

YANG HAN

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 Department of Chemical and Biomolecular Engineering
 Vanderbilt University

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EDUCATION

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| Ph.D. | Chemical Engineering, The Ohio State University, Columbus, Ohio
<i>Dissertation: “Facilitated Transport Membranes for Post-combustion Carbon Capture and H₂ Purification: From Membrane Synthesis to Process Design”</i>
<i>Advisor: Dr. W.S. Winston Ho</i> | 2018 |
| B.S. | Chemical Engineering, Tianjin University, Tianjin, China | 2011 |

RESEARCH INTERESTS

Molecular separation, polymeric membrane, carbon capture, hydrogen purification, chemical separation, reactive diffusion in polymers, membrane chemistry, roll-to-roll (R2R) fabrication of thin films

RESEARCH AND PROFESSIONAL EXPERIENCE

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| Vanderbilt University , Nashville, TN | Assistant Professor, Department of Chemical and Biomolecular Engineering | 2026–now |
| The Ohio State University , Columbus, OH | Research Assistant Professor, Department of Chemical and Biomolecular Engineering
– Structure–property engineering of polymers for molecular separations
– Membrane-based approach for debottlenecking energy-intensive separations, including CO ₂ capture, H ₂ purification, olefin/paraffin separation, and aromatic/saturate separation | 2024–2025 |
| The Ohio State University , Columbus, OH | Research Scientist, Department of Chemical and Biomolecular Engineering
– Additive manufacturing of membranes
– Membrane process prototyping and toolset development for process control & uncertainty quantification | 2019–2024 |
| The Ohio State University , Columbus, OH | Graduate Research Associate, Department of Chemical and Biomolecular Engineering
– Facilitated transport mechanism, aminopolymer synthesis, and amine–CO ₂ chemistry
– Roll-to-roll membrane fabrication and modular fabrication | 2013–2018 |
| Tianjin University , Tianjin, China | Research Assistant, School of Chemical Engineering
– Lattice Boltzmann method for large-eddy simulation in biofilm pore structures | 2011–2013 |
| Tianjin University , Tianjin, China | Undergraduate Researcher, School of Chemical Engineering
– Cellular automata model to study heterogeneity in biofilms | 2007–2011 |

TEACHING EXPERIENCE

Co-Instructor, Rheology of Fluids (ChBE 5775), The Ohio State University, Fall 2025. Lectures on viscoelasticity, shear and extensional rheometry, and rheology of polymeric liquids.

Guest Lecturer, Polymeric Membranes (ChBE 5574), The Ohio State University, Fall 2019. Delivered lectures on membrane materials and membrane preparation, selection of membrane process, and gas separation.

Teaching Assistant, Advanced Transport Phenomena (ChBE 8815), The Ohio State University, Falls 2015–2018. Held office hours, led review sessions, delivered lectures, and designed exams.

Instruction Assistant, Advanced Kinetics (ChBE 8812), The Ohio State University, Spring 2015. Conducted office hours, assessed assignments and exams, and contributed to the development of exam questions.

JOURNAL PUBLICATIONS (CITATIONS = 2474, H-INDEX = 24. * = CORRESPONDING AUTHOR. SEE [GOOGLE SCHOLAR PAGE](#) FOR UPDATES)

2025

1. **Y. Han**, S. Rao, and W.S.W. Ho, “Membranes for Acid Gas Enrichment: A Techno-Economic Analysis”, Journal of Membrane Science, **730**, 124201 (2025).
2. C. Zou, X. Deng, **Y. Han***, and L.-C., Lin, “Atomistic Insights into the Reactive Diffusion of CO₂ in Guanidine-based Facilitated Transport Membranes”, The Journal of Physical Chemistry C, (2025). *Accepted*
3. Y. Yang, **Y. Han**, B. Prasad, R. Pang, C. Zou, and W.S.W. Ho, “Carbon Capture from Flue Gases Using an Integrated Membrane Skid”, Journal of Membrane Science, **718**, 123674 (2025).

2024

4. S. Rao, X. Deng, C. Zou, B. Prasad, **Y. Han**, L.-C. Lin, and W.S.W. Ho, “Kinetic H₂S/CO₂ Selectivity in an Exceptionally Sterically Hindered Amine Membrane”, Journal of Materials Chemistry A, **12**, 29138–29144 (2024).
5. Y. Yang, **Y. Han**, C. Zou, R. Pang, J. Hu, K. Chen, and W.S.W. Ho, “A Commercial-size Prototype of Countercurrent Spiral-wound Membrane Module for Flue Gas CO₂ Capture”, Journal of Membrane Science, **696**, 122520 (2024).

2023

6. S. Rao, **Y. Han**, and W.S.W. Ho, “H₂S/CO₂ Separation Using Sterically Hindered Amine Membranes”, Journal of Membrane Science, **686**, 121989 (2023).
7. S. Rao, **Y. Han**, and W.S.W. Ho, “Polymeric Membranes for H₂S and CO₂ Removal from Natural Gas for Hydrogen Production: A Review”, Energies, **16(15)**, 5713 (2023). (invited)

