

Stanford

Mun Sek Kim

Ph.D. Student in Chemical Engineering, admitted Autumn 2019

Publications

PUBLICATIONS

- **Revealing the Multifunctions of Li₃N in the Suspension Electrolyte for Lithium Metal Batteries.** *ACS nano*
Kim, M. S., Zhang, Z., Wang, J., Oyakhire, S. T., Kim, S. C., Yu, Z., Chen, Y., Boyle, D. T., Ye, Y., Huang, Z., Zhang, W., Xu, R., Sayavong, et al
2023
- **Suspension electrolyte with modified Li⁺ solvation environment for lithium metal batteries.** *Nature materials*
Kim, M. S., Zhang, Z., Rudnicki, P. E., Yu, Z., Wang, J., Wang, H., Oyakhire, S. T., Chen, Y., Kim, S. C., Zhang, W., Boyle, D. T., Kong, X., Xu, et al
1800
- **Rational solvent molecule tuning for high-performance lithium metal battery electrolytes** *NATURE ENERGY*
Yu, Z., Rudnicki, P. E., Zhang, Z., Huang, Z., Celik, H., Oyakhire, S. T., Chen, Y., Kong, X., Kim, S., Xiao, X., Wang, H., Zheng, Y., Kamat, et al
2022
- **Enabling reversible redox reactions in electrochemical cells using protected LiAl intermetallics as lithium metal anodes** *Science Advances*
Kim, M., et al
2019; 5 (10)
- **Langmuir-Blodgett artificial solid-electrolyte interphases for practical lithium metal batteries** *NATURE ENERGY*
Kim, M., Ryu, J., Deepika, Lim, Y., Nah, I., Lee, K., Archer, L. A., Cho, W.
2018; 3 (10): 889–98
- **Designing solid-electrolyte interphases for lithium sulfur electrodes using ionic shields** *NANO ENERGY*
Kim, M., Kim, M., Do, V., Lim, Y., Nah, I., Archer, L. A., Cho, W.
2017; 41: 573–82
- **Multifunctional Separator Coatings for High-Performance Lithium-Sulfur Batteries** *ADVANCED MATERIALS INTERFACES*
Kim, M., Ma, L., Choudhury, S., Archer, L. A.
2016; 3 (22)
- **Fabricating multifunctional nanoparticle membranes by a fast layer-by-layer Langmuir-Blodgett process: application in lithium-sulfur batteries** *JOURNAL OF MATERIALS CHEMISTRY A*
Kim, M. S., Ma, L., Choudhury, S., Moganty, S. S., Wei, S., Archer, L. A.
2016; 4 (38): 14709–19
- **Templated 3D Ultrathin CVD Graphite Networks with Controllable Geometry: Synthesis and Application As Supercapacitor Electrodes** *ACS APPLIED MATERIALS & INTERFACES*
Hsia, B., Kim, M., Luna, L. E., Mair, N. R., Kim, Y., Carraro, C., Maboudian, R.
2014; 6 (21): 18413–17
- **Flexible micro-supercapacitors with high energy density from simple transfer of photoresist-derived porous carbon electrodes** *CARBON*
Kim, M., Hsia, B., Carraro, C., Maboudian, R.
2014; 74: 163–69
- **FLEXIBLE MICRO-SUPERCAPACITORS FROM PHOTORESIST-DERIVED CARBON ELECTRODES ON FLEXIBLE SUBSTRATES**
Kim, M., Hsia, B., Carraro, C., Maboudian, R., IEEE
IEEE.2014: 389–92

