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Assistant Professor

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## Education

- **Ph.D.(2014-2018)** Department of Chemical and Biomolecular Engineering in **Korea Advanced Institute of Science and Technology (KAIST)**. (Advisor: Prof. Hyunjoo Lee)
- **M.S. (2012-2014)** Department of Chemical and Biomolecular Engineering in **Yonsei University**.
- **B.S. (2008-2012)** Department of Chemical and Biomolecular Engineering in **Yonsei University**.

## Research experience

### Assistant Professor, DGIST (2022.10-Present)

- Heterogeneous Catalysis for Sustainable Fuel and Chemical Productions
- Heterogeneous Catalysis at Gas/Solid and Liquid/Solid Interfaces.
- Synthesis of Novel Heterogeneous Catalyst (Metal, Metal oxide, Carbon).
- Design of Microenvironment near the Catalyst Surface

### Postdoctoral research fellow at Lawrence Berkeley National Laboratory (LBNL)

**University of California, Berkeley(UCB) (2019.09-2022.09)** (Advisor: Prof. Alexis T. Bell)

- DOE Energy Innovation Hub, Liquid Sunlight Alliance (2020.10-2022.10, co-advisor: Dr. Adam Z. Weber, and Dr. Francesca M. Toma)
- DOE Energy Innovation Hub, Joint Center for Artificial Photosynthesis (2019.09-2020.09)
- Development of Catalyst for (Photo)Electrochemical CO<sub>2</sub> Reduction
- Detailed Understanding on Unsteady-State Reaction Dynamics on CO<sub>2</sub> Reduction
- Fundamental Study on Catalytic Microenvironment during CO<sub>2</sub> Reduction

### Postdoctoral research fellow at Korea Institute of Science and Technology (KIST)

**(2018.03-2019.08)** (Advisor: Dr. Byoung Koun Min)

- Self-Activation of Electrocatalyst with Metal Impurity in Electrolyte Solution
- Development of Non-Cu Catalyst for Electrochemical CO<sub>2</sub> Reduction Capable of C<sub>2</sub> Production

**KAIST, Department of Chemical and Biomolecular Engineering**

- Development of Catalyst for Light-Assisted CO<sub>2</sub> Conversion
- Fundamental Study on Solar to Chemical Conversion

**Yonsei University, Department of Chemical and Biomolecular Engineering**

- Development of Shape-Controlled Nanoparticle Catalysts for Thermal Catalysis

## Award & Honor

- Postdoctoral Fellowship (Nurturing Next-generation Researchers), National Research Foundation of Korea, 2021.09 – 2024.08 (45,000,000 KRW/yr)
- Full National Grantee, Korea Advanced Institute of Science and Technology, 2014.09-2018.02
- The Outstanding Oral Presentation Award, Korean Institute of Chemical Engineers, 2017.04.28
- The National Scholarship for Science and Engineering, Korea Student Aid Foundation, 2010.03 - 2012.02

## Patents

1. B. K. Min, Y. J. Hwang, H.-S. Oh, U. Lee, D. H. Won, D. K. Lee, **C. Kim**, "Self-activatable catalytic electrode for electrochemical CO<sub>2</sub> reduction using metal impurities and method for manufacturing the same", 10-2299406, 2021.09.01 (Registered, Domestic)
2. S. J. Lee, I. H. Son, H. Lee, **C. Kim**, "NICKEL CATALYSTS FOR REFORMING HYDROCARBONS", 10-2221550, 2021.02.23 (Registered, Domestic)
3. S. J. Lee, I. H. Son, H. Lee, **C. Kim**, "CATALYSTS FOR REFORMING HYDROCARBONS AND PRODUCTION METHODS THEREOF", US009533287B2, 2017.01.03 (Registered, US Patent)
4. H. Lee, J. W. Han, **C. Kim**, J. S. Park, I. K. Song, "Silica-coated Ni supported catalyst, method for manufacturing thereof and production method of synthesis gas using the catalyst", 10-1481972, 2015.01.07 (Registered, Domestic)

