

MIAO YU

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EDUCATION

Ph.D., Chemical Engineering, University of Colorado at Boulder, Apr 2007
Ph.D. Candidate, Chemical Engineering, University of Minnesota, Jan 2004 - May 2004
M.S., Chemical Engineering, Tianjin University, Jun 2002
B.S., Chemical Engineering, Tianjin University, Jul 1998

PROFESSIONAL EXPERIENCE

Professor, Dept. of Chem. & Biol. Eng. Empire Innovation Professor, RENEW Institute University at Buffalo, Buffalo, NY	Jan 2021 – Present
Associate Professor, Dept. of Chem. & Biol. Eng. Rensselaer Polytechnic Institute, Troy, NY	Aug 2017 – Jan 2021
Assistant Professor, Dept. of Chem. Eng. University of South Carolina, Columbia, SC	Aug 2012 – Aug 2017
Assistant Research Professor, Dept. of Chem. & Biol. Eng. University of Colorado, Boulder, CO	Jun 2010 – Jun 2012
Research Associate, Dept. of Chem. & Biol. Eng. University of Colorado, Boulder, CO	May 2007 – May 2010
Lecturer, Dept. of Chem. & Biol. Eng. University of Colorado, Boulder, CO	Aug 2007 – Dec 2007

HONORS AND AWARDS

AICHe Separations Division FRI/Yeoman Innovation Award, Jun 2022
Invited Speaker, Center for Enhanced Nanofluidic Transport (CENT), MIT, Sep 2022
Invited speaker, Shell, Apr 2021
Empire Innovation Professor, University at Buffalo, Jan 2021
Priti and Mukesh Chatter Career Development Chair, Rensselaer Polytechnic Institute, Oct 2018
UofSC Breakthrough Star Award, University of South Carolina, May 2016

Career Award, National Science Foundation, Apr 2015
 Keynote speaker, International Congress on Membranes and Membrane Processes, Jul 2014
 Invited speaker, American Business Conference: Graphene Commercialization & Applications Summit, Oct 2013
 3rd award (\$10,000 cash), Inventevent at University of South Carolina, May 2013
 Postdoctoral Fellowship, Colorado Center of Biorefining and Biofuels (C2B2), Jul 2009
 American Institute of Chemists Postdoctoral Award, University of Colorado, May 2008
 American Institute of Chemists Graduate Award, University of Colorado, May 2007
 Student Travel Award, North American Membrane Society (NAMS) Annual Meeting, May 2007
 Graduate Assistantship in Areas of National Need (GAANN) Fellowship, U.S. Department of Education, May 2004 – May 2007
 3rd place award, Student Annual Research Symposium (StARS) at University of Colorado, Apr 2006
 University fellowship, University of Minnesota, Twin Cities, Jan 2004
 Outstanding Graduate Student Scholarship, Tianjin University, 1999~2001
 Outstanding Undergraduate Student Scholarship, Tianjin University (1st in class), 1997~1998

GRANTS AND CONTRACTS

1. Compact, Modular, and High-Yield Membrane Reactor for Carbon-Neutral Methanol Synthesis from Direct Air Capture and Carbon-Free H₂ Production, Co-PI, 10/1/2023 – 9/30/2027, DOE, \$400,000 (Phase I; Yu's share: 17%) and \$8,000,000 (Phase II; Yu's share: 31%)
 Note: Lead organization is Yu's startup company; Phase II funds might be available upon successful competitive down-selection.
2. Scalable Production of Nano-confined Ionic Liquid (NCIL) Hollow Fiber Membrane for Highly Efficient CO₂ Capture, PI, 7/24/2023 – 9/30/2024, SUNY Technology Accelerator Fund, \$75,000 (Yu's share: 100%)
3. Transformational Nano-confined Ionic Liquid Membrane Combined with a Dehydration Membrane for ≥97% CO₂ Capture from NGCC Flue Gas, Co-PI, 10/1/2022 – 3/31/2024, DOE, \$1,000,000 (Yu's share: 60%)
4. REFUEL + IT, Co-PI, 8/1/2022 – 7/31/2024, DOE ARPA-E, \$13,000,000 (UB team share: \$1,550,000; Additionally, UB received \$500,000 matching grant from NYSTAR for this project) (Total UB team share: \$2,050,000)
5. Compact Catalytic Membrane Reactor for One-Step High-Efficiency Ammonia (NH₃) Synthesis at Moderate Temperatures and Pressures, Co-PI: 4/1/2021 – 3/31/2024, DOE, \$2,000,000 (Yu's share: 25%)
 Note: Lead organization is Yu's startup company.
6. Direct Air Capture Using Trapped Small Amines in Hierarchical Nanoporous Capsules on Porous Electrospun Fibers, PI, 2/1/2020 – 7/30/2024, DOE, \$800,000 (Yu's share: 75%)
7. Dehydration Membrane Reactor for Direct Production of Dimethyl Carbonate (DMC) from CO₂ and H₂, Co-PI, 10/1/2020 – 9/30/2022, DOE, \$1,000,000 (Yu's share: 31%)
8. Transformational Molecular Layer Deposition Tailor-made Size-Sieving Sorbents for Post-Combustion CO₂ Capture, PI, 10/1/2019 – 3/31/2024, DOE, \$3,000,000 (Yu's share: 40%)
9. Bench-scale Development of a Transformational Graphene Oxide-based Membrane Process for Post-combustion CO₂ Capture, Co-PI, 10/1/2018 – 6/30/2024, DOE, \$3,000,000 (Yu's share: 50%)