- **Solvation-property relationship of lithium-sulphur battery electrolytes.** *Nature communications*
Kim, S. C., Gao, X., Liao, S., Su, H., Chen, Y., Zhang, W., Greenburg, L. C., Pan, J., Zheng, X., Ye, Y., Kim, M. S., Sayavong, P., Brest, et al
2024; 15 (1): 1268
- **Recovery of isolated lithium through discharged state calendar ageing.** *Nature*
Zhang, W., Sayavong, P., Xiao, X., Oyakhire, S. T., Shuchi, S. B., Vilá, R. A., Boyle, D. T., Kim, S. C., Kim, M. S., Holmes, S. E., Ye, Y., Li, D., Bent, et al
2024; 626 (7998): 306-312
- **Proximity Matters: Interfacial Solvation Dictates Solid Electrolyte Interphase Composition.** *Nano letters*
Oyakhire, S. T., Liao, S., Shuchi, S. B., Kim, M. S., Kim, S. C., Yu, Z., Vila, R. A., Rudnicki, P. E., Cui, Y., Bent, S. F.
2023
- **High-entropy electrolytes for practical lithium metal batteries** *NATURE ENERGY*
Kim, S., Wang, J., Xu, R., Zhang, P., Chen, Y., Huang, Z., Yang, Y., Yu, Z., Oyakhire, S. T., Zhang, W., Greenburg, L. C., Kim, M., Boyle, et al
2023
- **Dissolution of the Solid Electrolyte Interphase and Its Effects on Lithium Metal Anode Cyclability.** *Journal of the American Chemical Society*
Sayavong, P., Zhang, W., Oyakhire, S. T., Boyle, D. T., Chen, Y., Kim, S. C., Vilá, R. A., Holmes, S. E., Kim, M. S., Bent, S. F., Bao, Z., Cui, Y.
2023
- **Data-driven electrolyte design for lithium metal anodes.** *Proceedings of the National Academy of Sciences of the United States of America*
Kim, S. C., Oyakhire, S. T., Athanitis, C., Wang, J., Zhang, Z., Zhang, W., Boyle, D. T., Kim, M. S., Yu, Z., Gao, X., Sogade, T., Wu, E., Qin, et al
2023; 120 (10): e2214357120
- **Correlating the Formation Protocols of Solid Electrolyte Interphases with Practical Performance Metrics in Lithium Metal Batteries** *ACS ENERGY LETTERS*
Oyakhire, S. T., Zhang, W., Yu, Z., Holmes, S. E., Sayavong, P., Kim, S., Boyle, D. T., Kim, M., Zhang, Z., Cui, Y., Bent, S. F.
2023: 869-877
- **Resolving Current-Dependent Regimes of Electroplating Mechanisms for Fast Charging Lithium Metal Anodes.** *Nano letters*
Boyle, D. T., Li, Y., Pei, A., Vila, R. A., Zhang, Z., Sayavong, P., Kim, M. S., Huang, W., Wang, H., Liu, Y., Xu, R., Sinclair, R., Qin, et al
2022
- **A Li-In alloy anode and Nb₂CTX artificial solid-electrolyte interphase for practical Li metal batteries** *JOURNAL OF MATERIALS CHEMISTRY A*
Lee, S., Kim, M., Lee, J., Ryu, J., Do, V., Lee, B., Kim, W., Il Cho, W.
2022
- **Regulating electrodeposition morphology of lithium: towards commercially relevant secondary Li metal batteries.** *Chemical Society reviews*
Zheng, J., Kim, M. S., Tu, Z., Choudhury, S., Tang, T., Archer, L. A.
2020
- **Facile and scalable fabrication of high-energy-density sulfur cathodes for pragmatic lithium-sulfur batteries** *JOURNAL OF POWER SOURCES*
Kim, M., Kim, M., Do, V., Xia, Y., Kim, W., Cho, W.
2019; 422: 104–12
- **Carbon Nitride Phosphorus as an Effective Lithium Polysulfide Adsorbent fro Lithium-Sulfur Batteries** *ACS APPLIED MATERIALS & INTERFACES*
Do, V., Deepika, Kim, M., Kim, M., Lee, K., Cho, W.
2019; 11 (12): 11431–41
- **alpha-Fe₂O₃ anchored on porous N doped carbon derived from green microalgae via spray pyrolysis as anode materials for lithium ion batteries** *JOURNAL OF INDUSTRIAL AND ENGINEERING CHEMISTRY*
Kwon, K., Kim, I., Lee, K., Kim, H., Kim, M., Cho, W., Choi, J., Nah, I.
2019; 69: 39–47
- **Stable Artificial Solid Electrolyte Interphases for Lithium Batteries** *CHEMISTRY OF MATERIALS*
Ma, L., Kim, M., Archer, L. A.
2017; 29 (10): 4181–89
- **Enhanced Li-S Batteries Using Amine-Functionalized Carbon Nanotubes in the Cathode** *ACS NANO*
Ma, L., Zhuang, H. L., Wei, S., Hendrickson, K. E., Kim, M., Cohn, G., Hennig, R. G., Archer, L. A.

2016; 10 (1): 1050–59

● **Photoresist-derived porous carbon for on-chip micro-supercapacitors** *CARBON*

Hsia, B., Kim, M., Vincent, M., Carraro, C., Maboudian, R.
2013; 57: 395–400

● **Silicon carbide nanowires as highly robust electrodes for micro-supercapacitors** *JOURNAL OF POWER SOURCES*

Alper, J. P., Kim, M., Vincent, M., Hsia, B., Radmilovic, V., Carraro, C., Maboudian, R.
2013; 230: 298–302

● **Cycling characteristics of high energy density, electrochemically activated porous-carbon supercapacitor electrodes in aqueous electrolytes** *JOURNAL OF MATERIALS CHEMISTRY A*

Hsia, B., Kim, M., Carraro, C., Maboudian, R.
2013; 1 (35): 10518–23