

CURRICULUM VITAE

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EDUCATION

Ph.D. in Chemical Engineering University of Minnesota Twin Cities, USA Thesis Advisors: Prof. Timothy P. Lodge & Prof. C. Daniel Frisbie	2007.09 ~ 2012.11
B.S. in Chemical & Biological Engineering Seoul National University, South Korea Graduated with honor: <i>Summa cum laude</i>	2000.03 ~ 2007.02

APPOINTMENTS

Associate Professor, Chemical Engineering, Inha University	2020.03 ~ present
Assistant Professor, Chemical Engineering, Inha University	2014.03 ~ 2020.02
Postdoc, Materials Science & Engineering, University of California Berkeley	2012.11 ~ 2014.02

RESEARCH INTERESTS

Design & Synthesis of Functional Polymer Electrolytes for Stretchable/flexible Devices

- Utilizing physical and/or chemical crosslinks to generate 3D structuring polymer networks
- Developing self-healable, stretchable, self-adhesive, and thermally stable polymer electrolytes
- Deformable devices: thin-film transistors, strain sensors, supercapacitors, batteries, and light emitting devices

Processing Techniques for Printed Electronic/Electrochemical Devices

- Design composite inks for functional electrodes, electrolytes, and semiconductors
- All-printed thin-film devices for signal processing, sensing, and energy storage
- 3D-printing, transfer-printing, spray printing, and other printing techniques

Investigating Carrier Accumulation, Interaction, and Transport for Future Electronics

- Understanding ion doping/dedoping, ion-carrier interactions, and charge accumulation/migration phenomena
- Optimizing physisorption/chemisorption of electrolyte ions for effective utilization of electrode interface
- Controlling carrier injection/transport to develop deformable ternary logic circuits for future electronics

SELECTED PUBLICATIONS

Note: JCR impact factors as of 2023

1. Sub-Band Filling and Hole Transport in Polythiophene-Based Electrolyte-Gated Transistors: Effect of Side-Chain Length and Density; K.G.Cho, DZ Adrahtas, **K.H.Lee***, CD Frisbie*, *Advanced Functional Materials*, **2023**, 33, 2303700 (**Corresponding author, IF=19.0**)
2. Self-healable, stretchable, and nonvolatile solid polymer electrolytes for sustainable energy storage and sensing applications; D.H.Cho, K.G.Cho, S.An, M.S.Kim, H.W.Oh, J.Yeo, W.C.Yoo, K.Hong*, M.Kim*, **K.H.Lee***, *Energy Storage Materials*, **2022**, 45, 323 (**Corresponding author, IF=20.4**)
3. Coarsening-induced hierarchically interconnected porous carbon polyhedrons for stretchable ionogel-based supercapacitors; M.S.Kang, I.Heo, K.G.Cho, H.Kyung, H.S.Kim, **K.H.Lee***, W.C.Yoo*, *Energy Storage*

Materials, **2022**, 45, 380 (**Corresponding author, IF=20.4**)

4. Block Copolymer-Based Supramolecular Ionogels for Accurate On-Skin Motion Monitoring; K.G.Cho, S.An, D.H.Cho, J.H.Kim, J.Nam, M.Kim*, K.H.Lee*, *Advanced Functional Materials*, **2021**, 31, 2102386 (**Corresponding author, IF=19.0**)
5. In situ polymerized solid electrolytes for superior safety and stability of flexible solid-state Al-ion batteries; I.Kim, S.Jang, K.H.Lee*, Y.Tak*, G.Lee*, *Energy Storage Materials*, **2021**, 40, 229 (**Corresponding author, IF=20.4**)
6. Ultra-Sensitive and Stretchable Ionic Skins for High-Precision Motion Monitoring; J.H.Kim, K.G.Cho, D.H.Cho, K.Hong*, K.H.Lee*, *Advanced Functional Materials*, **2021**, 31, 2010199 (**Corresponding author, IF=19.0**)
7. Electrochemiluminescent Transistors: A New Strategy toward Light-Emitting Switching Devices; S.Lee, H.J.Lee, Y.Ji, K.H.Lee*, K.Hong* *Advanced Materials*, **2021**, 33, 2005456 (**Corresponding author, IF=29.4**)
8. Optimizing Electrochemically Active Surfaces of Carbonaceous Electrodes for Ionogel Based Supercapacitors; K.G.Cho, H.S.Kim, S.S.Jang, H.Kyung, M.S.Kang, K.H.Lee*, W.C.Yoo* *Advanced Functional Materials*, **2020**, 30, 2002053 (**Corresponding author, IF=19.0**)
9. Light-Emitting Devices Based on Electrochemiluminescence Gels; K.G.Cho, J.I.Lee, S.Lee, K.Hong*, M.S.Kang*, K.H.Lee*, *Advanced Functional Materials*, **2020**, 30, 1907936 (**Corresponding author, IF=19.0**)
10. Solid-State Dual Function Electrochemical Devices: Energy Storage and Light-Emitting Applications; K.Hong, M.G.Kim, H.M.Yang, D.C.Lim, J.Y.Lee, S.J.Kim, I.Lee, K.H.Lee*, J.L.Lee*, *Advanced Energy Materials*, **2016**, 6, 1600651 (**Corresponding author, IF=27.8**)

