HANSEN WANG

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EDUCATIONAL BACKGROUND

Stanford University, Department of Materials Science and Engineering *Stanford, CA, US*
Ph.D. Candidate, GPA: 3.8/4.0 *Sep. 2016-present*

Tsinghua University, Department of Chemical Engineering *Beijing, China*
Chemical and Biological Engineering, B.E., Major GPA: 92/100 (1st/71) *Sep. 2012-Jul. 2016*
Scholarship: **National scholarship 2012-2013 & 2013-2014** (5/400 every year)

Tsinghua University, School of Economics and Management *Beijing, China*
Economics, B.S., (Second degree) *Sep. 2012-Jul. 2016*

Stanford University, Department of Material Science and Engineering *Stanford, CA, US*
Undergraduate visiting research program (UGVR) (Non-degree) *Jul. 2015-Sept. 2015*
Funded by School of Engineering, Stanford University

RESEARCH

- Research Assistant Materials Science and Engineering, Stanford University *Sep. 2016-present*
  Advisor: Prof. Yi Cui
  Research topics: Materials design for next generation high energy density lithium metal batteries; Smart sensing and fundamental studies for the fast charging of lithium-ion batteries.
- Research Assistant Chemical Engineering, Tsinghua University *Sep. 2015-Jun. 2016*
  Advisor: Prof. Jian Chen
  Research topic: Equation of state extended from SAFT model used for binary polar and associate fluid systems
- Research Assistant Materials Science and Engineering, Stanford University *Jul. 2015–Sept. 2015*
  Advisor: Prof. William Chueh
  Research topic: Surface modified lanthanum strontium manganese (LSM) as cathode of solid oxide fuel cell (SOFC)
- Research Assistant Chemical Engineering, Tsinghua University *Jul. 2014–Jun. 2015*
  Advisor: Prof. Qiang Zhang
  Research topic: Development of strongly coupled catalysts based on graphene for oxygen evolution/reduction reaction
- Research Assistant Chemical Engineering, Tsinghua University *Jan. 2014– Jun. 2014*
  Advisor: Prof. Ming-Han Han
  Research topic: High activity Ni based catalyst for the hydrogenation of Adiponitrile to 6-Aminocapronitrile

PUBLICATIONS

First author publications:

1. **Wang, H.**, Yu, Z., Kong, X., Huang, W., Zhang, Z., Mackanic, D. G., Bao, Z., and Cui, Y., Dual-Solvent Li-Ion Solvation Enables High Performance Li Metal Batteries. (in submission).
2. **Wang, H.**, Kim, S. C., Rojas, T., Zhu, Y., Li, Y., Ma, L., Xu, K., Ngo, A. T., and Cui, Y., Correlating Li-ion Solvation Structures and Electrode Potential Temperature Coefficients. ***J. Am. Chem. Soc.*** (under review).
3. **Wang, H.**, Huang, W., Yu, Z., Huang, W., Xu, R., Zhang, Z., Bao, Z., and Cui Y., Efficient Li Metal Cycling at a Wide Range of Pressures from an Anion-Derived Solid-Electrolyte Interphase Framework. ***Energy Environ. Sci.*** (under review).
4. **Wang, H.**, Zhu, Y., Kim, S. C. Pei, A., Li, Y., Boyle, D., Wang, H., Zhang, Z., Ye, Y., Huang, W., Liu, Y., Xu, J., Li, J., Liu, F., and Cui, Y., Underpotential Lithium Plating on Graphite Anodes Caused by Temperature Heterogeneity. ***Proc. Natl. Acad. Sci***. (in press).
5. Yu, Z., **Wang, H.**, Kong, X., Huang, W., Tsao, Y., Mackanic, D. G., Wang, K., Wang, X., Huang, W., Choudhury, S., Zheng, Y., Amanchukwu, C. V., Hung, S. T., Ma, Y., Lomeli, E. G., Qin, J., Cui, Y., and Bao, Z., Molecular Design for

Electrolyte Solvents Enabling Energy-Dense and Long-Cycling Lithium Metal Batteries. ***Nat. Energy***, 5, 526-533 (2020).

