

# Junseok Lee, Ph.D.

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Postdoctoral Associates | Department of Civil and Environmental Engineering

University of Southern California | 920 Downey Way, Los Angeles, CA 90089 | T: (203) 393-6023 |

E: junseok@usc.edu | <https://scholar.google.com/citations?hl=en&user=w8kBtH0AAAAAJ>

## EDUCATION

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Yale University New Haven, CT, USA	Ph.D. in Chemical and Environmental Engineering Advisor: Professor John D. Fortner Dissertation title: Engineering Nanomaterials for Advanced, Aqueous-Based Applications: Exploring Physical and Chemical Dynamics with a Focus on Surface Chemistry	2024
Korea University Seoul, Korea	M.S. in Civil and Environmental Engineering Dissertation advisor: Professor Seungkwan Hong Dissertation title: Effect of Channel Length on Water Flux and Membrane Fouling Distribution in Forward Osmosis	2013
Korea University Seoul, Korea	B.S. in Civil and Environmental Engineering	2011

## ACADEMIC APPOINTMENTS

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2024–Present	Postdoctoral Associates Department of Civil and Environmental Engineering University of Southern California
2017–2024	Graduate Research Assistant Department of Chemical and Environmental Engineering Yale University
2013–2016	Researcher Korea Basic Science Institute
2011–2013	Graduate Research Assistant School of Civil, Environmental and Architectural Engineering Korea University

## PUBLICATIONS

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### Peer-Reviewed Journal Articles

- Eun-Tae Yun, **Junseok Lee**, Seung Soo S Lee, Seungkwan Hong, and John D. Fortner "Harnessing the potential of in-situ, electrically generated microbubbles via nickel foam for enhanced, low energy membrane fouling control" *Water Research* **2024**, 249, 120886.
- Junseok Lee**, Changwoo Kim, Daniel Schmucker, Seung Soo Steve Lee, Shuchi Liao, Kurt D. Pennell, and John D. Fortner "Delineating the Role of Surface Grafting Density of Organic Coatings on the Colloidal Stability, Transport, and Sorbent Behavior of Engineered Nanoparticles" *Environmental Science: Nano* **2024**.