10. CARRER: A Few Layer Thin, Graphene-Based Membranes: Nanostructure Understanding, Permeation Mechanisms and Separation Applications, PI, 4/1/2015 – 3/31/2021, NSF, \$500,000 (Yu's share: 100%)
11. "A Novel Hollow Fiber Membrane Reactor for High Purity H₂ Generation from Thermal Catalytic NH₃ Decomposition", PI, DOE ARPA-E, \$1,600,000, 4/1/2017 – 12/31/2020 (Yu's share: 50%)
12. "A Novel Catalytic Membrane Reactor for DME Synthesis from Renewable Resources", Co-PI, 4/1/2017 – 6/30/2021, DOE ARPA-E, \$2,300,000 (Yu's share: 25%)
13. "Center for a Sustainable Water, Energy, and Food Nexus (SusWEF)", Co-PI, NSF EPSCoR: RII Track-2 FEC, \$4,000,000, 8/1/2016 – 7/31/2020 (Yu's share: 7%)
14. "Energy Efficient GO-PEEK Hybrid Membrane Process for Post-Combustion Carbon Dioxide Capture", Co-PI, DOE, \$2,000,000, 10/1/2015 – 9/30/2018 (Yu's share: 40%)
15. "Catalysis for Renewables: Applications, Fundamentals and Technologies (CRAFT)", Co-PI, NSF EPSCoR: RII Track-2 FEC, \$4,000,000, 8/1/2015 – 7/31/2019 (Yu's share: 17%)
16. "Production of High-Purity O₂ via Membrane Contactor with Oxygen Carrier Solutions", Co-PI, DOE, \$500,000, 10/1/2014 – 9/30/2016 (Yu's share: 50%)
17. "Collaborative Research: Advanced Zeolite-Composite Adsorbents with Fine Tuned Pore Sizes for Molecular Sieving Separation", PI, NSF, \$450,000, 7/1/2014 – 6/30/2017 (Yu's share: 50%)
18. "Nano-Valved Materials for Natural Gas Storage", Co-PI, DOE ARPA-E, \$875,000, 1/1/2013 – 12/31/2014 (Yu's share: 35%)
19. "I/UCRC: Efficient Molecular Separation Using Polymeric Membranes Integrated with Novel Structure-Tunable Organic Nanocages", Co-PI, National Science Foundation, \$199,998, July 2012 – June 2014
20. "Efficient CO₂ Capture Using Thin Polymerized Ionic Liquid Membranes Integrated with Novel Shape-Persistent Molecular Cages", Co-PI, NSF-Membrane Applied Science & Technology (MAST) Center, \$127,500 (direct cost), January 2011 – December 2013
21. "High-Efficiency, Dye-Sensitized Solar Cells", Co-PI, NSF, \$300,000, August 2010 – July 2013

JOURNAL PUBLICATIONS

Total citations: 8085; h-index: 44 (Source: Google Scholar, July 2024)

Google Scholar: <https://scholar.google.com/citations?user=ryUNRywAAAAJ&hl=en>

ORCID: orcid.org/0000-0003-4730-7563

1. Dinesh K. Behera, Fan Wang, Bratin Sengupta, Kaleb Friedman, Shiguang Li, and Miao Yu, "A Facilitated Transport Membrane Composed of Amine-Containing Ionic Liquid Confined in a GO/CNT Network for Highly Efficient Carbon Capture", Submitted (2024)
2. Dinesh K. Behera, Fan Wang, Bratin Sengupta, Qiaobei Dong, Weiwei Xu, Shiguang Li, and Miao Yu, "Optimized GO/CNT Network for Restricting Ionic Liquid as a Separation Membrane for Efficient CO₂ Capture", Submitted (2024)
3. Richard J. Ciora, Rumwald Lecaros, Bratin Sengupta, Jinyin Lyu, Kaiying Wang, Xinhua Liang, Shiguang Li, and Miao Yu, "A Dehydration Membrane Reactor Towards Highly Efficient LPG Synthesis via CO₂ Hydrogenation", Submitted (2024)
4. Richard J. Ciora, Bratin Sengupta, Fan Wang, Shiguang Li, and Miao Yu, "Direct Modification of Pelletized 13X Zeolite by Atomic Layer Deposition toward Effective CO₂ Capture from Flue Gas",

Chemical Engineering Journal, Submitted (2024)

