Kang, Dun-Yen （康敦彥）

Professor

B.S. in Chemical Engineering
National Taiwan University, 2004
M.S. in Applied Mechanics
National Taiwan University, 2006
Ph.D. in Chemical & Biomolecular Engineering
Georgia Institute of Technology, 2012
Postdoc in Chemistry and Biochemistry
Georgia Institute of Technology, 2012-2013

Research and Professional Interests
Zeolite Membranes/Thin Films
MOF Membranes/Thin Films
Computer-Aided Engineering

Journal Papers

1. C. H. Lam, H. Y. Chi, S. M. Hsu, Y. S. Li, W. Y. Lee, C. Cheng and **D. Y. Kang**, "Surfactant-mediated self-assembly of nanocrystals to form hierarchically structured zeolite thin films with controlled crystal orientation", *Rsc Advances*, 7(77), 49048-49055, 2017

2. H. Ting, H. Y. Chi, C. H. Lam, K. Y. Chan and **D. Y. Kang**, "High-permeance metal-organic framework-based membrane adsorber for the removal of dye molecules in aqueous phase", *Environmental Science-Nano*, 4(11), 2205-2214, 2017(Nov)

3. Y. L. Li, H. Y. Chi, M. Y. Kan, S. Y. Pao, Y. H. Kang, J. J. Chen and **D. Y. Kang**, "Surface Engineering Layered Metal-Organic Framework to Enhance Processability and Stability in Water", *Chemnanomat*, 3(12), 902-908, 2017(Dec)

4. Y. R. Chen, T. Tsuru and **D. Y. Kang**, "Simulation and design of catalytic membrane reactor for hydrogen production via methylcyclohexane dehydrogenation", *International Journal of Hydrogen Energy*, 42(42), 26296-26307, 2017(Oct)

5. C. W. Chang, Z. Y. Guan, M. Y. Kan, L. W. Lee, H. Y. Chen and **D. Y. Kang**, "Vapor-phase synthesis of poly(p-xylylene) membranes for gas separations", *Journal of Membrane Science*, 539, 101-107, 2017(Oct)

6. C. H. Liu and **D. Y. Kang**, "Influence of interwall interaction in double -walled aluminogermanate nanotubes on mechanical properties", *Computational Materials Science*, 135, 54-63, 2017(Jul)

7. K. H. Liou, **D. Y. Kang** and L. C. Lin, "Investigating the Potential of Single-Walled Aluminosilicate Nanotubes in Water Desalination", *Chemphyschem*, 18(2), 179-183, 2017(Jan)

8. C. C. Chiang, D. Y. Wu and **D. Y. Kang**, "Detailed Simulation of Fluid Dynamics and Heat Transfer in Coffee Bean Roaster", *Journal of Food Process Engineering*, 40(2), 2017(Apr)

9. H. Y. Chi, S. H. Hung, M. Y. Kan, L. W. Lee, C. H. Lam, J. J. Chen and **D. Y. Kang**, "Metal-organic frameworks for dye sorption: structure-property relationships and scalable deposition of the membrane adsorber", *Crystengcomm*, 20(36), 5465-5474, 2018(Sep)

10. P. S. Huang, C. H. Lam, C. Y. Su, Y. R. Chen, W. Y. Lee, D. M. Wang, C. C. Hua and **D. Y. Kang**, "Scalable Wet Deposition of Zeolite AEI with a High Degree of Preferred Crystal Orientation", *Angewandte Chemie-International Edition*, 57(40), 13271-13276, 2018(Oct)

11. Y. R. Chen, K. H. Liou, **D. Y. Kang**, J. J. Chen and L. C. Lin, "Investigation of the Water Adsorption Properties and Structural Stability of MIL-100(Fe) with Different Anions", *Langmuir*, 34(14), 4180-4187, 2018(Apr)

