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EDUCATION

- Ph.D.**, 2011, Civil, Architectural and Environmental Engineering, University of Texas at Austin, Austin, TX (Dissertation: 'Mercury Speciation during Thermal Remediation and in Post-Treatment Environments')
- M.S.**, 2008, Civil and Environmental Engineering, Virginia Tech, Blacksburg, VA, USA (Thesis: 'The Effect of Cations on Volatile Solids Destruction, Odors, and Dewatering in Anaerobic Digestion')
- B.Sc.**, 2006, Civil and Environmental Engineering, Hanyang University, Seoul, South Korea

HONORS AND AWARDS

- NRC Research Associateship (National Academy of Science), 2017 –
- Award of Recognized Reviewer (Journal of Hazardous Materials, Elsevier), 2016
- Research Assistantship (The University of Texas at Austin), 2008–2011
- Korean American Scholarship (Eastern Region), 2007
- Harry H. Hunt, III Grant (HHHunt), 2007
- Hokie Spirit Scholarship (Virginia Tech), 2007
- Excellent Student Scholarship (Hanyang University), 2005
- Outstanding Student Scholarship (Hanyang University), 2004

RESEARCH INTERESTS

- Fate and transport of carbon-metal nanohybrids in the subsurface and their application for water treatment
- Colloidal stability and transformations of nanohybrids in the aqueous environment
- Toxicity and nano-risk assessment of engineered nanomaterials in living organisms
- Synthesis of the next generation of multifunctional nanostructures
- Development of aqueous based nano-(photo)catalysts for the food-energy-water nexus

RESEARCH GRANT

1. Yoon, Y. and Park, C. M. "Application of Carbon Nanomaterials for Water Treatment and Their Toxicity assessment", *Korea Army Academy at Youngcheon/Ministry of Environment, South Korea* (obtained funding: \$625,760, 04/2015 – 03/2018)



2. Park, C. M. and Kim, J. "Inorganic and Organic Scale Inhibition in Semiconductor Wastewater Treatment", *Device Solutions (DS) Division, Samsung Electronics Co., Ltd, South Korea* (obtained funding: \$434,560, 01/2015 – 12/2015)
3. Park, C. M. and Yeo, J. "Optimization of Submerged Membrane Pretreatment for Industrial Water Treatment", *Device Solutions (DS) Division, Samsung Electronics Co., Ltd, South Korea* (obtained funding: \$217,280, 01/2015 – 12/2016)
4. Park, J. and Park, C. M. "Mitigation of Membrane Fouling in Ultrafiltration Membrane Bio-Reactor with Lower Energy Consumption Aerator", *Samsung-SDI Co., Ltd (formerly Samsung-Cheil Industries Inc.), South Korea* (obtained funding: \$1,042,930, 01/2012 – 12/2014)
5. Park, C. M. and Park, J. "Development of Submerged UF Membrane Design Tools for Water and Wastewater Treatment", *Samsung-SDI Co., Ltd (formerly Samsung-Cheil Industries Inc.), South Korea* (obtained funding: \$130,370, 01/2012 – 12/2014)
6. Min, G. and Park, C. M. "Pressurized Membrane Fiber and Module Development for Drinking Water Treatment", *Samsung-SDI Co., Ltd (formerly Samsung-Cheil Industries Inc.), South Korea* (obtained funding: \$347,640, 01/2012 – 12/2014)

RESEARCH EXPERIENCE

Postdoctoral Research: National Risk Management Research Laboratory, U.S. Environmental Protection Agency, 2017 – present (research advisor: Dr. Chunming Su)

- Fate and transport of reduced graphene oxide-metal/metal oxides nanohybrids under environmentally relevant conditions
- Removal of organic contaminants and toxic heavy metals using carbon-metal nanohybrids
- Interaction of carbon-metal nanohybrids with model lipid membranes

Postdoctoral Research: Department of Civil and Environmental Engineering, University of South Carolina, 2016 – 2017 (research advisor: Dr. Yeomin Yoon)

