

Ji Hoon Lee

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Birth: 1987, Republic of Korea

Work Experience

- Postdoctoral Researcher, Department of Chemical Engineering, Columbia University, USA (Aug 2017~)
Advisor: Prof. Jingguang G. Chen [[Link](#)]
- Postdoctoral Researcher, Applied Science Institute, KAIST, Republic of Korea (Mar 2017~ Jul 2017)
Advisor: Prof. Jang Wook Choi [[Link](#)]

Education

- **Ph. D.**, Graduate School of EEWS, KAIST, Republic of Korea (Feb 2017), GPA: 4.26/4.30
Thesis: Development and Analysis of Novel Functional Materials for Energy and Gas Storage Applications
Selected as the best Ph.D. Thesis
Advisor: Prof. Jang Wook Choi [[Link](#)]
- **M.S.**, Graduate School of EEWS, KAIST, Republic of Korea (Feb 2013), GPA: 4.25/4.30
Thesis: A Study on High Performance Lithium Ion Capacitors with Functionalized Graphene
Advisor: Prof. Jang Wook Choi [[Link](#)]
- **B.S.**, Department of Materials Science and Engineering, University of Seoul, Republic of Korea (Sep 2011)
GPA: 4.20/4.50, Summa Cum Laude, Early Graduation in 7 Semesters (*Ranked 1st in class of 2011*)

Awards and Honors

- The International Postdoctoral Fellowship, The Korean National Research Foundation (Mar 2017)
- The Best Doctoral Thesis Award, KAIST (Feb 2017)
- The Best XAFS Study Award, Korea Synchrotron Radiation User's Association (KOSUA) (Sep 2016)
- The Best Presentation Award, The Korean Society of Industrial and Engineering Chemistry (KSIEC) (May 2016)
- The Best Paper Award, KAIST Institute for the NanoCentury (KINC) (Oct 2015)
- The Best Poster Award, Korean Chemical Society (KCS) (Oct 2015)
- Early Graduation & Summa Cum Laude, Univ. of Seoul (Aug 2011)
- Full Scholarship in B.S. Degree, Korea Student Aid Foundation (KOSAF) (2009-2011)

Publications (# of citation as of Aug 1st 2019)

1. **J. H. Lee**[†], S. Kattel[†], Z. Jiang, Z. Xie, S. Yao, B. M. Tackett, W. Xu, N. S. Marinkovic, J. G. Chen*, "Tuning the Activity and Selectivity of Electroreduction of CO₂ to Synthesis Gas using Bimetallic Catalysts", (*†: equal contribution*), *Nature Commun.*, 2019, 10, 3724, [[Link](#)] (# of Citation=0), **IF=11.878**
2. X. Yang[†], S. Kattel[†], J. Nash, X. Chang, **J. H. Lee**, Y. Yan*, J. G. Chen*, B. Xu*, "Quantification of Active Sites and Elucidation of Reaction Mechanism of Electrochemical Nitrogen Reduction Reaction on Vanadium Nitride",

