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Education

2013.03.01- **Ph.D.**

2017.02.17 Graduate School of EEWS, KAIST, Republic of Korea

Thesis: An Efficient Light-Electrical Energy Conversion Strategy for Next Generation Optoelectronics (*Advisor*: Prof. Jung-Yong Lee)

** graduated best dissertation award*

2011.09.01- **M.S.**

2013.02.23 Graduate School of EEWS, KAIST, Republic of Korea

Thesis: Plasmonic Forward Light Scattering Effect of Size-controlled Silver Nanoparticles in Organic Photovoltaics (*Advisor*: Prof. Jung-Yong Lee)

2006.03.01- **B.S.**

2011.02.01 Department of Chemical & Biomolecular Engineering, KAIST
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Professional activity

2020.03-present **조교수-부교수**, 고려대학교 공과대학 화공생명공학과

2022.07-present **겸임교수**, 고려대학교 안산병원 의학과

2024.01-present **교육이사, 학회지편집위원, 학술위원**, 한국전기전자재료학회

2024.01-present **기술지편집위원회**, 한국전기화학학회

2023.01-present **국제화국제협력위원**, 한국화학공학회

2021.01-2022.12 **학회지편집위원**, 한국고분자학회

2017.03-2020.02 **Postdoctoral fellow**, Dept. of Electrical & Computer Engineering
University of Toronto, Canada
Advisor: Prof. Edward H. Sargent

Awards

03/2022	포스코사이언스펠로우, 포스코청암재단
11/2021	미원상사 신진연구자상, 한국공업화학회
06/2018	RSC awards, QD2018
03/2017	The 3rd best dissertation award, EEWS
11/2015	The best paper award, PVSEC-25
10/2014	The best English oral presentation, PSK
05/2014	Fusion research award, KINC
09/2013	Best poster presentation, KPVS
04/2012	Outstanding Research Awards, KINC

Publications

- [1] Hyejin Lee, Dae-Hee Cho, Chanwoo Lim, Woong Kim, Yoon Hee Jang, **Se-Woong Baek**, Byeong Kwon Ju, Phillip Lee, Hyeonggeun Yu*, “Pressurized Back-Junction Doping via Spray-Coating Silver Nanowires Top Electrodes for Efficient Charge Collection in Bifacial Colloidal PbS Quantum Dot Solar Cells”, *ACS Applied Materials & Interfaces*, (in press)
 - [2] Seungin Jee, Min-Jae Si, Jae-Hwan Choi, Dongeon Kim, Changjo Kim, Dongsoo Yang*, **Se-Woong Baek***, “P-Type Colloidal InSb Quantum Dot Ink Enables III–V Group Bulk-Heterojunction Shortwave Infrared (SWIR) Photodetector”, *Advanced Optical Materials*, 2024, 2303097
 - [3] Min-Jae Si, Seungin Jee, Minjung Yang, Dongeon Kim, Yongnam Ahn, Seungjin Lee, Changjo Kim, In-Ho Bae*, **Se-Woong Baek***, “Colloidal InAs Quantum Dot-Based Infrared Optoelectronics Enabled by Universal Dual-Ligand Passivation”, *Advanced Science*, 2024, 2306798
 - [4] Dongeon Kim,†, Gaeun Cho†, Yun Hoo Kim, Ji Hyun Kwon, YeonWoo Oh, Minjung Yang, Seungin Jee, In Suh Lee, Min-Jae Si, Yujin Jung, Ho Yeon Yang, Han Seul Kim* and **Se-Woong Baek***, “Multi-facet passivation of ternary colloidal quantum dot enabled by quadruple-ligand ensemble toward efficient lead-free optoelectronics”, *Advanced Energy Materials* 2024, 14(7), 2470030
 - [5] Yongseok Yoo, Gabseok Seo, Hee Jeong Park, Jichan Kim, Jihun Jang, Woosum Cho, Ji Hwan Kim, Jooyeon Shin, Ji Seong Choi, Donghyeon Lee, **Se-Woong Baek**, Sungkoo Lee, Seong Min Kang*, Min-cheol Kim*, Yung-Eun Sung*, Seunghwan Bae*, “Low-temperature rapid UV sintering of sputtered TiO₂ for flexible perovskite solar modules”, *Journal of Materials Chemistry A*, 2024, 12(3), 1562-1572
 - [6] Sol-Hee Kim†, Donggyu Lee†, Sanghyun Moon, Jae-Hwan Choi, Dongeon Kim, Jihyun Kim* and **Se-Woong Baek***, “Sulfurized colloidal quantum dot/tungsten disulfide multi-dimensional heterojunction for efficient self-powered visible-to-SWIR photodetector” *Advanced Functional Materials*, 2023, 2303778
 - [7] Jigeon Kim†, Dongeon Kim†, Wooyeon Kim, Sungho Woo, **Se-Woong Baek***, Min Jae Ko*, and Younghoon Kim*, “Efficient Semi-Transparent Perovskite Quantum Dot Photovoltaics Enabled by Asymmetric Dielectric/Metal/Dielectric Transparent Electrodes”, *Chemical Engineering Journal*, 2023, 469, 143824
 - [8] Yujin Jung†, Hyeyoung Shin†, **Se-Woong Baek†**, Truong Ba Ta, Benjamin Scheffel, Olivier Ouellette, Margherita Biondi, Sjoerd Hoogland, F. Pelayo García de Arquer, and Edward H. Sargent*, “Near-unity broadband quantum efficiency enabled by efficient colloidal quantum
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- [9] Ji Hun Kim, Jong-Yun Lee, Jiseok Lim, Jiho Roh, **Se-Woong Baek**, Woong Kim, Min Chul Suh*, and Hyeonggeun Yu* Highly Efficient Top-Emitting Infrared-to-Visible Up-Conversion Device Enabled by Microcavity Effect, *Advanced Functional Materials*, 2023, 2214530
 - [10] Hoon-Seok Jeong†, Dongeon Kim†, Seung-In Jee, Min-Jae Si, Chang-Jo Kim, Jung-Yong Lee, and **Se-Woong Baek***, “CQD:Organic ternary ink for efficient hybrid solar cells”, *International Journal of Energy Research*, 2023, 4911750
 - [11] Ji Hyeon Lee†, Dong Eon Kim†, Henry Opoku†, Hyungju Ahn, Jae-Joon Lee, **Se-Woong Baek***, Jea Woong Jo*, “Ethylene Glycol-Containing Ammonium Salt for Developing Highly Compatible Interfaces in Perovskite Solar Cells”, *Chemical Engineering Journal* 2023, 455, 2, 140833
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- News and Views in *Nature Energy*, “A bridge for charge carriers”
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- Impact factor: 54.000 (JCR 2018, Top <1% in Material science, Multidisciplinary, Energy & Fuels)
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- [34] **Se-Woong Baek**[†], Sang-Hoon Lee[†], Jung Hoon Song, Changjo Kim, Ye-Seol Ha, Hyeyoung Shin, Hyungjun Kim, Sohee Jeong, and Jung-Yong Lee*, "A hydro/oxo-phobic top selective layer for efficient and stable quantum dots solar cells", *Energy & Environmental Science*, **11**, 2078 (2018)
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Patents

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Invited Talk

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