Dan ZHAO

Department of Chemical & Biomolecular Engineering, National University of Singapore
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EDUCATION

Ph.D. in Chemistry (Inorganic Division)
Texas A&M University, College Station, Texas, USA 12/2010
Dissertation: Chemistry and Applications of Metal-Organic Materials (Advisor: Prof. Hong-Cai Zhou)

M.S. in Polymer Chemistry and Physics
Zhejiang University, Hangzhou, China 03/2006
Thesis: Research on the Thermosensitive Micellar Drug Delivery System Based on Dextran-graft-poly(N-isopropylacrylamide) (Advisor: Prof. Li-Qun Wang)

B.S. in Polymer Materials and Engineering
Minor in Intensive Training Program of Innovation & Entrepreneurship
Zhejiang University, Hangzhou, China 06/2003

EXPERIENCE

Full Professor with Tenure, National University of Singapore, Singapore Since 01/2025
Associate Professor with Tenure, National University of Singapore, Singapore 07/2018-12/2024
Assistant Professor, National University of Singapore, Singapore 07/2012-06/2018

- Design, synthesize, evaluate, and scale up advanced porous materials, including metal-organic frameworks (MOFs), covalent organic frameworks (COFs), porous organic polymers (POPs), metal-organic cages (MOCs), and porous organic cages (POCs)
- Develop membrane materials and modules, including mixed matrix membranes (MMMs), polycrystalline membranes (PCMs), thin-film composite membranes (TFMs), and two-dimensional-materials-based membranes (2DMs)
- Gas storage and separation for clean energy and environmental sustainability, including H_2 storage, H_2 purification, CO_2 capture, dehumidification, biogas upgrading, natural gas sweetening, and light hydrocarbon separation
- Liquid separation for process intensification and value-added products, including organic solvent recovery, organic solvent nanofiltration, and separation of hydrocarbon liquids
- Chemical sensing for health and environmental monitoring, including fluorescent chemosensors, microelectromechanical systems (MEMS), and sensor arrays

Postdoctoral Fellow, Argonne National Laboratory, Argonne, Illinois, USA (Advisor: Dr. Di-Jia Liu) 11/2010-06/2012

- Evaluated MOFs as photocatalysts for CO_2 reduction
- Evaluated MOFs as electrocatalysts for oxygen reduction reaction (ORR) in fuel cells
- Evaluated MOFs as electrocatalysts for oxygen evolution reaction (OER) in lithium-air batteries

Teaching and Research Assistant, Texas A&M University, College Station, Texas, USA 08/2008-10/2010

- Instructed undergraduate advanced inorganic chemistry laboratory
- Designed and synthesized MOFs with record-high surface areas
- Applied MOFs in H_2 and CH_4 storage, CO_2 sequestration and gas separation
- Evaluated coordination-driven polymeric surfactants as candidates in drug delivery
- Performed synchrotron X-ray diffraction studies of MOFs at Argonne National Laboratory
- Performed H_2 storage experiments of MOFs at Lawrence Berkeley National Laboratory

Teaching and Research Assistant, Miami University, Oxford, Ohio, USA 08/2006-07/2008

- Instructed undergraduate organic chemistry laboratory (major's only course)

- Instructed symmetry and crystallography at Talawanda High School
- Synthesized organic ligands to construct MOFs

Research Assistant, Zhejiang University, Hangzhou, China 07/2001-03/2006
- Designed and synthesized indomethacin-loaded polymeric micelles for drug delivery
- Analyzed thermosensitive micellization of amphiphilic polymer surfactants
- Synthesized dextran-*g*-2'-deoxy-5-fluorouridine as a colon-specific macromolecular prodrug
- Synthesized poly(lactide-co-glycolide) as a biodegradable elastomer

AFFILIATIONS

- Materials Research Society of Singapore (Executive Committee Member) 2020-present
- Membrane Society in Singapore 2016-present

SELECTED HONORS AND AWARDS

1. Stanford/Elsevier World's Top 2% Scientists since 2020
2. Clarivate Analytics' Highly Cited Researcher in 2019, 2020, and 2024 (Cross-Field)
3. Japan Society of Coordination Chemistry (JSCC) International Award for Creative Work 04/2023
4. NRF Investigatorship 11/2022
5. Dean's Chair, Faculty of Engineering, National University of Singapore 01/2021 – 12/2023
6. Faculty of Engineering Teaching Commendation List 2017/2018, National University of Singapore 02/2019
7. Young Researcher Award, National University of Singapore 05/2018
8. Engineering Young Researcher Award, National University of Singapore 11/2017
9. Outstanding Youth Award, 2017 Global Chinese Chemical Engineers Symposium 07/2017
10. Outstanding Young Faculty Award, AIChE Singapore Local Section 05/2017
11. Faculty of Engineering Teaching Commendation List 2014/2015, National University of Singapore 02/2016

PUBLICATIONS

- More than 250 peer-reviewed papers, 28k+ citations, h-index = 89 (Google Scholar Jan 2025)
- ORCID: 0000-0002-4427-2150
- ResearcherID: D-5975-2011
- Scopus: https://www.scopus.com/authid/detail.uri?authorId=55510434800
- Google Scholar: https://scholar.google.com.sg/citations?hl=en&user=YDWCxakAAAAJ

TRANSLATION

- 33 Patents & Patent Applications

1. **Tech Trove Pte. Ltd.** Co-Founder and Shareholder Since Jul 2018

BOOK SERIES

1. Szekely, G.; Zhao, D.: *Sustainable Separation Engineering: Materials, Techniques and Process Development*; 1 ed.; John Wiley & Sons Ltd.: Hoboken, NJ, 2022.

