

Jai Hyun Koh

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Education

- University of Texas at Austin**, Austin, TX, United States 2016–present
Ph.D. in Chemical Engineering
Advisors: C. Grant Willson and Nathaniel A. Lynd
- Seoul National University**, Seoul, Republic of Korea 2011–2013
M.S. in Chemical and Biological Engineering
Thesis titled *Biomimetic Water-Repelling Hierarchical Surfaces*
Advisor: Kookheon Char
- Seoul National University**, Seoul, Republic of Korea 2007–2011
B.S. in Chemical and Biological Engineering, *Cum Laude*

Experience

- Kwanjeong Educational Foundation Fellow** Aug 2016–present
McKetta Department of Chemical Engineering, University of Texas at Austin
Thesis Advisors: C. Grant Willson and Nathaniel A. Lynd
Synthesis of Silicon-Containing Block Copolymers and Their Applications in Nanolithography
- Explored the dependence of T_g on monomer compositions in styrene-based statistical copolymers
- Implemented a hybrid chemo-/grapho-epitaxial alignment strategy in directed self-assembly of high χ block copolymers
- Investigated the origin of pattern defects in directed self-assembly of Si-containing block copolymers
- Research Scientist** Feb 2013–July 2016
Clean Energy Research Center, Korea Institute of Science and Technology (KIST)
Research Advisors: Byoung Koun Min and Yun Jeong Hwang
Electrochemical CO₂ Reduction Catalysts for Renewable Energy
- Synthesized efficient electrocatalysts for artificial photosynthesis (H₂ evolution, CO₂ reduction).
- Designed and developed (photo)electrochemical CO₂ conversion system & solar fuel generators.
- Research Assistant** Mar 2011–Jan 2013
National Creative Research Initiative Center for Intelligent Hybrids, Seoul National University
Thesis Advisor: Kookheon Char
Design of Biomimetic Water-Repelling Hierarchical Surfaces by Soft Lithography
- Developed soft lithographic techniques for multiscale surfaces made of polymers and inorganic NPs.
- Teaching Assistant** Sep 2011–Dec 2011
School of Chemical and Biological Engineering, Seoul National University
Elementary Lab for Chemical and Biological Engineering
- Held office hours, instructed undergraduate students in laboratory and discussion sessions.
- Undergraduate Research Program** Jul 2010–Dec 2010
Ministry of Education, Science and Technology, Korea
Research Advisors: Hyunsik Yoon (SeoulTech) and Kookheon Char (SNU)
Wetting Characteristics on Biomimetic Hierarchical Surfaces
- Investigated the dependence of surface wettability on geometry of the surface.

Honors and Awards

- Kwanjeong Educational Foundation Fellowship 2016–present
- Graduate Dean's Prestigious Fellowship Supplement, UT Austin 2016–present
- Bronze Prize, Samsung HumanTech Paper Award 2013
- Superior Academic Performance Scholarship, Seoul National University 2012
- BK21 Scholarship, National Research Foundation (NRF) of Korea 2011–2012
- National Undergraduate S&T Scholarship, Korea Science and Engineering Foundation 2007–2011
- Gwangju Institute of Science and Technology (GIST) Scholarship 2006
- Bronze Prize, Korean Chemistry Olympiad (KChO) 2005