2022

8. X. Deng, **Y. Han***, L.-C. Lin, and W.S.W. Ho, “A New Measurement of Amine Steric Hindrance–N Exposure”, Separation and Purification Technology, **299**, 121601 (2022).
9. S. Rao, **Y. Han**, and W.S.W. Ho, “Recent Advances in Polymeric Membranes for Carbon Dioxide Capture from Syngas”, Separation Science and Technology, **58(6)**, 1050–1071 (2022). (invited)
10. R. Pang, Y. Yang, **Y. Han**, K.K. Chen, and W.S.W. Ho, “Bicontinuous Substrates with Reduced Pore Restriction for CO₂-Selective Composite Membranes”, Journal of Membrane Science, **654**, 120547 (2022). (Editor’s Choice)
11. X. Deng, **Y. Han***, L.-C. Lin, and W.S.W. Ho, “Computational Prediction of Water Sorption in Facilitated Transport Membranes”, The Journal of Physical Chemistry C, **126**, 3661–3670 (2022).
12. R. Pang, **Y. Han**, K.K. Chen, Y. Yang, and W.S.W. Ho, “Matrimid Substrates with Bicontinuous Surface and Macrovoids in the Bulk: A Nearly Ideal Substrate for Composite Membranes in CO₂ Capture”, Applied Energy, **311**, 118624 (2022). (invited)
13. **Y. Han** and W.S.W. Ho, “Moving beyond 90% Carbon Capture by Highly Selective Membrane Processes”, Membranes, **12**, 399 (2022). (invited)

14. **Y. Han** and W.S.W. Ho, “Mitigated Carrier Saturation of Facilitated Transport Membranes for Decarbonizing Dilute CO₂ Sources: An Experimental and Techno-Economic Study”, Journal of Membrane Science Letters, **2**, 100014 (2022). (invited)

2021

15. Z. Zhang, S. Rao, **Y. Han**, R. Pang, and W.S.W. Ho, “CO₂-selective Membranes Containing Amino Acid Salts for CO₂/N₂ Separation”, Journal of Membrane Science, **638**, 119696 (2021).
16. **Y. Han** and W.S.W. Ho, “Facilitated Transport Membranes for H₂ Purification from Coal-derived Syngas: A Techno-Economic Analysis”, Journal of Membrane Science, **636**, 119549 (2021). (invited)
17. **Y. Han** and W.S.W. Ho, “Polymeric Membranes for CO₂ Separation and Capture”, Journal of Membrane Science, **628**, 119244 (2021). (invited)
18. K.K. Chen, **Y. Han**, Z. Zhang, and W.S.W. Ho, “Enhancing Membrane Performance for CO₂ Capture from Flue Gas with Ultrahigh MW Polyvinylamine”, Journal of Membrane Science, **628**, 119215 (2021).
19. K.K. Chen, **Y. Han**, Z. Tong, M. Gasda, and W.S.W. Ho, “Membrane Processes for CO₂ Removal and Fuel Utilization Enhancement for Solid Oxide Fuel Cells”, Journal of Membrane Science, **620**, 118846 (2021).

2020

20. X. Deng, C. Zou, **Y. Han***, L.-C. Lin, and W.S.W. Ho, “Computational Evaluation of Carriers in Facilitated Transport Membranes for Postcombustion Carbon Capture”, The Journal of Physical Chemistry C, **124(46)**, 25322–25330 (2020).
21. Y. Yang, **Y. Han**, and W.S.W. Ho, “Amine-containing Membranes with Functionalized Multi-walled Carbon Nanotubes for CO₂/H₂ Separation”, Membranes, **10(11)**, 333 (2020). (invited)
22. K.K. Chen, W. Salim, **Y. Han**, M. Gasda, W.S.W. Ho, “Fluoride- and Hydroxide-containing CO₂-selective Membranes for Improving H₂ Utilization of Solid Oxide Fuel Cells”, Journal of Membrane Science, **612**, 118484 (2020).
23. R. Pang, K.K. Chen, **Y. Han**, W.S.W. Ho, “Highly Permeable Polyethersulfone Substrates with Bicontinuous Structure for Composite Membranes in CO₂/N₂ Separation”, Journal of Membrane Science, **612**, 118443 (2020). (Editor’s Choice)
24. K.K. Chen, W. Salim, **Y. Han**, D. Wu, and W.S.W. Ho, “Fabrication and Scale-up of Multi-leaf Spiral-wound Membrane Modules for CO₂ Capture from Flue Gas”, Journal of Membrane Science, **595**, 117504 (2020).
25. **Y. Han**, Y. Yang, and W.S.W. Ho, “Recent Progress in the Engineering of Polymeric Membranes for CO₂ Capture from Flue Gas”, Membranes, **10(11)**, 365 (2020). (invited)
26. **Y. Han**, and W.S.W. Ho, “Recent Advances in Polymeric Facilitated Transport Membranes for Carbon Dioxide Separation and Hydrogen Purification”, Journal of Polymer Science, **58(18)**, 2435–2449 (2020). (invited)
27. **Y. Han**, and W.S.W. Ho, “Recent Developments on Polymeric Membranes for CO₂ Capture from Flue Gas”, Journal of Polymer Engineering, **40(6)**, 529–542 (2020). (invited)
28. **Y. Han**, and W.S.W. Ho, “Design of Amine-containing CO₂-selective Membrane Process for Carbon Capture from Flue Gas”, Industrial & Engineering Chemistry Research, **59**, 5340–5350 (2020). (invited)

2019

29. **Y. Han**, W. Salim, K.K. Chen, D. Wu, and W.S.W. Ho, “Field Trial of Spiral-wound Facilitated Transport Membrane Module for CO₂ Capture from Flue Gas”, Journal of Membrane Science, **575**, 242–251 (2019).
30. **Y. Han**, D. Wu, and W.S.W. Ho, “Simultaneous Effects of Temperature and Vacuum and Feed Pressures on Facilitated Transport Membrane for CO₂/N₂ Separation”, Journal of Membrane Science, **573**, 476–484 (2019).

