

Min-Jae Choi

2066 Seobu-Ro, Jangan-Gu, Suwon, Gyeonggi-Do 16419, Republic of Korea
 Phone: +82-31-290-7355, E-mail: minjae.choi@skku.edu, Homepage: <https://mjchoi.net>

Education	Korea Advanced Institute of Science and Technology <i>Ph.D. Department of Materials Science and Engineering</i> <i>Supervisor: Prof. Yeon Sik Jung</i> (KAIST Best Ph.D. thesis Award)	Mar. 2013 – Feb. 2017
	Korea Advanced Institute of Science and Technology <i>M.S. Department of Materials Science and Engineering</i> <i>Supervisor: Prof. Yeon Sik Jung</i>	Mar. 2011 – Feb. 2013
	Korea Advanced Institute of Science and Technology <i>Bachelor of Science, Materials Science and Engineering</i> (Magna Cum Laude)	Mar. 2007 – Feb. 2011
Professional Experience	Sungkyunkwan University <i>Department of Materials Science and Engineering</i> <i>Associate Professor</i>	Mar. 2026 – Present
	Dongguk University <i>Department of Chemical and Biochemical Engineering</i> <i>Associate Professor</i>	Sep. 2024 – Feb. 2026
	Dongguk University <i>Department of Chemical and Biochemical Engineering</i> <i>Assistant Professor</i>	Sep. 2020 – Aug. 2024
	University of Toronto <i>Department of Electrical and Computer Engineering</i> <i>Postdoctoral Fellow (Supervisor: Prof. Edward H. Sargent)</i>	Oct. 2017 – Aug. 2020
	Korea Advanced Institute of Science and Technology <i>Department of Materials Science and Engineering</i> <i>Postdoctoral Associate (Supervisor: Prof. Yeon Sik Jung)</i>	Mar. 2017 – Sep. 2017
	Korea Institute of Energy Research <i>Researcher</i>	Dec. 2009 – Feb. 2010
	KIM Monthly Young Scientist Award	Aug. 2025
Awards	POSCO Science Fellowship	Oct. 2023
	2022 Dongguk Academic Award	Jun. 2022
	Miwon Commerical Co. Young Scientist Award	May. 2022
	Brain Korea 21+ postdoctoral fellowship	Mar. 2017 – Sep. 2017

KAIST Best Ph.D. thesis Award in Material Sciences & Engineering	Feb. 2017
The Silver Prize (Physical Devices Section), Samsung Human Tech Awards, Samsung Electronics Co., Ltd	Feb. 2016
Best Poster Award, Nano Korea, The 13 th International Nanotech Symposium, Seoul, Korea	Jul. 2015
Excellent Poster Award, Korean Chemical Society, Gyeonggi-do, Korea	Apr. 2013
The Honorable Prize (Basic Science & Technology Section), Samsung Human Tech Awards, Samsung Electronics Co., Ltd	Feb. 2013

Research Interests

- Infrared photodetectors for next-generation LiDAR
- Surface chemistry engineering of colloidal quantum dots
- Blue-emitting quantum dots
- Electrosynthesis using nanocrystal catalysts
- Infrared bio-imaging materials

Patents

- "Cascade surface modification of colloidal quantum dot inks enables efficient bulk homojunction photovoltaics", 17214113, US, 2021
- "InGAP QUANTUM DOT AND SYNTHESIZING METHOD THEREOF", 10-2023-0111369, Korea, 2023
- "Surface-functionalized Quantum Dots with PD-1 Binding Peptides and Augmented Anticancer Efficacy of Natural Killer Cells Using Thereof", 10-2023-0145042, Korea, 2023
- "SYNTHESIZING METHOD OF METAL-LIGAND COMPLEX WITH LIGAND COVERAGE CONTROL", 10-2023-0174454, Korea, 2023
- "Aminophosphine type P precursors and III-V quantum dot using the same", 10-2024-0081861, Korea, 2024

Representative Publications

- Vishwa Bhat, ... **Min-Jae Choi***, "Pyro-phototronic Effect in Colloidal Quantum Dots on Silicon Heterojunction for High-detectivity Infrared Photodetectors" **Nano Energy**, 133, 110465 (2025)
- Hongjoo Shin, ... **Min-Jae Choi***, Donghun Kim*, Yeon Sik Jung*, "Indirect-to-direct bandgap transition in GaP semiconductors through quantum shell formation on ZnS nanocrystals" **Nature Communications**, 15, 8125 (2024)

- Geon Yeong Kim, ... **Min-Jae Choi***, Min Seok Jang*, Yeon Sik Jung*, "Chiral 3D structures through multi-dimensional transfer printing of multilayer quantum dot patterns" **Nature Communications**, 15, 6996 (2024)
- Doheon Yoo and **Min-Jae Choi***, "Asymmetric Metal-carboxylate Complexes for Formation of InGaP Alloyed Quantum Dots with Blue Emission" **ACS Nano**, 18, 16051-16058 (2024)
- **Min-Jae Choi**, ... Edward Sargent, "Cascade Surface Modification of Colloidal Quantum Dot Inks Enables Efficient Bulk Homojunction Photovoltaics", **Nature Communications**, 11, 103 (2020).