- Fate and transport of silver nanoparticles in saturated porous media
- Colloidal stability and aggregation of single-walled carbon nanotubes in the aqueous environment
- Application of silver nanoparticles for water treatment and their toxicity assessment

Senior Engineering Research: Facility Technology Group, Samsung Electronics, South Korea, 2014 – 2016

- Full-scale study of inorganic and organic scale inhibition in semiconductor wastewater treatment



- Development of submerged membrane technology in industrial water purification and filtration system

Senior Engineering Research: Membrane Development Group, Samsung-SDI, South Korea, 2012 – 2014

- Pilot study of mitigation of membrane fouling in submerged membrane bio-reactor with lower energy consumption aerator
- Optimization of cleaning system of submerged- and pressurized-ultrafiltration membrane for water and wastewater treatment

Doctoral Research: Department of Civil, Architectural and Environmental Engineering, The University of Texas at Austin, 2008 – 2011 (research advisor: Dr. Howard M. Liljestrand)

- Thermodynamic Hg(II) speciation modeling during in-situ thermal treatment of Hg(II) in soil
- Surface complexation modeling of Hg(II) adsorption at the goethite/water interface using the Charge Distribution Multi-Site Complexation (CD-MUSIC) model

Master's Research: Department of Civil and Environmental Engineering, Virginia Tech 2007 – 2008 (research advisor: Dr. John T. Novak)

- Effect of iron and aluminum for phosphorus removal on anaerobic digestion performance and generation of organic sulfur compounds
- Influence of direct addition of iron(III) to anaerobic digesters on biosolids removal and odor reduction

TEACHING EXPERIENCE

Lecturer: Facility Technology Group, Samsung Electronics, South Korea, 2014 – 2015

- Physical and chemical treatment of industrial wastewater (Engineer I – III Level)

Instructor: Department of Civil, Architectural and Environmental Engineering, The University of Texas at Austin, 2009 – 2010

- CE 370K: Environmental Sampling and Analysis (Graduate Course)

Teaching Assistant: Department of Civil and Environmental Engineering, Virginia Tech 2006 – 2007

- CEE 3304: Fluid Mechanics (Graduate Course)
- CEE 5324: Advanced Hydrology (Graduate Course)

ACADEMIC SERVICES

Peer Reviewer: Water Research, Journal of Hazardous Materials, Engineering, Journal of the Air & Waste Management Association

Undergraduate Student Advisor: Environmental Engineering Program, Virginia Tech, 2008



REFEREED JOURNAL PUBLICATIONS (*CORRESPONDING AUTHOR)

1. Park, C. M.*, Wang, D., Han, J., Heo, J., and Su, C.* (2017) "Investigations of Mechanisms of Heavy Metal Removal by Reduced Graphene Oxide Sheets Supported Magnetite-Elemental Silver Bimetallic Nanoparticles in Aqueous Solutions", *Chemical Engineering Journal* (in preparation) (impact factor: 5.310).
2. Park, C. M., Heo, J., Su, C., Wang, D., and Yoon, Y.* (2017) "Interaction of Reduced Graphene Oxide–Silver Nanocomposite with Model Lipid Membranes", *Environmental Science & Technology* (in preparation) (impact factor: 5.393).
3. Park, C. M., Heo, J., Su, C., Her, N., and Yoon, Y.* (2017) "Heterogeneous Activation of Persulfate by Reduced Graphene Oxide-Elemental Silver Nanohybrid for the Degradation of Organic Contaminants", *Applied Catalysis B: Environmental* (in preparation) (impact factor: 8.328).
4. Wang, D.*, Park, C. M., Masud, A., Aich, N., and Su, C.* (2017) "Transport and Retention of Carboxymethylcellulose-Modified Carbon Nanotube-Magnetite Nanohybrids in Water-Saturated Porous Media", *Environmental Science & Technology* (under review) (impact factor: 5.393).
5. Park, C. M.*, Wang, D., Heo, J., Her, N., and Su, C.* (2017) "Aggregation of Reduced Graphene Oxide and Its Nanohybrids with Magnetite and Elemental Silver under Environmentally Relevant Conditions", *Environmental Science & Technology* (under review) (impact factor: 5.393).
6. Chu, K. H., Al-Hamadani, A. J., Park, C. M., Lee, G., Jang, M., Jang, A., Her, N., Son, A., and Yoon, Y.* (2017) "Ultrasonic Treatment of Endocrine Disrupting Compounds, Pharmaceuticals, and Personal Care Products in Water: A Review", *Ultrasonics Sonochemistry* (under review) (impact factor: 4.556).
7. Chu, K. H., Shankar, V., Park, C. M., Shon, J., and Yoon, Y.* (2017) "Evaluation of Fouling Mechanisms for Humic Acid Molecules in an Activated Biochar–Ultrafiltration Hybrid System", *Chemical Engineering Journal* (in revision) (impact factor: 5.310).
8. Park, C. M., Al-Hamadani, Y., Heo, J., Her, N., Chu, K. H., Jang, M., Lee, S., and Yoon, Y.* (2017) "Aggregation Kinetics of Single Walled Carbon Nanotubes Influenced by the Frequency of Ultrasound Irradiation in the Aquatic Environment", *Ultrasonics Sonochemistry* (in revision) (impact factor: 4.556).
9. Al-Hamadani, Y., Park, C. M., Assi, L. N., Chu, K. H., Hoque, S., Jang, M., Yoon, Y.*, and