## Publications as 1<sup>st</sup> author

1. Chanyeon Kim, Alex J. King, Francesca M. Toma, Adam Z. Weber, and Alexis T. Bell\*, "Codesign of an Integrated Metal-Insulator-Semiconductor Photocathode for Photoelectrochemical Reduction of CO<sub>2</sub> to Ethylene", *Energy & Environmental Science*, Under Review
2. J. C. Bui<sup>a</sup>, **C. Kim**<sup>a</sup>, A. J. King, O. Romiluyi, A. Kusoglu, A. Z. Weber and A. T. Bell\*, "Engineering Catalyst-Electrolyte Microenvironments to Optimize the Activity and Selectivity for the Electrochemical Reduction of CO<sub>2</sub> on Cu and Ag", *Accounts of Chemical Research*, 55(4), 484, (2022), <sup>a</sup>equally contributed (IF:24.466, JCR rank <10%)
3. **C. Kim**, J. C. Bui, X. Luo, J. K. Cooper, A. Kusoglu, A. Z. Weber and A. T. Bell\*, "Tailored catalyst microenvironments for CO<sub>2</sub> electroreduction to multicarbon products on copper using bi-layer ionomer coatings", *Nature Energy*, 6, 1026 (2021) (IF:67.439, JCR rank <1%)
4. **C. Kim**, L.-C. Weng and A. T. Bell\*, "The Impact of Pulsed Electrochemical Reduction of CO<sub>2</sub> on the Formation of C<sub>2+</sub> Products over Cu", *ACS Catalysis*, 10, 12403 (2020) (IF:13.7, JCR rank <10%)
5. **C. Kim**, Y.-K. Choe, D. H. Won, U. Lee, H.-S. Oh, D. K. Lee, C. H. Choi, S. Yoon, W. Kim, Y. J. Hwang\*, and B. K. Min\*, "Turning Harmful Deposition of Metal Impurities into Activation of Nitrogen-Doped Carbon Catalyst toward Durable Electrochemical CO<sub>2</sub> Reduction", *ACS Energy Letters*, 4, 9, 2343 (2019) (IF:23.991, JCR rank <5 %)
6. C. W. Lee<sup>a</sup>, **C. Kim**<sup>a</sup> and B. K. Min\*, "Theoretical Insights into Selective Electrochemical Conversion of Carbon Dioxide", *Nano Convergence*, 6:8 (2019) <sup>a</sup>equally contributed (IF:10.038)
7. **C. Kim**, S. Hyeon, J. Lee, W. D. Kim, D. C. Lee, J. Kim, H. Lee\*, "Energy-Efficient CO<sub>2</sub> Hydrogenation with Fast Response Using Photoexcitation of CO<sub>2</sub> Adsorbed on Metal Catalysts", *Nature Communications*, 9, 105 (2018) Selected as Editor's Highlights (IF:17.694, JCR rank <10%)
8. **C. Kim** and H. Lee\*, "Light-Assisted Surface Reactions on Metal Nanoparticles", *Catalysis Science & Technology*, 8, 3718 (2018) (IF:6.177)
9. **C. Kim**, B. L. Suh, H. Yun, J. Kim, H. Lee\*, "Surface Plasmon Aided Ethanol Dehydrogenation Using Ag-Ni Binary Nanoparticles", *ACS Catalysis*, 7, 2294 (2017) (IF:13.7, JCR rank <10%)
10. **C. Kim**, Y. Kwon, H. Lee\*, "Shape Effect of Ag-Ni Binary Nanoparticles on Catalytic Hydrogenation Aided by Surface Plasmon", *Chemical Communications*, 51, 12316 (2015) (IF:6.065)
11. **C. Kim**, C. Kim, K. T. Lee, H. Lee\*, "Shaped Ni Nanoparticles with Unconventional hcp Crystalline Structure", *Chemical Communications*, 50, 6353 (2014) (IF:6.065)

## Publications as co-author

1. J.C. Bui, **C. Kim**, A. Z. Weber and A. T. Bell\*, "Dynamic Boundary Layer Simulation of Pulsed CO<sub>2</sub> Electrolysis on a Copper Catalyst", *ACS Energy Letters*, **6**, 4, 1181 (2021)
2. S. Jeong, G.-M. Kim, G.-S. Kang, **C. Kim**, H. Lee, W.-J. Kim, Y. K. Lee, S. Lee, H. Kim\*, H. K. Lim\*, and D. C. Lee\*, "Selectivity Modulated by Surface Ligands on Cu<sub>2</sub>O/TiO<sub>2</sub> Catalysts for Gas-Phase Photocatalytic Reduction of Carbon Dioxide", *The Journal of Physical Chemistry C*, **123**(48) 29184 (2019)
3. H. S. Whang, M. S. Choi, J. Lim, **C. Kim**, I. Heo, T.-S. Chang, H. Lee\*, "Enhanced activity and durability of Ru catalyst dispersed on zirconia for dry reforming of methane", *Catalysis Today*, **293**, 122 (2017)
4. H. Jeong, **C. Kim**, S. Yang, H. Lee\*, "Selective Hydrogenation of Furanic Aldehydes Using Ni Nanoparticle Catalysts Capped with Organic Molecules", *Journal of Catalysis*, **344**, 609 (2016)
5. J. Lim, S. Yang, **C. Kim**, C.-W. Roh, Y. Kwon, Y.-T. Kim, H. Lee\*, "Shaped Ir-Ni Bimetallic Nanoparticles for Minimizing Ir utilization in Oxygen Evolution Reaction", *Chemical Communications*, **52**, 5641 (2016)
6. J. W. Han, **C. Kim**, J. S. Park, H. Lee\*, "Highly Coke-Resistant Ni Nanoparticle Catalysts with Minimized Sintering for Dry Reforming of Methane", *ChemSusChem*, **7**, 451 (2014)
7. J. Oh, S. Yang, **C. Kim**, I. Choi, J. H. Kim, H. Lee\*, "Synthesis of Biolubricants Using Sulfated Zirconia Catalysts", *Applied Catalysis A: General.*, **455**, 164 (2013)