6. **Wang, H.**, Cao, X., Gu, H., Liu, Y., Li, Y., Zhang, Z., Huang, W., Wang, H., Wang, J., Xu, W., Zhang, J.-G., and Cui, Y., Improving Lithium Metal Composite Anodes with Seeding and Pillaring Effects of Silicon Nanoparticles. ***ACS Nano***, 14, 4601-4608 (2020).
7. **Wang, H.**, Liu, Y., Li, Y., and Cui, Y., Lithium Metal Anode Materials Design: Interphase and Host. ***Electrochem. Energy Rev.***, 2, 509-517 (2019).
8. **Wang, H.**, Li, Y., Li, Y., Liu, Y., Lin, D., Zhu, C., Chen, G., Yang, A., Yan, K., Chen, H., Zhu, Y., Li, J., Xie, J., Xu, J., Zhang, Z., Vilá, R., Pei, A., Wang, K., and Cui, Y., Wrinkled Graphene Cages as Hosts for High-Capacity Li Metal Anodes Shown by Cryogenic Electron Microscopy. ***Nano Lett.***, 19, 1326-1335 (2019).
9. **Wang, H.**, Lin, D., Xie, J., Liu, Y., Chen, H., Li, Y., Xu, J., Zhou, G., Zhang, Z., Pei, A., Zhu, Y., Liu, K., Wang, K., and Cui, Y., An Interconnected Channel-Like Framework as Host for Lithium Metal Composite Anodes. ***Adv. Energy Mater.***, 9, 1802720 (2019).
10. Wang, J., **Wang, H.**, Xie, J., Yang, A., Pei, A., Wu, C.-L., Shi, F., Liu, Y., Lin, D., Gong, Y., and Cui, Y., Fundamental Study on the Wetting Property of Liquid Lithium. ***Energy Storage Mater.***, 14, 345-350 (2018).
11. **Wang, H.**, Lin, D., Liu, Y., Li, Y., and Cui, Y., Ultrahigh-Current Density Anodes with Interconnected Li Metal Reservoir through Overlithiation of Mesoporous AlF_3 Framework. ***Sci. Adv.***, 3, e1701301 (2017).
12. Tang, C., **Wang, H.**, Wang, H.-F., Zhang, Q., Tian, G.-L., Nie, J.-Q., Wei, F., Spatially Confined Hybridization of Nanometer-Sized NiFe Hydroxides into Nitrogen-Doped Graphene Frameworks Leading to Superior Oxygen Evolution Reactivity. ***Adv. Mater.***, 27, 4516-4522 (2015).

Other publications:

13. Oyakhire, S. T., Huang, W., **Wang, H.**, Boyle, D. T., Schneider, J. R., Paula, C., Wu, Y., Cui, Y., and Bent, S. F., Revealing and Elucidating ALD-Derived Control of Lithium Plating Microstructure. ***Adv. Energy Mater.***, 2002736, (2020).
14. Ye, Y., Chou, L.-Y., Liu, Y., **Wang, H.**, Lee, H. K., Huang, W., Wan, J., Liu, K., Zhou, G., Yang, Y., Yang, A., Xiao, X., Gao, X., Boyle, D. T., Chen, H., Zhang, W., Kim, S. C., and Cui, Y., Ultralight and Fire-Extinguishing Current Collectors for High-Energy and High-Safety Lithium-Ion Batteries. ***Nat. Energy***, 5, 786-793 (2020).
15. Chen, H., Zhou, G., Boyle, D., Wan, J., Wang, H., Lin, D., Mackanic, D., Zhang, Z., Kim, S. C., Lee, H. R., **Wang, H.**, Huang, W., Ye, Y., and Cui, Y., Electrode Design with Integration of High Tortuosity and Sulfur-Philicity for High-Performance Lithium-Sulfur Battery. ***Matter***, 2, 1605-1620 (2020).
16. Chen, H., Pei, A., Wan, J., Lin, D., Vilá, R., Wang, H., Mackanic, D., Steinrück, H.-G., Huang, W., Li, Y., Yang, A., Xie, J., Wu, Y., **Wang, H.**, and Cui, Y., Tortuosity Effects in Lithium-Metal Host Anodes. ***Joule***, 4, 938-952 (2020).
17. Huang, W., **Wang, H.**, Boyle, D. T., Li, Y., and Cui, Y., Resolving Nanoscopic and Mesoscopic Heterogeneity of Fluorinated Species in Battery Solid-Electrolyte Interphases by Cryogenic Electron Microscopy. ***ACS Energy Lett.***, 5, 1128-1135 (2020).
18. Weng, Y.-T., **Wang, H.**, Lee, R.-C., Huang, C.-Y., Huang, S.-S., Abdollahifar, M., Kuo, L.-M., Hwang, B.-J., Kuo, C.-L., Cui, Y., and Wu, N.-L., Efficient Synthesis of High-Sulfur-Content Cathodes for High-Performance Li-S Batteries Based on Solvothermal Polysulfide Chemistry. ***J. Power Sources***, 450, 227676 (2020).
19. Weng, Y.-T., Liu, H.-W., Pei, A., Shi, F., **Wang, H.**, Lin, C.-Y., Huang, S.-S., Su, L.-Y., Hsu, J.-P., Fang, C.-C., Cui, Y., and Wu, N.-L., An Ultrathin Ionomer Interphase for High Efficiency Lithium Anode in Carbonate Based Electrolyte. ***Nat. Commun.***, 10, 5824 (2019).
20. Li, Y., Zhou, W., Li, Y., Huang, W., Zhang, Z., Chen, G., **Wang, H.**, Wu, G.-H., Rolston, N., Vilá, R., Chiu, W., and Cui, Y., Unravelling Degradation Mechanisms and Atomic Structure of Organic-Inorganic Halide Perovskites by Cryo-EM. ***Joule***, 3, 2854-2866 (2019).
21. Yu, Z., Mackanic, D. G., Michaels, W., Lee, M., Pei, A., Feng, D., Zhang, Q., Tsao, Y., Amanchukwu, C. V., Yan, X.,