16. **Junseok Lee**, Changwoo Kim, Chen Liu, Michael Wong, Natalie L. Cápiro, Kurt D. Pennell, and John D. Fortner "Ultra-High Capacity, Multifunctional Nanoscale Sorbents for PFOA and PFOS Treatment" *npj Clean Water* **2023**, *6*, 62.
15. Dilara Hatinoglu, **Junseok Lee**, John D. Fortner, and Onur Apul "Superparamagnetic iron oxide nanoparticles as additives for microwave-based sludge pre-hydrolysis: A perspective" *Environmental Science & Technology* **2023**, *57*, 12191-12200.
14. Kelsey Haddad, Ahmed Abokifa, Siyuan An, **Junseok Lee**, Baranidharan Raman, Pratim Biswas, John D Fortner "Crumpled graphene oxide for enhanced room temperature gas sensing: understanding the critical roles of surface morphology and functionalization" *Journal of Materials Chemistry A* **2023**, *11*, 447-459.
13. Changwoo Kim, Seung Soo Lee, Anushree Ghosh, **Junseok Lee**, John D Fortner "Cetyltrimethylammonium bromide–Oleic acid (CTAB-OA) bilayer coated iron oxide nanocrystals for enhanced chromium (VI) photoreduction via ligand-to-metal charge transfer mechanism" *Chemical Engineering Journal* **2022**, *431*, 133938.
12. Changwoo Kim, Siyuan An, **Junseok Lee**, Anushree Ghosh, Mingjiang Zhong, John D Fortner "Photoactive Polyethylenimine-coated graphene oxide composites for enhanced Cr (VI) reduction and recovery" *ACS Applied Materials & Interfaces* **2021**, *13*, 28027-28035.
11. Changwoo Kim, **Junseok Lee**, Will Wang, John D. Fortner "Organic Functionalized Graphene Oxide Behavior in Water" *Nanomaterials* **2020**, *10*, 1228-1240.
10. Changwoo Kim, **Junseok Lee**, Daniel Schmucker, and John D. Fortner "Highly Stable Superparamagnetic Iron Oxide Nanoparticles as Functional Draw Solute for Osmotically Driven Water Transport" *npj Clean Water* **2020**, *3*, 1-6.
9. Changwoo Kim, Seung Soo Lee, Kit Tan Kwan, **Junseok Lee**, Wenlu Li, Brandon J Lafferty, Daniel E Giammar, John D Fortner "Surface functionalized nanoscale metal oxides for arsenic (V), chromium (VI), and uranium (VI) sorption: considering single- and multi-sorbate dynamics" *Environmental Science: Nano* **2020**, *7*, 3805-3813.
8. Changwoo Kim, Siyuan An, **Junseok Lee**, Qingqing Zeng, and John D. Fortner "Engineering Graphene Oxide Laminate Membranes for Enhanced Flux and Boron Treatment with Polyethylenimine (PEI) Polymers" *ACS Applied Materials & Interfaces* **2018**, *11*, 924-929.
7. Yountae Kim, **Junseok Lee**, and Hye-On Yoon "Determination of Sulfur in Soil and Plant Media using Wavelength Dispersive X-ray Fluorescence Spectrometry as a Tool for Assessment of Chemical Spills" *Microchemical Journal* **2016**, *124*, 594-599.
6. **Junseok Lee**, Jinsung An, Joo-Ae Kim, and Hye-On Yoon "Effectiveness of Activated Carbon Disk for the Analysis of Iodine in Water Samples using Wavelength Dispersive X-ray Fluorescence Spectrometry" *Chemosphere* **2016**, *142*, 72-76.
5. Jinsung An<sup>†</sup>, **Junseok Lee**<sup>†</sup>, and Hye-On Yoon "Strategies for Overcoming Limitations Associated with Fluorine Determination in Solid Materials by Conventional Wavelength Dispersive X-ray Fluorescence Spectrometry" *Microchemical Journal* **2015**, *122*, 76-81.
4. Jinsung An, **Junseok Lee**, Gyuri Lee, Kyoungphile Nam, and Hye-On Yoon "Combined Use of Collision Cell Technique and Methanol Addition for the Analysis of Arsenic in a High-chloride-containing Sample by ICP-MS" *Microchemical Journal* **2015**, *120*, 77-81.
3. **Junseok Lee**, Jinsung An, and Hye-On Yoon "Determination of Fluorine Contents in Plant Samples by means of Facilitated Extraction with Enzyme" *Talanta* **2015**, *132*, 648-652.
2. Jinsung An, Hyun A Lee, **Junseok Lee**, and Hye-On Yoon "Fluorine Distribution in Soil in the Vicinity of an Accidental Spillage of Hydrofluoric Acid in Korea" *Chemosphere* **2015**, *119*, 577-582.
1. **Junseok Lee**, Bongchul Kim, and Seungkwon Hong "Fouling Distribution in Forward Osmosis Membrane Process" *Journal of Environmental Sciences* **2014**, *26*, 1348-1354.

## PUBLICATIONS (UNDER REVIEW / TO BE SUBMITTED)

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## Peer-Reviewed Journal Articles

4. Junseok Lee, Seung Soo Steve Lee, Eun-tae Yun, Seunghyun Weon, Changwoo Kim, and John D. Fortner " Microwave Enhanced Catalytic Degradation of Organic Compounds with Iron Oxide Nanocrystals" *to be submitted*.
3. Junseok Lee, Seung Soo Steve Lee, Haesung Jung, Changwoo Kim, and John D. Fortner "Controlled Nitrate Reduction by Bimetallic Nanocrystals Supported on Mesoporous Silica Nanoparticles" *to be submitted*.
2. Junseok Lee, Ozce Durak, Susanna Maisto, Seung Soo Steve Lee, Kurt D. Pennell, and John D. Fortner "Enhanced Photocatalytic Oxidation of PFOA with Functionalized Metal Organic Framework (MOF) Composites" *to be submitted*.
1. Junseok Lee, Seung Soo Steve Lee, and John D. Fortner "Promoter (Secondary) Metal Effects of Bimetallic Pd–Metal Nanocatalysts Supported on Mesoporous Silica Nanoparticle (MSN) for Nitrate Reduction" *to be submitted*.

