Nanyang Wang

Research Fellow

School of Mechanical and Aerospace Engineering
Nanyang Technological University, Singapore

Phone: (+65) 8763 0495
E-mail: nanyang.wang@ntu.edu.sg

Summary

The applicant's research has mainly focused on anode protection, particularly the regulation of electrode–electrolyte interfaces in rechargeable batteries. To address critical challenges related to safety and cycling stability, several innovative strategies have been proposed and validated, including the construction of three-dimensional electrode frameworks and the design of high-performance electrolytes. During the postdoctoral period, the research focus further expanded to advanced electrolyte engineering and interfacial optimization, especially the development of single-ion-conducting hydrogel electrolytes for zinc-ion batteries, accompanied by in-depth investigations into their effects on interfacial stability and ion transport kinetics. To date, the applicant has published 6 papers in leading international journals, including Angewandte Chemie International Edition, Nano Letters, Advanced Energy Materials, Advanced Functional Materials, and Small, and holds two Chinese patents.

Education and Positions

2024-now **R.F.**, Nanyang Technological University (Singapore)
2019-2024 **Ph.D.**, Materials Science and Engineering, Nanjing University (Nanjing, China)
2015-2019 **B.E.**, Applied Chemistry, Beijing University of Chemical Technology (Beijing, China)

Honors and Awards

2019-2024 2023 Merit Scholarship; 2022 Second-class scholarship; 2021, 2020, 2019 First-class scholarship
2015-2019 2019 National scholarship for Encouragement; 2018 Second-class People's Scholarship;
2017 Third-class People's Scholarship (twice); 2016 Second-class People's Scholarship

Research Experience and Interest

[1] Design of high-performance lithium metal batteries.
[2] Modulation of SEI and electrolyte components for zinc anodes protection.
[3] Design of high-quality hydrogel electrolyte and solid-state electrolyte.
[4] Preparation of flexible and wearable aqueous batteries.

Published and submitted Journal Papers

[11] Hanjian Chen+, Jiapei Li+, **Nanyang Wang***, Yongyu Liu, Ruheng Jiang, Chengkai Liu, Yu Liu, Xiaoge Li, Dewu Lin, Yagang Yao, Mun Sek Kim*, Pan Xue*, Guo Hong*, Facet-driven interfacial regulation in a heterostructured dual-host for highly reversible Zn–I_2 batteries, **Advanced Energy Materials**, Under revision

[10] Xiang Chen+, Jiapei Li+, Lizhi Xiang+, Kunlun Liu, Yicai Pan, Xiaoge Li, Dewu Lin, **Nanyang Wang***, Can Guo*, Cuiping Han, Yagang Yao, Pan Xue* and Guo Hong*, Spatial-confined and bifunctional nanoreactors towards dendrite-free anode and shuttle-suppressed cathode in zinc–iodine batteries, **Advanced Energy Materials**, 2026, 16, e04798.

[9] Renle Tong, Jiapei Li, Lizhi Xiang, Kunlun Liu, Chengkai Liu, Qiushao Yang, Yueyue Qiao, Qiulong Li*, Xiaoge Li, Jiaping He, Yongbao Feng, Xiao Han*, **Nanyang Wang***, and Pan Xue*, In-situ Constructed Zn_3N_2-Enriched Hybrid Solid Electrolyte Interphase Enables Highly Efficient Zinc Deposition Kinetics for Ultra-stable Zinc-Iodine Batteries, **Small**. 2026; 22, e13659.

[8] Jiapei Li+, Zhiying Fang+, Hanjian Chen+, Kunlun Liu, Xiaoge Li, **Nanyang Wang***, Can Guo*, Pan Xue*, Cuiping Han, Yagang Yao and Guo Hong*, Synergistic construction of in-situ self-polymerized interface and localized pH buffer zone for high-performance aqueous zinc-iodine batteries, **Angewandte Chemie International Edition**, 2025, 64, e202511490.

[7] **Nanyang Wang+,** Kai Zhang+, Kaiping Zhu, Xin Chen, Ying Wang, Qian He, Wentao Zheng, Yagang Yao*, "Surface-like growth" strategy for the direct synthesis of horizontally aligned boron nitride nanotubes, **Nano Letters**, 2024, 24, 31, 9442–9450.

[6] **Nanyang Wang**+, Liping Ding+, Taotao Li+, Kai Zhang, Liyun Wu, Qian He, Xuhua He, Zhengyang Zhou, Xuebin Wang, Yue Hu,* Feng Ding,* Jin Zhang,* Yagang Yao*, Self-catalytic ternary compounds for efficient synthesis of high-quality boron nitride nanotubes, **Small**, 2023, 19, 2206933.

[5] Pan Xue+, Can Guo+, **Nanyang Wang**+, Kaiping Zhu, Shuang Jing, Shuo Kong, Xiaojie Zhang, Li Li, Hongpeng Li*, Yongbao Feng*, Wenbin Gong, Qiulong Li*, Synergistic manipulation of Zn^{2+} ion flux and nucleation induction effect enabled by 3D hollow SiO_2/TiO_2/carbon fiber for long-lifespan and dendrite-free Zn–Metal composite anodes, **Advanced Functional Materials**, 2021, 31, 2106417.

[4] 姚亚刚,王赢,汪南阳. 氮化硼纳米管的载体辅助制备方法及氮化硼纳米管:中国, CN202311088798.5.

[3] 姚亚刚,汪南阳.一种氮化硼纳米管的制备方法、氮化硼纳米管及其应用:中国,ZL 2021 1 0565679.9, 2022.9.23.

[2] Kaiping Zhu+, Jie Luo+, Dehe Zhang+, **Nanyang Wang**, Shibo Pan, Shujin Zhou, Zhenjie Zhang, Gengde Guo, Peng Yang, Yuan Fan, Shisheng Hou, Zhipeng Shao, Shizhuo Liu, Lin Lin, Pan Xue, Guo Hong, Yurong Yang, Yagang Yao*, Rational design of a bilayer interface for long-term stability of Zn anodes and MnO_2 cathode, **Advanced Materials**, 2024, 36, 231108.

[1] Kaiping Zhu+, Wubin Zhuang+, **Nanyang Wang**, Kai Zhang, Lin Lin, Zhipeng Shao, Chaowei Li, Wenhui Wang, Shizhuo Liu, Peng Yang, Pan Xue, Qichong Zhang, Guo Hong, and Yagang Yao, Yagang Yao*, Rational design of a bilayer interface for long-term stability of Zn anodes and MnO_2 cathode, **Advanced Materials**, 2025, 2502366.