31. W. Salim, **Y. Han**, V. Vakharia, D. Wu, D.J. Wheeler, and W.S.W. Ho, “Scale-up of Amine-containing Membranes for Hydrogen Purification for Fuel Cells”, Journal of Membrane Science, **573**, 465–475 (2019).
32. **Y. Han** and Z. Zhang, “Nanostructured Membrane Materials for CO₂ Capture: A Critical Review”, Journal of Nanoscience and Nanotechnology, **19**(6), 3173–3179 (2019).

2018 and earlier

33. **Y. Han**, D. Wu, and W.S.W. Ho, “Nanotube-reinforced Facilitated Transport Membrane for CO₂/N₂ Separation with Vacuum Operation”, Journal of Membrane Science, **567**, 261–271 (2018).
34. **Y. Han** and W.S.W. Ho, “Recent Advances in Polymeric Membranes for CO₂ Capture”, Chinese Journal of Chemical Engineering, **26**, 2238–2254 (2018). (invited)
35. D. Wu, **Y. Han**, W. Salim, K.K. Chen, J. Li, and W.S.W. Ho, “Hydrophilic and Morphological Modification of Nanoporous Polyethersulfone Substrates for Composite Membranes in CO₂ Separation”, Journal of Membrane Science, **565**, 439–449 (2018).
36. D. Wu, **Y. Han**, L. Zhao, W. Salim, V. Vakharia, and W.S.W. Ho, “Scale-up of Zeolite-Y/Polyethersulfone Substrate for Composite Membrane Fabrication in CO₂ Separation”, Journal of Membrane Science, **562**, 56–66 (2018).
37. W. Salim, V. Vakharia, Y. Chen, D. Wu, **Y. Han**, and W.S.W. Ho, “Fabrication and Field Testing of Spiral-wound Membrane Modules for CO₂ Capture from Flue Gas”, Journal of Membrane Science, **556**, 126–137 (2018).
38. V. Vakharia, W. Salim, D. Wu, **Y. Han**, Y. Chen, L. Zhao, and W.S.W. Ho, “Scale-up of Amine-containing Thin-film Composite Membranes for CO₂ Capture from Flue Gas”, Journal of Membrane Science, **555**, 379–387 (2018).
39. H. Bai, Y. Kang, H. Quan, **Y. Han**, J. Sun, and Y. Feng, “Bioremediation of Copper-containing Wastewater by Sulfate Reducing Bacteria Coupled with Iron”, Journal of Environmental Management, **129**, 350–356 (2013).
40. H. Bai, **Y. Han**, Y. Kang, J. Sun, “Removal of Cu (II) and Fe (III) from Aqueous Solutions by Dead Sulfate Reducing Bacteria”, Frontiers of Chemical Science and Engineering, **7**(2), 177–184 (2013).
41. H. Bai, Y. Kang, H. Quan, **Y. Han**, J. Sun, Y. Feng, “Treatment of Acid Mine Drainage by Sulfate Reducing Bacteria with Iron in Bench Scale Runs”, Bioresource Technology, **128**, 818–822 (2013).
42. H. Bai, Y. Kang, H. Quan, **Y. Han**, Y. Feng, “Treatment of Copper Wastewater by Sulfate Reducing Bacteria in the Presence of Zero Valent Iron”, International Journal of Mineral Processing, **112**, 71–76 (2012).

BOOKS AND BOOK CHAPTERS

1. L. Ansaloni, **Y. Han**, T.A. Peters, and W.S.W. Ho, “Membrane Technology for CO₂ Capture Processes”, in Carbon Capture and Storage: A Comprehensive Guide, S. Roussanaly and R. Anantharaman (Eds.), Elsevier, *in press*.
2. **Y. Han**, Y. Yang, and W.S.W. Ho, “Polymeric Membranes for CO₂ Capture”, in Scholarly Community Encyclopedia, <https://encyclopedia.pub/4200> (2020). (invited)

PATENTS

Issued Patents

1. W.S.W. Ho and Y. Han, “CO₂ Utilization for CO Production via Fuel Cell Enabled by CO₂-selective Membrane”, U.S. Patent 12,447,436 (10/21/2025).
2. W.S.W. Ho, and Y. Han, “Membranes for Gas Separation”, Japanese Patent 7,611,818 (12/26/2024).

3. W.S.W. Ho and Y. Han, “Gas Permeable Membranes and Methods of Using Thereof”, U.S. Patent 12,172,136 (12/24/2024).
4. W.S.W. Ho, D. Wu, and Y. Han, “Membranes for Gas Separation”, Korean Patent 10-2715599 (10/4/2024).
5. W.S.W. Ho, D. Wu, and Y. Han, “Membranes for Gas Separation”, U.S. Patent 12,023,633 (7/2/2024).
6. W.S.W. Ho and Y. Han, “Membranes for Gas Separation”, U.S. Patent 11,772,052 (10/3/2023).
7. W.S.W. Ho and Y. Han, “Methods for the Separation of CO₂ from a Gas Stream”, Canadian Patent 2,987,592 (9/19/2023).
8. W.S.W. Ho, D. Wu, and Y. Han, “Membranes for Gas Separation”, Japanese Patent 7,271,508 (4/28/2023).
9. W.S.W. Ho and Y. Han, “Methods for the Separation of CO₂ from a Gas Stream”, Chinese Patent ZL201680039626.0 (12/20/2022).
10. W.S.W. Ho and Y. Han, “Methods for the Separation of CO₂ from a Gas Stream”, U.S. Patent 11,358,093 (6/14/2022).

