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**Education:**

**Ph.D. University of Maryland** Civil/Environmental Engineering May 2000

**M.S. The Johns Hopkins University**  Geography/Environmental Engineering May 1997

**B.S. Yonsei University** Environmental Science February 1994

**Experience:**

**Mar. 2021 – current *Visiting Professor University of Delaware, New Ark, DE, USA***

**Dec. 2018 – Mar. 2021 *Affiliated Professor Argonne National Laboratory, Lemont, IL, USA***

**Jan. 2017 – current *Adjunct Professor Dept. of Graduate School of International Urban Science***

***UNIVERSITY OF SEOUL,*** *Seoul, Korea*

**Mar. 2014 – Feb. 2017 *Dept. Head Dept. of Environmental Engineering***

***UNIVERSITY OF SEOUL,*** *Seoul, Korea*

**Sep. 2013 – current *Guest Professor Center for Earth Resources Research & Management***

***UNIVERSITY MALAYSIA PAHANG****, Pahang, Malaysia*

**Dec. 2012 – current *Director R&D Center of Core Technologies for Water Treatment***

***UNIVERSITY OF SEOUL,*** *Seoul, Korea*

**Sep. 2011 – current *Professor UNIVERSITY OF SEOUL,*** *Seoul, Korea*

**Sep. 2010 – Sep. 2011 *Director EcoEnergy Research Center, UNIVERSITY OF SEOUL,*** *Seoul,*

*Korea*

**Oct. 2006 – Oct. 2011 *Associate Professor UNIVERSITY OF SEOUL,*** *Seoul, Korea*

**Dec. 2002 – Jun. 2010 *Adjunct Professor UNIVERSITY OF MARYLAND,*** *College Park, Maryland*

**Dec. 2002 – Jun. 2010 *Affiliated Scientist US DEPT OF AGRICULTURE****, Beltsville, Maryland*

**Feb. 2000 – Jul. 2002 *Environmental Engineer US DEPT OF AGRICULTURE****, Beltsville, Maryland*

**Jan. 2002 – Jun. 2002 *Instructor UNIVERSITY OF MARYLAND****, College Park, Maryland*

**Sep. 1997 – Feb. 2000 *Research Assistant UNIVERSITY OF MARYLAND***, *College Park, Maryland*

**Sep. 1998 – Jun. 1999 *Teaching Assistant UNIVERSITY OF MARYLAND***, *College Park, Maryland*

**Awards and Honors:**

Grand Award, International Sustainability in Civil Engineering Competition and Exhibition 2021, SiCEx 2021, Malaysia (2021)

National Medal of Honor for Contribution to Environmental Science and Technology from the President of Republic of Korea (2021)

Certificate of Merit for Contribution to Advancement of National Science and Technology from the Secretary of Korean Ministry of Science and Technology (2020)

Certificate of Merit for ICT Innovation 2019 from the Secretary of Korean Ministry of Science and Technology (2019)

Academic Award from Korea Federation of Water Science and Engineering Societies (2016)

JSWE-IDEA Water Environment International Exchange Award from Japan Society of Water Environment (2014)

Certificate of Merit for Successful Case of International Commercialization of Public Technology, Korean Intellectual Property Office (2013)

Certificate of Merit for Best Paper in Conference from Korean Society of Environmental Engineering (2012)

Certificate of Merit for Superior Research Performance in Conference from Korean Society of Environmental Engineering (2012)

Certificate of Merit for Best Academic and Industrial Cooperation from Sanhak Foundation (2012)

Certificate of Merit for Best Invention from Small & Medium Business Administration (2011)

Certificate of Appreciation for Contribution to National Water Quality Monitoring Program from Korean Environment Corporation (2011)

Certificate of Merit for Technology Transfer from the Administration for Industry and Academy Cooperation (2010)

Appreciation Plaque from Environmental Protection Administration Executive Yuan (EPA) of Taiwan (2010)

Appreciation Plaque from Ministry of Commerce of Taiwan (2009)

Appreciation Plaque from National Taiwan University (2009)

Appreciation Plaque from Taiwan Environmental Engineering Association (2009)

Teaching Award from University of Seoul (2007)

Certificate of Merit from the Secretary of Korean Ministry of Environment (2006)

Research Award from University of Seoul (2005)

Certificate of Merit from Yonsei University Alumni (2004)

Certificate of Nomination for WEF’s Harrison Presscot Eddy Medal from Chesapeake Water Environment Association (2002)

Certificate of Merit for Superior Research Performance from USDA, Beltsville, MD (2002)

