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Academic Qualification

2008 - 2013, Ph.D., Materials Science and Engineering, Arizona State University, USA

2004 - 2008, B.Sc., Polymer Science and Engineering, Zhejiang University, China

Previous and Present Academic Positions

2022 - Now, Associate Professor of Mechanical & Aerospace Engineering, and Chemistry, HKUST

2016 - 2022, Assistant Professor, HKUST

2014 - 2016, Postdoc, School of Engineering and Applied Sciences, Harvard University

2013 - 2014, Postdoc, Ira. Fulton School of Engineering, Arizona State University

Award

Excellent Young Scientist (Hong Kong and Macau), National Natural Science Foundation, China, 2020

Teaching

- Materials for Energy Technologies
- Mechanical Engineering Laboratory
- Fundamentals in Electrochemical Energy Conversion
- Advanced Materials Chemistry
- Intelligent Building Systems

Research Projects

- Controlling the micro-structural orientation of monolithic nanoporous metal, General

Research Fund, Research Grants Council, Hong Kong.

- Percolation dissolution and nanoporous metals for electrochemical energy storage, Excellent Young Scientist (Hong Kong and Macau) Award, National Natural Science Foundation, China.
- A high energy-density, rechargeable Zn-air battery powered by a bi-continuous nanoporous Zn anode, Innovation and Technology Fund, Hong Kong.
- Bi-continuous nanoporous metal formation by reduction-induced decomposition, Early Career Scheme, Research Grants Council, Hong Kong.
- Inorganic-organic hybrid electrolytes for redox flow batteries, Science and Technology Innovation Committee, Shenzhen, China.
- Creation of regenerative electron-fuels for stationary power-supplies and electric vehicles, Theme-based Research Scheme, Research Grants Council, Hong Kong (participating).
- Development of kilowatt-class flow batteries for cost-effective and scalable storage of renewable energies, Innovation and Technology Fund, Hong Kong (participating).
- Hong Kong's participation at the China Spallation Neutron Source, Collaborative Research Fund, Research Grants Council, Hong Kong (participating).
- Aqueous Zn-based batteries with ultimate safety and high energy density for large scale energy storage system, Collaborative Research Fund, Research Grants Council, Hong Kong (participating).

Publications

(1) Zheng, Y.; Cheung, Y. T.; Liang, L.; Qiu, H.; Zhang, L.; Tsang, A.; Chen, Q.; Tong, R. Electrochemical Oxidative Rearrangement of Tetrahydro-β-Carbolines in a Zero-Gap Flow Cell. *Chem. Sci.* **2022**, 13, 10479–10485.

(2) Zhao, Y.; Li, Y.; Mao, J.; Yi, Z.; Mubarak, N.; Zheng, Y.; Kim, J.-K.; Chen, Q. Accelerating the Dissolution Kinetics of Iodine with a Cosolvent for a High-Current Zinc–Iodine Flow Battery. *J. Mater. Chem. A* **2022**, 10, 14090–14097.

(3) Li, L.; Tsang, Y. C. A.; Xiao, D.; Zhu, G.; Zhi, C.; Chen, Q. Phase-Transition Tailored Nanoporous Zinc Metal Electrodes for Rechargeable Alkaline Zinc-Nickel Oxide Hydroxide and Zinc-Air Batteries. *Nat Commun* **2022**, *13*, 2870.

(4) Zhu, S.; Qin, X.; Xiao, F.; Yang, S.; Xu, Y.; Tan, Z.; Li, J.; Yan, J.; Chen, Q.; Chen, M.; Shao, M. The Role of Ruthenium in Improving the Kinetics of Hydrogen Oxidation and

Evolution Reactions of Platinum. *Nature Catalysis* **2021**, *4*, 711–718.

(5) Zhu, G.; Xiao, D.; Chen, Q. Spontaneous Formation of Porous Zinc in Rechargeable Zinc Batteries. *J. Electrochem. Soc.* **2021**, *168*, 110524.

(6) Yang, S.; Li, Y.; Chen, Q. Resolving Electron Transfer Kinetics in Porous Electrodes *via* Diffusion-Less Cyclic Voltammetry. *J. Mater. Chem. A* **2021**, *9*, 14025–14031.

(7) Xiao, D.; Ke, Y.; Wang, C.; He, C.; Chen, Q. Bi-Continuous Porous Structures from the Selective Dissolution of Ionic Solid Solutions. *Scripta Materialia* **2021**, *199*, 113865.

(8) Wang, C.; Chen, Q. Elucidating the Kinetic Root of the Evolution of the Oriented Nanoporous Metal from Reduction-Induced Decomposition. *Chem. Mater.* **2021**, *33*, 2604–2610.

