

Kang, Dun-Yen (康敦彥)

Associate 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. A. C. Yang, C. H. Liu and **D. Y. Kang**, "Estimations of effective diffusivity of hollow fiber mixed matrix membranes", *Journal of Membrane Science*, 495, 269-275, 2015(Dec), (SCI,EI)
2. W. C. Lee, H. T. Chien, Y. Lo, H. C. Chiu, T. P. Wang and **D. Y. Kang**, "Synthesis of Zeolitic Imidazolate Framework Core-Shell Nanosheets Using Zinc-Imidazole Pseudopolymorphs", *Acs Applied Materials & Interfaces*, 7(33), 18353-18361, 2015(Aug), (SCI,EI)
3. H. T. Chien, M. C. Chen, P. S. Huang, J. Y. Lai, C. C. Hsu and **D. Y. Kang**, "Reactive atmospheric pressure plasma for highly efficient removal of structure-directing agents from zeolite thin films", *Chemical Communications*, 51(73), 13910-13913, 2015, (SCI,EI)
4. **D. Y. Kang**, K. H. Liou and W. L. Chang, "Investigating Friction as a Main Source of Entropy Generation in the Expansion of Confined Gas in a Piston-and-Cylinder Device", *Journal of Chemical Education*, 92(10), 1667-1671, 2015(Oct), (SCI)
5. K. H. Liou, N. T. Tsou and **D. Y. Kang**, "Relationships among the structural topology, bond strength, and mechanical properties of single-walled aluminosilicate nanotubes", *Nanoscale*, 7(39), 16222-16229, 2015, (SCI,EI)
6. V. Mukundam, K. Dhanunjayarao, C. N. Chuang, **D. Y. Kang**, M. K. Leung, K. H. Hsieh and K. Venkatasubbaiah, "Design, synthesis, photophysical and electrochemical properties of 2-(4,5-diphenyl-1-p-aryl-1H-imidazol-2-yl)phenol-based boron complexes", *Dalton Transactions*, 44(22), 10228-10236, 2015, (SCI,EI)
7. **D. Y. Kang**, M. E. Lydon, G. I. Yucelen, C. W. Jones and S. Nair, "Solution-Processed Ultrathin Aluminosilicate Nanotube-Poly(vinyl alcohol) Composite Membranes with Partial Alignment of Nanotubes", *Chemnanomat*, 1(2), 102-108, 2015(Jun), (SCI,EI)
8. T. P. Wang and **D. Y. Kang**, "Predictions of effective diffusivity of mixed matrix membranes with tubular fillers", *Journal of Membrane Science*, 485, 123-131, 2015(Jul), (SCI,EI)
9. C. H. Lam, A. C. Yang, H. Y. Chi, K. Y. Chan, C. C. Hsieh and **D. Y. Kang**, "Microwave-Assisted Synthesis of Highly Monodispersed Single-Walled Aluminosilicate Nanotubes", *Chemistryselect*, 1(19), 6212-6216, 2016(Nov)

10. A. C. Yang, Y. S. Li, C. H. Lam, H. Y. Chi, I. C. Cheng and **D. Y. Kang**, "Solution-processed ultra-low-k thin films comprising single-walled aluminosilicate nanotubes", *Nanoscale*, 8(40), 17427-17432, 2016, (SCI)
11. Y. Lo, C. H. Lam, C. W. Chang, A. C. Yang and **D. Y. Kang**, "Polymorphism/pseudopolymorphism of metalorganic frameworks composed of zinc(II) and 2methylimidazole: synthesis, stability, and application in gas storage", *Rsc Advances*, 6(92), 89148-89156, 2016, (SCI)
12. M. J. Chen, A. C. Yang, N. H. Wang, H. C. Chiu, Y. L. Li, **D. Y. Kang** and S. L. Lo, "Influence of crystal topology and interior surface functionality of metal-organic frameworks on PFOA sorption performance", *Microporous and Mesoporous Materials*, 236, 202-210, 2016(Dec), (SCI)
13. T. P. Wang and **D. Y. Kang**, "cif2tube-Algorithm for constructing nanotube and nanoscroll models from crystallographic information files", *Journal of the Taiwan Institute of Chemical Engineers*, 68, 415-422, 2016(Nov), (SCI,EI)
14. C. C. Chiang, C. Y. Su, A. C. Yang, T. Y. Wang, W. Y. Lee, C. C. Hua and **D. Y. Kang**, "Relationships between the solution and solid-state properties of solution-cast low-k silica thin films", *Physical Chemistry Chemical Physics*, 18(30), 20371-20380, 2016(Aug), (SCI,EI)
15. Kang, D.-Y., Liou and K.-H., "Critical Role of Control Volume in Thermodynamics Education for the Analysis of Energy and Entropy Balance", *Academia Journal of Scientific Research*, 4(4), 85-92, 2016(Apr)
16. Y. Lo and **D. Y. Kang**, "Pseudopolymorphic seeding for the rational synthesis of hybrid membranes with a zeolitic imidazolate framework for enhanced molecular separation performance", *Journal of Materials Chemistry A*, 4(11), 4172-4179, 2016, (SCI,EI)
17. Liou, K.-H., Kang and D.-Y., "Defective Single-Walled Aluminosilicate Nanotubes: Structural Stability and Mechanical Properties", *ChemNanoMat*, 2(3), 189-195, 2016(Mar), Outside Front Cover
18. A. C. Yang, T. Y. Wang, C. A. Dai and **D. Y. Kang**, "Incorporation of single-walled aluminosilicate nanotubes for the control of crystal size and porosity of zeolitic imidazolate framework-L", *Crystengcomm*, 18(6), 881-887, 2016, (SCI), Outside Front Cover
19. T. P. Wang and **D. Y. Kang**, "Highly selective mixed-matrix membranes with layered fillers for molecular separation", *Journal of Membrane Science*, 497, 394-401, 2016(Jan)
20. 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
21. 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)
22. 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)