BOOK CHAPTERS

1. Ying, Y. P.; Rouhani, H.; Wang, D. C.; Zhao, D.: Two-Dimensional-Materials Membranes for Gas Separations. In *Two-Dimensional-Materials-Based Membranes: Preparation, Characterization, and Applications*; 1 ed.; Liu, G. P., Jin, W. Q., Eds.; WILEY-VCH GmbH: Weinheim, Germany, 2022; pp 173-220.
2. Peh, S. B.; Zhao, D.: Synthesis and Development of Metal-Organic Frameworks. In *Nanoporous Materials for Molecule Separation and Conversion*; Liu, J., Ding, F., Eds.; Elsevier: Amsterdam, Netherlands, 2020; pp 3-43.
3. Hu, Z. G.; Zhao, D.: Metal-Organic Frameworks Based Heterogeneous Catalysts for Biomass Conversion. In *Elaboration and Applications of Metal-Organic Frameworks*; Ma, S. Q., Perman, J. A., Eds.; World Scientific: Singapore, 2018; pp 495-518.
4. Makal, T. A.; Yuan, D. Q.; Zhao, D.; Zhou, H. C.: Metal-Organic Frameworks. In *The Chemistry of Nanostructured Materials*; Yang, P. D., Ed.; World Scientific: Singapore, 2011; Vol. II; pp 37-64.

EDITORIAL BOARDS

1. *Industrial & Engineering Chemistry Research*, **Executive Editor**, Since 01/2024
2. *Coordination Chemistry Reviews*, Guest Editor for the Special Issue "VSI: MOF2024 Invited Only", 12/2023
3. *Journal of the Korean Chemical Society*, International Advisory Board Member, Since 03/2023
4. *ACS Applied Engineering Materials*, Editorial Advisory Board Member, 06/2022 – 12/2024
5. *Chemistry – An Asian Journal*, International Advisory Board Member, Since 10/2021
6. *Journal of Membrane Science Letters*, Editorial Board Member, Since 07/2021
7. *Industrial & Engineering Chemistry Research*, **Associate Editor**, Since 06/2021
8. *Aggregate*, Next Generation Board Member, Since 09/2020
9. *Chemistry – An Asian Journal*, Early Career Advisory Board Member, Since 11/2019
10. *APL Materials*, Guest Editor for the Special Issue "Open Framework Materials for Energy Applications", 01/2019
11. *ACS Sustainable Chemistry & Engineering*, Guest Editor for the Thematic Issue "Advanced Porous Materials: Design, Synthesis and Application in Sustainability", 06/2018
12. *ACS Sustainable Chemistry & Engineering*, Early Career Board Member, 01/2018 – 12/2020
13. *Inorganic Chemistry*, Editorial Advisory Board Member, 01/2018 – 12/2020

CONFERENCE/SYMPOSIUM ORGANIZER

1. **Conference Co-Chair**, The 9th International Conference on Metal-Organic Frameworks & Open Framework Compounds (MOF2024), Singapore, 07/2024
2. Scientific Committee, The 9th International Zeolite Membrane Meeting (IZMM2023), Nanjing, China, 10/2023
3. International Scientific Committee, International Congress on Membranes & Membrane Processes 2023 (ICOM2023), Chiba, Japan, 07/2023
4. Symposium Chair, "Pollution Control and Mitigation", International Conference on Materials for Humanity 2021 (MH21), Singapore/Online, 07/2021
5. Local Organizing Committee Member, The 9th MRSS National Conference on Advanced Materials (MRSS AMC-9), Singapore, 11/2020
6. Local Organizing Committee Member, The 10th Singapore International Chemistry Conference (SICC10), Singapore, 12/2018
7. Scientific and Organizing Committee, The 1st International Symposium on Porous Organic Polymers (POPs2017), Zhangjiajie, China, 09/2017
8. Local Organizing Committee Member, The 3rd International Conference on Molecular & Functional Catalysis (ICMFC-3), Singapore, 02/2017
9. Technical Program Chair, The 15th International Conference on Sustainable Energy Technologies (SET2016), Singapore, 07/2016
10. Local Organizing Committee Member, The 13th International Conference on Carbon Dioxide Utilization (ICCDU-13), Singapore, 07/2015
11. Symposium Chair, "Synthesis and Architecture of Nanomaterials", International Conference on Materials for Advanced Technologies (ICMAT2015), Singapore, 06/2015
12. Symposium Co-Chair, "Emerging Investigators in Metal-Organic Frameworks", The 41st International Conference on Coordination Chemistry (ICCC41), Singapore, 07/2014

OTHER PROFESSIONAL EXPERIENCE

1. Member of the Working Group on Carbon Capture Utilisation and Storage (CCUS), Enterprise Singapore, Since 11/2022
2. Member of Pro Tem Committee for Carbon Capture, Utilisation & Storage (CCUS), Singapore Standards Council, Since 06/2021
3. Member of Technical Committee for Chemicals and Processes, Singapore Standards Council, Since 01/2021
4. Member of NUS Engineering Leadership Activation Team, Since 04/2018
5. Supervisor in NUS Integrative Sciences and Engineering Programme (ISEP), Since 10/2017
6. Judge for Singapore Science & Engineering Fair, Singapore, 2014, 2016
7. Panel member for Singapore Junior Chemistry Olympiad, Singapore, 2013

8. Judge for Youth Science Conference, Singapore, 2013