12. C. H. Lam, W. J. Hsu, H. Y. Chi, Y. H. Kang, J. J. Chen and **D. Y. Kang**, "High-throughput fabrication of zeolite thin films via ultrasonic nozzle spray deposition", *Microporous and Mesoporous Materials*, 267, 171-180, 2018(Sep)

13. K. Y. Huang, H. Y. Chi, P. K. Kao, F. H. Huang, Q. M. Jian, I. C. Cheng, W. Y. Lee, C. C. Hsu and **D. Y. Kang**, "Atmospheric Pressure Plasma Jet-Assisted Synthesis of Zeolite-Based Low-k Thin Films", *Acs Applied Materials & Interfaces*, 10(1), 900-908, 2018(Jan)

14. C. Y. Su, A. C. Yang, J. S. Jiang, Z. H. Yang, Y. S. Huang, **D. Y. Kang** and C. C. Hua, "Properties of Single-Walled Aluminosilicate Nanotube/Poly(vinyl alcohol) Aqueous Dispersions", *Journal of Physical Chemistry B*, 122(1), 380-391, 2018(Jan)

15. P. S. Huang, C. Y. Su, C. H. Lam, W. Y. Lee, D. M. Wang, C. C. Hua and **D. Y. Kang**, "Direct wet deposition of zeolite FAU thin films using stabilized colloidal suspensions", *Microporous and Mesoporous Materials*, 272, 286-295, 2018(Dec)

16. L. W. Lee, S. Y. Pao, A. Pathak, **D. Y. Kang** and K. L. Lu, "Membrane adsorber containing a new Sm(III)-organic framework for dye removal", *Environmental Science-Nano*, 6(4), 1067-1076, 2019(Apr)

17. M. Y. Kan, J. H. Shin, C. T. Yang, C. K. Chang, L. W. Lee, B. H. Chen, K. L. Lu, J. S. Lee, L. C. Lin and **D. Y. Kang**, "Activation-Controlled Structure Deformation of Pillared-Bilayer Metal-Organic Framework Membranes for Gas Separations", *Chemistry of Materials*, 31(18), 7666-7677, 2019(Sep)

18. Y. C. Huang, W. J. Hsu, C. Y. Wang, H. K. Tsao, Y. H. Kang, J. J. Chen and **D. Y. Kang**, "Wetting Properties and Thin-Film Quality in the Wet Deposition of Zeolites", *Acs Omega*, 4(8), 13488-13495, 2019(Aug)

19. W. J. Hsu, P. S. Huang, Y. C. Huang, S. W. Hu, H. K. Tsao and **D. Y. Kang**, "Zeolite-Based Antifogging Coating via Direct Wet Deposition", *Langmuir*, 35(7), 2538-2546, 2019(Feb)

20. Su, C.-Y.†, Lyu, Q.†, **Kang, D.-Y**.†*, Yang, Z.-H., Lam, C.H., Chen, Y.-H., Lo, S.-C., Hua, C.-C.*, and Lin, L.-C.*, "Hexagonal superalignment of nano-objects with tunable separation in a dilute and spacer-free solution", *Physical Review Letters*, 123, 238002, 2019(Dec)

21. Oh, J.W., Cho, K.Y., Kan, M.-Y., Yu, H.J., **Kang D.-Y.***, and Lee, J.S.*, "High-flux mixed matrix membranes containing bimetallic zeolitic imidazole framework-8 for C3H6/C3H8 separation", 596, 117735, 2020(Feb)

22. Lee, L.-W.; Chi, H.-Y.; Kao, Y.-C.; Hung, T.-H.; Chiou, D.-S.; Lee, G.-H.l Peng. S.-M., **Kang, D.-Y.***; Wang, C.-M.*, Zinc(II)–Organic Framework Films with Thermochromic and Solvatochromic Applications, *Chem. Eur. J.*, **2020**, 26, 4204–4208.