5. Yiming Hu, Bratin Sengupta, Hai Long, Lacey J. Wayment, Rick Ciora, Yinghua Jin, Jingyi Wu, Zepeng Lei, Kaleb Firedman, Hongxuan Chen, Miao Yu, Wei Zhang, “Molecular Recognition with Resolution below 0.2 Å via Thermo-regulatory Oscillations in Covalent Organic Frameworks”, *Science*, 384, 1441 (2024)
6. Xiao Fan, Kaiying Wang, Xiaoqing He, Shiguang Li, Miao Yu, Xinhua Liang, “Pd-modified CuO-ZnO-Al₂O₃ catalysts via mixed-phases-containing precursor for methanol synthesis from CO₂ hydrogenation under mild conditions”, *Carbon Resources Conversion*, 7, 100184 (2024)
7. Kaiying Wang, Shiguang Li, Miao Yu, Xinhua Liang, “Enhancing DMC Production from CO₂: Tuning Oxygen Vacancies and In Situ Water Removal”, *Energies*, 17, 839 (2024)
8. Ghader Mahmodi, Rasoul Rahimzadeh Bafti, Negin Iranpour Boroujeni, Sushobhan Pradhan, Shailesh Dangwal, Bratin Sengupta, Vahid Vatanpour, Mirco Sorci, Mahdi Fathizadeh, Prem Bikkina, Georges Belfort, Miao Yu, Seok-Jhin Kim, “Improving cellulose acetate mixed matrix membranes by incorporating hydrophilic MIL-101 (Cr)-NH₂ nanoparticles for treating dye/salt solution”, *Chemical Engineering Journal*, 146736 (2023)
9. Bratin Sengupta, Qiaobei Dong, Rajan Khadka, Dinesh Kumar Behera, Ruizhe Yang, Jun Liu, Ji Jiang, Pawel Keblinski, Georges Belfort, Miao Yu, “Carbon-doped Metal Oxide Interfacial Nanofilms for Ultrafast and Precise Separation of Molecules”, *Science*, 381, 1098 (2023)
10. Huanghe Li, Fan Wang, Shiguang Li, Miao Yu, “Two-Stage Membrane-based Process Utilizing Highly CO₂-Selective Membranes for Cost and Energy Efficient Carbon Capture from Coal Flue Gas: A Process Simulation Study”, *Journal of Membrane Science*, 669, 121259 (2023)
11. Dinesh K Behera, Bratin Sengupta, Fanglei Zhou, Mirco Sorci, Huazheng Li, Weiwei Xu, Qiaobei Dong, Georges Belfort, Miao Yu, “Tuning Structural Defects on a Nominal Single-Layered Graphene Oxide Membrane for Selective Separation of Biomolecules”, *ACS Applied Materials & Interfaces*, 15, 32066 (2023)
12. S Padinjarekutt, H Li, S Ren, P Ramesh, F Zhou, S Li, G Belfort, M Yu, “Na⁺-gated Nanochannel Membrane for Highly Selective Ammonia (NH₃) Separation in the Haber-Bosch Process”, *Chemical Engineering Journal*, 139998 (2023)
13. Surya Padinjarekutt, Bratin Sengupta, Huazheng Li, Kaleb Friedman, Dinesh Behera, Rumwald Lecaros, Miao Yu, “Synthesis of Na⁺-gated Nanochannel Membranes for The Ammonia (NH₃) Separation”, *Journal of Membrane Science*, 674, 121512 (2023)
14. Pranav Ramesh, Mirco Sorci, Bratin Sengupta, Surya Karla, Zerui Hao, Miao Yu, James Kilduff, Georges Belfort, “Highly Tunable Structure-by-design Polymer Brush Membranes for Organic Solvent Nanofiltration”, *Journal of Membrane Science*, 678, 121656 (2023)
15. Pranav Ramesh, Surya Karla, Abdullah Alshehri, Miao Yu, James Kilduff, Georges Belfort, “Stiffening Polymer Brush Membranes for Enhanced Organic Solvent Nanofiltration Selectivity”, *ACS Applied Materials & Interfaces*, 15, 31966 (2023)
16. Xiao Fan, Kaiying Wang, Xiaoqing He, Shiguang Li, Miao Yu, Xinhua Liang, “Pd-modified CuO-ZnO-Al₂O₃ Catalysts via Mixed-Phases-Containing Precursor for Methanol Synthesis from CO₂ Hydrogenation under Mild Conditions”, *Carbon Resources Conversion* (2023), doi: <https://doi.org/10.1016/j.crcon.2023.05.003>
17. H Li, F Wang, H Li, B Sengupta, DK Behera, S Li, M Yu, “Ultra-selective Membrane Composed of Charge-Stabilized Fixed Carrier and Amino Acid-Based Ionic Liquid Mobile Carrier for Highly