FULL PUBLICATION LIST: 58 PAPERS

Note: JCR impact factors as of 2023

1. Approaching Theoretical Limits in the Performance of Printed P-Type CuI Transistors via Room Temperature Vacancy Engineering; Y.A. Kwon, J.H.Kim, S.V. Barma, K.H.Lee, S.B. Jo*, J.H.Cho*, *Advanced Materials*, **2023**, accepted (**Coauthor, IF=29.4**)
2. High-performance lithium–sulfur batteries utilizing charged binder and solid-state ionogel electrolyte; J.M.Heo, J.Mun*, K.H.Lee*, *Macromolecular Research*, **2023**, accepted (**Corresponding author, IF=2.4**)
3. LEGO-like Assembly of Fibrous Modules for Display Textiles; S.Lee, W.S.Cho, K.G.Cho, J.-L.Lee, K.H.Lee*, K.Hong*, *ACS Applied Materials & Interfaces*, **2023**, 15, 41688 (**Corresponding author, IF=9.5**)
4. Sub-Band Filling and Hole Transport in Polythiophene-Based Electrolyte-Gated Transistors: Effect of Side-Chain Length and Density, K.G.Cho, DZ Adrahtas, K.H.Lee*, CD Frisbie*, *Advanced Functional Materials*, **2023**, 33, 2303700 (**Corresponding author, IF=19.0**)
5. Photopatternable and Self-Healable Ionogels for Organic Thin-film Transistors, S.Kim, J.Yeo, S.J.Kim, S.Park, K.G.Cho, K.Paeng*, K.H.Lee*, M.Kim*, *Organic Electronics*, **2023**, 122, 106895 (**Corresponding author, IF=3.2**)
6. Self-healable, stretchable, and nonvolatile solid polymer electrolytes for sustainable energy storage and sensing applications; D.H.Cho, K.G.Cho, S.An, M.S.Kim, H.W.Oh, J.Yeo, W.C.Yoo, K.Hong*, M.Kim*, K.H.Lee*, *Energy Storage Materials*, **2022**, 45, 323 (**Corresponding author, IF=20.4**)
7. Coarsening-induced hierarchically interconnected porous carbon polyhedrons for stretchable ionogel-based supercapacitors; M.S.Kang, I.Heo, K.G.Cho, H.Kyung, H.S.Kim, K.H.Lee*, W.C.Yoo*, *Energy Storage Materials*, **2022**, 45, 380 (**Corresponding author, IF=20.4**)
8. Tuning Threshold Voltage of Electrolyte-Gated Transistors by Binary Ion Doping; K.G.Cho, K.H.Seol, M.S.Kim, K.Hong*, K.H.Lee*, *ACS Applied Materials & Interfaces*, **2022**, 14, 50004 (**Corresponding author, IF=9.5**)