- Ziehl, P. (2017) "Sonocatalytic Removal of Ibuprofen and Sulfamethoxazole in the Presence of Different Fly Ash Sources", *Ultrasonics Sonochemistry* 39, 354–362 (impact factor: 4.556).
10. Shankar, V., Heo, J., Al-Hamadani, Y., Park, C. M., Chu, K. H.*, and Yoon, Y.* (2017) "Evaluation of Biochar-Ultrafiltration Membrane Processes for Humic Acid Removal under Various Hydrodynamic, pH, Ionic Strength, and Pressure Conditions", *Journal of Environmental Management* 197, 610–618 (impact factor: 2.197).
 11. Chu, K. H., Huang, Y., Yu, M., Heo, J., Flora, J. R. V., Jang, A., Jang, M., Jung, C., Park, C. M., Kim, D., and Yoon, Y.* (2017) "Evaluation of Graphene Oxide-Coated Ultrafiltration Membranes for Humic Acid Removal at Different pH and Conductivity Conditions", *Separation and Purification Technology* 181, 139–147 (impact factor: 3.299).
 12. Al-Hamadani, Y., Jung, C., Im, J-K., Boateng, L., Flora, J., Jang, M., Heo, J., Park, C. M., and Yoon, Y.* (2017) "Sonocatalytic Degradation Coupled with Single-Walled Carbon Nanotubes for Removal of Ibuprofen and Sulfamethoxazole", *Chemical Engineering Science* 162, 300–308 (impact factor: 2.750).
 13. Park, C. M., Han, J., Chu, K. H., Al-Hamadani, Y., Her, N., Heo, J.*, and Yoon, Y.* (2017) "Influence of Solution pH, Ionic Strength, and Humic Acid on Cadmium Adsorption onto Activated Biochar: Experiment and Modeling", *Journal of Industrial and Engineering Chemistry* 48, 186–193 (impact factor: 4.179).
 14. Park, C. M., Heo, J., and Yoon, Y.* (2017) "Oxidative Degradation of Bisphenol A and 17 α -Ethinyl Estradiol by Fenton-like Activity of Silver Nanoparticles in Aqueous Solution", *Chemosphere* 168, 617–622 (impact factor: 3.698).
 15. Park, C. M., Chu, K. H., Her, N., Jang, M., Baalousha, M., Heo, J.*, and Yoon, Y.* (2017) "Occurrence and Removal of Engineered Nanomaterials in Drinking Water Treatment and Wastewater Treatment Processes", *Separation & Purification Reviews* 00, 1–18 (impact factor: 5.824).
 16. Park, C. M., Heo, J., Her, N., Chu, K. H., Jang, M., and Yoon, Y.* (2016) "Modeling the Effects of Surfactants, Hardness, and Natural Organic Matter on Deposition and Mobility of Silver Nanoparticles in Saturated Porous Media", *Water Research* 103, 38–47 (impact factor: 5.991).
 17. Chu, K. H., Huang, Y., Yu, M., Her, N., Flora, J. R. V., Park, C. M., Kim, S., Cho, J., and Yoon, Y.* (2016) "Evaluation of Humic Acid and Tannic Acid Fouling in Graphene Oxide-Coated Ultrafiltration Membranes", *ACS Applied Materials & Interfaces* 8, 22270–22279 (impact factor: 7.145).