- Efficient Carbon Capture”, *Chemical Engineering Journal*, 139780 (2022)
18. Q Dong, WL Xu, X Fan, H Li, N Klinghoffer, T Pyrzynski, HS Meyer, “Prototype Catalytic Membrane Reactor for Dimethyl Ether Synthesis via CO₂ Hydrogenation”, *Industrial & Engineering Chemistry Research*, 61, 39 (2022)
 19. H Li, S Zhang, B Sengupta, H Li, F Wang, S Li, M Yu, “Polystyrene Sulfonate (PSS) Stabilized Polyethylenimine (PEI) Membranes Fabricated by Spray Coating For Highly Effective CO₂/N₂ Separation”, *Journal of Membrane Science*, 657, 120617 (2022)
 20. F Zhou, Q Dong, JT Chen, B Sengupta, J Jiang, WL Xu, H Li, S Li, M Yu, “Printed Graphene Oxide-Based Membranes for Gas Separation and Carbon Capture”, *Chemical Engineering Journal*, 430, 132942 (2022)
 21. Ji Jiang, Qiaobei Dong, Katherine McCullough, Jochen Lauterbach, Shiguang Li, Miao Yu, “Novel hollow fiber membrane reactor for high purity H₂ generation from thermal catalytic NH₃ decomposition”, *Journal of Membrane Science*, 629, 119281 (2021)
 22. Qiaobei Dong, Ji Jiang, Shiguang Li, and Miao Yu, “Molecular Layer Deposition (MLD) Modified SSZ-13 Membrane for Greatly Enhanced H₂ Separation”, *Journal of Membrane Science*, 622, 119040 (2021)
 23. Pranav Ramesh, Weiwei L Xu, Mirco Sorci, Carrie Trant, Sangwoo Lee, James Kilduff, Miao Yu, Georges Belfort, “Organic Solvent Filtration by Brush Membranes: Permeability, Selectivity And Fouling Correlate With Degree of SET-LRP Grafting”, *Journal of Membrane Science*, 618, 118699 (2021)
 24. Huazheng Li, Shoujie Ren, Shenxiang Zhang, Surya Padinjarekutt, Bratin Sengupta, Xinhua Liang, Shiguang Li, Miao Yu, “The High-Yield Direct Synthesis of Dimethyl Ether From CO₂ And H₂ In A Dry Reaction Environment”, *Journal of Materials Chemistry A*, 9, 2678 (2021)
 25. Sewoon Kim, Farivash Gholamirad, Miao Yu, Chang Min Park, Am Jang, Min Jang, Nadar Taheri-Qazvini, Yeomin Yoon, “Enhanced adsorption performance for selected pharmaceutical compounds by sonicated Ti₃C₂TX MXene”, *Chemical Engineering Journal*, 406, 126789 (2021)
 26. Ji Jiang, Syed Islam, Qiaobei Dong, Fanglei Zhou, Shiguang Li, Miao Yu, “Deposition of An Ultrathin Palladium(Pd) Coating on SAPO-34 Membranes for Enhanced H₂/N₂ Separation”, *International Journal of Hydrogen Energy*, 45, 33648 (2020)
 27. Qiaobei Dong, Fanglei Zhou, Ji Jiang, Weiwei Xu, Dinesh Behera, Bratin Sengupta, and Miao Yu, “Advanced Functional Hierarchical Nanoporous Structures with Tunable Microporous Coatings Formed via an Interfacial Reaction Processing”, *ACS Applied Materials & Interfaces*, 12, 26360 (2020)
 28. Ji Jiang, Qiaobei Dong, Fanglei Zhou, Weiwei Xu, Shiguang Li, Miao Yu, “Gel-Modulated Growth of High-quality Zeolite Membranes”, *ACS Applied Materials & Interfaces*, 12, 26095 (2020)
 29. Bin Wang, Tangyin Wu, Miao Yu, Shiguang Li, Rongfei Zhou, Weihong Xing, “Highly Ordered Nanochannels in a Nanosheet-Directed Thin Zeolite Nanofilm for Precise and Fast CO₂ Separation”, *Small*, 16, 2002836 (2020)
 30. Shenxiang Zhang, Huazheng Li, Huanghe Li, Bratin Sengupta, Shangwen Zha, Shiguang Li, Miao Yu, “Negative Charge-confined Amine-carriers within the Nanowire Network for Stable and Efficient Membrane Carbon Capture”, *Advanced Functional Materials*, 30, 2002804 (2020)
 31. Seohui Jung, Yufei Cui, Morgan Barnes, Chinmay Satam, Shenxiang Zhang, Reaz A Chowdhury, Aparna Adumbukulath, Onur Sahin, Corwin Miller, Seyed M Sajadi, Lucas M Sassi, Yue Ji,

