

**Sheng, Yu-Jane** ( 謹玉真 )

Professor

B.S. in Chemical Engineering

National Taiwan University, 1986

M.S. in Chemical Engineering

National Taiwan University, 1988

Ph.D. in Chemical Engineering

Cornell University, 1995

Postdoctoral Research Associate

Department of Physics

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#### **Research and Professional Interests**

Molecular simulations of the thermophysical properties of polymers and composites

Development of statistical mechanics-based equation of state for polyatomic molecules

Studies of the dynamical properties of polymers in dilute solutions

Topological effects on the relaxation dynamics of knotted polymers

#### **Journal Papers**

1. Y. L. Yang, M. Y. Chen, H. K. Tsao and **Y. J. Sheng**, "Dynamics of bridge-loop transformation in a membrane with mixed monolayer/bilayer structures", *Physical Chemistry Chemical Physics*, 20(9), 6582-6590, 2018(Mar), (SCI,EI)
2. V. Singh, C. J. Huang, **Y. J. Sheng** and H. K. Tsao, "Smart zwitterionic sulfobetaine silane surfaces with switchable wettability for aqueous/nonaqueous drops", *Journal of Materials Chemistry A*, 6(5), 2279-2288, 2018(Feb), (SCI,EI)
3. Y. H. Weng, Y. E. Liang, **Y. J. Sheng** and H. K. Tsao, "Controlling Nanodrop Passage through Capillary Nanovalves by Adjusting Lyophilic Crevice Structure", *Journal of Physical Chemistry C*, 122(4), 2231-2237, 2018(Feb), (SCI,EI)
4. Z. J. Wang, Y. F. Chen, H. Y. Chen, **Y. J. Sheng** and H. K. Tsao, "Mechanical pressure; surface excess; and polar order of a dilute rod-like nanoswimmer suspension: role of swimmer-wall interactions", *Soft Matter*, 14(15), 2906-2914, 2018(Apr), (SCI,EI)
5. V. Singh, **Y. J. Sheng** and H. K. Tsao, "Facile fabrication of superhydrophobic copper mesh for oil/water separation and theoretical principle for separation design", *Journal of the Taiwan Institute of Chemical Engineers*, 87, 150-157, 2018(Jun), (SCI,EI)
6. Y. F. Chen, Z. J. Wang, K. C. Chu, H. Y. Chen, **Y. J. Sheng** and H. K. Tsao, "Hydrodynamic interaction induced breakdown of the state properties of active fluids", *Soft Matter*, 14(25), 5319-5326, 2018(Jul), (SCI,EI)
7. Y. H. Weng, H. K. Tsao and **Y. J. Sheng**, "Self-healing and dewetting dynamics of a polymer nanofilm on a smooth substrate: strategies for dewetting suppression", *Physical Chemistry Chemical Physics*, 20(31), 20459-20467, 2018(Aug), (SCI,EI)
8. V. Singh, T. P. Nguyen, **Y. J. Sheng** and H. K. Tsao, "Stress-Driven Separation of Surfactant-Stabilized Emulsions and Gel Emulsions by Superhydrophobic/Superoleophilic Meshes", *Journal of Physical Chemistry C*, 122(43), 24750-24759, 2018(Nov), (SCI,EI)
9. Y. L. Yang, **Y. J. Sheng** and H. K. Tsao, "Branching pattern effect and co-assembly with