18. Park, C. M., Chu, K. H., Heo, J., Her, N., Jang, M., Son, A., and Yoon, Y.* (2016) "Environmental Behavior of Engineered Nanomaterials in Porous Media: A Review", *Journal of Hazardous Materials* 309, 133–150 (impact factor: 4.836).
19. Kim, E., Jung, C., Han, J., Her, N., Park, C. M., Jang, M., Son, A.*, and Yoon, Y.* (2016) "Sorptive Removal of Selected Emerging Contaminants Using Biochar in Aqueous Solution", *Journal of Industrial and Engineering Chemistry* 36, 364–371 (impact factor: 4.179).
20. Kim, E., Jung, C., Han, J., Her, N., Park, C. M., Son, A.*, and Yoon, Y.* (2016) "Adsorption of Selected Micropollutants on Powdered Activated Carbon and Biochar in the Presence of Kaolinite", *Desalination and Water Treatment* 57, 27601–27613 (impact factor: 1.272).
21. Park, C. M.*, Katz, L. E., and Liljestrand, H. M. (2015) "Mercury Speciation during In Situ Thermal Desorption in Soil", *Journal of Hazardous Materials* 300, 624–632 (impact factor: 4.836).
22. Al-Hamadani, Y., Chu, K. H., Son, A., Heo, J., Her, N., Jang, M., Park, C. M., and Yoon, Y.* (2015) "Stabilization and Dispersion of Carbon Nanomaterials in Aqueous Solutions: A Review", *Separation and Purification Technology* 156, 861–874 (impact factor: 3.299).
23. Mangold, J., Park, C. M., Liljestrand, H. M., and Katz, L. E.* (2014) "Surface Complexation Modeling of Hg(II) Adsorption at the Goethite/Water Interface Using the Charge Distribution Multi-Site Complexation (CD-MUSIC) Model", *Journal of Colloid and Interface Science* 418, 147–161 (impact factor: 3.782).
24. Park, C. M.* and Novak, J. T. (2013) "The Effect of Direct Addition of Iron(III) on Anaerobic Digestion Efficiency and Odor Causing Compounds", *Water Science & Technology* 68(11), 2391–2396 (impact factor: 1.064).
25. Novak, J. T.* and Park, C. M. (2010) "The Effect of Iron and Aluminum for Phosphorus Removal on Anaerobic Digestion and Organic Sulfur Generation", *Water Science & Technology* 62, 419–426 (impact factor: 1.064).

BOOK CHAPTERS

1. Park, C. M., Wang, D., and Su, C.* (2017) "Recent Developments in Engineered Nanomaterials for Water Treatment and Environmental Remediation", *Handbook on Industrial Applications of Engineered Nanomaterials: Current and Emerging Trends*, Section 8: Engineered Nanomaterial in Environmental Industry, Ed. Hussain, C. M., Elsevier (in preparation).