Wang, H., Chen, S., Liu, K., Kang, J., Qin, J., Cui, Y., and Bao, Z., A Dynamic, Electrolyte-Blocking, and Single-Ion-Conductive Network for Stable Lithium-Metal Anodes. ***Joule***, 3, 2761-2776 (2019).

22. Cao, X., Ren, X., Zou, L., Engelhard, M. H., Huang, W., **Wang, H.**, Matthews, B. E., Lee, H., Niu, C., Arey, B. W., Cui, Y., Wang, C., Xiao, J., Liu, J., Xu, W., and Zhang, J.-G., Monolithic Solid-Electrolyte Interphases Formed in Fluorinated Orthoformate-Based Electrolytes Minimize Li Depletion and Pulverization. ***Nat. Energy***, 4, 796-805 (2019).
23. Li, Y., Wang, K., Zhou, W., Li, Y., Vilá, R., Huang, W., Wang, H., Chen, G., Wu, G.-H., Tsao, Y., **Wang, H.**, Sinclair, R., Chui, W., and Cui, Y., Cryo-EM Structures of Atomic Surfaces and Host-Guest Chemistry in Metal-Organic Frameworks. ***Matter***, 1, 428-438 (2019).
24. Huang, W., Attia, P. M., **Wang, H.**, Renfrew, S. E., Jin, N., Das, S., Zhang, Z., Boyle, D. T., Li, Y., Bazant, M. Z., McCloskey, B. D., Chueh, W. C., and Cui, Y., Evolution of the Solid-Electrolyte Interphase on Carbonaceous Anodes Visualized by Atomic-Resolution Cryogenic Electron Microscopy. ***Nano Lett.***, 19, 5140-5148 (2019).
25. Chen, H., Pei, A., Lin, D., Xie, J., Yang, A., Xu, J., Lin, K., Wang, J., **Wang, H.**, Shi, F., Boyle, D., and Cui, Y., Uniform High Ionic Conducting Lithium Sulfide Protection Layer for Stable Lithium Metal Anode. ***Adv. Energy Mater.***, 9, 1900858 (2019).
26. Zhu, Y., Xie, J., Pei, A., Liu, B., Wu, Y., Lin, D., Li, J., **Wang, H.**, Chen, H., Xu, J., Yang, A., Wu, C.-L., Wang, H., Chen, W., and Cui, Y., Fast Lithium Growth and Short Circuit Induced by Localized-Temperature Hotspots in Lithium Batteries. ***Nat. Commun.***, 10, 2067 (2019).

SELECTED PRESENTATIONS

- **Battery 500 Consortium Quarterly Review** *Nov. 2018*
  Oral presentation: Seeded wrinkle graphene cages as stable hosts for Li metal anodes
- **Gordon Research Conference on Electrochemistry** *Jan. 2020*
  Poster presentation: Seeded wrinkle graphene cages as stable hosts for Li metal anodes
- **Stanford University eWEAR Annual Meeting Symposium** *Feb. 2020*
  Poster presentation: Si nanoparticle embedded reduced graphene oxide as Li metal "host"

AWARDS

- Tsinghua University Supreme Scholarship (Highest scholarship awarded to top 10/3500 senior students) *Nov. 2015*
- National Scholarship (5/400 in Chemical Engineering department every year) *Dec. 2013, Dec. 2014*
- First Prize, Tsinghua University "Challenge Cup" Technology and Innovation Competition *Apr. 2015*
- First Prize, Beijing "Challenge Cup" Technology and Innovation Competition *May. 2015*

LEADERSHIP AND COMMUNITY SERVICE

- **Journal Reviewer** *Nano Letters*
- **Teaching Assistant,** MATSCI 316 Nanoscale Science, Engineering, and Technology *Spring, 2020*
- **Teaching Assistant,** MATSCI 303 Principles, Materials and Devices of Batteries *Fall, 2020*
- **Glovebox Superuser and Website Organizer,** Yi Cui Group *Feb. 2018-present*
- **StorageX Staff Researcher,** Stanford University *Feb. 2019-present*
- **Vice President, Student Union of ChemE Department,** Tsinghua University *Nov. 2013–Nov. 2014*
- **Member of "SiYuan" Student Leadership Program,** Tsinghua University *Apr. 2013–Jul. 2016*
- **Minister of Entrepreneurship Association,** Tsinghua University *Nov. 2014–Mar. 2015*