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RESEARCHER INFORMATION

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• Gender	Male
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• Researcher Info.	Google Scholar , Scopus , ORCID: 0000-0001-6693-7603
• Personal Website	https://sites.google.com/view/jung-been-park/home
• Research Interests	Nanomaterials, Surface Engineering of Metal anodes, Electrochemical analysis, Li/Zn metal batteries, Li-S batteries, Energy Storage Materials

PROFESSIONAL EXPERIENCE

Nanyang Technological University	<i>Aug. 2026–present</i>
<u>Research fellow</u> in School of Mechanical and Aerospace Engineering	
Korea University, South Korea	<i>Mar. 2026–Aug. 2026</i>
<u>Postdoctoral Researcher</u> in School of Civil, Environmental and Architectural Engineering (Climate and Energy)	

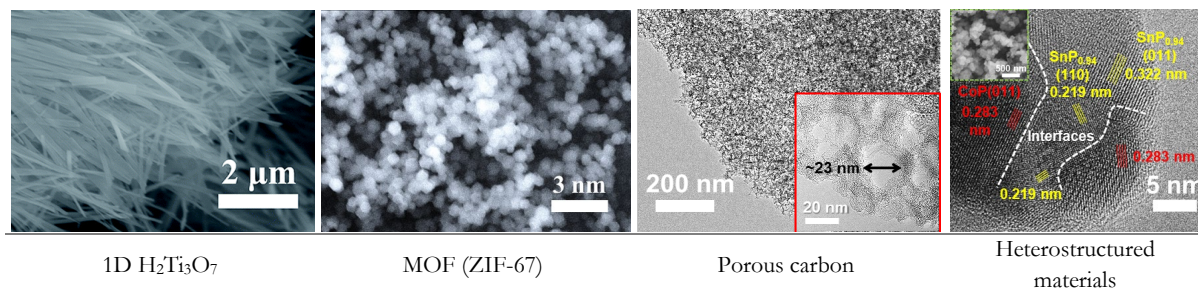
EDUCATION

Korea University, South Korea	<i>Mar. 2020–Feb. 2026</i>
<u>Ph.D.</u> in School of Civil, Environmental and Architectural Engineering (Climate and Energy) Advisor: Prof. Dong-Wan Kim	
Thesis: Tailoring Inorganic Interface Design via Physicochemical Principles for Stable Advanced Metal Anodes in Next-Generation Batteries	
Ajou University, South Korea	<i>Mar. 2014–Feb. 2020</i>
<u>B.S.</u> in Materials Science and Engineering Advisor: Prof. Hyungtak Seo	

RESEARCH SPECIALTY

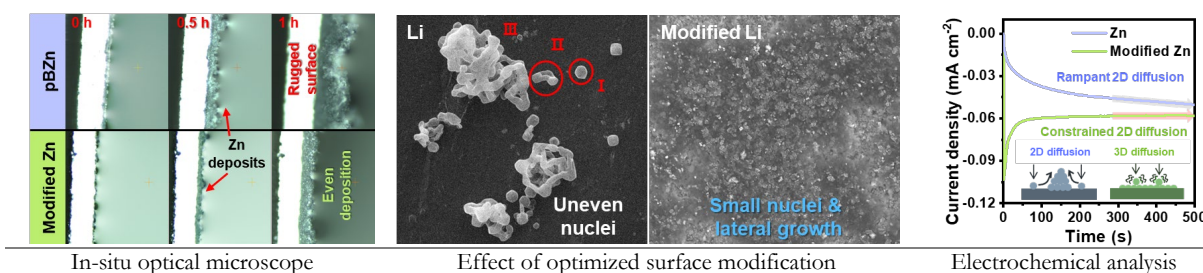
• Optimal material design according to various physicochemical properties

Leveraging extensive expertise in material synthesis and intellectual property, capable of designing and developing materials optimized for battery applications, electrochemistry, and diverse scientific fields.



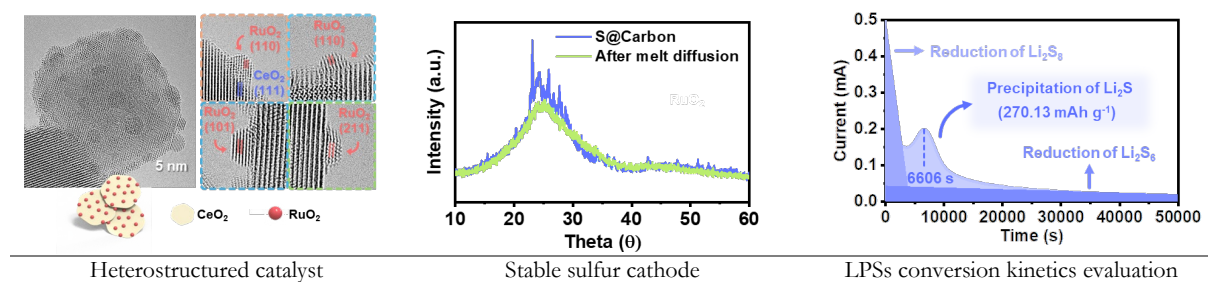
• Surface engineering of Li/Zn metal anodes for advanced Li/Zn metal batteries with superior cyclability

