Curriculum Vitae

Dr. Leiming Guo
Date of birth: 15/06/1988
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Affiliation: Physical Sciences and Engineering Division, KAUST Catalysis Center, King Abdullah University of Science and Technology (KAUST)

Working experience

- 05/2020 – present, postdoctoral fellow at KAUST
  Supervisor: Prof. Nikos Hadjichristidis
- 09/2017 – 10/2020, postdoctoral researcher at Universität Osnabrück, Germany
  Project: Insect-inspired capillary nanostamping (ERC-CoG-2014, project 646742 INCANA)
  Supervisor: Prof. Martin Steinhart

Education Background

- 09/2012 - 06/2017, Master-doctor combined program graduate student (recommended postgraduate without exams) at College of Chemical Engineering, Nanjing Tech University, China
  PhD thesis: Design, preparation and applications of homoporous membranes based on selective swelling-induced cavitation of block copolymers
  Supervisor: Prof. Yong Wang
- 02/2014 - 03/2014, Exchange to Universität Osnabrück supported by Research Group Linkage Programme funded by the Alexander von Humboldt foundation
- 09/2008 - 06/2012, Undergraduate student at College of Chemical Engineering, Nanjing Tech University, China

Research interest

- Design of topographical patterns in polymers for developing functional applications
- Construction of polymeric films having well-ordered nanopore geometries by self-assembly for membrane separation, sensing and *etc.*

Research Skill

- Design of varied patterns in porous polymers
- Annealing block copolymers for creating highly regular phase separation in their films
- Building ultrathin nanoporous membranes for ultrafiltration
- Up-scaling synthesis of low-cost and solvent-resistant phenolic membranes with gradient nanopores for separation
- Well hands-on training and capable of independent operation on several important characterization tools for materials science including: FESEM, AFM, spectroscopic ellipsometer, atomic layer deposition, contact angle goniometer, UV-vis absorption spectrometer, FTIR, XRD
- Setting up the device for molecular separation by nanoporous membranes

Publications

1. **L. Guo**,* Y. Wang*, M. Steinhart*. Porous block copolymer separation membranes for 21st century sanitation and hygiene. *Chemical Society Reviews*, 2021, DOI: 10.1039/d0cs00500b.
2. **L. Guo**,* J. Klein, J. Thien, J. Wollschläger, M. Steinhart.* Phenolic microdot arrays for multiple quartz crystal microbalance sensing. *In submission*.
3. **L. Guo**,* M. Philippi, J. Thien, J. Wollschläger, C. You,* J. Piehler, M. Steinhart,* Patterned breath figure arrays for fast printing of cells and functional nanoparticles. *In preparation*.
4. **L. Guo**,* M. Steinhart*. Highly ordered topographical surfaces from spongy block copolymer monoliths by capillary microstamping. *In preparation*.
5. X. Shi, L. Wang, N. Yan, Z. Wang, **L. Guo**, M. Steinhart, Y. Wang.* Fast evaporation enabled ultrathin polymer coatings on nanoporous substrates for highly permeable membranes. *The Innovation*, 2021, 2, 100088-100093.
6. **L. Guo**,* M Philippi, M. Steinhart.* Substrate patterning using regular macroporous block copolymer monoliths as sacrificial templates and as capillary microstamps. *Small*, 2018, 14, 1801452-1801458. (**Frontispiece**)