Full List of Publications (†Equal contribution; *Corresponding author)

- 79 "Iodide-Coated CsPbBr₃ Perovskite Nanowires for Resistive-Switching Memory in Neuromorphic Systems and Edge Computing"
Jooyoung Uhm, Yongjin Byun, Seungman Park, Sungjun Kim, **Min-Jae Choi***
Nano Letters, online published (2026)
- 79 "Ligand-Driven Tuning of Adsorption Energy in Nanocrystals for High-Performance H₂O₂ Electrosynthesis"
Jeong-Gyu Lee, Jae Won Choi, Sooyeon Kim, Wenjun Zhang, Heejong Shin, Jeong-Hyun Kim, Edward H Sargent, Sang Soo Han, Jong Min Kim, **Min-Jae Choi***
Journal of the American Chemical Society, 148, 9, 9268-9276 (2026)
- 78 "Integrated carbon nanotube fiber free-standing cathode for efficient metal-free H₂O₂ electrosynthesis and electro-Fenton process"
Jae Won Kim, Jeong-Gyu Lee, Hyun Jun Cho, Seung Min Kim, **Min-Jae Choi***, Young-Kwan Kim
Carbon, online published (2026)
- 77 "Silver chalcogenide colloidal quantum dots for NIR-to-MWIR photodetection"
Vishwa Bhatt, Abhishek Sharma, **Min-Jae Choi***
Nano Today, 67, 102956 (2026)
- 76 "Ultrahigh-Mass-Loading Electrodes With Enhanced Homogeneity Using a High-Concentration Slurry for Lithium-Ion Batteries"
Jun Kyu Park, Woohyeon Shin, Woohyeon Jo, Hyo-Jeong Lee, Won-Yong Jeon, Jinho Ahn, Jihee Yoon, Yea-Ji Jeong, Joonyoung Oh, Minji Kang, **Min-Jae Choi**, Jin Joo, Jongsoon Kim, Seong-Keun Cho, Jun Dong Park, Jaewook Nam, Jung-Keun Yoo
Carbon Energy, 8, 1, e70108 (2026)
- 75 "Modulating Precursor Reactivity for Precise Control of NIR-II Optical Properties in Ag₂Te Quantum Dot Synthesis"
Ga Yeon Kwon, Doheon Yoo, Ha-Neul Kim, Jeong-Gyu Lee, Jooyoung Uhm, **Min-Jae Choi***
Korean Journal of Chemical Engineering, 43, 2 (2026)
- 74 "Tailoring edge functionalization of graphene quantum dots for efficient two-electron oxygen reduction reaction"
Shiva Kumar Arumugasamy, Jeong-Gyu Lee, **Min-Jae Choi***
Journal of Power Sources, 654, 237883 (2025)

- 73 "Design of Aminophosphine Precursor for Robust Synthesis of InP Quantum Dots with Near-unity Quantum Yield"
Doheon Yoo, Euk Hyun Kim, Ji-Seoung Jeong, Ji Yeon Ryu, Sang Man Koo, **Min-Jae Choi***
Angewandte Chemie, e202513545 (2025)
- 72 "Facet-Controlled Growth of Molybdenum Phosphide Single Crystals for Efficient Hydrogen Peroxide Synthesis"
Seo Hyun Kim, Jeong-Hyun Kim, Bogeun Park, Hanhwi Jang, Jeong-Gyu Lee, Soonmin Yim, Jae Won Jeong, Seyoung Koo, Yeon Sik Jung, Byung-Hyun Kim*, **Min-Jae Choi***, Hyeuk Jin Han*
Advanced Materials, 37, e70219 (2025) **Inside Front cover**
- 71 "Continuous Monomer Supply for Highly Monodisperse Ag₂Te Colloidal Quantum Dots for SWIR Photodetectors"
Ha-Neul Kim, Doheon Yoo, Abhishek Sharma, **Min-Jae Choi***
Materials Horizons, 12, 6342-6348 (2025)
- 69 "Sequential Surface Tailoring from Colloid to Solid in Ag₂Te Colloidal Quantum Dots Enables High Hole Mobility and Efficient Shortwave Infrared Photodetection"
Abhishek Sharma, Doheon Yoo, Ha-Neul Kim, **Min-Jae Choi***
Nano Energy, 141, 111091 (2025)
- 68 "Ligand-induced surface functionalization in Ag₂S nanocrystals for efficient hydrogen evolution reaction in acidic media"
Shiva Kumar Arumugasamy, Sampath Prabhakaran, Jeong-Gyu Lee, Do Hwan Kim*, **Min-Jae Choi***
Materials Today Energy, 48, 101770 (2025)
- 67 "SN₂-mediated decoupled precursor provision enables large-scale production of monodisperse lead halide perovskite quantum dots in a single reactor"
Jigeon Kim, Woongchan Kim, Jin Il Jang, Wooyeon Kim, Doheon Yoo, Jae Woo Kim, Yubin Lee, **Min-Jae Choi**, Jongmin Choi, Hyung Min Kim, Sung Beom Cho, Min Jae Ko*, Younghoon Kim*
Advanced Composites and Hybrid Materials, 8, 125 (2025)
- 66 "High-performance electrocatalyst of activated carbon-decorated molybdenum trioxide nanocomposites for effective production of H₂ and H₂O₂"
Sankar Sekar, Eojin Lee, Juho Yun, Shiva Kumar Arumugasamy, **Min-Jae Choi**, Youngmin Lee, Sejoon Lee
Separation and Purification Technology, 361, 131614 (2025)
- 65 "Role of Cu²⁺/Cu¹⁺ induced adsorbed oxygen species in SnO₂ nanocrystals for H₂S gas detection at ppb level"
Vishwa Bhatt, Manjeet Kumar, **Min-Jae Choi**, Ju-Hyung Yun
International Journal of Hydrogen Energy, 112, 482-492 (2025)
- 64 "Pyro-phototronic Effect in Colloidal Quantum Dots on Silicon Heterojunction for High-detectivity Infrared Photodetectors"

