, K. L., Abang Mahmud, D. S., Chin, B. L. F., Lock, S. S. M., Chan, Y. H., Cheah, K. W., Taylor, M. & Kyriakou, G. Role of deep eutectic solvents as pretreatment medium for biomass transformation. In Pandey, A., Tiwari, B., Pandey, A & Yusup, S. (Eds.). *Current Developments in Biotechnology and Bioengineering: Deep Eutectic Solvent Fund Emerging Applications* (pp. 139-160). Elsevier, 2022.
38. Zhou, C., Chen, Z., Nasr, M., Osman, A. I., Lai, Z. Y., **Yiin, C. L.**, Chin, B. L. F. & Yap, P. S. (2024). Monitoring and Assessment Techniques for Microplastics. In *Microplastics in African and Asian Environments: The Influencers, Challenges, and Solutions* (pp. 601-646). Cham: Springer Nature Switzerland.
39. Chin, B. L. F., Loy, A. C. M., Cheah, K. W., Chan, Y. H., Lock, S. S. M., **Yiin, C. L.** (2023). Graphene-based nanomaterials for CO₂ capture and conversion. In Mazari, S. A., Mubarak, N. M., & Tripathi, M. (Eds.). *Nanomaterials for Carbon Dioxide Capture and Conversion Technologies* (pp. 211-243). Elsevier.
40. Hii, S. W., Chin, B. L. F., Majing, F. R. S., Lim, H. Y., Loy, A. C. M., **Yiin, C. L.**, Yusup, S., Quitain, A. T., Acda, M. N., Unrean, P., Rianawati, E. (2022). Iso-conversional kinetic and thermodynamic analysis of catalytic pyrolysis for palm oil wastes. In S. Yusup & N. A. Rashidi (Eds.). *Value-Chain of Biofuels: Fundamentals, Technology, and Standardization* (pp. 277-300). Elsevier.
41. Chee, A. L. K., Chin, B. L. F., Sulaiman, S. A., Chai, Y. H., Saptoro, A., Umar, H. A., Lam, M. K., **Yiin, C. L.** (2023). Preliminary study for catalytic gasification of water hyacinth for syngas production. *Materials Research Proceedings*, 29 (2023), 439-445.
42. Atmowidjojo, A., Rianawati, E., Chin, B.L.F., Yusup, S., Quitain, A.T., Assabumrungrat, S., **Yiin, C.L.**, Kiatkittipong, W., Srifa, A., Eiad-ua, A (2021). Supporting Clean Energy in the ASEAN: Policy Opportunities from Sustainable Aviation Fuels Initiatives in Indonesia and Malaysia. *IOP Conf. Ser.: Earth Environ. Sci.* 940, 012031.
43. N. R. Yusuf, S. Yusup, **C. L. Yiin**, P. J. Ratri, A. A. Halim, N. A. Razak (2021). Prediction of solvation properties of low transition temperature mixtures (LTTMs) using COSMO-RS and NMR approach. *IOP Conf. Ser.: Mater. Sci. Eng.* 1195, 012006.

PATENT FILED

Title: Method of Producing Bio-oil from Lignocellulosic Biomass and Bio-oil Thereof

Patent application no.: PI 2024004800

Intellectual Property Corporation of Malaysia