OTHER REFEREED PUBLICATIONS

1. Park, C. M. and Kim, J. (2015) "Inorganic and Organic Scale Inhibition in Semiconductor Wastewater Treatment", Technical Report, *Device Solutions (DS) Division, Samsung Electronics Co., Ltd*, South Korea.
2. Park, C. M. and Yeo, J. (2015) "Optimization of Submerged Membrane Pretreatment for Industrial Water Treatment", Technical Report, *Device Solutions (DS) Division, Samsung Electronics Co., Ltd*, South Korea.
3. Park, J. and Park, C. M. (2014) "Mitigation of Membrane Fouling in Ultrafiltration Membrane Bio-Reactor with Lower Energy Consumption Aerator", Technical Report, *Samsung-SDI Co., Ltd (formerly Samsung-Cheil Industries Inc.)*, South Korea.
4. Park, C. M. and Park, J. (2014) "Development of Submerged UF Membrane Design Tools for Water and Wastewater Treatment", Technical Report, *Samsung-SDI Co., Ltd (formerly Samsung-Cheil Industries Inc.)*, South Korea.
5. Min, G. and Park, C. M. (2013) "Pressurized Membrane Fiber and Module Development for Drinking Water Treatment", Technical Report, *Samsung-SDI Co., Ltd (formerly Samsung-Cheil Industries Inc.)*, South Korea.
6. Park, C. M. (2011) "Mercury Speciation during Thermal Remediation and in Post-Treatment Environments" Ph.D. Dissertation, *The University of Texas at Austin*, Austin, TX.
7. Novak, J. T.* and Park, C. M. (2010) "Effect of Aluminum and Iron on Odors, Digestion Efficiency, and Dewatering Properties Phase IV", Technical Report, *Water Environment Research Foundation*, Report No. 03-CTS-9B.
8. Park, C. M. (2008) "The Effect of Cations on Volatile Solids Destruction, Odors, and Dewatering in Anaerobic Digestion" M.S. Thesis, *Virginia Tech*, Blacksburg, VA.

CONFERENCE PROCEEDING AND PRESENTATIONS (*INVITED)

1. Heo, J., Park, C. M., Yoon, Y., Han J., and Her, N.* (2016) "Transport and Retention Behavior of PVP-AgNPs in Porous Media: Effect of Soil Organic Matter and Kaolinite Particles", Conference proceeding, *The 14th International Nanotech Symposium & Nano-Convergence Expo*, KINTEX, Ilsan, South Korea.
2. Park, C. M.* and Eun, J. (2011) "Thermochemical Mercury Speciation during the Thermal Treatment", Conference proceeding, *US-Korea Conference on Science, Technology, and Entrepreneurship (UKC 2011)*, Green Civil, Environment, and Transportation (CET), Park



City, UT.

3. Eun, J.* and Park, C. M. (2011) "Evaluation of Pullout Behavior in Reinforced Pavement System Using Analytical, Experimental and Numerical Approaches", Conference proceeding, *US-Korea Conference on Science, Technology, and Entrepreneurship (UKC 2011)*, Green Civil, Environment, and Transportation (CET), Park City, UT.
4. Park, C. M.* and Novak, J. T. (2010) "The Effect of Fe (III) on Odor Causing Compounds under Anaerobic Conditions", Conference proceeding, *US-Korea Conference on Science, Technology, and Entrepreneurship (UKC 2010)*, Green Civil, Environment, and Transportation (CET), Seattle, WA.
5. Novak, J. T.* and Park, C. M. (2009) "The Effect of Iron and Aluminum for Phosphorus Removal on Anaerobic Digestion and Odor Generation", Conference proceeding, *The 12th IWA Sludge Conference – Sustainable Management of Water & Wastewater Sludges*, Harbin, China.
6. Park, C. M.* (2013) "Membrane Filtration Technology in Drinking Water Treatment", Oral presentation, Industrial Seminar (27th September), *Yeoncheon Lohas Public Water Service*, Yeoncheon, South Korea.
7. Park, C. M., Park, P. K., Hwang, B. K. and Zha, F. (2012) "Membranes by Cheil – features with innovations", Oral presentation, Industrial Forum, *IWA World Water Congress & Exhibition 2012*, Busan, South Korea.
8. Park, C. M., Mangold, J., Katz, L. E., and Liljestrand, H. M. (2012) "Surface Complexation Model for Hg(II) Adsorption at the Solid-Water Interface", Oral presentation, *IWA World Water Congress & Exhibition 2012*, Busan, South Korea.
9. Park, C. M., Katz, L. E., and Liljestrand, H. M. (2011) "CD-MUSIC Modeling of Hg(II) Adsorption on Gibbsite", Oral presentation, *EWRE Seminar Series*, Fall 2011, The University of Texas at Austin, Austin, TX.
10. Park, C. M., Mangold, J., Katz, L. E., and Liljestrand, H. M. (2011) "Application of Charge Distribution Multi-Site Complexation (CD-MUSIC) Modeling in describing Hg(II) adsorption at the goethite-water interface", Oral presentation, *EWRE Seminar Series*, Spring 2011, The University of Texas at Austin, Austin, TX.
11. Park, C. M., Mangold, J., Katz, L. E., and Liljestrand, H. M. (2011) "Charge Distribution Multi-Site Complexation (CD-MUSIC) Modeling of Hg(II) Adsorption on Goethite", Oral presentation, *241st ACS National Meeting & Exposition*, Anaheim, CA.