Patent Applications

11. W.S.W. Ho and Y. Han, “Guanidine-containing Membranes and Methods of Using Thereof”, U.S. Patent Application Publication No. US2022/0305436 (9/29/2022); PCT Publication No. WO 2020/240522 (12/3/2020); PCT Application No. PCT/IB2020/055179 (filed 6/1/2020); U.S. Patent Application No. 17/615,503 (filed 11/30/2021 with the priority date of 6/1/2020).
12. W.S.W. Ho and Y. Han, “Crosslinked Facilitated Transport Membrane for Hydrogen Purification from Coal-derived Syngas”, U.S. Patent Application Publication No. US2023/0182089 (6/15/2023); PCT Publication No. WO 2021/236220 (11/25/2021); PCT Application No. PCT/US2021/023031 (filed 3/18/2021); U.S. Provisional Patent Application No. 63/026,627 (filed 5/18/2020).
13. W.S.W. Ho and Y. Han, “Alkanolamine-containing Membranes and Methods of Making and Using Thereof”, PCT Publication No. WO 2023/141426 (7/27/2023); PCT Application No. PCT/US2023/060767 (filed 1/17/2023); U.S. Provisional Patent Application No. 63/300,450 (filed 1/18/2022).
14. Y. Han, S. Rao, and W.S.W. Ho, “Membranes for the Separation of H₂S from H₂S-CO₂ Mixtures”, PCT Publication No. WO 2023/19270 (10/5/2023); PCT Application No. PCT/US2023/061538 (filed 1/30/2023); U.S. Provisional Patent Application No. 63/325,429 (filed 3/30/2022).
15. Y. Han, J. Hu, and W.S.W. Ho, “Polyamidine-containing Membranes for CO₂ Separation from Gaseous Streams”, PCT Publication No. WO 2023/212445 (11/2/2023); PCT Application No. PCT/US2023/063348 (filed 2/27/2023); U.S. Provisional Patent Application No. 63/335,496 (filed 4/27/2022).
16. Y. Han, J. Hu, and W.S.W. Ho, “Polyguanidine-containing Membranes and Methods of Using Thereof”, PCT Publication No. WO 2024/059033 (3/21/2024); PCT Publication No. WO2024/059033 (3/21/2024); PCT Application No. PCT/US2023/032480 (filed 12/9/2023); U.S. Provisional Patent Application No. 63/405,825 (filed 9/12/2022).
17. W.S.W. Ho, Y. Han, and Y.-C Huang, “Membrane-adsorption Process for Direct Air Capture”, PCT Application No. PCT/US2024/029412 (filed 5/15/2024); U.S. Provisional Patent Application No. 63/466,619 (filed 5/15/2023).
18. W.S.W. Ho, R. Pang, and Y. Han, “Polymeric Substrates and Methods of Making and Using Thereof”, PCT Application No. PCT/US2024/047959 (filed 9/23/2024); U.S. Provisional Patent Application No. 63/584,569 (filed 9/22/2023).

19. W.S.W. Ho, Y. Han, and R. Pang, “Methods of Fabricating Support Layers Using a Cosolvent and Pore Former”, PCT Publication No. WO 2025/193864 (9/18/2025); PCT Application No. PCT/US2025/019620 (filed 3/12/2025); U.S. Provisional Patent Application No. 63/564,351 (filed 3/12/2024).
20. Y. Han and W.S.W. Ho, “Thin-film Composite Membrane Formation with Polyguanidine”, PCT Publication No. WO 2025/193865 (9/18/2025); PCT Application No. PCT/US2025/019622 (filed 3/12/2025); U.S. Provisional Patent Application No. 63/564,357 (filed 3/12/2024).
21. Y. Han and W.S.W. Ho, “Enhancing Membrane Stability through Utilization of High Molecular Weight Fixed Carriers”, PCT Publication No. WO 2025/193866 (9/18/2025); PCT Application No. PCT/US2025/019623 (filed 3/12/2025); U.S. Provisional Patent Application No. 63/564,363 (filed 3/12/2024).
22. W.S.W. Ho and Y. Han, “Polyguanidine-containing Membranes and Methods of Using Thereof”, PCT Application No. PCT/US2025/019624 (filed 3/12/2025); U.S. Provisional Patent Application No. 63/564,369 (filed 3/12/2024).
23. Y. Han and W.S.W. Ho, “Methods for the Separation of CO₂ from a Gas Stream”, U.S. Provisional Patent Application No. 63/749,589 (filed 1/25/2025).