7. **L. Guo**,* M. Steinhart, Y. Yang, L. Zhu, Tailored pore gradient in phenolic membranes for adjustable permselectivity by leveraging different poloxamers. *Separation and Purification Technology*, 2020, 242, 116818-116826.
8. **L. Guo**, Z. Wang, Y. Wang.* Chapter 2: Selective Swelling of Block Copolymers for Porous Nanostructures in *World Scientific Reference of Hybrid Materials*. World Scientific Publishing Co, Singapore, 2019, 1, pp 45-117, DOI: 10.1142/9789813270527_0002.
9. **L. Guo**, Y. Yang, Y. Wang.* Single-step coating of polyethylenimine on gradient nanoporous phenolics for tight membranes with ultrahigh permeance. *Journal of Membrane Science*, 2019, 587, 117112-117118.
10. Q. Lan, Y. Yang, **L. Guo**, Y. Wang.* Gradient nanoporous phenolics filled in macroporous substrates for highly permeable ultrafiltration. *Journal of Membrane Science*, 2019, 576, 123-130.
11. J. Zhou, D. Sun, L. Wang, **L. Guo**, W. Chen, F. Yu, Y. Wang,* Y. Yang.* Two-dimensional superstructures filled into polysulfonemembranes for highly improved ultrafiltration: the case of cuprous iodide nanosheets. *Journal of Membrane Science*, 2019, 576, 142-149.
12. **L Guo**, Y Yang, F Xu, Q Lan, M Wei, Y Wang.* Design of gradient nanopores in phenolics for ultrafast water permeation. *Chemical Science*, 2019, 10, 2093-2100.
13. **L. Guo**,* Y. Yang, C. Yu. Facile synthesis of three-dimensional Au/C networks by directly carbonizing nanoporous block copolymers. *Materials Letters*, 2019, 253, 255-258.
14. **L. Guo**, Y. Wang.* Retarded evaporation-induced synthesis of lamellar block copolymer supramolecules for solvatochromic sensing. *Sensors and Actuators B: Chemical*, 2018, 277, 172-178.
15. **L. Guo**, Z. Wang, Y. Wang.* Perpendicular alignment and selective swelling-induced generation of homopores of polystyrene-*b*-poly(2-vinylpyridine)-*b*-poly(ethylene oxide) triblock terpolymer. *Macromolecules*, 2018, 51, 6248-6256.
16. **L. Guo**,[+] X. Wang,[+] Y. Wang,*. Facile synthesis of bimodal nanoporous carbons by templating selective swelling-induced mesoporous block copolymers. *Chemical Engineering Journal*, 2017, 313, 1295-1301. ([+] equal contribution)
17. **L. Guo**, Z. Zhong, Y. Wang.* Atomic layer deposition on block copolymer membranes with gyroidal nanopores toward periodically nanostructured vapor sensors: nanotubes versus nanorods. *Advanced Materials Interfaces*, 2016, 3, 1600017-1600025.
18. H. Yang, **L. Guo**, Z. Wang, N. Yan, Y. Wang.* Nanoporous films with superior resistance to protein adsorption by selective swelling of polystyrene-block-poly(ethylene oxide). *Industrial & Engineering Chemistry Research*, 2016, 55, 8133-8140.
19. **L. Guo**, L. Wang, Y. Wang.* Stretched homoporous composite membranes with elliptic nanopores for external-energy-free ultrafiltration. *Chemical Communications*, 2016, 52, 6899-6902.
20. **L. Guo**, Y. Wang.* Monolithic membranes with designable pore geometries and sizes via retarded evaporation of block copolymer supramolecules. *Macromolecules*, 2015, 48, 8471-8479.
21. X. Yao, **L. Guo**, X. Chen, J. Huang, M. Steinhart,* Y. Wang.* Filtration-based synthesis of micelle-derived composite membranes for high-flux ultrafiltration. *ACS Applied Materials & Interfaces*, 2015, 7, 6974-6981.
22. Z. Wang, **L. Guo**, Y. Wang,* Isoporous membranes with gradient porosity by selective swelling of UV-crosslinked block copolymers. *Journal of Membrane Science*, 2015, 476, 449-456.
23. W. Sun, Z. Wang, X. Yao, **L. Guo**, X. Chen, Y. Wang,* Surface-active isoporous membranes nondestructively derived from perpendicularly aligned block copolymers for size-selective separation. *Journal of Membrane Science*, 2014, 466, 229-237.
24. **L. Guo**, Y. Wang.* Nanoslitting of phase-separated block copolymers by solvent swelling for membranes with ultrahigh flux and sharp selectivity. *Chemical Communications*, 2014, 50, 12022-12025. (**Inside back cover**)

