

YOONSEOB KIM

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Research Interests

My group synthesizes materials – covalent organic frameworks and polymers – and applies them to energy applications. Specifically, we develop solid electrolytes for rechargeable batteries and fuel cells, and single-atom catalysts for gas conversion.

Academic Qualifications

2016 *Ph.D.*, Department of Chemical Engineering, **University of Michigan**, Ann Arbor, MI, USA
2010 *B.S.*, Department of Chemical Engineering, **Hanyang University**, Korea, *Summa Cum Laude*

Appointments

2019–present **Hong Kong University of Science and Technology**, Hong Kong SAR, China
Assistant Professor, Department of Chemical and Biological Engineering
2016–2019 **Massachusetts Institute of Technology**, Cambridge, MA, USA
Postdoctoral Associate, Department of Chemistry (with Prof. Timothy M. Swager)
2010–2016 **University of Michigan**, Ann Arbor, MI, USA
Research Assistant, Department of Chemical Engineering (with Prof. Nicholas A. Kotov)
2009–2010 **University of Michigan**, Ann Arbor, MI, USA
Visiting Scholar, Department of Chemistry (with Prof. Adam J. Matzger)

Professional Affiliations and Service

2023–present Community Board, *Nanoscale Horizons*
2022–present Early Career Advisory Board, *Materials Today Energy*
2014–present Reviewer for *Angew. Chem. Int. Ed.* | *ACS Appl. Bio Mater.* | *ACS Applied Polymer Materials* | *ACS Appl. Mater. Interfaces* | *ACS Nano* | *ACS Omega* | *Adv. Func. Mater.* | *Chem. Mater.* | *Chemical Engineering Journal* | *Carbon Energy* | *CrystEngComm* | *Energy Environ. Sci.* | *Energy & Fuels* | *Inorganic Chemistry* | *iScience* | *J. Am. Chem. Soc.* | *JACS Au* | *J. Electrochem* | *Joule* | *Langmuir* | *Macromolecules* | *Mater. Chem. Front.* | *Micromachines* | *Nanoscale* | *Nanoscale Horizon* | *Nature Communications* | *Polymer* | *Polymers* | *RSC Advances* | *Sci. China Chem.* | *Star Protocol*
2023 Reviewer for ACS Petroleum Research Fund proposal
2014–present Member of *American Chemical Society*
2013–present Member of *American Institute of Chemical Engineers*
2012–present Member of *Materials Research Society*

Selected Honors and Awards

2024 Early Investigator, PMSE, *ACS*
2024 Early Career Forum, *ACS Appl. Mater. Interfaces*, *ACS*
2023 Influential Researcher, *I&EC Research*, *ACS* ([about](#))
2023 Emerging Investigator, *Nanoscale*, *RSC* ([about](#))
2022 Rising Star, *ACS Materials Au*, *ACS* ([about](#))
2021 Delegate, World Laureates Forum, China
2020 Early Career Grant, RGC, Hong Kong
2018 DSM Science & Technology Award, POLY, *ACS* ([about](#)) – *One awardee annually*
2017 ProQuest Distinguished Dissertation Award, *U of M* ([about](#)) – *One percent annually*
2012–2017 Travel Grants: Gordon Research Conference, Layer-By-Layer Conference, Institute of Physics, University of Michigan, and Hanwha Chemical
2014–2016 Graduate Student Awards – *Each from AIChE (2014), ACS (2015), and MRS (2016)*
2014–2015 Rackham Predoctoral Fellowship, *U of M* ([about](#))

2014 Towner Prize for Distinguished Academic Achievement, *U of M*
2011–2013 Graduate Scholarship, US \$30,000 per year, STX Foundation, Korea

Selected Publications

†Equal contribution, *Corresponding author

For publications at the HKUST: ^pmy PG students, ^dmy postdoc researchers, and ^umy undergraduate students

Huang, J.^p; Cheng, L.; Zhang, Z.; Li, C.^p; Bang, K.T.^d; Liem, A.^u; Luo, H.^p; Hu, C.; Lee, Y.M.; Lu, Y.; Wang, Y.*; Kim, Y.* High-Performance All-Solid-State Lithium Metal Batteries Enabled by Ionic Covalent Organic Framework Composites. *Adv. Energy Mater.* 2400762 (2024)

Yuan, Y.^p; Zhang, Z.; Zhang, Z.; Bang, K.T.^d; Tian, Y.^p; Dang, Z.; Gu, M.^p; Wang, R.^p; Tao, R.^p; Lu, Y.; Wang, Y.; Kim, Y.* Highly Conductive Imidazolate Covalent Organic Frameworks with Ether Chains as Solid Electrolytes for Lithium Metal Batteries. *Angew. Chem. Int. Ed.* e202402202 (2024)

Li, C.^p; Wang, D.D.; Poon Ho, G.S.H.^p; Zhang, Z.; Huang, J.^p; Bang, K.T.^d; Lau, C.Y.; Leu, S.Y.; Wang, Y.; Kim, Y.* Anthraquinone-Based Silicate Covalent Organic Frameworks as Solid Electrolyte Interphase for High-Performance Lithium-Metal Batteries. *J. Am. Chem. Soc.* 145, 45, 24603 (2023)

Wang, R.^p; Lyu, H.; Poon Ho, G.S.H.^p; Chen, H.^p; Yuan, Y.^p; Bang, K.T.^d; Kim, Y.* Highly Conductive Covalent Organic Framework Films. *Small* 2306634 (2023)

Chen, H.^p; Bang, K.T.^d; Tian, Y.^p; Hu, C.; Tao, R.^p; Yuan, Y.^p; Wang, R.^p; Shin, D-M.; Shao, M.; Lee, Y.M.; Kim, Y.* Poly(Ethylene Piperidinium)s for Anion Exchange Membranes. *Angew. Chem. Int. Ed.* e202307690 (2023)

Yuan, Y.^{p,†}; Bang, K.^{d,†}; Wang, R.^p; Kim, Y.* Macrocyclic-Based Covalent Organic Frameworks. *Advanced Materials* 2210952 (2023)

Chen, H.^{p,†}; Tao, R.^{p,†}; Bang, K.^d; Shao, M.; Kim, Y.* Anion Exchange Membranes for Fuel Cells: State of the Art and Perspectives. *Advanced Energy Materials* 2200934 (2022)

Liang, X.^{d,†}; Tian, Y.^{p,†}; Yuan, Y.^p; Kim, Y.* Ionic Covalent Organic Frameworks for Energy Devices *Advanced Materials* 2105647 (2021)

- Top Downloaded Article in 2021 by Wiley.

Prior to HKUST

Kim, Y.; Lin, Z.; Jeon, I.; Voorhis, T.V.; Swager, T.M.* Polyaniline Nanofiber Electrodes for Reversible Capture and Release of Mercury(II) from Water. *J. Am. Chem. Soc.* 140, 14413 (2018).

Kim, Y.; Zhu, J.; Yeom, B.; Prima, M.D.; Su, X.; Kim, J.G.; Yoo, S.J.; Uher, C.; Kotov, N.A.* Stretchable Nanoparticle Conductors with Self-Organized Conductive Pathways. *Nature* 500, 59 (2013).

- Featured on the University of Michigan's home page, C&EN, MRS bulletin, Phys.org, Science Daily, etc.

Kim, Y.; Koh, K.; Roll, M.F.; Laine, R.M.; Matzger, A.J.* Porous Networks Assembled with Octa Phenyl Silsesquioxanes as Building Blocks. *Macromolecules* 43, 6995 (2010). (Undergraduate publication)