PRESENTATIONS

Invited Talks

1. Y. Han, “Membranes for CO₂ Capture with Molecular Precision”, 2025 3M Non-Tenure Faculty Award (NTFA) Symposium, St. Paul, MN, 10/3/2025.
2. Y. Han and W.S.W. Ho, “New Facilitated Transport Membranes for CO₂ Capture from Flue Gases: Skid Testing and Process Demonstration”, ACS 2025 Spring Meeting, San Diego, 3/23/2025.
3. Y. Han, “Membranes for CO₂ Capture with Molecular Precision”, Samsung Advanced Institute of Technology, online, 12/11/2024.
4. Y. Han, “Membranes for CO₂ Capture with Molecular Precision”, Department of Chemical and Biomolecular Engineering Seminar, University of Maryland, College Park, MD, 11/4/2024.
5. Y. Han, Y. Yang, J. Hu, R. Pang, B. Prasad, and W.S.W. Ho, “Innovating Membranes for Carbon Capture: From Material Synthesis to Process Prototype”, the 3rd International Conference on Energy and Environment, Lexington, KY, 7/17/2024.
6. Y. Han, “Innovating Membranes for Energy-Efficient Gas Separations”, Department of Chemical and Biomolecular Engineering Seminar, Vanderbilt University, Nashville, TN, 7/8/2024.
7. Y. Han, “Moving Beyond 90% Carbon Capture by Highly Selective Membranes and Processes”, Net-zero Flexible Power: High Capture Rate Project Review Meeting, Philadelphia, PA, 6/7/2024.
8. Y. Han and W.S.W. Ho, “OSU Membrane Technology Development”, Carbon Capture Technology Showcase at Wyoming Integrated Test Center, Gillette, WY, 5/30/2024.
9. Y. Han, “Innovating Membranes for Energy-Efficient Gas Separations”, Department of Chemical Engineering and Materials Science Seminar, Michigan State University, East Lansing, MI, 4/22/2024.
10. Y. Han, “Innovating Membranes for Energy-Efficient Gas Separations”, Department of Chemical and Biological Engineering Seminar, University of Alabama, Tuscaloosa, AL, 4/8/2024.
11. Y. Han, “Innovating Membranes for Energy-Efficient Gas Separations”, Department of Chemical and Petroleum Engineering Seminar, University of Kansas, Lawrence, KS, 4/2/2024.
12. Y. Han, “Innovating Membranes for Energy-Efficient Gas Separations”, MizzouForward Keynote, University of Missouri, Columbia, MO, 3/21/2024.

13. Y. Han, “Innovating Membranes for Energy-Efficient Gas Separations”, William A. Brookshire Department of Chemical and Biomolecular Engineering Seminar, University of Houston, Houston, TX, 2/29/2024.
14. Y. Han, “Innovating Membranes for Energy-Efficient Gas Separations”, Cain Department of Chemical Engineering Seminar, Louisiana State University, Baton Rouge, LA, 2/8/2024.
15. Y. Han, “Innovating Membranes for Energy-Efficient Gas Separations”, Department of Chemical and Biomolecular Engineering Seminar, New York University, New York City, NY, 1/22/2024.
16. Y. Han, “Innovating Membranes for Energy-Efficient Gas Separations”, Department of Chemical and Environmental Engineering Seminar, Yale University, New Haven, CT, 1/18/2024.
17. Y. Han, L.-C. Lin, and W.S.W. Ho, “Novel Transformational Membranes and Process for CO₂ Capture from Flue Gas”, National Carbon Capture Center Biannual Project Review Meeting, Birmingham, AL, 5/17/2023.
18. Y. Han, L.-C. Lin, and W.S.W. Ho, “Deep Dive: Novel Transformational Membranes and Process for CO₂ Capture from Flue Gas”, National Carbon Capture Center Biannual Project Review Meeting, Wilsonville, AL, 5/16/2023.
19. Y. Han, “CCS State of the Art: Polymeric Membranes for CO₂ Capture and H₂ Purification”, Battelle, 8/25/2022. (*virtual*)
20. Y. Han and W.S.W. Ho, “Unprecedented CO₂/H₂ Selectivity and CO₂ Permeance Demonstrated in Facilitated Transport Membranes with Tunable Amine-CO₂ Chemistry”, NAMS Annual Meeting, Pittsburg, PA, 5/15/2019. (*Young Membrane Scientist Award Session*)

Conference Presentations

21. Y. Han, Y. Yang, J. Hu, R. Pang, B. Prasad, and W.S.W. Ho, “Innovating Membranes for Carbon Capture: From Material Synthesis to Process Prototype”, Paper 44d, AIChE 2024 Annual Meeting, San Diego, CA, 10/27/2024.
22. S. Li, Y. Han, W.S.W. Ho, T. Tamale, W. Xu, T. Pyrzynski, M. Stevens, H. Meyer, A. Sexton, and W. Morris, “Engineering Scale Design and Testing of Transformational Membrane Technology for CO₂ Capture”, 2024 Carbon Management Research Project Review Meeting, Pittsburgh, PA, 8/7/2024.
23. Y. Han, Y. Yang, B. Prasad, R. Pang, and W.S.W. Ho, “Carbon Capture from Flue Gases Using an Integrated Membrane Skid at ~1 Tonne CO₂/Day Scale”, Paper 285e, AIChE 2023 Annual Meeting, Orlando, FL, 11/17/2023.
24. S. Li, Y. Han, W.S.W. Ho, T. Tamale, W. Xu, T. Pyrzynski, M. Stevens, H. Meyer, A. Sexton, and W. Morris, “Engineering Scale Design and Testing of Transformational Membrane Technology for CO₂ Capture”, 2023 Carbon Management Research Project Review Meeting, Pittsburgh, PA, 8/30/2023.
25. Y. Han, Y. Yang, B. Prasad, R. Pang, and W.S.W. Ho, “Carbon Capture from Flue Gases Using an Integrated Membrane Skid at ~1 Tonne CO₂/Day Scale”, NAMS Annual Meeting, Tuscaloosa, AL, 5/15/2023.
26. Y. Han, Y. Yang, R. Pang, and W.S.W. Ho, “Integrated Facilitated Transport Membrane Modules for Highly Selective Syngas Purification and Carbon Capture”, Paper 278a, AIChE 2022 Annual Meeting, Phoenix, AZ, 11/15/2022.
27. Y. Han and W.S.W. Ho, “Mitigated Carrier Saturation of Facilitated Transport Membranes for Decarbonizing Dilute CO₂ Sources”, Paper 343d, AIChE 2022 Annual Meeting, Phoenix, AZ, 11/15/2022.
28. Y. Han and W.S.W. Ho, “Novel Transformational Membranes and Process for CO₂ Capture from Flue Gas”, Carbon Management Project Review Meeting, Pittsburgh, PA, 8/18/2022.