- (*†: equal contribution*), *Angew. Chem. Int. Ed.*, 2019, Online Published, [[Link](#)] (# of Citation=0), *Featured as a Cover Picture*, IF=12.257
3. H. J. Lee[†], S. Back[†], **J. H. Lee**, S. H. Choi, Y. Jung*, J. W. Choi*, “Mixed Transition Metal Oxide with Vacancy-Induced Lattice Distortion for Enhanced Catalytic Activity of Oxygen Evolution Reaction”, (*†: equal contribution*), *ACS Catal.*, 2019, 9, 7099-7108, [[Link](#)] (# of Citation=0), IF=12.221
 4. J. Wang[†], K. Chang[†], Z. Sun, **J. H. Lee**, B. M. Tackett, Z. Xie, N. Rui, C. Zhang, J. G. Chen*, C.-J. Liu*, “A Combined Experimental and Theoretical Study of the Accelerated Hydrogen Evolution Kinetics over Wide pH Range on Porous Transition Metal doped Tungsten Phosphide electrocatalysts”, (*†:equal contribution*) *Appl. Cat. B: Environmental*, 2019, 251, 162-167 [[Link](#)] (# of Citation=0), IF=14.229
 5. J. Wang[†], S. Kattel[†], C. J. Hawxhurst[†], **J. H. Lee**, B. M. Tackett, K. Chang, N. Rui, C.-J. Liu*, J. G. Chen*, “Enhancing Activity and Reducing Cost for Electrochemical Reduction of CO₂ by Supporting Palladium on Metal Carbides”, (*†:equal contribution*), *Angew. Chem. Int. Ed.*, 2019, 58, 6271-6275, [[Link](#)] (# of Citation: 1), IF=12.257
 6. Z. Xie, B. Yan, **J. H. Lee**, Q. Wu, X. Li, B. Zhao, D. Su, L. Zhang*, J. G. Chen*, “Effects of Oxide Supports on the CO₂ Reforming of Ethane over Pt-Ni Bimetallic Catalysts”, *Appl. Cat. B: Environmental*, 2019, 245, 376-388 [[Link](#)] (# of Citation: 2), IF=14.229
 7. H. J. Lee, **J. H. Lee**, I. H. Son, S. Han, P. Byeon, M.-S. Park, S.-Y. Chung, J. W. Choi*, “Off-Stoichiometry Induced Few Nanometer Thick Surface Layer for High Performance Layered Cathode in Nonaqueous and Aqueous Electrolytes”, *ACS Appl. Energy Mater.*, 2018, 1, 10, 5726-5734 [[Link](#)] (# of Citation: 1), IF=N/A
 8. **J. H. Lee**[†], S. Kattel[†], Z. Xie, B. M. Tackett, J. Wang, C.-J. Liu, J. G. Chen*, “Understanding of the Role of Functional Groups in Polymeric Binders for Electrochemical CO₂ Reduction over Gold Nanoparticles”, (*†: equal contribution*), *Adv. Funct. Mater.*, 2018, 28, 1804762 [[Link](#)]. (# of Citation: 6), IF=15.621
 9. K. A. Kuttiyiel, S. Kattel, S. Cheng, **J. H. Lee**, L. Wu, Y. Zhu*, G.-G. Park, P. Liu, K. Sasaki*, J. G. Chen*, R. R. Adic, “Au-doped Stable L1₀ Structured Platinum Cobalt Ordered Intermetallic Nanoparticle Catalysts for Enhanced Electrocatalysis”, *ACS Appl. Energy Mater.*, 2018, 1, 3771-3777 [[Link](#)] (# of Citation: 1), IF=N/A
 10. Z. Xie, B. Yan, S. Kattel, **J. H. Lee**, S. Yao, Q. Wu, N. Rui, E. Gomez, Z. Liu, W. Xu, L. Zhang, J. G. Chen*, “Dry Reforming of Methane over CeO₂-supported Pt-Co Catalysts with Enhanced Activity”, *App. Cat. B. Environ.*, 2018, 236, 280-293, [[Link](#)] (# of Citation: 20), IF=14.229
 11. S. Yao, B. Yan, Z. Jiang, Z. Liu, Q. Wu, **J. H. Lee**, J. G. Chen*, “Combining CO₂ Reduction with Ethane Oxidative Dehydrogenation by Oxygen-modification of Molybdenum Carbide”, *ACS Catal.*, 2018, 8, 5374-5381 [[Link](#)] (# of Citation: 2), *Featured as a Cover Picture*, IF=12.221
 12. **J. H. Lee**, H. J. Lee, S. H. Choi, J. Shin, S.-Y. Chung, J. W. Choi*, “Superlattice Formation of Crystal Water in Layered Double Hydroxides for Long-term and Fast Operation of Aqueous Rechargeable Batteries”, *Adv. Energy Mater.*, 2018, 8, 1703572, [[Link](#)] (# of Citation: 5), IF=24.884
 13. **J. H. Lee**[†], H. J. Lee[†], J. W. Choi*, “Unveiling Anomalous CO₂-to-N₂ Selectivity of Graphene Oxide”, *Physical Chemistry Chemical Physics*, 2017, 19, 22743-22748 (*†: equal contribution*) [[Link](#)] (# of Citation: 6), *Selected as “2017 PCCP HOT Articles”*, IF=3.567
 14. S. Y. Lim, **J. H. Lee**, S. Kim, J. Shin, W. Choi, K. Y. Chung, D. S. Jung, J. W. Choi*, “Lattice Water for the Enhanced Performance of Amorphous Iron Phosphate in Sodium-ion Batteries”, *ACS Energy Lett.*, 2017, 2, 998-1004 [[Link](#)] (# of Citation: 16), IF=16.331

