Soohwan Kim

Battery Cell Engineer

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US Permanent Resident - Authorized to work in the US for any employer

Experience

Cell Testing and Optimization Engineer **August 2024 - Present**

Alkegen – Tonawanda, NY

- Lead development of SOPs for coin- and pouch-cell assembly/testing, incorporating process control documentation.
- Design and execute validation test plans; perform root-cause analysis to resolve performance issues.
- Establish centralized SQL-based database for cell testing data and build automated Python/Tableau, Power BI pipelines for real-time performance monitoring, enabling proactive design and process decisions.
- Partner with materials and application engineers for commercial development of Si-based anodes.

Graduate Research Assistant **January 2021 - August 2024**

Purdue University - West Lafayette, IN

- Designed electrodes/electrolytes for extreme low-temperature (–100 °C) operation.
- Built prototype cells and test methods; developed validation protocols for cycle life and rate capability.
- Performed degradation mechanism analysis (EIS, GITT, CV, dQ/dV, and dV/dQ) to propose mitigation via design and process changes.
- Authored publications and presented findings at conferences; secured competitive funding (DURIP, ONR) through technical proposals.

Engineering Intern – Battery Cell Engineer **May 2023 - December 2023**

Rivian - Irvine, CA

- Conducted current-violation and high-rate DC fast-charging tests on pouch and 2170 cylindrical cells; extracted parameters to inform cell modeling and integration
- Supported failure analysis, cell tear-downs, and root-cause investigations.
- Improved SOH estimation process and specified lab equipment to expand validation capability.

Graduate Research Assistant **January 2018 - September 2020**

Hanyang University - Seoul, Korea

- Developed SiO-based anode materials using composite and prelithiation strategies; improved initial coulombic efficiency and cycling stability.
- Worked on collaborative projects with Samsung, SK Innovation, and Korea Automotive Technology Institute, aligning research deliverables with industrial requirement.
- Performed electrode fabrication, prototype cell assembly, and electrochemical characterization.

Intern Researcher **March 2017 - August 2017**

KIST EUROPE – Saarbrücken, Germany

- Screened and developed novel electrode materials for vanadium redox flow batteries; supported early-stage prototype construction and performance validation

Education

Ph.D., Chemical Engineering – Purdue University, Aug 2024 | GPA: 3.68/4.0

M.S., Energy Engineering – Hanyang University, Feb 2020 | GPA: 4.5/4.5

B.S., Energy Engineering – Hanyang University, Feb 2018 | GPA: 4.18/4.5

Technical Skills

Battery Cell Testing: Arbin, Maccor, BioLogic, Gamry, BaSyTec, TOYO, WonATech, Neware

Electrochemical Analysis: EIS, GITT, CV, PITT, dQ/dV, dV/dQ

Materials Characterization: SEM, XRD, TEM, Raman, FT-IR, DSC, TGA, XPS

Software: Python, SQL, Tableau, Power BI, Jira

Selected Publications & Patent

(Full list available in Google Scholar - https://scholar.google.com/citations?user=e5cvYMAAAAAJ&hl=ko)

Insights into Electrolyte-Solvent Interactions and SEI Formation for Sustainable Soduim-Ion Battery Operation at Low Temperatures

S. Kim*, V. Mirzapure*, R. Atwi*, H. V. S. R. M. Koppisetti, N. N. Rajput, M. Shelke, V. G. Pol, *Small Methods,* 2025, 15, 10190. (*equally contributing first authors).

Innovative amorphous multiple anionic transition metal compound electrode for extreme environments (≤ -80 ℃) battery operations

J. H. Kim*, **S. Kim***, Y. C. Kang, V. G. Pol, *Nano Energy*, 2024, 109823. (*equally contributing first authors).

Enabling Extreme Low-Temperature (≤ -100 ℃) Battery Cycling with Niobium Tungsten Oxides Electrode and Tailored Electrolytes

S. Kim, Y. Zhang, H. Wang, T. E. Adams, V. G. Pol, *Small*, 2024, 20, 2306438.

Ion-Solvent Interplay in Concentrated Electrolytes Enables Subzero Temperature Li-ion Battery Operations

S. Kim*, B. Seo*, H. V. Ramasamy, Z. Shang, H. Wang, B. M. Savoie, V. G. Pol, *ACS Appl. Mater.*, 2022, 14, 41934-41944. (*equally contributing first authors).

Topology Optimized Prelithiated SiO Anode Materials for Lithium-Ion Batteries

D. J. Chung, D. Youn, J. Y. Kim, W. J. Jeong, **S. Kim**, D. Ma, T. R. Lee, S. T. Kim, H. Kim, *Small*, 2022, 18, 2202209.

Dehydrogenation-driven Li Metal-free Prelithiation for High Initial Efficiency SiO-based Lithium Storage Materials

D. J. Chung, D. Youn, **S. Kim**, D. Ma, J. Lee, W. J. Jeong, E. Park, J-S. Kim, C. Moon, J. Y. Lee, H. Sun, H. Kim, *Nano Energy*, 2021, 89, 106378.

US Patent 20230369650A1 - Electrolyte Compositions for Use in Electrochemical Cells

Awards

Graduate Student Recognition Award (Purdue University), 2024

Bilsland Dissertation Fellowship (Purdue University), 2024

GUINNESS WORLD RECORDS™ - The Lowest Temperature (-100 ℃) to Charge a Lithium-ion Battery, 12/2021