- Matthew R Bennett, Miao Yu, Jefferson Friguglietti, Fatima A Merchant, Rafael Verduzco, Soumyabrata Roy, Robert Vajtai, J Carson Meredith, Jeffrey P Youngblood, Nikhil Koratkar, Muhammad M Rahman, Pulickel M Ajayan, “Multifunctional Bio-Nanocomposite Coatings for Perishable Fruits”, *Advanced Materials*, 32, 1908291 (2020)
32. Huazheng Li, Chenglong Qiu, Shoujie Ren, Qiaobei Dong, Shenxiang Zhang, Fanglei Zhou, Xinhua Liang, Jianguo Wang, Shiguang Li, Miao Yu, “Na⁺-gated Water-Conducting Nanochannels for Boosting CO₂ Conversion to Liquid Fuels”, *Science*, 367, 667 (2020)
 33. Fanglei Zhou, Huynh Ngoc Tien, Qiaobei Dong, Weiwei L. Xu, Bratin Sengupta, Shangwen Zha, Ji Jiang, Dinesh Behera, Shiguang Li, and Miao Yu, “Novel Carbon-Based Separation Membranes Composed of Integrated Zero- And One-Dimensional Nanomaterials”, *Journal of Materials Chemistry A*, 8, 1084 (2020)
 34. Sewoon Kim, Juan C Muñoz-Senmache, Byung-Moon Jun, Chang Min Park, Am Jang, Miao Yu, Arturo J Hernández-Maldonado, Yeomin Yoon, “A Metal Organic Framework-Ultrafiltration Hybrid System for Removing Selected Pharmaceuticals and Natural Organic Matter”, *Chemical Engineering Journal*, 382, 122920 (2020)
 35. Sewoon Kim, Miao Yu, Yeomin Yoon, “Fouling and Retention Mechanisms of Selected Cationic and Anionic Dyes in a Ti₃C₂T_x MXene-Ultrafiltration Hybrid System”, *ACS Applied Materials & Interfaces*, 12, 16557 (2020)
 36. Shoujie Ren, Xiao Fan, Zeyu Shang, Weston R Shoemaker, Lu Ma, Tianpin Wu, Shiguang Li, Naomi B Klinghoffer, Miao Yu, Xinhua Liang, “Enhanced Catalytic Performance of Zr Modified CuO/ZnO/Al₂O₃ Catalyst for Methanol and DME Synthesis via CO₂ Hydrogenation”, *Journal of CO₂ Utilization*, 36, 82 (2019)
 37. Yuting Li, Konstantin Khivantsev, Yu Tang, Luan Nguyen, Mahdi Fathizadeh, Jingyue Liu, Miao Yu, Franklin Tao, “Synthesis of NaA nanoFAU Zeolite Catalyst and Catalysis for Production of Formic Acid with NaA nanoFAU”, *Catalysis Letters*, 149, 1965 (2019)
 38. Qiaobei Dong, Zhuonan Song, Fanglei Zhou, Huazheng Li, Miao Yu, “Ultrathin, Fine-Tuned Microporous Coating Modified 5A Zeolite for Propane/Propylene Adsorptive Separation”, *Microporous and Mesoporous Materials*, 281, 9 (2019)
 39. Shoujie Ren, Shiguang Li, Naomi Klinghoffer, Miao Yu, Xinhua Liang, “Effects of Mixing Methods of Bifunctional Catalysts on Catalyst Stability of DME Synthesis via CO₂ Hydrogenation”, *Carbon Resources Conversion*, 2, 85 (2019)
 40. Lesley Joseph, Byung-Moon Jun, Min Jang, Chang Min Park, Juan C Muñoz-Senmache, Arturo J Hernández-Maldonado, Andreas Heyden, Miao Yu, Yeomin Yoon, “Removal of Contaminants of Emerging Concern by Metal-Organic Framework Nano-adsorbents: A Review”, *Chemical Engineering Journal*, 369, 928 (2019)
 41. Fanglei Zhou, Huynh Ngoc Tien, Qiaobei Dong, Weiwei L Xu, Huazheng Li, Shiguang Li, Miao Yu, “Ultrathin, Ethylenediamine-Functionalized Graphene Oxide Membranes on Hollow Fibers for CO₂ Capture”, *Journal of Membrane Science*, 573, 184 (2019)
 42. Shoujie Ren, Weston R Shoemaker, Xiaofeng Wang, Zeyu Shang, Naomi Klinghoffer, Shiguang Li, Miao Yu, Xiaoqing He, Tommi A White, Xinhua Liang. “Highly Active and Selective Cu-Zn Based Catalyst for Methanol and Dimethyl Ether Synthesis via CO₂ Hydrogenation”, *Fuel*, 239, 1125 (2019)
 43. Sewoon Kim, Chang Min Park, Am Jang, Min Jang, Arturo J Hernández-Maldonado, Miao Yu,