- Vishwa Bhatt, Manjeet Kumar*, Ha-Neul Kim, Doheon Yoo, Ju-Hyung Yun*, **Min-Jae Choi***
Nano Energy, 133, 110465 (2025)
- 63 “Precise weight tuning in quantum dot-based resistive-switching memory for neuromorphic systems”
 Gyeongpyo Kim, Doheon Yoo, Hyojin So, Seoyoung Park, Sungjoon Kim, **Min-Jae Choi***, Sungjun Kim*
Materials Horizons, 12, 915-925 (2025)
- 62 “Ligand-Driven Electron-Deficient Cobalt Pentlandite Nanocrystals for Efficient Hydrogen Peroxide Electrosynthesis”
 Jeong-Hyun Kim, Jeong-Gyu Lee, Chang Seong Kim, **Min-Jae Choi***
Energy & Environmental Materials, 8, e12848 (2025)
- 61 “Indirect-to-direct bandgap transition in GaP semiconductors through quantum shell formation on ZnS nanocrystals”
 Hongjoo Shin, Doosun Hong, Hyunjin Cho, Hanhwi Jang, Geon Yeong Kim, Kyeong Min Song, **Min-Jae Choi***, Donghun Kim*, Yeon Sik Jung*
Nature Communications, 15, 8125 (2024)
- 60 “Chiral 3D structures through multi-dimensional transfer printing of multilayer quantum dot patterns”
 Geon Yeong Kim, Shinho Kim, Ki Hyun Park, Hanhwi Jang, Moohyun Kim, Tae Won Nam, Kyeong Min Song, Hongjoo Shin, Yemin Park, Yeongin Cho, Jihyeon Yeom, **Min-Jae Choi***, Min Seok Jang*, Yeon Sik Jung*
Nature Communications, 15, 6996 (2024)
- 59 “Thermal decomposition-assisted, aspect ratio controlled ZnO nanorods towards highly selective H₂ gas detection”
 Thanh Thao Tran, Vishwa Bhatt, **Min-Jae Choi**, Ha Trang Nguyen, Ankush Sharma, Manjeet Kumar, Ju-Hyung Yun
International Journal of Hydrogen Energy, 84, 767-779 (2024)
- 58 “Synthesis and surface engineering of Ag chalcogenide quantum dots for near-infrared biophotonic applications”
 Shiva Kumar Arumugasamy, Gayathri Chellasamy, Nanthagopal Murugan, Saravanan Govindaraju, Kyusik Yun, **Min-Jae Choi***
Advances in Colloid and Interface Science, 331, 103245 (2024)
- 57 “Asymmetric Metal-carboxylate Complexes for Formation of InGaP Alloyed Quantum Dots with Blue Emission”
 Doheon Yoo and **Min-Jae Choi***
ACS Nano, 18, 16051-16058 (2024)
- 56 “Injectable composite hydrogels embedded with gallium-based liquid metal particles for solid breast cancer treatment via chemo-photothermal combination”

- Wonjeong Lee, Min Joo Shin, Sungjun Kim, Chae Eun Lee, Jonghoon Choi, Hyung-Jun Koo, **Min-Jae Choi**, Jae Ho Kim, Kyobum Kim
Acta biomaterialia, 180, 140-153 (2024)
- 55 “Surface engineering of tin dioxide through chitosan: Band-gap tuning of spherical structure with oxygen vacancies for enhanced antibacterial therapeutic effects”
Karthikeyan Chandrasekaran, Sungjun Kim, **Min-Jae Choi**, Kyobum Kim
Journal of Industrial and Engineering Chemistry, 130, 255-265 (2024)
- 54 “MXene–MOF architectural hybrid-supported nickel single-atom catalysts for hydrogen evolution reactions”
Gayathri Chellasamy, Shiva Kumar Arumugasamy, Satheesh Kuppasamy, Viswanathan Ekambaram, Kandeegan Rajagopalan, Sada Venkateswarlu, Prabhakaran Deivasigamani, **Min-Jae Choi**, Saravanan Govindaraju, Kyusik Yun
Journal of Materials Chemistry A, 12, 1115-1127 (2024)
- 53 “Dual-Ligand Surface Passivation Enables Monodisperse Ag₂S Colloidal Quantum Dots for Efficient Near-Infrared Photothermal Therapy”
Doheon Yoo, Sehwan Jeong, Hae Mee Ju, Woo-jin Jeong, Kyobum Kim*, **Min-Jae Choi***
ACS Materials Letters, 6, 308-313 (2024)
- 52 “Gel polymer electrolyte with improved adhesion property based on poly (4-hydroxybutyl acrylate) for lithium-ion batteries”
Hui Ju Choi, Yea-Ji Jeong, Hong Soo Choi, Jun Seop Kim, Junho Ahn, Woohyeon Shin, Byung Mun Jung, Eunyeong Cho, Hee Jung Lee, Jin Hyun Choi, **Min-Jae Choi**, Jihee Yoon, Jin Woo Yi, Geon-Tae Hwang, Jung-Keun Yoo, Kyeongwoon Chung
Chemical Engineering Journal, 474, 145673 (2023)
- 51 “Experimental and simulation studies of bioinspired Au-enhanced copper single atom catalysts towards real-time expeditious dopamine sensing on human neuronal cell”
Gayathri Chellasamy, Shiva Kumar Arumugasamy, Myeong Jin Nam, Sada Venkateswarlu, Elumalai Varathan, Karthikeyan Sekar, Kamaraj Manokaran, **Min-Jae Choi**, Saravanan Govindaraju, Kyusik Yun
Chemical Engineering Journal, 471, 144842 (2023)
- 50 “Modulating the folding and binding of peptides using a stimuli-responsive molecular tweezer”
SooHo Ko, Joo-Young Kim, Jung Yeon Park, You-jin Jung, **Min-Jae Choi**, Kyeong Sik Jin, Yongju Kim, Yong-beom Lim, Woo-jin Jeong
Chemical Science, 14, 9600-9607 (2023)
- 49 “Ligand-induced surface reconstruction in Ag₂S colloidal quantum dots for highly luminescent infrared fluorescence”
Hae Mee Ju, Doheon Yoo, **Min-Jae Choi***
Applied Surface Science, 635, 157706 (2023)