- Expertise in customized analytical techniques (ex-situ/in-situ observation, phase transition analysis, electrochemical analysis) for addressing challenges and understanding deposition/stripping mechanisms in Li and Zn metal anodes
- Proficient in diverse surface modification strategies tailored to specific materials, including preferred crystallographic orientation control, porous material design, utilization of metallophilic materials, and heterogeneous interface engineering
- Possess in-depth electrochemical analysis expertise for material suitability assessment (nucleation/growth kinetics and behavior, reversibility, chemical stability etc.)



• Catalyst and host development toward practical Li-S batteries

- Development of heterostructured materials ($\text{CeO}_2/\text{RuO}_4$, $\text{TiO}_2/\text{MoS}_2$, MXene/ $\text{H}_2\text{Ti}_3\text{O}_7$) for improving lithium polysulfides (LPSs) adsorption-migration-conversion mechanism
- Possess expertise in fabricating stable sulfur hosts (from melt diffusion) to minimize LPSs dissolution
- Analytical techniques for kinetics and mechanisms of LPSs adsorption (physisorption and chemisorption) and conversion (Li_2S nucleation kinetics)



PROFESSIONAL SKILLS

• Zero to one

Equipment construction from material synthesis stage (hydrothermal, heat-treatment equipment etc.) to cell manufacturing stage (glove box, cell fabrication process etc.) of Li-ion/metal batteries and scale-up of the battery cyler

• Synthesis of nanomaterials

Optimized design and synthesis of materials at the nanoscale using diverse methods (sol-gel, precipitation, hydrothermal, solid-state, wire-explosion etc.)

- Porous carbon, various metal hydroxides/oxides/sulfides/phosphides (using tube furnace with flow gas), heterostructured materials, Metal-Organic-Frameworks, composite materials

• Coating techniques

The application of diverse coating strategies (blade, drop, dip, and spin coating), tailored to material and substrate types, for maximizing material performance

• Electrochemical analysis/evaluation

- Electrochemical performance evaluation of half/full-cell, galvanostatic cycling for Li/Zn-ion, Li/Zn-metal, and Li-S battery, cyclic voltammetry (CV) tests, chronoamperometry (CA) tests, Coulombic efficiency evaluation, linear sweep voltammetry (LSV), electrochemical impedance spectroscopy (EIS), ionic/electronic conductivity, Li/Zn-ion transference number, galvanostatic intermittent titration technique (GITT)

• Materials characterization

- Powder X-ray diffraction (XRD) & 2D XRD, X-ray/ultraviolet photoelectron spectroscopy (XPS/UPS), transmittance electron microscope (TEM, CS-TEM, EDS), scanning electron microscope (SEM, EDS), atomic force microscope (AFM), confocal laser scanning microscopy (CLSM), thermalgravimetric analysis (TGA), UV-Vis spectrophotometer, Fourier-transform infrared spectroscopy (FT-IR), Raman spectroscopy, inductively coupled plasma optical emission spectroscopy (ICP-OES), Elemental analyzer (EA), time-of-flight secondary ion mass spectrometry (TOF-SIMS), Brunauer, Emmett, Teller (BET) analysis

• Software skills

- Origin Pro, Word, Excel, PowerPoint, Rhino, KeyShot 9, Adobe Photoshop, VESTA, IVIUM software, Battery cyler software (WonATech, Sinopro), XPS fitting software (XPSPEAK41), Gatan

RESEARCH ACHIEVEMENTS

Note: † indicates equally contributed authors, * represents corresponding authors