15. **J. H. Lee**, H. J. Lee, S. Y. Lim, K. H. Chae, S. H. Park, K. Y. Chung, E. Deniz*, J. W. Choi*, “Stabilized Octahedral Frameworks in Layered Double Hydroxides by Solid-Solution Mixing of Transition Metals”, *Adv. Funct. Mater.*, 2017, 27, 1605225 [[Link](#)] (# of Citation: 19), *Selected as “2017 Science Highlights in PAL”*, **IF=15.621**
16. S. N. Talapaneni, **J. H. Lee**, S. H. Je, O. Buyukcakir, T.-w. Kwon, K. Polychronopoulou, J. W. Choi*, Ali Coskun*, “Chemical Blowing Approach for Ultramicroporous Carbon Nitride Frameworks and Their Applications in Gas and Energy Storage”, *Adv. Funct. Mater.*, 2017, 27, 1604658 [[Link](#)] (# of Citation: 39), **IF=15.621**
17. T. Yim, N. H. Park, M.-S. Park, S. H. Han, **J. H. Lee**, J. Shin, J. W. Choi*, Y. Jung, Y. N. Jo, J.-S. Yu, K. J. Kim*, “Effective Polysulfide Rejection by Dipole-aligned BaTiO₃ Coated Separator in Lithium–Sulfur Batteries”, *Adv. Funct. Mater.*, 2016, 26, 7817-7823 [[Link](#)] (# of Citation: 69), **IF=15.621**
18. **J. H. Lee**, K. Kwac, H. J. Lee, S. Y. Lim, D. S. Jung, Y. Jung*, J. W. Choi*, “Optimal Activation of Porous Carbon for High Performance CO₂ Capture”, *ChemNanoMat*, 2016, 2, 528-533 [[Link](#)] (# of Citation: 5), **IF=3.379**
19. K. Kwac, **J. H. Lee**, J. W. Choi*, Y. Jung*, “Computational Analysis of Pressure-Dependent Optimal Pore size for CO₂ Capture with Graphitic Surfaces”, *J. Phys. Chem. C*, 2016, 120, 3978-3985 [[Link](#)] (# of Citation: 6), **IF=4.309**
20. T. J. Trivedi, **J. H. Lee**, H. J. Lee, Y. K. Jeong, J. W. Choi*, “Deep Eutectic Solvents as Attractive Media for CO₂ Capture”, *Green Chem.*, 2016, 18, 2834-2842 [[Link](#)] (# of Citation: 59), **IF=9.405**
21. H. J. Lee†, **J. H. Lee**†, S.-Y. Chung*, J. W. Choi*, “Enhanced Pseudocapacitance in Multicomponent Transition Metal Oxides by Local Distortion of Oxygen Octahedra”, *Angew. Chem. Int. Ed.*, 2016, 55, 3958-3962 (†: equal contribution) [[Link](#)] (# of Citation: 14), *Selected as “the best XAFS study”* in KOSUA (2016), **IF=12.257**
22. **J. H. Lee**, H. J. Lee, S. Y. Lim, B. G. Kim, J. W. Choi*, “Combined CO₂-philicity and Ordered Meso-porosity for Highly Selective CO₂ Capture at High Temperatures”, *J. Am. Chem. Soc.*, 2015, 137, 7210-7216 [[Link](#)] (# of Citation: 59), *Highlighted in ACS Virtual Issue*, **IF=14.695**
23. D. S. Jung, T. H. Hwang, **J. H. Lee**, H. Y. Koo, R. A. Shakoor, R. Kahraman, Y. N. Jo, M.-S. Park, J. W. Choi*, “Hierarchical Porous Carbon by Ultrasonic Spray Pyrolysis Yields Stable Cycling in Lithium-Sulfur Battery”, *Nano Lett.*, 2014, 14, 4418-4425 [[Link](#)] (# of Citation: 170), **IF=12.279**
24. **J. H. Lee**, W. H. Shin, S. Y. Lim, B. G. Kim, J. W. Choi*, “Modified Graphite and Graphene Electrodes for High Performance Lithium Ion Hybrid Capacitors”, *Mater. Renew. Sustain. Energy*, 2014, 3, 1-8 [[Link](#)] (# of Citation: 30), **IF=N/A**
25. S. Y. Lim†, H. Kim†, J. Chung, **J. H. Lee**, B. G. Kim, J.-J. Choi, K. Y. Chung, W. Cho, S.-J. Kim, W. A. Goddard III*, Y. Jung*, J. W. Choi*, “Role of Intermediate Phase for Stable Cycling of Na₇V₄(P₂O₇)₄PO₄ in Sodium Ion Battery”, *Proc. Natl. Acad. Sci. USA*, 2014, 111, 599-604 (†:equal contribution) [[Link](#)] (# of Citation: 85), **IF=9.580**
26. **J. H. Lee**, N. Park, B. G. Kim, D. S. Jung, K. Im, J. Hur*, J. W. Choi*, “Restacking-Inhibited 3D Reduced Graphene Oxide for High Performance Supercapacitor Electrodes”, *ACS Nano*, 2013, 7, 9366-9374 [[Link](#)] (# of Citation: 283), **IF=13.903**
27. **J. H. Lee**, W. H. Shin, M. H. Ryou, J. K. Jin, J. Kim, J. W. Choi*, “Functionalized Graphene for High Performance Lithium Ion Capacitor”, *ChemSusChem*, 2012, 5, 2328-2333 [[Link](#)] (# of Citation: 87), *Featured in Chemistry Views*, **IF=7.804**