## HONORS AND AWARDS

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The Second Stage of BK21 Scholarship, Korea	2012
Administrative Assistant Scholarships, Korea University, Korea	2011
Special Scholarship, Korea University, Korea	2010

## PRESENTATIONS

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### Conference Presentations (International)

15. **Junseok Lee**, Seung Soo Steve Lee, Susanna Maisto, John D. Fortner "Nitrate Degradation Using Palladium, Platinum, and Copper Embedded in Mesoporous Silica Nanoparticles Under the Hydrogen Assisted Catalytic Reduction" AEESP Research and Education Conference, Boston, MA. June 2023
14. Dilara Hatinoğlu, **Junseok Lee**, John D. Fortner, Onur Apul "Superparamagnetic iron oxide nanoparticles (SPIONs) as additives for microwave-based sludge pre-hydrolysis" AEESP Research and Education Conference, Boston, MA. June 2023 (Poster Presentation)
13. **Junseok Lee**, Chen Liu, Seungsoo Steve Lee, Susanna Maisto, Seung Hee Chae, Kurt D. Pennell, and John D. Fortner "Understanding Oriented Attachment and Sorption Behavior of Perfluoroalkyl Substances (PFASs) on Surface Tailored Iron Oxide Nanocrystals by QCM-D" AEESP Research and Education Conference, June 28-30, 2022, St. Louis, US (Poster Presentation)
12. Hnatko, J.P., C. Liu, **Junseok Lee**, S. Dong, H. Torkzadeh, John D. Fortner, Kurt D. Pennell, and N.L. Cápiro "Sequential Biological and Adsorptive Material Treatment of Chlorinated Ethenes and PFAS Co-contaminated Contaminated Groundwater" AEESP Research and Education Conference, June 28-30, 2022, St. Louis, US (Poster Presentation)
11. **Junseok Lee**, Doyoung Kim, Eunhye Kwon, Hyun A Lee, Sanghoon Lee, Hye-On Yoon, "Effect of soil properties on fluorine desorption behavior in soil using various leaching tests" Poster presented at 2015 Goldschmidt, Praha, Czech (Poster Presentation)
10. Hyun A Lee, **Junseok Lee**, Joo-Ae Kim, Hye-On Yoon, Preparation of QA/QC protocol for environmental CCS management: Selecting the pertinent analytical methods, Poster presented at 2015 Goldschmidt, Praha, Czech (Poster Presentation)
9. Sanghoon Lee, Eunhye Kwon, Doyoung Kim, **Junseok Lee**, Hyun A Lee, Hye-On Yoon, Geochemical controls on dispersion and migration of fluoride in soil and soil solution via accidental leakage, Poster presented at 2015 Goldschmidt, Praha, Czech (Poster Presentation)

8. **Junseok Lee**, Jinsung An, Hyun A Lee, Hye-On Yoon, "Optimization of ultrasound assisted enzymatic extraction for the analysis of fluorine contents in rice samples", Poster presented at 2014 SETAC Europe 24th annual meeting, Basel, Switzerland (Poster Presentation)
7. Hyun A Lee, Jinsung An, **Junseok Lee**, Hye-On Yoon, "Applicability of existing sequential extraction schemes to identify the fractionation of fluorine in soil", Poster presented at 2014 SETAC Europe 24th annual meeting, Basel, Switzerland (Poster Presentation)
6. **Junseok Lee**, Jinsung An, Doyoung Kim, Eunhye Kwon, Hyun A Lee, Hye-On Yoon, "A novel approach of WD-XRF for the analysis of fluorine content in soil with suggested correction factors for Fe/Mn interference", Poster presented at 2014 Goldschmidt, 2014, Sacramento, US (Poster Presentation)
5. Jinsung An, Junseok Lee, Hyun A Lee, Hye-On Yoon, "Determination of fluorine species in a rice sample affected by the accidental release of anhydrous hydrofluoric acid using XPS and GC/MS", Poster presented at 2014 Goldschmidt, 2014, Sacramento, US (Poster Presentation)
4. Hyun A Lee, Jinsung An, **Junseok Lee**, Jiyeon Lee, Hye-On Yoon, "Assessment of removable F fraction in the soil through existing sequential extraction schemes", Poster presented at 2014 Goldschmidt, 2014, Sacramento, US (Poster Presentation)
3. **Junseok Lee**, Hye-On Yoon, Jinsung An, "Selective sorption behavior of iodine species on an activated carbon disk and its implication for the speciation analysis", Poster presented at 2013 AGU Fall meeting, Dec. 09, 2013, San Francisco, US (Poster Presentation)
2. **Junseok Lee**, Jinsung An, Hye-On Yoon, "Total and soluble fluorine distribution in soil after occurring hydrogen fluoride spill", 2013 AGU Chapman Conference, Oct. 22, 2013, US (Poster Presentation)
1. Jinsung An, **Junseok Lee**, Hye-On Yoon, "Chemical speciation of fluorine in solid materials by the combined use of X-ray photoelectron spectrometry and sequential extraction scheme", 2013 AGU Chapman Conference, Oct. 22, 2013, US (Poster Presentation)