- lipids of amphiphilic Janus dendrimersomes", *Physical Chemistry Chemical Physics*, 20(43), 27305-27313, 2018(Nov), (SCI,EI)
10. S. W. Hu, C. Y. Huang, H. K. Tsao and **Y. J. Sheng**, "Hybrid membranes of lipids and diblock copolymers: From homogeneity to rafts to phase separation", *Physical Review E*, 99(1), 12403, 2019(Jan), (SCI,EI)
  11. K. C. Chu, H. K. Tsao and **Y. J. Sheng**, "Penetration dynamics through nanometer-scale hydrophilic capillaries: Beyond Washburn's equation and extended menisci", *Journal of Colloid and Interface Science*, 538, 340-348, 2019(Mar), (SCI,EI)
  12. Y. L. Yang, **Y. J. Sheng** and H. K. Tsao, "Hybridization of lipids to monolayer and bilayer membranes of triblock copolymers", *Journal of Colloid and Interface Science*, 544, 53-60, 2019(May), (SCI,EI)
  13. Y. L. Yang, **Y. J. Sheng** and H. K. Tsao, "Bilayered membranes of Janus dendrimers with hybrid hydrogenated and fluorinated dendrons: microstructures and coassembly with lipids", *Physical Chemistry Chemical Physics*, 21(28), 15400-15407, 2019(Jul), (SCI,EI)
  14. Y. H. Weng, H. K. Tsao and **Y. J. Sheng**, "Patterning Dewetting and Self-Healing of Polymer Nanofilms on a Brush Layer", *Journal of Physical Chemistry C*, 123(6), 3560-3567, 2019(Feb), (SCI,EI)
  15. V. Singh, **Y. J. Sheng** and H. K. Tsao, "Self-healing atypical liquid-infused surfaces: Superhydrophobicity and superoleophobicity in submerged conditions", *Journal of the Taiwan Institute of Chemical Engineers*, 97, 96-104, 2019(Apr), (SCI,EI)
  16. Y. S. Peng, Z. J. Wang, K. C. Chu, **Y. J. Sheng** and H. K. Tsao, "Favorable partition of nanoswimmers toward a confined slit", *Physical Review E*, 100(4), 2019(Oct), (SCI,EI)
  17. Y. E. Liang, I. K. Maharsih, **Y. J. Sheng** and H. K. Tsao, "Capillary interactions between droplets and ideal roughness: Attractive protrusion and repulsive trench", *Experimental Thermal and Fluid Science*, 105, 216-222, 2019(Jul), (SCI,EI)
  18. S. W. Hu, C. Y. Wang, **Y. J. Sheng** and H. K. Tsao, "Peculiar Wetting of N,N-Dimethylformamide: Expansion; Contraction; and Self-Running", *Journal of Physical Chemistry C*, 123(40), 24477-24486, 2019(Oct), (SCI,EI)
  19. K. C. Chu, S. W. Hu, H. K. Tsao and **Y. J. Sheng**, "Strong competition between adsorption and aggregation of surfactant in nanoscale systems", *Journal of Colloid and Interface Science*, 553, 674-681, 2019(Oct), (SCI,EI)
  20. K. W. Teng, S. H. Tu, S. W. Hu, Y. X. Huang, **Y. J. Sheng** and H. K. Tsao, "Abnormal redeposition of silicate from Si<sub>3</sub>N<sub>4</sub> etching onto SiO<sub>2</sub> surfaces in flash memory manufacturing", *Journal of Materials Science*, 55(3), 1126-1135, 2020(Jan), (SCI,EI)
  21. K. C. Chu, **Y. J. Sheng** and H. K. Tsao, "Pressure-gated Capillary Nanovalves Based on Liquid Nanofilms", *Journal of Colloid and Interface Science*, 560, 485-491, 2020(Feb), (SCI,EI)
  22. S. W. Hu, V. Singh, **Y. J. Sheng** and H. K. Tsao, "Facilely-Fabricated Smart Hydroxyl-Surfaces with Rapidly Switchable Wettability for Water and Oil : Reversibility between Superoleophilicity and Near Superoleophobicity", *Journal of the Taiwan Institute of Chemical Engineers*, 107, 182-188, 2020, (SCI,EI).