- 48 “Sequential Co-Passivation in InAs Colloidal Quantum Dot Solids Enables Efficient Near-Infrared Photodetectors”
Pan Xia, Bin Sun, Margherita Biondi, Jian Xu, Ozan Atan, Muhammad Imran, Yasser Hassan, Yanjiang Liu, Joao M. Pina, Amin Morteza Najarian, Luke Grater, Koen Bertens, Laxmi Kishore Sagar, Husna Anwar, **Min-Jae Choi**, Yangning Zhang, Minhal Hasham, F. Pelayo García de Arquer, Sjoerd Hoogland, Mark W. B. Wilson, Edward H. Sargent*
Advanced Materials, 35, 2301842 (2023)
- 47 “Ultrahigh-resolution quantum dot patterning for advanced optoelectronic devices”
Tae Won Nam, **Min-Jae Choi***, Yeon Sik Jung*
Chemical Communications, 59, 2697-2710 (2023)
- 46 “Infrared-harvesting colloidal quantum dot inks for efficient photovoltaics: Impact of surface chemistry and device engineering”
Younghoon Kim*, **Min-Jae Choi***, Jongmin Choi*,
Journal of Materials Science & Technology, 147, 224-240 (2023)
- 45 “Dual-Phase Stabilized Perovskite Nanowires for Reduced Defects and Longer Carrier Lifetime”
Yoo Min Shin, Ji Hyeon Lee, Geon Yeong Kim, Hae Mee Ju, Yeon Sik Jung, Jea Woong Jo*, **Min-Jae Choi***
Advanced Functional Materials, 33, 2210155 (2023)
- 44 “Fast Near-Infrared Photodetection using III-V Colloidal Quantum Dots”
Bin Sun†, Amin Morteza Najarian†, Laxmi Kishore Sagar†, Margherita Biondi†, **Min-Jae Choi†**, Xiyan Li, Larissa Levina, Se-Woong Baek, Chao Zheng, Seungjin Lee, Ahmad R Kirmani, Randy Sabatini, Jehad Abed, Mengxia Liu, Maral Vafaie, Peicheng Li, Lee J Richter, Oleksandr Voznyy, Mahshid Chekini, Zheng Hong Lu, F Pelayo García de Arquer, Edward H Sargent*
Advanced Materials, 34, 2203039 (2022)
- 43 “Bright and Stable Light-Emitting Diodes Based on Perovskite Quantum Dots in Perovskite Matrix”
Yuan Liu, Yitong Dong, Tong Zhu, Dongxin Ma, Andrew Proppe, Bin Chen, Chao Zheng, Yi Hou, Seungjin Lee, Bin Sun, Eui Hyuk Jung, Fanglong Yuan, Ya-kun Wang, Laxmi Kishore Sagar, Sjoerd Hoogland, F Pelayo García de Arquer, **Min-Jae Choi**, Kamalpreet Singh, Shana O Kelley, Oleksandr Voznyy, Zheng-Hong Lu, Edward H Sargent*
Journal of the American Chemical Society, 143, 15606-15615 (2021)
- 42 “Ligand Exchange at a Covalent Surface Enables Balanced Stoichiometry in III–V Colloidal Quantum Dots”
Min-Jae Choi†, Laxmi Kishore Sagar†, Bin Sun†, Margherita Biondi, Seungjin Lee, Amin Morteza Najjariyan, Larissa Levina, F Pelayo García de Arquer, Edward H Sargent*
Nano Letters, 21, 6057-6063 (2021)
- 41 “Facet-Oriented Coupling Enables Fast and Sensitive Colloidal Quantum Dot Photodetectors”
Margherita Biondi†, **Min-Jae Choi†**, Zhibo Wang†, Mingyang Wei, Seungjin Lee, Hitarth Choubisa, Laxmi Kishore Sagar, Bin Sun, Se-Woong Baek, Bin Chen, Petar Todorović, Amin Morteza Najarian, Armin Sedighian Rasouli, Dae-Hyun Nam, Maral Vafaie, Yuguang C Li, Koen Bertens, Sjoerd