Patents

1. Graphene Based Electrode Material for Supercapacitor Electrode with High Performance and Supercapacitor Including Same; Applied; SEP 13, 2013 (10-2013-0110233), **Registered: JAN 1, 2015 (10-1486658)**.
2. Negative Electrode Active Material of Lithium Ion Capacitor, Manufacturing Method Thereof, and Lithium Ion Capacitor Including Same; Applied; FEB 7, 2013 (10-2013-0013960)
3. Anode Active Material Lithium Ion Capacitor and Method for Manufacturing Same; Applied; OCT 30, 2012 (10-2012-0121604)

Technical Skills

1. Characterization

- TEM, SEM, XPS, FT-IR, TGA/DSC, EA, Raman, UV-Vis, XRD
- Electrochemistry (VMP3, WonATEC, Princeton), Gas Sorption Analysis (3FLEX)

2. Material Design and Synthesis

- CVD Synthesis, Hummers' Method, Co-precipitation, Hydrothermal Synthesis
- XRD Structural Refinement (Fullprof, GSAS-II)

3. Synchrotron Analysis

- Structure refinement using X-ray Absorption Fine Structure (XAFS) and X-ray Diffraction (XRD)

Research Interests

1. Material Synthesis and Characterization

- Carbon Materials (Graphene, CNTs, Activated Carbons, etc.)
- Low Dimensional Inorganic Materials (Layered Double Hydroxides)
- Ordered Mesoporous Materials (Silica, Polymers, Carbons, etc.)
- Synchrotron-based X-ray Analyses (X-ray Scattering, PDF, X-ray Absorption Spectroscopy etc.)
- *In-situ* Infrared Electrochemistry

2. Electrochemistry

- Rechargeable Batteries, Electrochemical Capacitors, Electrocatalysts (CO₂/Water/N₂)

3. Gas Storage

- Selective CO₂ Capture and Storage, Chemical CO₂ Fixation

References

1. **Prof. Jang Wook Choi** (chief advisor)

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2. **Prof. Jingguang G. Chen**

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Chemistry Department, Brookhaven National Laboratory, USA
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3. **Prof. Sung-Yoon Chung**

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