23. Chen, J.-J.; Chiu, H.-C.; Chang, C.-W.; Shen, C.-Y.; Kang, Y.-H; Chi, H.-Y.; Chang, C.-K.; Chuang, Y.C.; **Kang, D.-Y.***, Core-shell metal-organic frameworks with improving cyclic stability for water adsorption, *J. Chem. Eng. Japan*, **2020**, 53(8), 1–7.

24. Ren, L.-X.; Chang, F.-L.; **Kang, D.-Y.**; Chen, C.-L.*, Hybrid membrane process for post-combustion CO_2 capture from coal-fired power plant, *J. Membr. Sci*., **2020**, 603, 118001.

25. Lyu, Q.; **Kang, D.-Y.**; Hu, S.*; Lin, L.-C.*, Exploiting interior surface functionalization in reverse osmosis desalination membranes to mitigate permeability−selectivity trade-off: molecular simulations of nanotube-based membranes, *Desalination*, **2020**, 491, 114537.

26. Chang, T.-A.; Hsu, W.-J.; Hung, T.-H.; Hu, S.-W.; Tsao, H.K.; Zou, C.; Lin, L.-C.; Kang, Y.-H.; Chen, J.-J.*; **Kang, D.-Y.***, Toward Long-lasting Low-haze Anti-fog Coatings through the Deposition of Zeolites, *Ind. Eng. Chem. Res.*, **2020**, 59(29), 13042–13050.

27. Tao, T.-L.; Chang, C.-K.; Kang, Y.-H.; Chen, J.-J.; **Kang, D.-Y.***, Enhanced pervaporation performance of zeolite membranes treated by atmospheric-pressure plasma, *J. Taiwan Inst. Chem. Eng.*, **2020**, 116, 112–120.

28. Chiou, D.-S; Yu, H.J.; Hung, T.-H; Lyu, Q.; Chang C.-K.; Lee, J.S.*; Lin, L.-C.*; **Kang, D.-Y.***, Highly CO_2 Selective Metal-Organic Framework Membranes with Favorable Coulombic Effect, *Adv. Funct. Mater.*, **2021**, 31, 2006924

29. Shin, J.H.; Kan, M.-Y.; Oh, J.-W.; Yu, H.J.; Lin, L.-C.; **Kang, D.-Y.***; Lee, J.S.*, Solubility selectivity-enhanced SIFSIX-3-Ni-containing mixed matrix membranes for improved CO_2/CH_4 separation efficiency, *J. Membr. Sci.*, **2021**, 633, 119390.

30. Hsieh, Y.-J.; Zou C; Chen, J.-J.*; Lin, L.-C.*; **Kang, D.-Y.***, Pillared-bilayer metal-organic framework membranes for dehydration of isopropanol, *Microporous Mesoporous Mater*., **2021**, 326, 111344

31. An, H.; Cho, K.Y.; Lyu, Q.; Chiou, D.-S.; Nam, K.J.; **Kang, D.-Y.***; Lin, L.-C.*; Lee, J.S.*, Facile Defect Engineering of Zeolitic Imidazolate Frameworks Towards Enhanced C_3H_6/C_3H_8 Separation Performance, *Adv. Funct. Mater.*, **2021**, 31, 2105577

32. Hung, T.-H.; Deng, X.; Lyu, Q.; Lin, L.-C.*; **Kang, D.-Y.***, Coulombic effect on permeation of CO_2 in metal-organic framework membranes, *J. Membr. Sci.*, **2021**, 639, 119742.