• First-Author Papers

- 1 H. Kang†, **J. B. Park†**, M. Jang, M. S. Kim, S. Yu*, and D. W. Kim*, “Synergistically Accelerating Zn²⁺ Transport and Desolvation through Cation-Deficient Ion Channels in High-Performance Zn Metal Batteries”, *Carbon Energy* **2026**
- 2 M. S. Kim†, **J. B. Park†**, H. Kang, S. W. Jung, and D. W. Kim*, “Rapid Construction of a Nanoscale Indium Interfacial Layer via Synergistic Facet-Defect Modulation for Stable Zn-Metal Anodes”, *Chem. Eng. J.* **2026**, 545, 180008
- 3 **J. B. Park†**, C. Choi†, M. S. Kim, H. Kang, E. Kwon, S. Yu, and D. W. Kim*, “Designing Metal Phosphide Solid-Electrolyte Interphase for Stable Lithium Metal Batteries through Electrified Interface Optimization and Synergistic Conversion”, *Nano-Micro Lett.* **2025**, 17, 12.
- 4 B. C. Min†, **J. B. Park†**, C. Choi†, D. W. Kim*, Dynamic construction of a composite solid electrolyte interphase for dendrite-free lithium metal batteries via lithium-antimony self-alloying, *Adv. Compos. Hybrid Mater.* **2025**, 8(1), 1-15.
- 5 J. Lee†, S. Kim†, **J. B. Park†**, D. Park, C. Choi, H. Lee, G. Jang, Y. S. Park, J. Yun, S. Moon, S. Lee, C. S. Jeong, J. H. Kim, H. J. Choi, D. W. Kim*, J. Moon*, “Electrochemically Active MoO₃/TiN Sulfur Host Inducing Dynamically Reinforced Built-in Electric Field for Advanced Lithium–Sulfur Batteries”, *Small* **2024**, 20, 2406018.
- 6 J. H. Park†, C. Choi†, **J. B. Park†**, S. Yu, D. W. Kim*, “Fortifying Zinc Metal Anodes against Uncontrollable Side-Reactions and Dendrite Growth for Practical Aqueous Zinc Ion Batteries: A Novel Composition of Anti-Corrosive and Zn²⁺ Regulating Artificial Protective Layer”, *Adv. Energy Mater.* **2024**, 14 (5), 2302493. [selected as Front Cover]
- 7 **J. B. Park†**, C. Choi†, S. W. Jung, B. C. Min, J. H. Park, D. W. Kim*, “Designing Chemically Replaced Interfacial Layer via Unveiling the Influence of Zn Crystal Facets for Practical Zn-Metal Anodes”, *Adv. Mater.* **2024**, 36 (1), 2308684. [selected as Inside Front Cover]
- 8 D. K. Kim†, **J. B. Park†**, C. Choi†, D. W. Kim* “An oxygen-vacancy-boosted heterostructured catalyst with synergistically integrated dual transition-metal oxides for high-performance lithium-sulfur batteries”, *Chem. Eng. J.* **2024**, 479, 147820.
- 9 **J. B. Park†**, C. Choi†, J. H. Park, S. Yu, D. W. Kim*, “Synergistic Design of Multifunctional Interfacial Zn Host toward Practical Zn Metal Batteries”, *Adv. Energy Mater.* **2022**, 12 (48), 2202937.
- 10 **J. B. Park†**, C. Choi†, S. Yu, K. Y. Chung, D. W. Kim*, “Porous Lithiophilic Li-Si Alloy-Type Interfacial Framework via Self-Discharge Mechanism for Stable Lithium Metal Anode with Superior Rate”, *Adv. Energy Mater.* **2021**, 11 (37), 2101544. [selected as Back Cover]