- Jiyong Heo, Yeomin Yoon, "Removal of Selected Pharmaceuticals in An Ultrafiltration-Activated Biochar Hybrid System", *Journal of Membrane Science*, 570, 77 (2019)
44. Mahdi Fathizadeh, Weiwei L Xu, Margaret Shen, Emily Jeng+, Fanglei Zhou, Qiaobei Dong, Dinesh Behera, Zhuonan Song, Lei Wang, Abolfazl Shakouri, Konstantin Khivantsev, Miao Yu, "Antifouling UV-treated GO/PES Hollow Fiber Membranes in A Membrane Bioreactor (MBR)", *Environmental Science: Water Research & Technology*, 5, 1244 (2019)
 45. Mahdi Fathizadeh, Huynh Ngoc Tien, Konstantin Khivantsev, Zhuonan Song, Fanglei Zhou, and Miao Yu, "Polyamide/Nitrogen-Doped Graphene Oxide Quantum Dots (N-GOQD) Thin Film Nanocomposite Reverse Osmosis Membranes for High Flux Desalination", *Desalination*, 451, 125 (2019)
 46. Sewoon Kim, Chang Min Park, Min Jang, Ahjeong Son, Nauguk Her, Miao Yu, Shane Snyder, Do-Hyung Kim, Yeomin Yoon, "Aqueous Removal of Inorganic and Organic Contaminants by Graphene-Based Nanoadsorbents: A Review", *Chemosphere*, 212, 1104 (2018)
 47. Weiwei L Xu, Fanglei Zhou, Miao Yu, "Tuning Water Nanofiltration Performance of Few-Layered, Reduced Graphene Oxide Membranes by Oxygen Plasma", *Industrial & Engineering Chemistry Research*, 57, 16103 (2018)
 48. Fanglei Zhou, Mahdi Fathizadeh, Miao Yu, "Single- to Few-Layered, Graphene-Based Separation Membranes", *Annual Review of Chemical and Biomolecular Engineering*, 9, 17 (2018)
 49. Konstantin Khivantsev, Alessandro Biancardi, Mahdi Fathizadeh, Fahad Almalki, Job L Grant, Huynh Ngoc Tien, Abolfazl Shakouri, Douglas A Blom, Thomas M Makris, John R Regalbuto, Marco Caricato, Miao Yu, "Catalytic N-H Bond Activation and Breaking by a Well-Defined Co^{II}O₄ Site of a Heterogeneous Catalyst", *ChemCatChem*, 10, 736 (2018)
 50. Mahdi Fathizadeh, Konstantin Khivantsev, Travis J Pyrzynski, Naomi B Klinghoffer, Abolfazl Nabi Shakouri, Miao Yu, Shiguang Li, "Bio-mimetic Oxygen Separation via A Hollow Fiber Membrane Contactor with O₂ Carrier Solutions", *Chemical Communications*, 54, 9454 (2018)
 51. Sewoon Kim, Kyoung Hoon Chu, Yasir AJ Al-Hamadani, Chang Min Park, Min Jang, Do-Hyung Kim, Miao Yu, Jiyong Heo, Yeomin Yoon, "Removal of contaminants of emerging concern by membranes in water and wastewater: A review", *Chemical Engineering Journal* 335, 896 (2018)
 52. Zhuonan Song, Qiaobei Dong, Weiwei L. Xu, Xinhua Liang and Miao Yu, "Molecular Layer Deposition (MLD) Modified Zeolites for Highly Efficient CO₂ Capture", *ACS Applied Materials & Interfaces*, 10, 769 (2018)
 53. Fanglei Zhou, Huynh Ngoc Tien, Jung-Tsai Chen, Weiwei L. Xu, Qiuli Liu, Ethan Hicks+, Mahdi Fathizadeh, Shiguang Li, and Miao Yu, "Ultrathin Graphene Oxide-Based Hollow Fiber Membranes with Brush-Like CO₂-Philic Agent for Highly Efficient CO₂ Capture", *Nature Communications*, 8, Article No. 2107 (2017)
 54. Mahdi Fathizadeh, Huynh Ngoc Tien, Konstantin Khivantsev, Jung-Tai Chen, and Miao Yu, "Printing Ultrathin Graphene Oxide Nanofiltration Membranes for Water Purification", *Journal of Materials Chemistry A*, 5, 20860 (2017)
 55. Weiwei L. Xu, Chao Fang, Fanglei Zhou, Zhuonan Song, Qiuli Liu, Rui Qiao, and Miao Yu, "Self-Assembly: A Facile Way of Forming Ultrathin, High Performance Graphene Oxide Membranes for Water Purification", *Nano Letters*, 17, 2928 (2017)
 56. Kyoung Hoon Chu, Mahdi Fathizadeh, Miao Yu, Joseph RV Flora, Am Jang, Min Jang, Chang Min Park, Sung Soo Yoo, Namguk Her, Yeomin Yoon, "Evaluation of Removal Mechanisms in a