29. S. Li, Y. Han and W.S.W. Ho, T. Pyrzynski, W. Xu, M. Stevens, D. Heim, H. Meyer, A. Sexton and W. Morris, “Engineering Scale Design and Testing of Transformational Membrane Technology for CO₂ Capture”, Carbon Management Project Review Meeting, Pittsburgh, PA, 8/16/2022.
30. Y. Han, Y. Yang, R. Pang, and W.S.W. Ho, “Integrated Facilitated Transport Membrane Modules for Highly Selective Syngas Purification and Carbon Capture”, NAMS Annual Meeting, Tempe, AZ, 5/16/2022.
31. Y. Han and W.S.W. Ho, “Mitigated Carrier Saturation of Facilitated Transport Membranes for Decarbonizing Dilute CO₂ Sources”, NAMS Annual Meeting, Tempe, AZ, 5/16/2022.
32. Y. Han, Y. Yang, R. Pang, and W.S.W. Ho, “Upscaling of Facilitated Transport Membranes for Hydrogen Purification from Coal-Derived Syngas”, Paper 579f, AIChE 2021 Annual Meeting, Boston, MA, 11/11/2021.
33. Y. Han and W.S.W. Ho, “Techno-economic Analysis of Facilitated Transport Membranes for H₂ Purification from Coal-Derived Syngas”, Paper 514f, AIChE 2021 Annual Meeting, Boston, MA, 11/10/2021.
34. Y. Han and W.S.W. Ho, “Techno-economic Analysis of Facilitated Transport Membranes for H₂ Purification from Coal-Derived Syngas”, NAMS Annual Meeting, Estes Park, CO, 9/1/2021.
35. Y. Han, Y. Yang, R. Pang, and W.S.W. Ho, “Upscaling of Facilitated Transport Membranes for Hydrogen Purification from Coal-Derived Syngas”, NAMS Annual Meeting, Estes Park, CO, 8/30/2021.
36. Y. Han and W.S.W. Ho, “Novel Transformational Membranes and Process for CO₂ Capture from Flue Gas”, Carbon Management and Natural Gas & Oil Research Project Review Meeting, Pittsburgh, PA, 8/17/2021.
37. Y. Han and W.S.W. Ho, “Transformational Membranes for Pre-combustion Carbon Capture”, Carbon Management and Natural Gas & Oil Research Project Review Meeting, Pittsburgh, PA, 8/16/2021.
38. S. Li, Y. Han and W.S.W. Ho, T. Pyrzynski, W. Xu and H. Meyer, “Engineering Scale Design and Testing of Transformational Membrane Technology for CO₂ Capture”, Carbon Management and Natural Gas & Oil Research Project Review Meeting, Pittsburgh, PA, 8/13/2021.
39. Y. Han, K.K. Chen, W. Salim, D. Wu, and W.S.W. Ho, “Novel Facilitated Transport Membrane and Process for Post-combustion Carbon Capture”, Paper 681b, AIChE 2020 Annual Meeting, online, 11/19/2020.
40. Y. Han, X. Deng, L.-C. Lin, and W.S.W. Ho, “New Facilitated Transport Membranes for Hydrogen Purification from Coal-derived Syngas”, Paper 538b, AIChE 2020 Annual Meeting, online, 11/19/2020.
41. Y. Han, B. Wang, and W.S.W. Ho, “CO₂ Utilization for CO Production via Fuel Cell Enabled by CO₂-selective Membrane”, Paper 423f, AIChE 2020 Annual Meeting, online, 11/19/2020.
42. Y. Han, X. Deng, L.-C. Lin, and W.S.W. Ho, “New Facilitated Transport Membranes for Hydrogen Purification from Coal-derived Syngas”, NAMS Annual Meeting, Pittsburgh, PA, 5/20/2020.
43. Y. Han, K.K. Chen, W. Salim, D. Wu, and W.S.W. Ho, “Novel Facilitated Transport Membrane and Process for Post-combustion Carbon Capture”, NAMS Annual Meeting, Pittsburgh, PA, 5/18/2020.
44. Y. Han and W.S.W. Ho, “Facilitated Transport Membranes with Tunable Amine-CO₂ Chemistry for Highly Selective CO₂/H₂ Separation”, Paper 750a, AIChE 2019 Annual Meeting, Orlando, FL, 11/15/2019.
45. Y. Han, W. Salim, K.K. Chen, D. Wu, and W.S.W. Ho, “Field Trial of Spiral-wound Facilitated Transport Membrane Module for CO₂ Capture from Flue Gas”, Paper 27d, AIChE 2019 Annual Meeting, Orlando, FL, 11/10/2019.
46. Y. Han and W.S.W. Ho, “Novel CO₂-selective Membranes for CO₂ Capture from <1% CO₂ Sources”, 2019 NETL Technologies Integrated Review Meeting, Pittsburgh, PA, 8/27/2019.
47. Y. Han and W.S.W. Ho, “Transformational Membranes for Pre-combustion Carbon Capture”, 2019 NETL Technologies Integrated Review Meeting, Pittsburgh, PA, 8/27/2019.