23. Y. L. Yang, H. K. Tsao and **Y. J. Sheng**, "Morphology and Wetting Stability of Nanofilms of ABC Miktoarm Star Terpolymers", *Macromolecules*, 53, 594-601, 2020, (SCI,EI).
24. Thao Phuong Nguyen, Ssu-Wei Hu, **Y. J. Sheng**, and Heng-Kwong Tsao, "Scanty-water Oil-in-water Emulsion Glasses Synthesized through a Low-energy Process: Nucleation and Growth Mechanism", *J. Taiwan Inst. Chem. E.*, 109, 129-136, 2020, (SCI, EI)
25. Hsiang-Chi Tsai, Yan-Ling Yang, **Y. J. Sheng** and Heng-Kwong Tsao "Formation of Asymmetric and Symmetric Hybrid Membranes of Lipids and Triblock Copolymers", *Polymers*, 12, 639, 2020, (SCI, EI)
26. Ssu-Wei Hu, Pin-Jung Sung, Thao Phuong Nguyen, **Y. J. Sheng**, and Heng-Kwong Tsao, "UV-resistant Self-healing Emulsion Glass as a New Liquid-like Solid Material for 3D Printing", *ACS Applied Materials & Interfaces*, 12(21), 24450-24457, 2020 (May), (SCI, EI)
27. Ying-Shuo Peng, **Y. J. Sheng**, and Heng-Kwong Tsao, "Partition of nanoswimmers between two immiscible phases: soft and penetrable boundary", *Soft Matter*, 16, 5054-5061, 2020 (May), (SCI, EI)
28. Yu-Ting Cheng, Kang-Ching Chu, Heng-Kwong Tsao and **Y. J. Sheng** "Size-dependent behavior and failure of Young's equation for wetting of two-component nanodroplets", *J. Colloid Interface Sci.* 578, 69-76, 2020, (SCI, EI)
29. Wan-Ju Liao, Kang-Ching, Chu, Yu-Hao, Tsao, Heng-Kwong Tsao and **Y. J. Sheng** "Size-dependence and interfacial segregation in nanofilm and nanodroplet of homologous polymer blends," *Phys. Chem. Chem. Phys.*, 22, 21801-21808, 2020, (SCI, EI)
30. Thao Phuong Nguyen, Ssu-Wei Hu, Yu-Jung Lin, **Y. J. Sheng**, and Heng-Kwong Tsao "Coexistence of liquid-like emulsion and solid-like emulsion glass beyond the close-packing limit," *J. Taiwan Inst. Chem. E.*, 115, 28-34, 2020, (SCI, EI)
31. Ting-Ya Wang, Heng-Kwong Tsao and **Y. J. Sheng** "Perforated Vesicles of ABA Triblock Copolymers with ON/OFF-Switchable Nanopores," *Macromolecules*, 53, 10582-10590, 2020, (SCI, EI)
32. Yan-Ling Yang, Heng-Kwong Tsao and **Y. J. Sheng** "Molecular structure incorporated deep learning approach for the accurate interfacial tension predictions," *J. Mol. Liq.* 323, 114571, 2021, (SCI, EI)
33. Ssu-Wei Hu, Kuan-Yu Chen, **Y. J. Sheng**, and Heng-Kwong Tsao, "Directed self-propulsion of droplets on surfaces absent of gradients for cargo transport," *J. Colloid Interface Sci.* 586, 469-478, 2021, (SCI, EI)
34. Hsin-Yu Chang, Hsiang-Chi Tsai, **Y. J. Sheng** and Heng-Kwong Tsao, "Floating and Diving Loops of ABA Triblock Copolymers in Lipid Bilayers and Stability Enhancement for Asymmetric Membranes," *Biomacromolecules*, 22, 494-503, 2021, (SCI, EI)
35. Yi-Ting Cheng, Heng-Kwong Tsao and **Yu-Jane Sheng** "Non-affinity adsorption of nanorods onto smooth walls with entropy driven mechanism," *Soft Matter*, 17, 5756 - 5762 (June, 2021) (SCI, EI).