- Hoogland, Oleksandr Voznyy, F Pelayo García de Arquer, Edward H Sargent*
Advanced Materials, 33, 2101056 (2021)
- 40 “Control Over Ligand Exchange Reactivity in Hole Transport Layer Enables High-Efficiency Colloidal Quantum Dot Solar Cells”
Margherita Biondi, **Min-Jae Choi**, Seungjin Lee, Koen Bertens, Mingyang Wei, Ahmad R. Kirmani, Geonhui Lee, Hao Ting Kung, Lee J. Richter, Sjoerd Hoogland, Zheng-Hong Lu, F. Pelayo García de Arquer, and Edward H. Sargent*
ACS Energy Letters, 6, 468-476 (2021)
- 39 “A Tuned Alternating D–A Copolymer Hole-Transport Layer Enables Colloidal Quantum Dot Solar Cells with Superior Fill Factor and Efficiency”
Hong Il Kim, Se-Woong Baek, Hyung Jin Cheon, Seung Un Ryu, Seungjin Lee, **Min-Jae Choi**, Kyoungwon Choi, Margherita Biondi, Sjoerd Hoogland, FP García de Arquer, Soon-Ki Kwon, Yun-Hi Kim, Taiho Park, Edward H Sargent*
Advanced Materials, 32, 2004985 (2020)
- 38 “Orthogonal colloidal quantum dot inks enable efficient multilayer optoelectronic devices”
Seungjin Lee†, **Min-Jae Choi**, Geetu Sharma, Margherita Biondi, Bin Chen, Se-Woong Baek, Amin Morteza Najarian, Maral Vafaie, Joshua Wicks, Laxmi Kishore Sagar, Sjoerd Hoogland, F Pelayo García de Arquer, Oleksandr Voznyy, Edward H Sargent*
Nature Communications, 11, 4814 (2020)
- 37 “Monolithic Organic/Colloidal Quantum Dot Hybrid Tandem Solar Cells via Buffer Engineering”
Hong Il Kim†, Se-Woong Baek†, **Min-Jae Choi**, Bin Chen, Olivier Ouellette, Kyoungwon Choi, Benjamin Scheffel, Hyuntae Choi, Margherita Biondi, Sjoerd Hoogland, F. Pelayo García de Arquer, Taiho Park*, Edward H. Sargent*
Advanced Materials, 32, 2004657 (2020)
- 36 “Efficient and Stable Colloidal Quantum Dot Solar Cells with a Green-Solvent Hole-Transport Layer”
Hong Il Kim†, Junwoo Lee†, **Min-Jae Choi**, Seung Un Ryu, Kyoungwon Choi, Seungjin Lee, Sjoerd Hoogland, F. Pelayo García de Arquer, Edward H. Sargent*, Taiho Park*
Advanced Energy Materials, 10, 2002084 (2020)
- 35 “Suppression of Auger Recombination by Gradient Alloying in InAs/CdSe/CdS QDs”
Laxmi Kishore Sagar, Golam Bappi, Andrew Johnston, Bin Chen, Petar Todorović, Larissa Levina, Makhsud I. Saidaminov, F. Pelayo García de Arquer, Dae-Hyun Nam, **Min-Jae Choi**, Sjoerd Hoogland, Oleksandr Voznyy, Edward H. Sargent*
Chemistry of Materials, 32, 7703–7709 (2020)
- 34 “Thermodynamic-driven polychromatic quantum dot patterning for light-emitting diodes beyond eye-limiting resolution”
Tae Won Nam, Moohyun Kim, Yanming Wang, Geon Yeong Kim, Wonseok Choi, Hunhee Lim, Kyeong Min Song, **Min-Jae Choi**, Duk Young Jeon, Jeffrey C Grossman, Yeon Sik Jung*
Nature Communications, 11, 3040 (2020)