- Graphene Oxide-Coated Ceramic Ultrafiltration Membrane for Retention of Natural Organic Matter, Pharmaceuticals, and Inorganic Salts”, *ACS Applied Materials & Interfaces*, 9, 40369 (2017)
57. Yanzhe Qin, Yongyou Hu, Stephan Koehler, Liheng Cai, Junjie Wen, Xiaojun Tan, Weiwei L. Xu, Qian Sheng, Xu Hou, Jianming Xue, Miao Yu, David Weitz, “Ultrafast Nanofiltration through Scalable Single-layered Graphene Membranes”, *ACS Applied Materials & Interfaces*, 9, 9239 (2017)
 58. X. Wang, M. R. Bayan, M. Yu, D. K. Ludlow, X. Liang, “Atomic layer deposition surface functionalized biochar for adsorption of organic pollutants: improved hydrophilia and adsorption capacity”, *International Journal of Environmental Science and Technology*, 4, 1825 (2017)
 59. Kyoung Hoon Chu, Yi Huang, Miao Yu, Jiyong Heo, Joseph R.V. Flora, Am Jang, Min Jang, Chanil Jung, Chang Min Park, Do-Hyung Kim, Yeomin Yoon, “Evaluation of graphene oxide-coated ultrafiltration membranes for humic acid removal at different pH and conductivity conditions”, *Separation and Purification Technology*, 181, 139 (2017)
 60. Xiaojie Zhang, Guoqing Zuo, Xin Lu, Changqing Tang, Shuo Cao, and Miao Yu, “Anatase TiO₂ Sheet-assisted Synthesis of Ti³⁺ Self-doped Mixed Phase TiO₂ Sheet with Superior Visible-light Photocatalytic Performance: Roles of Anatase TiO₂ Sheet”, *Journal of Colloid and Interface Science*, 490, 774-782 (2017)
 61. Mahdi Fathizadeh, Weiwei L. Xu, Fanglei Zhou, Yeomin Yoon, and Miao Yu, “Graphene Oxide: A Novel 2-Dimensional Material in Membrane Separation for Water Purification”, *Advanced Materials Interfaces*, Article No. 1600918 (2017) (invited review)
 62. Zhong, S.L., Bu, N., Zhou, R.F., Jin, W.Q., Yu, M., and Li, S.G., “Aluminophosphate-17 and silicoaluminophosphate-17 membranes for CO₂ separations”, *Journal of Membrane Science*, 520, 507-514 (2016)
 63. Song, Z.N., Nambo, A., Tate, K.L., Bao, A.N., Zhu, M.Q., Jasinski, J.B., Zhou, S.J., Meyer, H.S., Carreon, M.A., Li, S.G., and Yu, M., “Nano-Valved Adsorbents for CH₄ Storage”, *Nano Letters*, 16, 3309-3313 (2016)
 64. Song, Z.N., Fathizadeh, M., Huang, Y., Chu, K.H., Yoon, Y.B., Wang, L., Xu, W.W.L., and Yu, M., “TiO₂ Nanofiltration Membranes Prepared by Molecular Layer Deposition for Water Purification”, *Journal of Membrane Science*, 510, 72-78 (2016)
 65. Zong, Z.W., Huang, Y., Song, Z.N., Feng, X.H., Zhou, R.F., Meyer, H.S., Zhou, S.J., Carreon, M.A., Yu, M., and Li, S.G., “Highly Permeable N₂-Selective SAPO-34 Membranes for N₂/CH₄ Separation”, *Microporous & Mesoporous Materials*, 224, 36-42 (2016)
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PATENTS

Inventors	Title	Year	Application Number
Miao Yu, Surya Padinjarekutt, Li Huazheng	NaA Zeolite Membrane for Recovery of Ammonia	2022	US Patent App. 17/776,047
Miao Yu, Li Huazheng	Methods and Systems for Producing High Purity Methanol from Carbon Dioxide Hydrogenation Using NaA Membrane Reactor	2022	US Patent App. 17/424,234
Miao Yu, Fanglei Zhou, Feng Zhao, Jinyun Liao	Printing Nanoporous Ultrathin Membranes for Lithium-Sulfur Batteries	2022	US Patent App. 17/297,184
Miao Yu, Zhuonan Song	TiO ₂ Nanofiltration Membranes Prepared by Molecular Layer Deposition for Water Purification	2021	US Patent 11,033,860
Miao Yu, Mahdi Fathizadeh	Thin Film Composites Having Graphene Oxide Quantum Dots	2021	US Patent 10,953,371