• Co-Author Papers

- 1 I K. R. A. Dipta, **J. B. Park**, M. S. Kim, D. W. Kim*, and C. W. Lee*, “Selective Synthesis of Sub-20 nm Carbon Nanotubes via Carbonate Electroreduction in Fluoride-based Molten Carbonates”, *Carbon* **2026**, 258, 121782.
- 2 J. Lee†, Y. S. Park†, T. J. Lim, Y. Won, **J. B. Park**, S. Moon, S. Lee, S. Kim, J. H. Kim, D. Kim, H. An, J. Lee, D. W. Kim, K. Kim, J. Moon*, “Rational Engineering of Chiral Ni-Based Layered Double Hydroxide Electrocatalysts with Enhanced Oxygen Evolution Reaction Enabling High-Performance Zn–Air Battery”, *Chem. Eng. J.* **2026**, 529, 172562.
- 3 S. H. Hwang†, S. D. Seo†, D. Kim, **J. B. Park**, S. C. Kim, and D. W. Kim*, “Expediting Solid Electrolyte Synthesis: Microwave-Assisted Wet Synthesis of Halogen-rich Li-Argyrodite”, *J. Energy Chem.* **2025**, 104, 527.
- 4 S. Kim†, J. Lee†, S. Lee, **J. B. Park**, C. Choi, G. Jang, Y. S. Park, H. Lee, J. Yun, S. Moon, W. Jeong, S. Lee, C. S. Jeong, D. W. Kim, and J. Moon*, “Elucidating the Dominant Role of All-amorphous Heterostructure on Optimized Built-in Electric Field with Abundant Active Sites for Advanced Lithium–Sulfur Batteries”, *Appl. Catal. B-Environ. Energy* **2025**, 363, 124806.
- 5 Y. S. Park†, J. Lee†, H. Lee, **J. B. Park**, J. Yun, C. U. Lee, S. Moon, S. Lee, S. Kim, J. Kim, D. Kim, J. Han, D. W. Kim, and J. Moon*, “Elucidating Chirality-Induced Spin Selectivity Effect of Co-doped NiO Deposited on Ni Foam for Highly Stable Zn–Air Batteries”, *ACS Appl. Mater. Interfaces* **2025**, 17, 18228.
- 6 J. H. Han†, M. Park†, J. u. Lee, C. Choi, **J. B. Park**, Y. Lim, G. Kim, J. Jung, D. Langerich, C. H. Jun, D. W. Kim, and J. Cheon*, “Molecular Drillers for 2 nm Resolution Nanochannel Perforation of 2D Nanoplates”, *J. Am. Chem. Soc.* **2025**, 147, 1399.
- 7 K. Jang†, H. J. Song†, **J. B. Park**, S. W. Jung, and D. W. Kim*, “Magnesium Fluoride-Engineered UiO-66 Artificial Protection Layers for Dendrite-Free Lithium Metal Batteries”, *Energy Environ. Sci.* **2024**, 17, 4622.
- 8 D. Lee†, C. Choi†, **J. B. Park**, S. W. Jung, D. W. Kim*, “Ingenious separator architecture: Revealing the versatile 3D heterostructured MXene-hydrogen titanate electrocatalysts for advanced lithium-sulfur battery”, *Energy Storage Mater.* **2024**, 70, 103529.
- 9 C. Choi, **J. B. Park**, J. H. Park, S. Yu, D. W. Kim*, “Simultaneous manipulation of electron/Zn²⁺ ion flux and desolvation effect enabled by *in-situ* built ultra-thin oxide-based artificial interphase for controlled deposition of zinc metal anodes”, *Chem. Eng. J.* **2023**, 456, 141015.
- 10 J. Lee, C. Choi, **J. B. Park**, S. Yu, J. Ha, H. Lee, G. Jang, Y. S. Park, J. Yun, H. I., S. Moon, S. Lee, J.-I. Choi, D.-W. Kim*, J. Moon*, “Optimally arranged TiO₂@MoS₂ heterostructures with effectively induced built-in electric field for high-performance lithium-sulfur batteries”, *J. Energy Chem.* **2023**, 83, 496–508.
- 11 N. Kim†, Y. Kim†, **J. B. Park**, H. H. Cho, D. K. Lee, G. Kwak, H. K. Yu*, “Micro-networked metal coating using self-cracked WO₃ inorganic thin film as sacrificial layer: Application to transparent flexible electrodes”, *Thin Solid Films* **2021**, 736, 138916.
- 12 C. Choi, **J. B. Park**, D. W. Kim*, “A synergistic engineering layer with a versatile H₂Ti₃O₇ electrocatalyst for a suppressed shuttle effect and enhanced catalytic conversion in lithium-sulfur batteries”, *J. Mater. Chem. A* **2020**, 8 (47), 25411-25424.
- 13 C. Choi, D. Y. Lee, **J. B. Park**, D. W. Kim*, “Separators Modified Using MoO₂@Carbon Nanotube Nanocomposites as Dual-Mode Li-Polysulfide Anchoring Materials for High-Performance Anti-Self-Discharge Lithium-Sulfur Batteries”, *ACS Sustain. Chem. Eng.* **2020**, 8 (40), 15134-15148.

PROJECTS

1. **NRF Postdoctoral Fellowship for Overseas Research**, National Research Foundation of Korea (NRF Korea), 2026.09 ~ 2027.08, “Elucidating Li-ion Transport Mechanisms via Grain Boundary-Controlled Heterostructures for Next-Generation Lithium Metal batteries”.