Conferences

- **Poster**, *Bunsentagung 2019 - 118th General Assembly of the German Bunsen Society for Physical Chemistry*, Jena, Germany, 30/05/2019 - 01/06/2019
- **Oral**, *Europolymer Conference (EUPOC 2016, Block copolymers for nanotechnology applications)*, Gargnano, Italy, 22/05/2016 - 26/05/2016
- **Oral**, *Academic Seminar of the mainland, HongKong and Taiwan on Liquid Crystal State and Supramolecular Ordered Structure of Polymers (2016)*, Nanchang, China, 2/08/2016 - 5/08/2016
- **Oral** (Best presenter), *8th International Conference on Materials* for Adv*anced Technologies*, Suntec, Singapore, 28/06/2015 - 03/07/2015
- **Poster**, *The 10th International Congress on Membranes and Membranes Progress (ICOM2014)*, Suzhou, China 20/07/2014 - 25/07/2014
- **Poster**, *Academic Seminar of the mainland, HongKong and Taiwan on Liquid Crystal State and Supramolecular Ordered Structure of Polymers (2014)*, Changchun, China, 12/08/2014 - 16/08/2014

- **Oral** (Excellent report), *8th National Congress on Membranes and Membranes Progress*, Dalian, China, 25/10/2013 - 27/10/2013
- *The 4th Cross-Strait Seminar of Membrane Science and Technology & the 1st "Huangshan Cup" Doctoral Forum, Huangshan, China,*18/08/2012 - 22/08/2012

Prizes and awards

- 2017 Outstanding graduate of Nanjing Tech University (Top 3%)
  Outstanding doctoral thesis at College of Chemical Engineering, Nanjing Tech University (Top 10%)
- 2016 National scholarship for graduate students (Top 2%, Chinese Ministry of Education)
  Jiusi scholarship at membrane center of Nanjing Tech University (Top 2%)
- 2015 Best presenter at *8th International Conference on Materials for Advanced Technologies*
  Shijun scholarship at College of Chemical Engineering of Nanjing Tech University (Top 3%)
  Jiusi scholarship (Top 2%); Jiusi scholarship at membrane center of Nanjing Tech University (Top 2%)
- 2014 National scholarship for graduate students (Top 2%, Chinese Ministry of Education)
  Jiusi scholarship at membrane center of Nanjing Tech University (Top 2%)
- 2013 Excellent report at *8th National Congress on Membranes and Membranes Progress*
- 2008-2012 National Encouragement scholarship (Top 2%, Jiangsu Provincial Department of Education) three times; First grade scholarship (top 3%) three times; second grade scholarship (Top 5%) for two times; third grade scholarship (Top 8%) for two times; Pacemaker to Merit Student (top 2%) for one time; Pacemaker to Merit Student (top 4%) for two times; Advanced Class of Nanjing Tech University

Supervising and mentoring activities

- *Research guider* (2 master students)
  Output: 1) *Journal of Membrane Science*, 2019, 576, 142-149;
  2) L. Wang,[+] N. Yan,[+] **L. Guo**, *et al*. Ultra-permeable and highly selective composite membranes by nanoscale polymeric coatings. *Science China Chemistry*, 2020, *under review*. ([+] equal contribution)
- Mentoring *Experiment of Innovation Fund for College Student* (10 bachelor students)
  2016 Self-assemble of triblock copolymers by solvent annealing (*Project 1*);
  Construction of Au/C carbonaceous networks from nanoporous block copolymers (*Project 2*)
  2015 Synthesis of hollow Al_2O_3 spheres templated by block copolymer micelles (*Project 3*)
- Mentoring one class of bachelor students as the assistant class teacher (35 bachelor students)
  2010-2011 To help them in the aspects of campus life and study