33. Guo, J.-C.; Zou, C.; Chiang, C.-Y.; Chang, T.-A.; Chen, J.-J.*; L.-C. Lin*; **Kang, D.-Y.***, NaP1 zeolite membranes with high selectivity for water-alcohol pervaporation, *J. Membr. Sci.*, **2021**, 639, 119762

34. Kan, M.-Y.; Lyu, Q.; Chu, Y.-H.; Hsu, C.-C.; Lu, K.-L.; Lin, L.-C.*; **Kang, D.-Y.***, Suppressing Defect Formation in Metal-organic Framework Membranes via Plasma-assisted Synthesis for Gas Separations, *ACS Appl. Mater. Interfaces*, **2021**, 13, 41904–41915

35. Hung, T.-H.; Lyu, Q.; Lin, L.-C.*; **Kang, D.-Y.***, Transport-Relevant Pore Limiting Diameter for Molecular Separations in Metal-Organic Framework Membranes, *J. Phys. Chem. C.*, **2021**, 125, 20416–20425

36. Chang, C.-K.; Yu, H.J.; Jang, H.; Hung, T.-H.; Chang, C.-K.; Kim*, J.; Lee, J.S.*; **Kang, D.-Y.***, Conformational-change-induced selectivity enhancement of CAU-10-PDC membrane for H_2/CH_4 and CO_2/CH_4 separation, *J. Membr. Sci. Lett.*, 2021, 1, 100005.

37. Chiou, Da-Shiuan; Chuang, Yu-Chun; Chang, Chung-Kai; Hsu, Cheng-Hsun; Lin, Li-Chiang; **Kang, Dun-Yen**, X-ray diffraction for probing free energy profiles and self-diffusivity of gases in metal-organic frameworks, *crystengcomm*, 24(36),6302-6308, 2022

38. Hu, Tsai-Ning; Hsu, Cheng-Hsun; Chiou, Da-Shiuan; **Kang, Dun-Yen**; Luo, Shyh-Chyang, CAU-10-H as efficient water sorbent for solar steam generation, *Journal Of The Taiwan Institute Of Chemical Engineers*, 141, 2022

39. **Kang, Dun-Yen**; Lee, Jong Suk; Lin, Li-Chiang, X-ray Diffraction and Molecular Simulations in the Study of Metal-Organic Frameworks for Membrane Gas Separation, *Langmuir*, 38(31),9441-9453, 2022

40. Yu, Hyun Jung; Chiou, Da-Shiuan; Hsu, Cheng-Hsun; Tsai, Hsin-Yu; Kan, Ming-Yang; Lee, Jong Suk; **Kang, Dun-Yen**, Engineering CAU-10-H in the preparation of mixed matrix membranes for gas separation, *Journal Of Membrane Science*, 663, 2022

41. Lai, Jun-Yu; Wang, Ting-Yuan; Zou, Changlong; Chen, Jiun-Jen; Lin, Li-Chiang; **Kang, Dun-Yen**, Highly-selective MOF-303 membrane for alcohol dehydration, *Journal Of Membrane Science*, 661, 2022

42. Usman, Muhammad; Yang, An-Chih; Inamdar, Arif I.; Kamal, Saqib; Hsu, Ji-Chiang; **Kang, Dun-Yen**; Tseng, Tien-Wen; Hung, Chen-Hsiung; Lu, Kuang-Lieh, Thin Film Growth of 3D Sr-based Metal-Organic Framework on Conductive Glass via Electrochemical Deposition, *chemistryopen*, 11(2), 2022

Conference Papers

1. **Kang, D.-Y.**, "Wet Deposition of Inorganic Nanoporous Thin Films", Japan-Taiwan International Engineering Forum, Tokyo Japan, 2017(Mar), (Invited Speaker)

2. **Kang, D.-Y.**, "Microwave-Assisted Synthesis of Inorganic Nanomaterials", CEM Workship, Taipei Taiwan, 2017(May), (Invited Speaker)

3. **Kang, D.-Y.**, "Wet Deposition of Inorganic Nanoporous Thin Films", KIChE Fall Meeting, Daejeon Korea, 2017(Oct), (Invited Speaker)

4. **Kang, D.-Y.**, "Metal-Organic Frameworks as Membrane Adsorber for Water Treatment", IUMRS-ICA, Taipei Taiwan, 2017(Nov)