9. Copper halide anion engineering for p-channel electrolyte-gated transistors with superior operational reliability; D.I.Lee, M.S.Kim, K.G.Cho, K.Hong*, K.H.Lee*, *Journal of Materials Chemistry C*, **2022**, *10*, 12829 (**Corresponding author, IF=6.4**)
10. 3D printed solid-state composite electrodes and electrolytes for high-energy-density flexible microsupercapacitors; K.G.Cho, S.S.Jang, I.Heo, H.Kyung, W.C.Yoo*, K.H.Lee*, *Journal of Energy Storage*, **2022**, *53*, 105206 (**Corresponding author, IF=9.4**)
11. Amorphous copper iodide: a p-type semiconductor for solution processed p-channel thin-film transistors and inverters; H.J.Lee, S.Lee, K.H.Lee*, K.Hong*, *Journal of Materials Chemistry C*, **2022**, *10*, 7815 (**Corresponding author, IF=6.4**)
12. Water Washable and Flexible Light-Emitting Fibers Based on Electrochemiluminescent Gels; S.Lee, W.S.Cho, J.Y.Park, H.J.Lee, J.-L.Lee*, K.H.Lee*, K.Hong*, *ACS Applied Materials & Interfaces*, **2022**, *14*, 17709 (**Corresponding author, IF=9.5**)
13. Intrinsically Stretchable and Printable Lithium-Ion Battery for Free-Form Configuration; S.Y.Hong, S.M.Jee, Y.Ko, J.Cho, K.H.Lee, B.Yeom, H.Kim, J.G.Son*, *ACS Nano*, **2022**, *16*, 2271 (**Coauthor, IF=17.5**)
14. Facile Achievement of Complementary Resistive Switching in Block Copolymer Micelle-Based Resistive Memories; H.-H.Choi, H.J.Kim, J.Oh, M.Kim, Y.Kim, J.Y.Jho, K.H.Lee, J.G.Son, J.H.Park*, *Macromolecular Rapid Communications*, **2022**, *43*, 2100686 (**Coauthor, IF=4.6**)
15. Self-Healable and Tough Polymer Electrolyte Composites Based on Associative Nanostructural Networks; Y.Lee, M.Kim; H.Kim, K.H.Lee, S.Kim*, *ACS Applied Polymer Materials*, **2022**, *4*, 5821 (**Coauthor, IF=5.0**)
16. Block Copolymer-Based Supramolecular Ionogels for Accurate On-Skin Motion Monitoring; K.G.Cho, S.An, D.H.Cho, J.H.Kim, J.Nam, M.Kim*, K.H.Lee*, *Advanced Functional Materials*, **2021**, *31*, 2102386 (**Corresponding author, IF=19.0**)
17. In situ polymerized solid electrolytes for superior safety and stability of flexible solid-state Al-ion batteries; I.Kim, S.Jang, K.H.Lee*, Y.Tak*, G.Lee*, *Energy Storage Materials*, **2021**, *40*, 229 (**Corresponding author, IF=20.4**)
18. Ultra-Sensitive and Stretchable Ionic Skins for High-Precision Motion Monitoring; J.H.Kim, K.G.Cho, D.H.Cho, K.Hong*, K.H.Lee*, *Advanced Functional Materials*, **2021**, *31*, 2010199 (**Corresponding author, IF=19.0**)
19. Electrochemiluminescent Transistors: A New Strategy toward Light-Emitting Switching Devices; S.Lee, H.J.Lee, Y.Ji, K.H.Lee*, K.Hong*, *Advanced Materials*, **2021**, *33*, 2005456 :selected as the back cover (**Corresponding author, IF=29.4**)
20. Optimizing Electrochemically Active Surfaces of Carbonaceous Electrodes for Ionogel Based Supercapacitors; K.G.Cho, H.S.Kim, S.S.Jang, H.Kyung, M.S.Kang, K.H.Lee*, W.C.Yoo*, *Advanced Functional Materials*, **2020**, *30*, 2002053 :selected as the front cover (**Corresponding author, IF=19.0**)
21. Light-Emitting Devices Based on Electrochemiluminescence Gels; K.G.Cho, J.I.Lee, S.Lee, K.Hong*, M.S.Kang*, K.H.Lee*, *Advanced Functional Materials*, **2020**, *30*, 1907936 :invited review (**Corresponding author, IF=19.0**)
22. Thermostable Ion Gels for High-Temperature Operation of Electrolyte-Gated Transistors; K.G.Cho, Y.K.Cho, J.H.Kim, H.-Y.Yoo, K.Hong*, K.H.Lee*, *ACS Applied Materials & Interfaces*, **2020**, *12*, 15464 (**Corresponding author, IF=9.5**)
23. Printable carbon nanotube-based elastic conductors for fully-printed sub-1 V stretchable electrolyte-gated transistors and inverters; K.G.Cho, Y.K.Kwon, S.S.Jang, K.H.Seol, J.H.Park, K.Hong*, K.H.Lee*, *Journal of Materials Chemistry C*, **2020**, *8*, 3639 (**Corresponding author, IF=6.4**)
24. Vacancy engineering of a solution processed CuI semiconductor: tuning the electrical properties of inorganic P-channel thin-film transistors; S.Lee, H.J.Lee, Y.Ji, S.M.Choi, K.H.Lee*, K. Hong*, *Journal of Materials Chemistry C*, **2020**, *8*, 9608 (**Corresponding author, IF=6.4**)