Certificate of Merit for Superior Research Performance from USDA, Beltsville, MD (2001)

Certificate of Merit for Honorable Mention, Poster Day, USDA, Beltsville, MD (2001)

Named for Presidential Research and Teaching Fellowship from Texas A&M University, (2000, Turned down due to the

employment at USDA)

Certificate of Merit for Research Presentation awarded from Univ. of MD, College Park, MD (2000)

Harkins Group Fellowship awarded from Univ. of MD, College Park, MD (1999)

Fellowship awarded from Dept. of Geography and Environmental Engr., The Johns Hopkins University (1995 - 1997)

Academic Honor Award awarded from Yonsei University, Seoul, Korea (1990 - 1993)

**Professional and Honor Society:**

American Chemist Society (ACS)

International Union of Pure and Applied Chemistry (IUPAC)

Water Environment Federation (WEF)

Korean Society of Environmental Engineers (KSEE)

Korean Society for Environmental Analysis (KSEA)

Korean Society of Odor Research and Engineering (KOSORE)

The Membrane Society of Korea (MSK)

Honor Society of 

**Professional Services:**

***Academic***

2021 – current **Associate Editor, *Journal of Analytical Science and Technology***

2020 – current **Vice President, *Korean Environmental Analysts Association***

2017 – current **Editor in Chief, *Water-Energy Nexus***

2015 – current **Associated Editor for *Energy, Ecology and Environment***

2014 – current **Review Editor for *Frontier in Wastewater Management***

2012 – current **Responsible Editor for *Frontiers of Environmental Science and Engineering***

2012 – 2020 **Associate Editor for *Critical Reviews in Environmental Science & Technology***

2010 – current **Associate Editor for *Chemosphere***

2010 – 2011 Steering Committee member for *Korean Society of Odor Research and Engineering*

2009 – 2009 Steering Committee member for *The Membrane Society of Korea*

2009 – 2011 Editor-in-chief for *Journal of Korean Environmental Analysts Association*

2007 – 2010 Member of Editorial Board for *Chemosphere*

2007 – 2010 Editor for *Journal of Korean Environmental Analysts Association*

2006 – 2008 Member of Editorial Board for *Journal of Environmental Engineering, KSEE*

2005 – current Member of Editorial Board for *Research Journal of Chemistry and Environment*

2004 – current Member of Editorial Board for *Open Journal of Biological Monitoring*

2002 – current Member of *IUPAC(International Union of Pure and Applied Chemistry)*

2002 – 2003 Member of Editorial Board for *Chesapeake Water Environment Association*

2000 – 2004 Member *of BORG (Biosolids Odor Research Group)*

2000 – current Review papers submitted to *Chemosphere*, *Chemical Engineering Journal,*

*Journal of Environmental Engineering, Water Research, Water Environment Research,* and

*Analytical Chemistry*

***Professional***

2019 –current Panel Member / Presidential Advisory Council on Science & Technology, Korea

2019 –current Panel Member / Central Advisory Board for Environmental Policy, Ministry of Environment,

Korea

2016 –current Advisory Panel / Fellow for the implementation of total maximum daily load, NAHRIM in Malaysia

2016 –current Advisory Panel / Fellow for the implementation of total maximum daily load, NAHRIM in Malaysia

2016 – current Member of Committee for Cultural Integrity, The Korea Evaluation Institute of Industrial

Technology

2015 – current Member of Responsible Editorial Board of ‘Water News Giving’, The Office of Waterworks

Seoul Metroplotan Government

2015 – current Committee for Court Specialized Court Hearing, Administration

2014 – current International Professional Consultant of Seoul Policy Consulting Organization for Seoul Metroplotan Government

2014 – current Member of Advisory Board for Korea Enterprise Data Co. Ltd

2014 – current Member of The Third Research Committee for The Office of Waterworks Seoul Metroplotan Government

2014 – current Member of Development Alliance Korea(DAK) for Korea International Cooperation

Agency (KOICA)

2014 – current Member of The Third Research Review Committee for Institute of Water Supply, The Office of Waterworks Seoul Metropolitan Government

2014 – current Member of ‘Korea Technology Advisory Group’ Technical Support for Korea Institute for

Advancement of Technology, Korean Ministry of Trade, Industry & Energy

2014 – current Member of Advisory Board for Seoul Landfill Site, Korean Ministry of Environment

2013 – current Member of Committee for ISO TC 147/SC6

2012 – 2013 Member of Operation Committee for Environmental Technology Development, Korean Ministry of Environment