48. Y. Han, W. Salim, K.K. Chen, D. Wu, and W.S.W. Ho, “Field Trial of Facilitated Transport Membrane Module for CO₂ Capture from Flue Gas”, NAMS Annual Meeting, Pittsburg, PA, 5/13/2019.
49. Y. Han and W.S.W. Ho, “Novel Facilitated Transport Membrane for Post-combustion Carbon Capture: From Membrane Synthesis to Process Design”, Paper No. 628d, AIChE 2018 Annual Meeting, Pittsburgh, PA, 11/1/2018.
50. Y. Han and W.S.W. Ho, “Facilitated Transport Membranes for Hydrogen Purification from Coal-derived Syngas”, Paper No. 11f, AIChE 2018 Annual Meeting, Pittsburgh, PA, 10/28/2018.
51. Y. Han and W.S.W. Ho, “Novel CO₂-selective Membranes for CO₂ Capture from <1% CO₂ Sources”, 2018 NETL CO₂ Capture Technology Project Review Meeting, Pittsburgh, PA, 8/15/2018.
52. Y. Han and W.S.W. Ho, “Synthesis and Techno-economic Analysis of Novel Facilitated Transport Membrane for Post-combustion Carbon Capture”, NAMS Annual Meeting, Lexington, KY, 6/11/2018.
53. Y. Han, D. Wu and W.S.W. Ho, “Application of Facilitated Transport Membrane for Carbon Capture from Low CO₂ Concentration Sources”, 2018 NAMS Annual Meeting, Lexington, KY, 6/11/2018.
54. Y. Han and W.S.W. Ho, “Techno-economic Analysis of Polymeric Membrane Systems for Post-combustion Carbon Capture”, Paper 387d, AIChE Annual Meeting, Minneapolis, MN, 10/31/2017.
55. Y. Han and W.S.W. Ho, “Technical & Economic Feasibility Study of Membranes for Carbon Capture from Low CO₂ Conc. Sources”, Paper 57g, AIChE Annual Meeting, Minneapolis, MN, 10/31/2017.

AWARDS

1. Young Membrane Scientist Award, North American Membrane Society (NAMS), Pittsburgh, PA, 2019.
2. Separations Division Graduate Research Award, AIChE, Pittsburgh, PA, 2018.
3. Best Paper of Advanced Materials for Carbon Dioxide Capture for Power Generation Session, AIChE 2018 Annual Meeting, Pittsburgh, PA, 2018.
4. Poster Competition Award, NAMS 2018 Annual Meeting, Lexington, KY, 2018.
5. Elias Klein Founders’ Travel Supplement Award, NAMS, Lexington, KY, 2018.
6. Outstanding Poster Presentation, the 7th Graduate Research Symposium (GRS) at OSU, Columbus, OH, 2018.
7. Outstanding Oral Presentation, at the 6th GRS at OSU, Columbus, OH, 2017.
8. Outstanding Graduate Awards for Academic Achievement, Dept. of Chemical & Biomolecular Eng., OSU, Columbus, OH, 2017–2018.
9. National Scholarship for Outstanding Academic Performance, China, 2009–2011.

RESEARCH GRANTS (\$38.6MM TOTAL FUNDED; \$21.5MM AS LEAD PI)

(Abbreviations: BETO = Bioenergy Technologies Office; DOE = Department of Energy; EERE = Office of Energy Efficiency & Renewable Energy; FECM = Office of Fossil Energy and Carbon Management; IEDO = Industrial Efficiency & Decarbonization Office; NETL = National Energy Technology Laboratory; ODOD = Ohio Department of Development)

1. DE-EE0011209: “Bench-Scale Development of Facilitated Transport Membranes for Olefin/Paraffin Separations”
 – **Yang Han (PI)** and W.S. Winston Ho (co-PI)
 – Sponsored by DOE, IEDO, \$3,000,000 (3/1/2014–2/28/2027)
2. DE-FE0032467: “Engineering-Scale Testing of Transformational Membrane Technology for CO₂ Capture from Natural Gas Combined Cycle (NGCC) Flue Gas”
 – **Yang Han (PI)** and W.S. Winston Ho (co-PI)
 – Sponsored by DOE, NETL, \$5,000,000 (8/1/2024–7/31/2027)

3. DE-FE0032463: “Engineering-Scale Design and Testing of Transformational Membrane Technology for CO₂ Capture from Cement Gas”
 - **Yang Han (PI)** and W.S. Winston Ho (co-PI)
 - Sponsored by DOE, NETL, \$7,000,000 (5/1/2024–4/30/2028)
4. DE-EE0011112: “Bench-Scale Development of Facilitated Transport Membranes for Bio-Syngas Cleanup”
 - **Yang Han (PI)** and W.S. Winston Ho (co-PI)
 - Sponsored by DOE, BETO, \$2,499,657 (3/1/2014–2/28/2027)
5. DE-FE0031946: “Engineering Scale Design and Testing of Transformational Membrane Technology for CO₂ Capture”
 - Shiguang Li (Contact PI, GTI Energy), **Yang Han (OSU PI)**, and W.S. Winston Ho (OSU co-PI)
 - Sponsored by DOE, NETL, \$16,650,507 (\$4,000,000 to OSU) (4/1/2021–7/31/2025)
6. DE-FE0031731: “Novel Transformational Membranes and Process for CO₂ Capture from Flue Gas”
 - W.S. Winston Ho (PI), **Yang Han (co-PI)**, and Li-Chiang Lin (co-PI)
 - Sponsored by DOE, NETL, \$2,999,988 (7/01/2019–3/31/2023).
7. DE-FE0031635: “Transformational Membranes for Pre-Combustion Carbon Capture”
 - W.S. Winston Ho (PI) and **Yang Han (co-PI)**
 - Sponsored by DOE, NETL, \$799,988 (10/01/2018–2/28/2022)
8. OER-CDO-D-19-12: “Novel Transformational Membranes and Process for CO₂ Capture from Flue Gas”
 - W.S. Winston Ho (PI) and **Yang Han (co-PI)**
 - Sponsored by ODOD, \$500,000 (10/1/2019–6/30/2022)
9. OER-CDO-D-19-13: “Transformational Membranes for Pre-Combustion Carbon Capture”
 - W.S. Winston Ho (PI) and **Yang Han (co-PI)**
 - Sponsored by ODOD, \$150,000 (10/1/2019–9/30/2021)