- 33 “Monolayer Perovskite Bridges Enable Strong Quantum Dot Coupling for Efficient Solar Cells”
Bin Sun, Andrew Johnston, Chao Xu, Mingyang Wei, Ziru Huang, Zhang Jiang, Hua Zhou, Yajun Gao, Yitong Dong, Olivier Ouellette, Xiaopeng Zheng, Jiakai Liu, **Min-Jae Choi**, Yuan Gao, Se-Woong Baek, Frédéric Laquai, Osman M Bakr, Dayan Ban, Oleksandr Voznyy, F Pelayo García de Arquer, Edward H Sargent*
Joule, 4, 1542-1556 (2020)
- 32 “Colloidal Quantum Dot Bulk Heterojunction Solids with Near-Unity Charge Extraction Efficiency”
Min-Jae Choit, Se-Woong Baekt, Seungjin Leet, Margherita Biondi, Chao Zheng, Petar Todorovic, Peicheng Li, Sjoerd Hoogland, Zheng-Hong Lu, F. Pelayo García de Arquer, Edward H. Sargent*
Advanced Science, 7, 2000894 (2020)
- 31 “Bipolar Shell Resurfacing Enables Blue LEDs based on Strongly-Confined Perovskite Quantum Dots”
Yitong Dong, Ya-Kun Wang, Fanglong Yuan, Andrew Johnston, Yuan Liu, Dongxin Ma, **Min-Jae Choi**, Bin Chen, Mahshid Chekini, Se-Woong Baek, Laxmi Kishore Sagar, James Fan, Yi Hou, Mingjian Wu, Seungjin Lee, Bin Sun, Sjoerd Hoogland, Rafael Quintero-Bermudez, Hinako Ebe, Petar Todorovic, Filip Dinic, Peicheng Li, Hao Ting Kung, Makhsud I. Saidaminov, Eugenia Kumacheva, Erdmann Spiecker, Liang-Sheng Liao, Oleksandr Voznyy, Zheng-Hong Lu*, Edward H. Sargent*
Nature Nanotechnology, 15, 668 (2020)
- 30 “Ligand-Assisted Reconstruction of Colloidal Quantum Dots Decreases Trap State Density”
Bin Sun, Maral Vafaie, Larissa Levina, Mingyang Wei, Yitong Dong, Yajun Gao, Hao Ting Kung, Margherita Biondi, Andrew H Proppe, Bin Chen, **Min-Jae Choi**, Laxmi Kishore Sagar, Oleksandr Voznyy, Shana O Kelley, Frédéric Laquai, Zheng-Hong Lu, Sjoerd Hoogland, F Pelayo García de Arquer, Edward H Sargent*
Nano Letters, 20, 3694–3702 (2020)
- 29 “A Chemically Orthogonal Hole Transport Layer for Efficient Colloidal Quantum Dot Solar Cells”
Margherita Biondi†, **Min-Jae Choit**, Olivier Ouellette, Se-Woong Baek, Petar Todorović, Bin Sun, Seungjin Lee, Mingyang Wei, Peicheng Li, Ahmad R. Kirmani, Laxmi K. Sagar, Lee J. Richter, Sjoerd Hoogland, Zheng-Hong Lu, F. Pelayo García de Arquer, Edward H. Sargent*
Advanced Materials, 32, 1906199 (2020)
- 28 “Stabilizing Surface Passivation Enables Stable Operation of Colloidal Quantum Dot Photovoltaic Devices at Maximum Power Point in an Air Ambient”
Jongmin Choit, **Min-Jae Choit**, Junghwan Kim†, Filip Dinic, Petar Todorovic, Bin Sun, Mingyang Wei, Se-Woong Baek, Sjoerd Hoogland, F. Pelayo García de Arquer, Oleksandr Voznyy, and Edward H. Sargent*
Advanced Materials, 32, 1906497 (2020)
- 27 “Cascade Surface Modification of Colloidal Quantum Dot Inks Enables Efficient Bulk Homo Junction Photovoltaics”
Min-Jae Choi, F. Pelayo Garcia de Arquer, Andrew Proppe, Ali Seifitokaldani, Jongmin Choi, Junghwan Kim, Se-Woong Baek, Mengxia Liu, Bin Sun, Margherita Biondi, Benjamin Scheffel, Grant

- Walters, Dae-Hyun Nam, Jea Woong Jo, Olivier Ouellette, Oleksandr Voznyy, Sjoerd Hoogland, Shana Kelley, Yeon Sik Jung*, Edward Sargent*
Nature Communications, 11, 103 (2020)
- 26 “Suppressing Interfacial Dipoles to Minimize Open-Circuit Voltage Loss in Quantum Dot Photovoltaics”
Hunhee Lim, Donghun Kim, **Min-Jae Choi**, Edward H. Sargent, Yeon Sik Jung*, Jin Young Kim*
Advanced Energy Materials, 9, 1901938 (2019)
- 25 “Mixed Lead Halide Passivation of Quantum Dots”
James Z. Fan, Nigel T. Andersen, Margherita Biondi, Petar Todorović, Bin Sun, Olivier Ouellette, Jehad Abed, Laxmi K. Sagar, **Min-Jae Choi**, Sjoerd Hoogland, F. Pelayo García de Arquer, Edward H. Sargent*
Advanced Materials, 31, 1904304 (2019)
- 24 “Stable Colloidal Quantum Dot Inks Enable Inkjet-Printed High-Sensitivity Infrared Photodetectors”
Rafal Sliz, Marc Lejay, James Z. Fan, **Min-Jae Choi**, Sachin Kinge, Sjoerd Hoogland, Tapio Fabritius, F. Pelayo García de Arquer, Edward H. Sargent*
ACS Nano, 13, 11988 (2019)
- 23 “Machine Learning Accelerates Discovery of Optimal Colloidal Quantum Dot Synthesis”
Oleksandr. Voznyy, Larissa. Levina, James. Z. Fan, Mikhail. Askerka, Ankit. Jain, **Min-Jae. Choi**, Olivier Ouellette, Petar Todorovic, Laxmi K. Sagar, Edward H. Sargent*
ACS Nano, 13, 11122 (2019)
- 22 “Accelerated solution-phase exchanges minimize defects in colloidal quantum dot solids”
Yong-Biao Zhao, Mengxia Liu, Oleksandr Voznyy, Bin Sun, Pei-Cheng Li, Haoting Kung, Olivier Ouellette, **Min-Jae Choi**, Zheng-Hong Lu, F. Pelayo García de Arquer, Edward H. Sargent*
Nano Energy, 63, 103876 (2019)
- 21 “Nanostructured Back Reflectors for Efficient Colloidal Quantum-Dot Infrared Optoelectronics”
Se-Woong Baek+, Pau Molet+, **Min-Jae Choi+**, Margherita Biondi, Olivier Ouellette, James Fan, Sjoerd Hoogland, F. Pelayo García de Arquer, Agustín Mihi, Edward H. Sargent*
Advanced Materials, 31, 1901745 (2019)
- 20 “Tuning Solute-Redistribution Dynamics for Scalable Fabrication of Colloidal Quantum-Dot Optoelectronics”
Min-Jae Choi†, YongJoo Kim†, Hunhee Lim, Erkki Alarousu, Aniruddha Adhikari, Basamat S. Shaheen, Yong Ho Kim, Omar F. Mohammed, Edward. H. Sargent, Jin Young Kim, Yeon Sik Jung*
Advanced Materials, 31, 1805886 (2019), **Front cover**.
- 19 “Lattice anchoring stabilizes solution-processed semiconductors”
Mengxia Liu, Yuelang Chen, Chih-Shan Tan, Rafael Quintero-Bermudez, Andrew H. Proppe, Rahim Munir, Hairen Tan, Oleksandr Voznyy, Benjamin Scheffel, Grant Walters, Andrew Pak Tao Kam, Bin Sun, **Min-Jae Choi**, Sjoerd Hoogland, Aram Amassian, Shana O. Kelley, F. Pelayo García de Arquer, Edward H. Sargent*