PATENTS

1. Kim, J. M. and Park, C. M. "Spiral Aerator and Hollow Fiber Membrane Module Having Same", *US Patent* US20160207002 A1, Jul 21, 2016.
2. Kim, J. M. and Park, C. M. "Spiral Aerator and Hollow Fiber Membrane Module Having Same", *European Patent* EP3040111 A1, Jul 6, 2016.
3. Kim, J. M. and Park, C. M. "Spiral Aerator and Hollow Fiber Membrane Module Having Same", *Chinese Patent* CN105531018 A, April 27, 2016.
4. Kim, J. M. and Park, C. M. "Spiral Aerator and Hollow Fiber Membrane Module Having Same", *International Patent* WO2015030310 A1, Mar 5, 2015.
5. Park, P. K., Yoon, T. K., Park, C. M., Hwang, B. K., Jo, J. S., Hong, S. H., Min, G. H., and Park, J. S. "Separation Membrane Cleaning System and Separation Membrane Cleaning Method Using the Same", *US Patent* US20140183132 A1, Jul 3, 2014.
6. Park, P. K., Yoon, T. K., Park, C. M., Hwang, B. K., Jo, J. S., Hong, S. H., Min, G. H., and Park, J. S. "Separation Membrane Cleaning System and Separation Membrane Cleaning Method Using the Same", *Chinese Patent* CN103894072 A, Jul 2, 2014.
7. Park, C. M., Kim, J. H., and Hong, S. H. "Diffuser", *Korea Patent Application* No. 10-2014-0078463, June 25, 2014.
8. Park, C. M., Suk, E. M., and Hong, S. H. "Cleaning System of Separation Membrane and Method Using the Same", *Korea Patent Application* No. 10-2014-0076806, June 23, 2014.
9. Hwang, B. K., Min, G. H., Park, J. S., and Park, C. M. "Anaerobic Membrane System and Method of Treating Wastewater Using the Same", *Korea Patent Application* No. 10-2014-0066568, May 30, 2014.
10. Kim, J. M. and Park, C. M. "Apparatus of Spiral Aerator and Hollow Fiber Membrane Module Including the Same", *Korea Patent Application* No. 10-2013-0103081, August 29, 2013.
11. Hwang, B. K., Min, G. H., Park, J. S., Park, C. M., and Suk, E. M. "Cleaning System of Separation Membrane and Method Using the Same", *Korea Patent Application* No. 10-2013-0074045, June 26, 2013.
12. Park, C. M., Park, P. K., Hwang, B. K., Min, G. H., and Park, J. S. "Cleaning System of Separation Membrane and Method Using the Same", *Korea Patent Application* No. 10-2012-0157684, December 29, 2012.



13. Park, P. K., Yoon, T. K., Park, C. M., Hwang, B. K., Jo, J. S., Hong, S. H., Min, G. H., and Park, J. S. "Cleaning System of Separation Membrane and Method Using the Same", *Korea Patent Application* No. 10-2012-0155611, December 27, 2012.

PROFESSIONAL CERTIFICATIONS

- Engineer in Training (Texas Board of Professional Engineers), 2010
- Civil Engineer (Human Resources Development Service of Korea), 2005
- Information Processing Engineer (Human Resources Development Service of Korea), 2004

REFERENCES

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