25. Solution processed vertical p-channel thin film transistors using copper(I) thiocyanate; Y.Ji, S.Lee, H.J.Lee, K.S.Choi, C.Jeon, **K.H.Lee***, K.Hong*, *Journal of Materials Chemistry C*, **2020**, *8*, 5587 (**Corresponding author, IF=6.4**)
26. Tough and ionically conductive polymer electrolyte composites based on random copolymers with crystallizable side chain architecture; H.-Y.Yoo, D.Son, H.Kim, K.G.Gho, M.Kim, **K.H.Lee***, S.Kim*, *Organic Electronics*, **2020**, *84*, 105788 (**Corresponding author, IF=3.2**)
27. High-Mobility Low-Hysteresis Electrolyte-Gated Transistors with a DPP-Benzotriazole Copolymer Semiconductor; S.J.Lee, K.G.Cho, S.-H.Jung, S.Kim, J.-K.Lee, **K.H.Lee***, *Macromolecular Research*, **2020**, *28*, 683 (**Corresponding author, IF=2.4**)
28. Tip-enhanced electric field-driven efficient charge injection and transport in organic material-based resistive memories; H.-H.Choi, M.Kim, J.Jang, **K.H.Lee**, J.Y.Jho, J.H.Park*, *Applied Materials Today*, **2020**, *20*, 100746 (**Coauthor, IF=8.3**)
29. Meyer-Rod Coated 2D Single-Crystalline Copper Nanoplate Film with Intensive Pulsed Light for Flexible Electrode; M.Go, A.Alam, H.K.Choie, Z.Zhong, **K.H.Lee**, Y.Seo, B.Hwang*, K.Woo*, T.-W.Kim*, S.Lim*, *Coatings*, **2020**, *10*, 88 (**Coauthor, IF=3.4**)
30. Ultrahigh-Mobility and Solution-Processed Inorganic P-Channel Thin-Film Transistors Based on a Transition-Metal Halide Semiconductor; H.J.Lee, S.Lee, Y.Ji, K.G.Cho, K.S.Choi, C.Jeon, **K.H.Lee***, K.Hong*, *ACS Applied Materials & Interfaces*, **2019**, *11*, 40243 (**Corresponding author, IF=9.5**)
31. High-Performance P-Type Copper(I) Thiocyanate Thin Film Transistors Processed from Solution at Low Temperature; Y.Ji, H.J.Lee, S.Lee, K.G.Cho, **K.H.Lee***, K.Hong *, *Advanced Materials Interfaces*, **2019**, *6*, 1900883 (**Corresponding author, IF=5.4**)
32. Low voltage, high gain electrolyte-gated complementary inverters based on transfer-printed block copolymer ion gels; D.Lee, K.G.Cho, K.H.Seol, S.Lee, S.-H.Choi, **K.H.Lee***, *Organic Electronics*, **2019**, *71*, 266 (**Corresponding author, IF=3.2**)
33. High-conductivity electrolyte gate dielectrics based on poly(styrene-co-methyl methacrylate)/ionic liquid; D.Lee, Y.Jung, M.Ha, H.Ahn, **K.H.Lee***, M.Seo*, *Journal of Materials Chemistry C*, **2019**, *7*, 6950 (**Corresponding author, IF=6.4**)
34. Highly conductive and mechanically robust nanocomposite polymer electrolytes for solid-state electrochemical thin-film devices; S.J.Lee, H.M.Yang, K.G.Cho, K.H.Seol, S.Kim, K.Hong*, **K.H.Lee***, *Organic Electronics*, **2019**, *65*, 426 (**Corresponding author, IF=3.2**)
35. Sub-2 V, Transfer-Stamped Organic/Inorganic Complementary Inverters Based on Electrolyte-Gated Transistors; K.G.Cho, H.J.Kim, H.M.Yang, K.H.Seol, S.J.Lee, **K.H.Lee***, *ACS Applied Materials & Interfaces*, **2018**, *10*, 40672 :selected as the front cover (**Corresponding author, IF=9.5**)
36. Highly conductive, binary ionic liquid–solvent mixture ion gels for effective switching of electrolyte-gated transistors; K.H.Seol, S.J.Lee, K.G.Cho, K.Hong*, **K.H.Lee***, *Journal of Materials Chemistry C*, **2018**, *6*, 10987 :selected as the front cover (**Corresponding author, IF=6.4**)
37. Electrospun polymer electrolyte nanocomposites for solid-state energy storage; K.Hong*, J.Yuk, H.J.Kim, J.Y.Lee, S.Kim, J.-L.Lee, **K.H.Lee***, *Composites Part B: Engineering*, **2018**, *152*, 275 (**Corresponding author, IF=13.1**)
38. Solution-Processed Perovskite Gate Insulator for Sub-2 V Electrolyte-Gated Transistors; K.Hong, J.M.Kim, K.G.Cho, W.-S.Choi, J.Y.Park, J.Ham, J.-L.Lee*, **K.H.Lee***, *Journal of Physical Chemistry C*, **2018**, *122*, 10552 (**Corresponding author, IF=3.7**)
39. Nonvolatile Electric Double-Layer Transistor Memory Devices Embedded with Au Nanoparticles; J.Koo, J.Yang, B.Cho, H.Jo, **K.H.Lee**, M.S.Kang*, *ACS Applied Materials & Interfaces*, **2018**, *10*, 9563 (**Coauthor, IF=9.5**)
40. Light emitting fabrics based on luminophore dye-doped ion gel electrolyte microfibers; K.Hong*, K.G.Cho, D.C.Lim, J.Y.Lee, **K.H.Lee***, *Dyes and Pigments*, **2018**, *154*, 188 (**Corresponding author, IF=4.5**)
41. Area-Controllable Stamping of Semicrystalline Copolymer Ionogels for Solid-State Electrolyte-Gated