36. Hsin-Yu Chang, Po-Hao Chiu, Heng-Kwong Tsao and **Yu-Jane Sheng** “Strengthening mechanism of mechanical properties of graft copolymers with incompatible pendant groups: nano-cluster and weak cross-linking,” *Soft Matter*, 17, 5730 - 5737 (June, 2021) (SCI, EI).
37. Po-Hao Chiu, Yan-Lin Yang, Heng-Kwong Tsao, and **Yu-Jane Sheng** “Deep Learning for Predictions of Hydrolysis Rates and Conditional Molecular Design of Esters”, *J. Taiwan Inst. Chem. E.*, 126, 1-13 (2021) (SCI, EI).
38. Yu-Hao Tsao, Ting-Ya Wang, Heng-Kwong Tsao and **Yu-Jane Sheng**, “Thermally assisted mobility of nanodroplets on surfaces with weak defects,” *J. Colloid Interface Sci.* 604, 150-156 (2021) (SCI, EI).
39. ZhengjiaWang, Kang-Ching Chu, Heng-Kwong Tsao and **Yu-Jane Sheng**, “Preferred penetration of active nano-rods into narrow channels and their clustering,” *Phys. Chem. Chem. Phys.*, 23, 16234-16241 (2021) (SCI, EI).
40. Yi-Ting Cheng, Heng-Kwong Tsao and **Yu-Jane Sheng**, “Interfacial assembly of nanorods: smectic alignment and multilayer stacking,” *Nanoscale*, 13, 14236-14244 (2021) (SCI, EI).
41. Kang-Ching Chu, Heng-Kwong Tsao, and **Yu-Jane Sheng**, “Spontaneous spreading of nanodroplets on partially wetting surfaces with continuous grooves: synergy of imbibition and capillary condensation”, *J. Mol. Liq.* 339, 117270 (2021) (SCI, EI).
42. Trung Hieu Vo, Phuc Khanh Lam, **Yu-Jane Sheng** and Heng-Kwong Tsao “Amphibious superamphiphilic polystyrene monolith with underwater superoleophilicity: capture of underwater oil,” *Appl. Surf. Sci.* 570, 151142 (2021) (SCI, EI).
43. Guan-Yu He, Heng-Kwong Tsao, and **Yu-Jane Sheng** “Imbibition dynamics in an open-channel capillary with holes,” *J. Mol. Liq.* 349, 118117 (2022) (SCI, EI).
44. Yu-Ming Huang, **Yu-Jane Sheng**, Heng-Kwong Tsao “Peculiar encounter between self-propelled droplet and static droplet: swallow, rerouting, and recoil,” *J. Mol. Liq.* 347, 118378 (2022) (SCI, EI).
45. Ting-Ya Wang, Hsin-Yu Chang, Guan-Yu He, Heng-Kwong Tsao, and **Yu-Jane Sheng**, “Anomalous spontaneous capillary flow of water through graphene nanoslits: channel width-dependent density,” *J. Mol. Liq.* 352, 118701 (2022) (SCI, EI).
46. Karthik Nuthalapati, **Yu-Jane Sheng**, Heng-Kwong Tsao, “Anomalous interfacial dynamics of pendant droplets of N,N-dimethylformamide containing Silwet, ” *J. Taiwan Inst. Chem. E.*, 133, 104282 (2022) (SCI, EI).
47. Kang-Ching Chu, Yu-Hao Tsao, Heng-Kwong Tsao and **Yu-Jane Sheng**, “Spontaneous formation of nanopores within a nanofilm: phase diagram and multiple stable states,” *J. Mol. Liq.* 360, 119541 (2022) (SCI, EI).
48. Karthik Nuthalapati, **Yu-Jane Sheng**, Heng-Kwong Tsao, “Abnormal wetting dynamics of Silwet-laden droplets on partially wetting substrates,” *Colloids Surf. A Physicochem. Eng. Asp.*, 648, 129381 (2022) (SCI, EI).
49. Hsin-Yu Chang, **Yu-Jane Sheng** and Heng-Kwong Tsao “Packing microstructures and thermal properties of compressed emulsions: effect of droplet size,” *J. Mol. Liq.* 364,

120025 (2022) (SCI, EI).