Publications

1. **J. H. Koh**, D. H. Won, T. Eom, N.-K. Kim, K. D. Jung, H. Kim, Y. J. Hwang, B. K. Min, “Facile CO₂ Electro-Reduction to Formate via Oxygen Bidentate Intermediate Stabilized by High-Index Planes of Bi Dendrite Catalyst”, *ACS Catal.* **2017**, *7*, 5071–5077. [[doi](#)]
2. Y. Sung, J. Lim, **J. H. Koh**, B. K. Min, J. Pyun, K. Char, “Arm Length Dependency of Pt-Decorated CdSe Tetrapods on the Performance of Photocatalytic Hydrogen Generation”, *Korean J. Chem. Eng.* **2016**, *33*, 2287–2290. [[doi](#)]
3. M. S. Jee, H. S. Jeon, C. Kim, H. Lee, **J. H. Koh**, J. Cho, B. K. Min, Y. J. Hwang, “Enhancement in Carbon Dioxide Reduction Activity and Stability on Nanostructured Silver Electrode and the Role of Oxygen”, *Appl. Catal., B* **2016**, *180*, 372–378. [[doi](#)]
4. E. B. Nursanto, H. S. Jeon, C. Kim, M. S. Jee, **J. H. Koh**, Y. J. Hwang, B. K. Min, “Gold Catalyst Reactivity for CO₂ Electro-Reduction: From Nano Particle to Layer”, *Catal. Today* **2016**, *260*, 107–111. [[doi](#)]
5. Y. Sung, J. Lim, **J. H. Koh**, L. J. Hill, B. K. Min, J. Pyun, K. Char “Uniform Decoration of Pt Nanoparticles on Well-Defined CdSe Tetrapods and Their Effect of Pt Cluster Size on the Photocatalytic H₂ Generation”, *CrystEngComm* **2015**, *17*, 8423–8427. [[doi](#)]
6. **J. H. Koh**, H. S. Jeon, M. S. Jee, E. B. Nursanto, H. Lee, Y. J. Hwang, B. K. Min, “Oxygen Plasma Induced Hierarchically Structured Gold Electrocatalyst for Selective Reduction of Carbon Dioxide to Carbon Monoxide”, *J. Phys. Chem. C* **2015**, *119*, 883–889. [[doi](#)]
7. H. S. Jeon, **J. H. Koh**, S. J. Park, M. S. Jee, D.-H. Ko, Y. J. Hwang, B. K. Min, “A Monolithic and Standalone Solar-Fuel Device Having Comparable Efficiency to Photosynthesis in Nature”, *J. Mater. Chem. A* **2015**, *3*, 5835–5842. [[doi](#)] [[back cover](#)]
8. H. Yoon, S. H. Sung, **J. H. Koh**, S. M. Kim, S.-J. Choi, K. Y. Suh, K. Char, “Directional Step Flow across Ridges on Multiscale Two-Face Prism Array”, *Macromol. Res.* **2015**, *23*, 145–148. [[doi](#)]
9. S. Wooh*, **J. H. Koh*** (co-first author), S. Lee, H. Yoon, K. Char, “Trilevel-Structured Superhydrophobic Pillar Arrays with Tunable Optical Functions”, *Adv. Funct. Mater.* **2014**, *24*, 5550–5556. [[doi](#)] [[inside front cover](#)]
10. S. Wooh, H. Yoon, J.-H. Jung, Y.-G. Lee, **J. H. Koh**, B. Lee, Y. S. Kang, K. Char, “Efficient Light Harvesting with Micropatterned 3D Pyramidal Photoanodes in Dye-Sensitized Solar Cells”, *Adv. Mater.* **2013**, *25*, 3111–3116. [[doi](#)]
11. S. M. Kim, D. H. Kang, **J. H. Koh**, H. S. Suh, H. Yoon, K.-Y. Suh, K. Char, “Thermoresponsive switching of liquid flow direction on a two-face prism array”, *Soft Matter* **2013**, *9*, 4145–4149. [[doi](#)] [[front cover](#)]

Presentations

- Oral** 2016 Korean Institute of Chemical Engineers (KICChE) Spring Meeting, “Electrochemical CO₂ Reduction Catalysts for Production of Liquid Fuels,” Busan, Korea, April 28, 2016.
- 250th American Chemical Society (ACS) National Meeting, “Electrochemical CO₂ conversion catalysts for integrated monolithic solar-fuel generators,” Boston, MA, August 16, 2015.
- The Korean Society of Industrial and Engineering Chemistry (KSIEC) Spring Meeting, “Design of Hierarchically Structured Gold Catalysts for Electrochemical CO₂ Reduction,” Jeju, Korea, May 2, 2014.
- 2014 Materials Research Society (MRS) Spring Meeting & Exhibit, “Photoelectrochemical CO₂ Conversion for Fuel Production Powered by Monolithic Thin-Film Photovoltaic Devices,” San Francisco, CA, April 24, 2014.
- Poster** Nano Korea 2016 Symposium, “Electrocatalytic CO₂ Reduction on Dendritic Bi for HCOO⁻ Production,” Ilsan, Korea, July 14, 2016.
- 27th International Conference on Photochemistry (ICP2015), “Selective Production of CO from Electrocatalytic CO₂ Reduction on Hierarchically Structured Gold Catalysts,” Jeju, Korea, July 2, 2015.
- The Korean Electrochemical Society (KECS) Spring Meeting, “Highly Selective Electrochemical CO₂ Conversion on a Hierarchically Structured Gold Catalyst,” Gwangju, Korea, April 3, 2015.
- Polymer Society of Korea (PSK) Fall Meeting, “Biomimetic Water-Repelling Hierarchical Surfaces Inspired from Termite Wings,” Changwon, Korea, October 11, 2012.
- Polymer Society of Korea (PSK) Fall Meeting, “Fabrication of Water-Repelling Hierarchical Surfaces Inspired from Termite Wings,” Gwangju, Korea, October 6, 2011.

Patents

- “Nickel based electrocatalyst for water oxidation and process of preparing the same,” Yun Jeong Hwang, Byoung Koun Min, Hyo Sang Jeon, **Jai Hyun Koh**. KR Patent Application No. 2015-0158885.
- “Photoelectrochemical artificial photosynthesis device,” Byoung Koun Min, Yun Jeong Hwang, **Jai Hyun Koh**, Hyo Sang Jeon. KR Patent Application No. 2015-0036172.
- “Carbon dioxide reduction electrode and the preparation method thereof,” Byoung Koun Min, **Jai Hyun Koh**, Yun Jeong Hwang. KR Patent Application No. 10-2014-0090895.
- “Selective reducing method of carbon dioxide using silicon nanowire and pyridine,” Yun Jeong Hwang, Byoung Koun Min, Oh Shim Joo, **Jai Hyun Koh**, Sang Jun Sim, Hyo Sang Jeon, Michael Shincheon Jee. KR Patent Registration No. 10-1566471.

References

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Nathaniel Lynd

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