23. 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)
24. 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)
25. 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)
26. 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)
27. 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)
28. 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)
29. 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)
30. 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)
31. 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)
32. 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)
33. 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)
34. 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)
35. 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)
36. 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)
37. 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)
38. 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)
39. 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)
40. 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)

Conference Papers

1. **Kang, D.-Y.**, "Ultra Nanotube Composite Membranes for Molecular Separations", NTU-NIMS Workshop 2015, Nantou Taiwan, 2015(Jun), (Invited Speaker)
2. **Kang, D.-Y.**, and Liou, K.-H., "Rational Engineering Metal Oxide Nanotubes", International Conference on Nanospace Materials, Taipei Taiwan, 2015(Jun), (Invited Speaker)
3. **Kang, D.-Y.**, "Ultra Thin Nanotube Composite Membranes for Molecular Separations", The 9th Conference of Aseanian Membrane Society, Taipei Taiwan, 2015(Jul)
4. **Kang, D.-Y.**, "Facile Removal of Structure Directing Agent from Zeolite Membranes Using Atmospheric Pressure Plasma Jet", Sol-Gel 2015, Kyoto Japan, 2015(Sep)
5. **Kang, D.-Y.**, "Mechanical Properties of Single-Walled Aluminosilicate Nanotubes", 1st Computational Mechanics Conference in Taiwan, Taipei Taiwan, 2015(Oct), (Keynote Speaker)
6. **Kang, D.-Y.**, "Estimations of Effective Diffusivity of Various Types of Mixed Matrix Membranes", TwIChE Annual Meeting 2015, Kaohsiung Taiwan, 2015(Nov), (Invited Speaker)
7. **Kang, D.-Y.** and Lo, Y., "ZIF-ZIF Hybrid Membranes for Hydrogen Purification", 12th World Filtration Congress 2016, Taipei Taiwan, 2016(Apr), (Invited Speaker)
8. **Kang, D.-Y.** and Lo, Y., "Hybrid ZIF Membranes with Enhanced Hydrogen Separation Performance", International Membrane Conference in Taiwan 2016, Chungli Taiwan, 2016(May), (Invited Speaker)
9. **Kang, D.-Y.**, "Emerging methods for fabrication of MOF, zeolite, and nanotube membranes", 7th International Symposium on Inorganic Membranes 2016, Tokyo Japan, 2016(Jul), (Invited Speaker)

10. **Kang, D.-Y.**, "Hybrid Zeolite Imidazolate Framework Thin Films for Gas Separations", Advances in Functional Materials 2016, Jeju Korea, 2016(Aug)
11. **Kang, D.-Y.**, "Direct Deposition of Inorganic Nanoporous Thin Films for Applications in Electronics", 7th International Zeolite Membrane Meeting 2016, Dalian China, 2016(Aug)
12. **Kang, D.-Y.**, "Simulations of Transport Phenomena Using COMSOL Multiphysics – Class Projects", COMSOL Multiphysics Conference 2016, Taipei Taiwan, 2016(Nov), (Invited Speaker)
13. **Kang, D.-Y.**, "Wet Deposition of Inorganic Nanoporous Thin Films", Japan-Taiwan International Engineering Forum, Tokyo Japan, 2017(Mar), (Invited Speaker)
14. **Kang, D.-Y.**, "Microwave-Assisted Synthesis of Inorganic Nanomaterials", CEM Workshop, Taipei Taiwan, 2017(May), (Invited Speaker)
15. **Kang, D.-Y.**, "Wet Deposition of Inorganic Nanoporous Thin Films", KICHe Fall Meeting, Daejeon Korea, 2017(Oct), (Invited Speaker)
16. **Kang, D.-Y.**, "Metal-Organic Frameworks as Membrane Adsorber for Water Treatment", IUMRS-ICA, Taipei Taiwan, 2017(Nov)
17. **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)
18. **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)
19. **Kang, D.-Y.**, "Metal-organic framework membranes for liquid-phase and gas-phase separations", Summer Workshop of KICHe, Cheonan Korea, 2018(Oct), (Invited Speaker)
20. **Kang, D.-Y.**, "MOF and Zeolite Membranes: Fabrication and Applications", Annual Meeting of Taiwan Filtration and Separations, Taipei Taiwan, 2019(May), (Invited Speaker)
21. **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)
22. **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)
23. **Kang, D.-Y.**, "Zeolite/MOF membranes for antifogging coating and molecular separations", KICHe Annual Meeting, Daejeon Korea, 2019(Oct), (Invited Speaker)
24. **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)

Honors and Others

1. 2019 科技部年輕學者養成計畫-哥倫布計畫得主
2. 2019 台大優良導師獎
3. 2018 化工系優良導師獎
4. 2019 台大教學優良獎
5. 2018 台大教學優良獎
6. 2016 台大教學優良獎
7. 2016 台灣化工學會學術勵進獎
8. 2016 發表論文獲選刊登於CrystEngComm、ChemNanoMat期刊封面
9. 2015-2018 科技部優秀年輕學者計畫
10. 2014 IUMRS-ICA Young Scientist Award – Gold Award
11. 2013-2014 科技部新聘特殊優秀人才獎勵