50. Yueh-Chi Tseng, Hsin-Yu Chang, **Yu-Jane Sheng** and Heng-Kwong Tsao "Atypical vesicles and membranes with monolayer and multilayer structures formed by graft copolymers with diblock side-chains: nonlamellar structure and curvature-enhanced permeability," *Soft Matter* 18, 7559 (2022) (SCI, EI).
51. Guan-Yu He, Heng-Kwong Tsao, and **Yu-Jane Sheng** "Wicking dynamics into two-rail open channel with periodical branches," *Phys. Fluids* 34, 102004 (2022) (SCI, EI).
52. Yi-Ting Cheng, Hsin-Yu Chang, Heng-Kwong Tsao, **Yu-Jane Sheng** "Imbibition dynamics and steady flows in graphene nanochannels with sparse geometric and chemical defects," *Phys. Fluids* 34, 112003 (2022) (SCI, EI).
53. Hsin-Jou Huang, Karthik Nuthalapati, **Yu-Jane Sheng**, Heng-Kwong Tsao, "Precursor film of self-propelled droplets: inducing motion of a static droplet," *J. Mol. Liq.* 368, 120729 (2022) (SCI, EI).
54. Yen-Chih Chiu, Trung Hieu Vo, **Yu-Jane Sheng**, Heng-Kwong Tsao, "Spontaneous formation of microgels for 3D printing supporting medium," *ACS Appl. Polym. Mater.* 5, 764-774 (2023) (SCI, EI).
55. Wen-Zhen Hsieh, Yu-Hao Tsao, Heng-Kwong Tsao, **Yu-Jane Sheng** "Diverse wetting behavior of a binary mixture of antagonist liquids: nanodroplet with finite precursor film and leak-out phenomenon" *J. Mol. Liq.* 372, 121197 (2023) (SCI, EI).
56. Karthik Nuthalapati, **Yu-Jane Sheng**, Heng-Kwong Tsao "Atypical wetting behavior of binary mixtures of partial and total wetting liquids: leak-out phenomena" *Colloids Surf. A: Physicochem. Eng. Asp.* 666, 131299 (2023).
57. Karthik Nuthalapati, **Yu-Jane Sheng**, Heng-Kwong Tsao "Evaporation-driven directed motion of droplets on the glass" *Surf. Interfaces* in press (2023) (SCI, EI).
58. Hsin-Yu Chang, Heng-Kwong Tsao, **Yu-Jane Sheng** "Solid-like elastic behavior of nanosized concentrated emulsions: size-dependent Young's and bulk moduli" *J. Mol. Liq.* in press (2023) (SCI, EI).

### Conference Papers

1. **Yu-Jane Sheng**, "Controlling Nanodrop Passage through Capillary Nanovalves by Adjusting Lyophilic Crevice Structure", 32st Conference of The European Colloid and Interface Society (ECIS 2018), Ljubljana Slovenia, 2018(Sep)
2. **Yu-Jane Sheng**, "Smart Zwitterionic Sulfobetaine Silane Surfaces with Switchable Wettability for Aqueous/Nonaqueous Drops", 32st Conference of The European Colloid and Interface Society (ECIS 2018), Ljubljana Slovenia, 2018(Sep)
3. **Yu-Jane Sheng**, "Active particles in confined space.", 2018 台灣化學工程學會 65 週年年會暨科技部化學工程學門成果發表會., 雲林科技大學, Taiwan, 2018(Nov)
4. **Yu-Jane Sheng**, "Hybridization of Lipids to Monolayer and Bilayer Membranes of Triblock Copolymers", 10th Triennial Congress of the International Society for Theoretical Chemical Physics, 挪威特羅姆瑟, 2019(Jul)