Shiguang Li, Miao Yu	Devices and Methods for Hydrogen Generation via Ammonia Decomposition	2021	US Patent 10,906,804
Miao Yu, Fanglei Zhou, Ngoc Tien Huynh, Shiguang Li	Graphene Oxide Coated Porous Hollow Fibrous Substrates for Carbon Dioxide Capture	2020	US Patent App. 16/494,955
Miao Yu, Mahdi Fathizadeh	Printable Graphene Oxide Coatings and Membranes	2019	US Patent App. 16/477,252
Miao Yu	Ion Removal from Water by Ultra-Thin Graphene-Based Membranes	2019	US Patent 10,183,259
Miao Yu	Ultrathin, Graphene-Based Membranes for Water Treatment and Methods of Their Formation and Use	2018	US Patent 10,092,882
Miao Yu, Hang Li	Ultrathin, Molecular-Sieving Graphene Oxide Membranes for Separations along with Their Methods of Formation and Use	2017	US Patent 9,795,931
Shiguang Li, Shaojun Zhou, Miao Yu	Process for Purification of Methyl Methacrylate Using Molecular Sieve Membranes	2016	US Patent 9,487,469
Shiguang Li, Shaojun Zhou, Howard S Meyer, Miao Yu	Method of Producing High Purity Oxygen	2016	US Patent App. 14/870,906
Shiguang Li, Shaojun Zhou, Howard S Meyer, Miao Yu, Moises A Carreon	Method for Loading and Storing Gas in Nano-Valved Sorbents	2016	US Patent 9,249,934
Miao Yu, Hang Li	Ultrathin, Molecular-Sieving Graphene Oxide Membranes for Separations along with Their Methods of Formation And Use	2015	US Patent 9,108,158
Alan W Weimer, Xinhua Liang, Jianhua Li, John L Falconer, Miao Yu	Ultra-thin Metal Oxide and Carbon-Metal Oxide Films Prepared by Atomic Layer Deposition (ALD)	2015	US Patent 9,090,971
Shiguang Li, Shaojun Zhou, Miao Yu, Moises A Carreon	Nano-channel Enhanced Composite Membranes	2015	US Patent 9,005,345
Miao Yu, Wei Zhang, John L Falconer, Richard D. Noble	High Efficiency Dye-Sensitized Solar Cell with Layered Structures	2011	US Patent App. 13/114,948
John L Falconer, Richard D Noble, Miao Yu	Valving and Storage Using Molecular Sieve Membranes	2010	US Patent App. 12/529,236

INVITED TALKS

1. Graphene-Based Molecular Filters, Graphene Commercialization & Applications Summit, American Business Conferences, Santa Clara, CA, Dec 10-11, 2013
2. Graphene-Based Membranes for Separation Applications, International Congress on Membranes and Membrane Processes, Suzhou, China, July 2014
3. Graphene-Based Membranes for Separation Applications”, AICHE, Membrane Research and Innovation Activities Around the World session, Atlanta, USA, November 2014
4. Advanced Nanostructures for Energy and Environmental Applications, Tianjin University, Tianjin, China, July 2014

5. Engineering Nanoporous Structures for Distinguishing Molecules, Penn State University, March 2017
6. Engineering Nanoporous Structures for Distinguishing Molecules, University of Colorado at Boulder, April 2017
7. Engineering Nanoporous Structures for Distinguishing Molecules, Rensselaer Polytechnic Institute, March 2017
8. Engineering Nanoporous Structures for Distinguishing Molecules, North Carolina State University, April 2017
9. Engineering Nanoporous Structures for Distinguishing Molecules, Stony Brook University, March 2017
10. Engineering Nanoporous Structures for Distinguishing Molecules, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, China, July 2018
11. Engineering Nanoporous Structures for Distinguishing Molecules, Department of Chemical and Biological Engineering, Zhejiang University of Technology, China, July 2018
12. Advanced Nanoporous Structures for Energy and Environmental Applications, Tianjin University, China, July 2019
13. Advanced Nanoporous Structures for Energy and Environmental Applications, Nanjing Tech University, China, August 2019
14. Na⁺-gated Nanochannel Membrane for Renewable Fuel Synthesis, Shell, April 2021
15. Na⁺-gated Nanochannel Membrane for Renewable Fuel Synthesis, CENT, MIT, September 2022
16. “Na⁺-gated Nanochannel Membrane for Renewable Fuel Synthesis”, AIChE, November 2022
17. “Na⁺-gated Nanochannel Membrane for Renewable Fuel Synthesis”, Vanderbilt University, March 2023
18. “Na⁺-gated Nanochannel Membrane for Renewable Fuel Synthesis”, University of Rochester, April 2023
19. “Na⁺-gated Nanochannel Membrane for Renewable Fuel Synthesis”, Tianjin University, July 2023
20. “Na⁺-gated Nanochannel Membrane for Renewable Fuel Synthesis”, Tianjin Polytechnic University, July 2023
21. “Na⁺-gated Nanochannel Membrane for Renewable Fuel Synthesis”, Nanjing Tech University, July 2023
22. “Na⁺-gated Nanochannel Membrane for Renewable Fuel Synthesis”, Soochow University, August 2023
23. “Na⁺-gated Nanochannel Membrane for Renewable Fuel Synthesis”, Washington University in St. Louis, October 2023
24. “Engineered Nanoporous Structures for Energy and Environmental Applications”, W.L. Gore & Associates, Inc., December 2023
25. “Carbon-doped Metal Oxide Interfacial Nanofilms for Precise Separation of Molecules”, The École Polytechnique Fédérale de Lausanne (EPFL), April 2024

26. “Carbon-doped Metal Oxide Interfacial Nanofilms for Precise Separation of Molecules”,
Rochester Institute of Technology, April 2024