5. **Kang, D.-Y.**, "Metal-organic framework membranes for liquid-phase and gas-phase separations", Symposium on Advanced Drying Techniques, ITRI Hsinchu Taiwan, 2018, (Invited Speaker)

6. **Kang, D.-Y.**, "Wet Deposition of Nanoporous Thin Films", 7th Summer Course and Workshop on Emergent Functional Matter Science, Hsinchu Taiwan, 2018(Jun), (Invited Speaker)

7. **Kang, D.-Y.**, "Metal-organic framework membranes for liquid-phase and gas-phase separations", Summer Workshop of KIChE, Cheonan Korea, 2018(Oct), (Invited Speaker)

8. **Kang, D.-Y.**, "MOF and Zeolite Membranes: Fabrication and Applications", Annual Meeting of Taiwan Filtration and Separations, Taipei Taiwan, 2019(May), (Invited Speaker)

9. **Kang, D.-Y.**, "Influence of Structural Flexibility of MOF Membranes on Molecular Transport Properties", International Membrane Conference in Taiwan (IMCT), Taipei Taiwan, 2019(Jun), (Invited Speaker)

10. **Kang, D.-Y.**, "Effects of Framework Flexibility and Aperture Size of Metal-Organic Frameworks on Molecular Transport in Membranes", 12th Conference of the Aseanian Membrane Society, Jeju Korea, 2019(Jul), (Invited Speaker)

11. **Kang, D.-Y.**, "Zeolite/MOF membranes for antifogging coating and molecular separations", KIChE Annual Meeting, Daejeon Korea, 2019(Oct), (Invited Speaker)

12. **Kang, D.-Y.**, "Emerging Applications of Zeolite/Ceramic Nanotube Thin Films and MOF Membranes for Gas Separations", International Symposium on Porous Materials, Tokyo Japan, 2019(Nov), (Invited Speaker)

13. **Kang, D.-Y.,** Rational engineering of metal-organic framework membranes for gas separation - a combination of computational and experimental approach, Pacifichem, online 2021 (Dec) (Invited Speaker)

14. **Kang, D.-Y.**, MOF membranes for gas separations: recent advancement, IChES, online, 2022 (Mar), (Invited Speaker)

15. **Kang, D.-Y.** (Keynote Speaker), MOF membranes for gas separation and pervaporation, AMS annual meeting, online, 2022 (Jul.), (Invited Speaker)

Patents

1. Nair, S; **Kang, D.-Y.**; Brunelli, B.A.; Jones, "Functionalized Single-Walled Nanotubes and Methods Thereof", US Patent, 2016, #9290381 3.

2. Nair, S; **Kang, D.-Y.**; Jones, C.W., "Single-Walled Metal Oxide and Metal Sulphide Nanotubes/Polymer Composites", US Patent, 2015, #9174842

3. **Kang, D.-Y.**; Nair, S; Jones, C.W., "Single-Walled Metal Oxide Nanotubes", US Patent #8637693

Honors and Others

1. 2023 國科會 傑出研究獎

2. 2022, 2021, 2020, 2019, 2018, 2016 台大教學優良獎

3. 2021 台灣化工學會 李長榮學術研究傑出青年教授獎

4. 2021 傑出發展人才基金會 年輕學者創新獎

5. 2020 日本化工學會(SCEJ)傑出亞洲研究員暨工程師獎

6. 2019 科技部 吳大猷先生紀念獎

7. 2019 科技部年輕學者養成計畫-哥倫布計畫得主

8. 2019 台大優良導師獎

9. 2018 化工系優良導師獎

10. 2016 台灣化工學會學術勵進獎

11. 2016 發表論文獲選刊登於CrystEngComm、ChemNanoMat期刊封面

12. 2015-2018 科技部優秀年輕學者計畫

13. 2014 IUMRS-ICA Young Scientist Award – Gold Award

14. 2013-2014 科技部新聘特殊優秀人才獎勵