Nature, 570, 96 (2019)

- 18 “A Facet-Specific Quantum Dot Passivation Strategy for Colloid Management and Efficient Infrared Photovoltaics”
Younghoon Kim, Fanglin Che, Jea Woong Jo, Jongmin Choi, F. Pelayo García de Arquer, Oleksandr Voznyy, Bin Sun, Junghwan Kim, **Min-Jae Choi**, Rafael Quintero-Bermudez, Fengjia Fan, Chih Shan Tan, Eva Blatt, Grant Walters, Andrew H. Proppe, Chengqin Zou, Haifeng Yuan, Sara Bals, Johan Hofkens, Maarten B. J. Roelofs, Sjoerd Hoogland, Edward H. Sargent*
Advanced Materials 25, 1805580 (2019)
- 17 “Infrared Cavity-Enhanced Colloidal Quantum Dot Photovoltaics Employing Asymmetric Multilayer Electrodes”
Se-Woong Baek, Olivier Ouellette, Jea Woong Jo, Jongmin Choi, Ki-Won Seo, Junghwan Kim, Bin Sun, Sang-Hoon Lee, **Min-Jae Choi**, Dae-Hyun Nam, Li Na Quan, Juhoon Kang, Sjoerd Hoogland, F. Pelayo García de Arquer, Jung-Yong Lee, Edward H. Sargent*
ACS Energy Letter 3, 2908-2913 (2018)
- 16 “Butylamine-Catalyzed Synthesis of Nanocrystal Inks Enables Efficient Infrared CQD Solar Cells”
Junghwan Kim, Olivier Ouellette, Oleksandr Voznyy, Mingyang Wei, Jongmin Choi, **Min-Jae Choi**, Jea Woong Jo, Se-Woong Baek, James Fan, Makhsud I. Saidaminov, Bin Sun, Peicheng Li, Dae-Hyun Nam, Sjoerd Hoogland, Zheng-Hong Lu, F. Pelayo García de Arquer, Edward H. Sargent*
Advanced Materials 30, 1803830 (2018)
- 15 “Metal–Organic Frameworks Mediate Cu Coordination for Selective CO₂ Electroreduction”
Dae-Hyun Nam, Oleksandr S. Bushuyev, Jun Li, Phil De Luna, Ali Seifitokaldani, Cao-Thang Dinh, F. Pelayo García de Arquer, Yuhang Wang, Zhiqin Liang, Andrew H. Proppe, Chih Shan Tan, Petar Todorović, Osama Shekhah, Christine M. Gabardo, Jea Woong Jo, Jongmin Choi, **Min-Jae Choi**, Se-Woong Baek, Junghwan Kim, David Sinton, Shana O. Kelley, Mohamed Eddaoudi, and Edward H. Sargent*
Journal of the American Chemical Society 140, 11378-11386 (2018)
- 14 “Acid-Assisted Ligand Exchange Enhances Coupling in Colloidal Quantum Dot Solids”
Jea Woong Jo, Jongmin Choi, F. Pelayo García de Arquer, Ali Seifitokaldani, Bin Sun, Younghoon Kim, Hyungju Ahn, James Fan, Rafael Quintero-Bermudez, Junghwan Kim, **Min-Jae Choi**, Se-Woong Baek, Andrew H. Proppe, Grant Walters, Dae-Hyun Nam, Shana Kelley, Sjoerd Hoogland, Oleksandr Voznyy, Edward H. Sargent*
Nano Letters 18, 4417-4423 (2018)
- 13 “Activated Electron-Transport Layers for Infrared Quantum Dot Optoelectronics”
Jongmin Choi, Jea Woong Jo, F. Pelayo García de Arquer, Yong-Biao Zhao, Bin Sun, Junghwan Kim, **Min-Jae Choi**, Se-Woong Baek, Andrew H. Proppe, Ali Seifitokaldani, Dae-Hyun Nam, Peicheng Li, Olivier Ouellette, Younghoon Kim, Oleksandr Voznyy, Sjoerd Hoogland, Shana O. Kelley, Zheng-Hong Lu, Edward H. Sargent*
Advanced Materials 30, 1801720 (2018)