- Transistors and Light-Emitting Devices; H.J.Kim, H.M.Yang, J.Koo, M.S.Kang, K.Hong*, **K.H.Lee***, ACS *Applied Materials & Interfaces*, **2017**, 9, 42978 (**Corresponding author, IF=9.5**)
42. Physically Cross-Linked Homopolymer Ion Gels for High Performance Electrolyte-Gated Transistors; H.M.Yang, Y.K.Kwon, S.B.Lee, S.Kim, K.Hong*, **K.H.Lee***, ACS *Applied Materials & Interfaces*, **2017**, 9, 8813 (**Corresponding author, IF=9.5**)
 43. Solid-State Dual Function Electrochemical Devices: Energy Storage and Light-Emitting Applications; K.Hong, M.G.Kim, H.M.Yang, D.C.Lim, J.Y.Lee, S.J.Kim, I.Lee, **K.H.Lee***, J.-L.Lee*, *Advanced Energy Materials*, **2016**, 6, 1600651 :selected as the inside front cover (**Corresponding author, IF=27.8**)
 44. Self-Supporting Ion Gels for Electrochemiluminescent Sticker-Type Optoelectronic Devices; K.Hong*, Y.K.Kwon, J.Ryu, J.Y.Lee, S.H.Kim, **K.H.Lee***, *Scientific Reports*, **2016**, 6, 29805 (**Corresponding author, IF=4.6**)
 45. Improve Hierarchical Ordering in Supramolecules via Symmetrically Bifunctionalized Organic Semiconductor; **K.H.Lee**, P.Bai, B.J. Rancatore, B.He, Y.Liu, T.Xu*, *Macromolecules*, **2016**, 49, 2639 (**First author, IF=5.5**)
 46. Photo-Patternable ZnO Thin Films Based on Cross-Linked Zinc Acrylate for Organic/Inorganic Hybrid Complementary Inverters; Y.J.Jeong, T.K.An, D.-J.Yun, L.H.Kim, S.Park, Y.Kim, S.Nam, **K.H.Lee**, S.H.Kim*, J.Jang*, C.E.Park*, ACS *Applied Materials & Interfaces*, **2016**, 8, 5499 (**Coauthor, IF=9.5**)
 47. Apparent pH sensitivity of solution-gated graphene transistors; M.H.Lee, B.J.Kim, **K.H.Lee**, I.Shin, W.Huh, J.H.Cho*, M.S.Kang*, *Nanoscale*, **2015**, 7, 7540 (**Coauthor, IF=6.7**)
 48. Optimization of nanocomposite gate insulators for organic thin film transistors; S.Lim, **K.H.Lee**, H.Kim*, S.H.Kim*, *Organic Electronics*, **2015**, 17, 144 (**First author, IF=3.2**)