PROFESSIONAL AFFILIATIONS

1. American Institute of Chemical Engineers (AIChE)
2. North American Membrane Society (NAMS)
3. American Chemical Society (ACS)

MENTORING

Graduate Student

- | | |
|---|------|
| 1. Abdallah Ghalli Mashud, Chemical Eng., OSU | 2025 |
|---|------|

Undergraduate Students

- | | |
|---|-------------|
| 1. Ryan Bottini, Chemical Eng., Purdue | 2025 Summer |
| <i>2025 Summer Research Opportunities Program (SROP) Scholarship</i> | |
| 2. Sarah Li, Materials Sci., OSU | 2025 Summer |
| <i>2025 COE Undergraduate Summer Research Scholarship</i> | |
| 3. Matthew Oya, Chemical Eng., OSU | 2024–2025 |
| 4. Sam Johnstone, Chemical Eng., OSU | 2019–2021 |
| <i>Undergraduate Honors Research Distinction, now Ph.D. student at UW–Madison</i> | |
| 5. Eric McPherson, Chemical Eng., OSU | 2019–2020 |

Now Ph.D. student at the City College of New York

- | | |
|---------------------------------------|-----------|
| 6. Jack Allbright, Chemical Eng., OSU | 2019–2020 |
| 7. Melissa Ardagh, Chemical Eng., OSU | 2017–2018 |

Postdoctoral Researcher

- | | |
|---------------------|-----------|
| 1. Ruth Dikki, OSU | 2025 |
| 2. Rana Ikram, OSU | 2024–2025 |
| 3. Nasir Ahmed, OSU | 2024–2025 |
| 4. Harilal, OSU | 2024–2025 |

Research Staff and Visiting Scholars

- | | |
|---|-------------|
| 1. Li-Chiang Lin, Visiting Professor, OSU | 2025 Summer |
| 2. Changlong Zou, Researcher 3, OSU | 2023–2025 |

Service of Qualifier/Candidacy Exam Committees

Osas Ikponmwsa (Chemical and Biomolecular Engineering, OSU)

Xiaofeng Jiang (Chemical and Biomolecular Engineering, OSU)

Yi-Chen Huang (Chemical and Biomolecular Engineering, OSU)

Service of Ph.D. Exam Committees

Jiamin Wen (Materials Science and Engineering, OSU)

PROFESSIONAL SERVICE

American Institute of Chemical Engineers (AIChE)

- Judge for the Undergraduate Student Poster Competition, AIChE Annual Meeting, 2021–2024.
- Co-chaired session “Thin-Film Composite Membranes for Gas and Vapor Separations” at AIChE 2024 Annual Meeting, San Diego, CA, 11/5/2024.
- Theme team member for abstract selection and session planning for Area 2D (Membrane-based Separations), AIChE 2024 Annual Meeting.
- Co-chaired session “Advanced Membranes for Carbon Capture and Sustainability” at AIChE 2023 Annual Meeting, Orlando, FL, 11/7/2023.
- Co-chaired session “Membranes for CO₂ Capture II” at AIChE 2022 Annual Meeting, Phoenix, AZ, 11/16/2022.
- Co-chaired session “Membranes for CO₂ Capture” at AIChE 2021 Annual Meeting, Boston, MA, 11/11/2021.
- Co-chaired sessions “Membranes for Electrochemical Conversions and Applications I&II” at AIChE 2020 Annual Meeting, online, 11/17/2020.
- Session assistant for “Fuel Cell Membranes” at AIChE 2018 Annual Meeting, Pittsburgh, PA, 10/28/2018.

North American Membrane Society (NAMS)

- Judge for student poster competition, 2019–2024.

Departmental

10. Poster judge for Graduate Research Symposium, 2019, 2022–2024.
11. Member of Chemical Hygiene Committee (ChyComm), Department of Chemical and Biomolecular Engineering, The Ohio State University, 2018–2020.

Editorial

12. Review editor on the Editorial Board of Membrane Applications - Gas and Vapor (specialty section of *Frontiers in Membrane Science and Technology*), 2022–now.
13. Topical Advisory Panel Member for journal *Membranes*, 2020–now.

Proposal Review Work

14. NSF – Interfacial Engineering Program, 2024.
15. Sustainability Research seed grant, The Ohio State University, 2024.
16. President’s Research Excellence (PRE) program, The Ohio State University, 2021–2023.

Journal Review Work

17. Reviewer for Science, Nature Materials, Nature Sustainability, Nature Chemical Engineering, Nature Communications, Journal of Membrane Science, Advanced Functional Materials, ACS Applied Materials & Interfaces, ACS Omega, Separation and Purification Technology, Industrial & Engineering Chemistry Research, Chemical Engineering Journal, Chemical Engineering Science, Current Opinion in Chemical Engineering, Cell iScience, Polymers, Membranes, Journal of Natural Gas Science and Engineering, Advanced Membranes, Next Energy, Materials Today Sustainability, Sustainable Energy & Fuel.