PATENTS

1. D. W. Kim, J. C. Kim, C. Choi, J. C. Park, W. J. Kim, **J. B. Park**, “Hydrothermal Method of Barium Titanate Doped Metal Atom, and Barium Titanate Nano Rods for Multi-Layer Ceramic Capacitor and Manufacturing Method Thereof, and Multi-Layer Ceramic Capacitor”, [KR 10-2021-0127599](#)

AWARDS & HONORS

- 1 2025 BK21 Creative Graduate (Korea University, 2026. 02)
- 2 2023 KU Graduate School Achievement Award (Korea University, 2024. 02)
- 3 2023 KU Graduate School Achievement Award (Korea University, 2024. 02)
- 4 2023 KU Best Paper Award (Korea University, 2024. 02)
- 5 2022 GS Construction Scholarship (Scholarship, Korea University, 2022. 02)
- 6 KcerS Excellent Poster Presentation Award (2024 Spring Meeting of The Korean Ceramic Society)
- 7 Yangsong Excellent Poster Presentation Award (2022 Fall Meeting of The Korean Ceramic Society)
- 8 KcerS Excellent Poster Presentation Award (2022 Spring Meeting of The Korean Ceramic Society)
- 9 Yangsong Excellent Poster Presentation Award (2021 Fall Meeting of The Korean Ceramic Society)

PRESENTATIONS in Academic Meeting & Conference

- 1 **J. B. Park**, D. W. Kim, “Design of lithiophilic phosphide-based heterojunction material for stable Li deposition”, 2025 Spring Meeting of The Korean Electrochemical Society, Jeju, Korea, Apr. 02–04, **2025**.
- 2 S. W. Jung, **J. B. Park**, D. W. Kim, “Covalent organic framework (COF)-based Li ion filtering protective layer for stable Li metal anodes”, 2024 Spring Meeting of The Korean Ceramic Society, Busan, Korea, Apr. 18, **2024**.
- 3 B. Min, **J. B. Park**, D. W. Kim, “Gel polymer electrolyte with a TiO₂-based filler for safer and durable Li metal batteries.”, 2024 Spring Meeting of The Korean Ceramic Society, Busan, Korea, Apr. 18, **2024**.
- 4 D. Lee, C. Choi, **J. B. Park**, S. W. Jung, D. W. Kim, “Ingenious Separator Architecture: Revealing the Versatile 3D Heterostructured MXene-Hydrogen Titanate Electrocatalysts for Advanced

Lithium-Sulfur Battery”, 2024 Spring Meeting of The Korean Ceramic Society, Busan, Korea, Apr. 18, **2024**.

- 5 **J. B. Park**, D. W. Kim, “Functional carbon-based Zn host assisted with ultra-thin hydrophilic ZnO layer for practical aqueous Zn-metal batteries”, 2024 MATERIALS RESEARCH SOCIETY SPRING MEETING & EXHIBIT, Seattle, United States, Apr. 22–26, **2024**.
- 6 **J. B. Park**, D. W. Kim, “Synergistic effect with hydrophobic and hydrophilic interfacial layers for high-performance aqueous Zn metal batteries”, 2023 International Conference on Surface Engineering, Busan, Korea, Nov. 23, **2023**.
- 7 **J. B. Park**, B. Min, S. W. Jung, D. W. Kim, “Rational Design of Interfacial Layers with Hydrophobicity and Hydrophilicity for Practical Zn Metal Batteries”, 2023 Spring Meeting of The Korean Ceramic Society, Jeju, Korea, Apr. 14, **2024**.
- 8 J. H. Park, C. Choi, **J. B. Park**, D. W. Kim, “Multi-functional silicate based protective layer for dendrite-free and durable zinc metal anode”, 2022 Fall Meeting of The Korean Ceramic Society, Seoul, Korea, Oct. 26, **2024**.
- 9 **J. B. Park**, C. Choi, J. H. Park, D. W. Kim, “Zincophilic porous interfacial Zn host enabling stable Zn deposition behavior for aqueous Zn metal batteries”, 2022 Fall Meeting of The Korean Ceramic Society, Seoul, Korea, Oct. 26, **2024**.
- 10 **J. B. Park**, C. Choi, J. H. Park, D. W. Kim, “Zn-rich interfacial protective layer via facile spin coating process for ultra-stable zinc metal anode”, 2022 Spring Meeting of The Korean Ceramic Society, Yeosu, Korea, Apr. 14, **2024**.
- 11 **J. B. Park**, S. H. Choi, D. W. Kim, “Prelithiated silicon-based artificial protection layer for highly stable lithium metal anode”, 2022 NANO CONVERGENCE CONFERENCE, Gwangju, Korea, Jan. 19, **2022**.
- 12 **J. B. Park**, C. Choi, D. W. Kim, “Synthesis of Porous Interfacial Framework via Spontaneous Li-Si Alloy for Lithium Metal Battery with High Rate”, 2021 Fall Meeting of The Korean Ceramic Society, Seoul, Korea, Jul. 16, **2021**.

REFERENCES

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