5. **Yu-Jane Sheng**, "Partition of nanoswimmers between two immiscible phases: soft and penetrable boundary", 2019 台灣化學工程學會 66 週年年會暨科技部化學工程學門成果發表會, 東海大學, 2019(Nov)
6. **Yu-Jane Sheng**, "Strengthening mechanism of mechanical properties of graft copolymers with incompatible pendant groups: nano-cluster and weak cross-linking," 2020 界面研討會(2020 年 07 月 31 日 · 國立台灣大學鄭江樓)
7. **Yu-Jane Sheng**, "Perforated Vesicles of ABA Triblock Copolymers with ON/OFF-Switchable Nanopores," 台灣化學工程學會 67 週年年會暨科技部化學工程學門成果發表會。2020 年 10 月 23 日-10 月 24 日 · 清華大學。
8. **Yu-Jane Sheng**, "Strengthening mechanism of mechanical properties of graft copolymers with incompatible pendant groups: nano-cluster and weak cross-linking," 台灣化學工程學會 67 週年年會暨科技部化學工程學門成果發表會。2020 年 10 月 23 日-10 月 24 日 · 清華大學。
59. **Yu-Jane Sheng**, "Interfacial assembly of nanorods: smectic alignment and multilayer stacking," 台灣化學工程學會 67 週年年會暨科技部化學工程學門成果發表會。2022 年 1 月 6 日-1 月 7 日 · 高雄展覽館。
9. **Yu-Jane Sheng**, "Microstructural Dynamics of Asymmetric Polymer Membrane Formation Developed by Nonsolvent Induced Phase Separation" 台灣化學工程學會 69 週年年會暨科技部化學工程學門成果發表會/台、日、韓、捷化學工程國際研討會, 2022 年 12 月 2 日至 3 日台北淡江大學。
60. **Yu-Jane Sheng**, "Atypical vesicles and membranes with monolayer and multilayer structures formed by graft copolymers with diblock side-chains," 10th International Conference on Advanced Materials and Nanotechnology (AMN10), 2 月 7 日- 2 月 10 日 2023 年紐西蘭 Rotorua。
10. **Yu-Jane Sheng**, "Packing microstructures and thermal properties of compressed emulsions: effect of droplet size," 10th International Conference on Advanced Materials and Nanotechnology (AMN10), 2 月 7 日- 2 月 10 日 2023 年紐西蘭 Rotorua。

### Honors and Others

1. 張弘郁同學 (諶玉真教授指導) 2014 台灣化學工程學會 61 週年年會暨科技部化學工程學門成果發表會學生英語專題報告競賽優勝獎
2. 榮獲臺灣大學 106 學年度教學優良獎
3. "Structural and Mechanical Characteristics of Polymersomes," 獲選為 2014 年 Soft Matter 之 Highlight

4. 2014 台灣化學工程學會 61 週年年會暨科技部化學工程學門成果發表會海報評審委員
5. 熱力與界面領域之邀請演講者，化工年會，Nov. 6-7，高雄，台灣 (2015)
6. “Blending-induced helical morphologies of confined linear triblock copolymers,” 獲選為 2016 年「台灣化學工程學會傑出論文獎」
7. 獲得 2011-2017 年國立臺灣大學學術研究績效獎勵
8. 2016 Fall Progress in Mathematical and Computational Studies on Science and Engineering Problems, invited speaker. Nov. 30 – Dec. 2 (2016)
9. One of the top 100 reviewers for Langmuir in 2016
10. 獲得 2018-2023 年國立臺灣大學學術研究績效加給
11. 王亭雅同學 (湛玉真教授指導)台灣化學工程學會 67 週年年會暨科技部化工學門成果發表會在學生競賽-學生口頭(Oral)競賽獲得優等(Excellence award)