(9) Ruan, W.; Mao, J.; Chen, Q. Redox Flow Batteries toward More Soluble Anthraquinone Derivatives. *Current Opinion in Electrochemistry* **2021**, *29*, 100748.

(10) Nambafu, G. S.; Siddharth, K.; Zhang, C.; Zhao, T.; Chen, Q.; Amine, K.; Shao, M. An Organic Bifunctional Redox Active Material for Symmetric Aqueous Redox Flow Battery. *Nano Energy* **2021**, *89*, 106422.

(11) Li, Y.; Ma, L.; Yi, Z.; Zhao, Y.; Mao, J.; Yang, S.; Ruan, W.; Xiao, D.; Mubarak, N.; Wu, J.; et al. Metal–Organic Framework-Derived Carbon as a Positive Electrode for High-Performance Vanadium Redox Flow Batteries. *J. Mater. Chem. A* **2021**, *9*, 5648–5656.

(12) Li, Y.; Ma, L.; Yi, Z.; Zhao, Y.; Mao, J.; Yang, S.; Ruan, W.; Xiao, D.; Mubarak, N.; Wu, J.; et al. Metal–Organic Framework-Derived Carbon as a Positive Electrode for High-Performance Vanadium Redox Flow Batteries. *J. Mater. Chem. A* **2021**, *9*, 5648–5656.

(13) He, C. X.; Yue, Q. L.; Wu, M. C.; Chen, Q.; Zhao, T. S. A 3D Electrochemical-Thermal Coupled Model for Electrochemical and Thermal Analysis of Pouch-Type Lithium-Ion Batteries. *International Journal of Heat and Mass Transfer* **2021**, *181*, 121855.

(14) Zheng, Y.; Luo, R.; Xu, Y.; Zhang, L.; Liu, P.; Chen, Q. Adsorbate-Mediated Deposition of Noble-Metal Nanoparticles on Carbon Substrates for Electrocatalysis. *ACS Appl. Energy Mater.* **2020**, *3*, 6460–6465.

(15) Yang, S.; Chen, Q. Quantifying Electron Transfer Kinetics on Porous Carbon Electrodes for Redox Flow Batteries. *J. Electrochem. Soc.* **2020**, *167*, 160501.

(16) Xiong, C.; Zhu, G. Y.; Jiang, H. R.; Chen, Q.; Zhao, T. S. Achieving Multiplexed Functionality in a Hierarchical MXene-Based Sulfur Host for High-Rate, High-Loading Lithium-Sulfur Batteries. *Energy Storage Materials* **2020**, *33*, 147–157.

(17) Wang, C.; Zhu, G.; Liu, P.; Chen, Q. Monolithic Nanoporous Zn Anode for Rechargeable

Alkaline Batteries. *ACS Nano* **2020**, *14*, 2404–2411.

(18) Ruan, W.; Mao, J.; Yang, S.; Shi, C.; Jia, G.; Chen, Q. Designing Cr Complexes for a Neutral Fe–Cr Redox Flow Battery. *Chem. Commun.* **2020**, *56*, 3171–3174.

(19) Ruan, W.; Mao, J.; Yang, S.; Chen, Q. Communication—Tris(Bipyridyl)Iron Complexes for High-Voltage Aqueous Redox Flow Batteries. *J. Electrochem. Soc.* **2020**, *167*, 100543.

(20) Ren, Y. X.; Zeng, L.; Zhao, C.; Xiong, C.; Chen, Q.; Zhao, T. S. A Safe and Efficient Lithiated Silicon-Sulfur Battery Enabled by a Bi-Functional Composite Interlayer. *Energy Storage Materials* **2020**, *25*, 217–223.

(21) Mao, J.; Ruan, W.; Chen, Q. Understanding the Aqueous Solubility of Anthraquinone Sulfonate Salts: The Quest for High Capacity Electrolytes of Redox Flow Batteries. *J. Electrochem. Soc.* **2020**, *167*, 070522.

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(23) Liang, J.; Pan, M.; Chai, G.; Peng, Z.; Zhang, J.; Luo, S.; Han, Q.; Chen, Y.; Shang, A.; Bai, F.; et al. Random Polymerization Strategy Leads to a Family of Donor Polymers Enabling Well-Controlled Morphology and Multiple Cases of High-Performance Organic Solar Cells. *Adv. Mater.* **2020**, *32*, 2003500.

(24) Chi, H.; Wang, C.; Wang, Z.; Zhu, H.; Mesias, V. St. D.; Dai, X.; Chen, Q.; Liu, W.; Huang, J. Highly Reusable Nanoporous Silver Sheet for Sensitive SERS Detection of Pesticides. *Analyst* **2020**, *145*, 5158–5165.