- 12 "Extremely Small Pyrrhotite Fe₇S₈ Nanocrystals with Simultaneous Carbon-Encapsulation for High-Performance Na-Ion Batteries"
Min-Jae Choi, Jongsoon Kim†, Jung-Keun Yoo, Soonmin Yim, Jaebeom Jeon, Yeon Sik Jung*
Small 14, 1702816 (2018)
- 11 "Long-Term Stable 2H-MoS₂ Dispersion: Critical Role of Solvent for Simultaneous Phase Restoration and Surface Functionalization of Liquid-Exfoliated MoS₂"
Dong Min Sim+, Hyeuk Jin Han+, Soonmin Yim, **Min-Jae Choi**, Jaebeom Jeon, Yeon Sik Jung*
ACS Omega 2, 4678-4687 (2017)
- 10 "Interfacial Band-Edge Engineered TiO₂ Protection Layer on Cu₂O Photocathodes for Efficient Water Reduction Reaction"
Jaesuk Choi, Jun Tae Song, Ho Seong Jang, **Min-Jae Choi**, Dong Min Sim, Soonmin Yim, Hunhee Lim, Yeon Sik Jung*, Jihun Oh*
Electronic Materials Letters 13, 57-65 (2017)
- 9 "Surface-Shielding Nanostructures Derived from Self-Assembled Block Copolymers Enable Reliable Plasma Doping for Few-Layer Transition Metal Dichalcogenides"
Soonmin Yim, Dong Min Sim, Woon Ik Park, **Min-Jae Choi**, Jaesuk Choi, Jaebeom Jeon, Kwang Ho Kim, Yeon Sik Jung*
Advanced Functional Materials 26, 5631-5640 (2016)
- 8 "Highly asymmetric n⁺-p heterojunction quantum dot solar cells with significantly improved charge collection efficiencies"
Min-Jae Choi, Sunchuel Kim, Hunhee Lim, Jaesuk Choi, Dong Min Sim, Soonmin Yim, Byung Tae Ahn, Jin Young Kim*, Yeon Sik Jung*
Advanced Materials 28, 1780-1787 (2016)
- 7 "Single Nanoparticle Localization in the Perforated Lamellar Phase of Self-assembled Block Copolymer Driven by Entropy Minimization"
Tae Won Nam, Jae Won Jeong, **Min-Jae Choi**, Kwang Min Baek, Jong Min Kim, Yoon Hyung Hur, YongJoo Kim, Yeon Sik Jung*
Macromolecules 48, 7938-7944 (2015)
- 6 "Controlled Doping of Vacancy-Containing Few-Layer MoS₂ via Highly Stable Thiol-Based Molecular Chemisorption"
Dong Min Sim, Mincheol Kim, Soonmin Yim, **Min-Jae Choi**, Jaesuk Choi, Seunghyup Yoo, Yeon Sik Jung*
ACS Nano 9, 12115-12123 (2015)
- 5 "Tailoring the PbS/metal interface in colloidal quantum dot solar cells for improvements of performance and air stability"
Min-Jae Choi, Jihun Oh, Jung-Keun Yoo, Jaesuk Choi, Dong Min Sim, and Yeon Sik Jung*
Energy & Environmental Science 7, 3052-3060 (2014)

- 4 “Extremely High-yield Conversion from Low-cost Sand to High-Capacity Si Electrodes for Li-ion Batteries”
Jung-Keun Yoo, Jongsoo Kim, **Min-Jae Choi**, Young-Uk Park, Jihyun Hong, Kwang Min Baek, Kisuk Kang, Yeon Sik Jung*
Advanced Energy Materials 4, 1400622 (2014)
- 3 “Porous Silicon Nanowires for Lithium Rechargeable Batteries”
Jung-Keun Yoo, Jongsoo Kim, Hojun Lee, Jaesuk Choi, **Min-Jae Choi**, Dong Min Sim, Yeon Sik Jung*, Kisuk Kang*
Nanotechnology 24, 424008 (2013)
- 2 “Localized Surface Plasmon-Enhanced Nanosensor Platform using Dual-Responsive Polymer Nanocomposites”
Jaesuk Choi, **Min-Jae Choi**, Jung-Keun Yoo, Woon Ik Park, Ju Ho Lee, Jeong Yong Lee, Yeon Sik Jung*
Nanoscale 5, 7403-7409 (2013)
- 1 “Ultra-High Optical Transparency of Robust, Graded-Index, and Anti-Fogging Silica Coating Derived from Si-Containing Block Copolymer”
Dong Min Sim, **Min-Jae Choi**, Yoon Hyung Hur, Boae Nam, Geesung Cha, Jong Hyun Park, Yeon Sik Jung*
Advanced Optical Materials 1, 428-433 (2013)