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49. Dielectric properties of barium titanate supramolecular nanocomposites; **K.H.Lee**, J.Kao, S.S.Parizi, G.Caruntu, T.Xu*, *Nanoscale*, **2014**, 6, 3526 (**First author, IF=6.7**)
50. Printed, sub-2V ZnO Electrolyte Gated Transistors and Inverters on Plastic; K.Hong, S.H.Kim, **K.H.Lee**, C.D.Frisbie*, *Advanced Materials*, **2013**, 25, 3413 :selected as the front cover (**Coauthor, IF=29.4**)
51. Transfer Printing of Thermoreversible Ion Gels for Flexible Electronics; **K.H.Lee**, S.Zhang, Y.Gu, T.P.Lodge*, C.D.Frisbie*, ACS *Applied Materials & Interfaces*, **2013**, 5, 9522 (**First author, IF=9.5**)
52. Performance and Stability of Aerosol-Jet-Printed Electrolyte-Gated Transistors Based on Poly(3-hexylthiophene); S.H.Kim, K.Hing, **K.H.Lee**, C.D.Frisbie*, ACS *Applied Materials & Interfaces*, **2013**, 5, 6580 (**Coauthor, IF=9.5**)
53. High Toughness, High Conductivity Ion Gels by Sequential Triblock Copolymer Self-Assembly and Chemical Cross-Linking; Y.Gu, S.Zhang, L.Martinetti, **K.H.Lee**, L.D.McIntosh, C.D.Frisbie*, T.P.Lodge*, *Journal of the American Chemical Society*, **2013**, 135, 9652 (**Coauthor, IF=15.0**)
54. Electrolyte-Gated Transistors for Organic and Printed Electronics; S.H.Kim, K.Hong, W.Xie, **K.H.Lee**, S.Zhang, T.P.Lodge*, C.D.Frisbie*, *Advanced Materials*, **2013**, 25, 1822 (**Coauthor, IF=29.4**)
55. “Cut and Stick” Rubbery Ion Gels as High Capacitance Gate Dielectrics; **K.H.Lee**, M.S.Kang, S.Zhang, Y.Gu, T.P.Lodge*, C.D.Frisbie*, *Advanced Materials*, **2012**, 24, 4457 :highlighted in Nature (2012, 489, 510) (**First author, IF=29.4**)
56. Viscoelastic Properties, Ionic Conductivity, and Materials Design Considerations for Poly(styrene-b-ethylene oxide-b-styrene)-Based Ion Gel Electrolytes; S.Zhang, **K.H.Lee**, J.Sun, C.D.Frisbie*, T.P.Lodge*, *Macromolecules*, **2011**, 44, 8981 (**Coauthor, IF=5.5**)
57. Electrical Impedance of Spin-Coatable Ion Gel Films; **K.H.Lee**, S.Zhang, T.P.Lodge*, C.D.Frisbie*, *Journal of Physical Chemistry B*, **2011**, 115, 3315 (**First author, IF=3.3**)
58. Ionic Conductivity, Capacitance, and Viscoelastic Properties of Block Copolymer-Based Ion Gels; S.Zhang, **K.H.Lee**, C.D.Frisbie*, T.P.Lodge*, *Macromolecules*, **2011**, 44, 940 (**Coauthor, IF=5.5**)