(25) Xu, Y.; Zheng, Y.; Wang, C.; Chen, Q. An All-Organic Aqueous Battery Powered by Adsorbed Quinone. *ACS Appl. Mater. Interfaces* **2019**, *11*, 23222–23228.

(26) Ren, Y. X.; Zeng, L.; Jiang, H. R.; Ruan, W. Q.; Chen, Q.; Zhao, T. S. Rational Design of Spontaneous Reactions for Protecting Porous Lithium Electrodes in Lithium–Sulfur Batteries. *Nature Communications* **2019**, *10*, 3249.

(27) Wang, C.; Chen, Q. Reduction-Induced Decomposition: Spontaneous Formation of Monolithic Nanoporous Metals of Tunable Structural Hierarchy and Porosity. *Chem. Mater.* **2018**, *30*, 3894–3900.

(28) Chen, Q.; Ding, Y.; Chen, M. Nanoporous Metal by Dealloying for Electrochemical Energy Conversion and Storage. *MRS Bull.* **2018**, *43*, 43–48.

(29) Tong, L.; Chen, Q.; Wong, A. A.; Gómez-Bombarelli, R.; Aspuru-Guzik, A.; Gordon, R.

G.; Aziz, M. J. UV-Vis Spectrophotometry of Quinone Flow Battery Electrolyte for *in Situ* Monitoring and Improved Electrochemical Modeling of Potential and Quinhydrone Formation. *Phys. Chem. Chem. Phys.* **2017**, *19*, 31684–31691.

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(38) Chen, Q. Bi-Continuous Nanoporous Structure Formation via Compound Decomposition. *J. Electrochem. Soc.* **2014**, *161*, H643–H646.

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(40) Chen, Q.; Sieradzki, K. Spontaneous Evolution of Bicontinuous Nanostructures in Dealloyed Li-Based Systems. *Nature Materials* **2013**, *12*, 1102–1106.

(41) Chen, Q.; Sieradzki, K. Mechanisms and Morphology Evolution in Dealloying. *J. Electrochem. Soc.* **2013**, *160*, C226–C231.

(42) McCue, I.; Snyder, J.; Li, X.; Chen, Q.; Sieradzki, K.; Erlebacher, J. Apparent Inverse Gibbs-Thomson Effect in Dealloyed Nanoporous Nanoparticles. *Phys. Rev. Lett.* **2012**,

108, 225503.

Patent

(1) Chen, Q., Gordon, R.G. and Aziz, M.J., 2020. Flow battery with electrolyte rebalancing system. U.S. Patent 10840532.

(2) Aziz, M.J., Gordon, R.G., Lin, K., Marshak, M., Chen, Q. and Gerhardt, M.R., 2018. High pH organic flow battery. U.S. Patent US20180048011A1.

(3) Chen, Q., Li, L and Tsang, Y.C.A., Method of fabricating nanoporous Zn anodes and the applications in Zn batteries. U. S. Patent Application No. 17/933,657.

Invited Talk

(1) Mass transports in nanoporous metals. *The Annual Meeting of the Chinese Materials Research Society*, Xiamen, China, July 2021.

(2) Morphological evolution in rechargeable Zn anodes. *The Annual Conference of Physics Society of Hong Kong*, Hong Kong, July 2020.

(3) Nanoporous metal from reduction-induced decomposition. *The Third International Symposium of Nanoporous Materials by Alloy Corrosion,* Philadelphia, USA, February 2019.

(4) Organic molecules for redox flow batteries. *The First International Conference on 4D Materials and Systems*, Yonezawa, Japan, August 2018.

(5) What limits the performance of a quinone-based redox flow battery. *The Annual Conference of the Asian-pacific Confederation of Chemical Engineering*, Hong Kong, August 2017.

(6) Selective dissolution and bi-continuous nanoporous metal formation. *The Annual Meeting of the Chinese Materials Research Society*, Yinchuan, China, July 2017.

Academic Services

- Organizer, *The Hong Kong Battery Symposium*, 2023 – (www.qing-chen/battery).
- Organizer, *The Dealloying Symposium*, 2021 – (www.qing-chen.org/dealloying).
- Co-chair, *The Symposium of Self-organizing Nano-architectured Materials, The TMS Annual Meeting*, Anaheim, USA, Feb. 2022.
- Co-chair, *The Symposium of Nanoporous Metal, The Annual Meeting of the Chinese Materials Research Society*, Xiamen, July 2018, and Chengdu, July 2019.

- Co-chair, *Advanced Study Institute on Frontiers in Energy Storage*, Hong Kong, June 2018.
- Journal reviewer (*Nature Materials, Advanced Materials, Nano Letters, Joule, Chemistry of Materials,* etc.)
- Proposal reviewer (*A*STAR*, Singapore, *Green Tech. Fund*, Hong Kong, and *Chinese Neutron Spallation Source*, China).