2012 – 2013 Member of Research Fellow for Watershed Management Research Center, Ministry of Knowledge Economy

2011 – current Member of Evaluation Panel for Innovative Technology, Korea Evaluation Institute of Industrial Technology

2008 – 2012 Member of TFT for Water Quality Tele-Monitoring System, Korean Ministry of Environment

2005 – current Member of Committee for ISO TC 224

2005 – 2008 Member of TFT for Water Reuse Policy, Korean Ministry of Environment

2005 – 2006 Member of Advisory Board for Song-do New City Development

2005 – 2005 Member of Advisory Board for Water Reuse, Korean Ministry of Environment

2004 – current Member of Korean Board for ISO TC224

2004 – current Member of Advisory Board for Wastewater Treatment Plant Operation, Seoul

2003 – 2004 Member of TFT for Water Reuse Policy, Environmental Management Corporation

2003 – current Member of Evaluation Panel for Environmental Technology, Korean Ministry of Environment

2003 – current Member of Evaluation Panel for New Technology, Korean Ministry of Knowledge and Economy

2003 – current Member of Evaluation Panel for New Technology, Trust Funds for Industrial Technology

**Research Network:**

***University***

Ho Chi Minh City University of Technology, Ho Chi Minh City, Vietnam

Tsinghua University, School of Environment, Beijing, China

Texas A&M University, School of Public Health, Texas, USA

Belarusian National Technical University, Minsk, Belarus

Islamic University of Gaza, Gaza, Palestine

National Taiwan University, Taipei, Taiwan

University of Malaysia Pahang, Kuantan, Malaysia

University of Maryland, College Park, USA

University of Delaware, Newark, USA

Technical University of Denmark, Copenhagen, Denmark

***Research Institute***

National Hydraulic Research Institute of Malaysia (NAHRIM), Malaysia

DC-Water, USA

United States Department of Agriculture (USDA)

Environmental Protection Administration Executive Yuan (EPA), Taiwan

USGS (United States Geological Survey), USA

CERRM (Center for Earth Resources Research & Management), Malaysia

The Mongolian Academy of Science (MAS), Mongolia

The Korean Academy of Science and Technology, Korea

**Funded Research Projects:**

1. “Development of odor control strategy for Blue Plains WWTP.” DC Water and Sewer Authority, Washington DC., Duration: 2 years (Sep. 2001 ~ Aug. 2003), Co-PI (completed).
2. “Characterization of odors from biosolids mixed with BioxideTM.” USFilter, NJ., Duration: 1 month (Dec. 2001), Co-PI (completed).
3. "Evaluating odor characteristics of dewatered biosolids.”.DC Water and Sewer Authority, Washington DC., Duration: 2 years (Jul. 2002 ~ Jun. 2004), PI (completed).
4. “Quantification of odors and VOCs in an industrial complex located in south-eastern Incheon.” Incheon-City Dept. of Environment, Duration: 2 years (Mar. 2003 ~ Jan. 2006), PI (completed).
5. "Minimizing the production of reduced sulfur gases from waste treatment processes." DC Water and Sewer Authority, Washington DC., Duration: 3 years (Sep. 2003 ~ Aug. 2006), PI (completed).
6. “Study on odor abatement mechanism in livestock by applying biotechnology.” Korean Science Foundation, Duration: 3 years (Sep. 2003 ~ Aug. 2006), Co-PI (completed).
7. “SGER-Testing of innovative ferrate technology for sludge management.” University of Maryland, College Park, Duration: 1year (2004), PI (Completed)
8. "Testing of innovative ferrate technology for sludge management." The US National Science Foundation, Duration: 1 year (Jan. 2004 ~ Dec. 2004), PI (completed).
9. “Eco STAR project: development of evaluation guide for membrane performance.” Korean Ministry of Environment, Duration: 1 year (Jun. 2004 ~ May 2005), Co-PI (completed).
10. “Development of an automatic control scheme of chemical dosing for chlorination and dechlorination using pH and ORP.” Small and Medium Business Administration, Duration: 1 year (Apr. 2004 ~ Mar. 2005), PI (completed).
11. “Development of innovative dividers for anoxic tanks.” Jentro Inc., Duration: 6 month (Jun. 2004 ~ Nov. 2004), PI (completed).
12. “Development of effective recycling strategy for food waste.” Korean Ministry of Agriculture, Duration: 3 years (Jan. 2005 ~ Dec. 2007), Co-PI (completed).
13. “Study on long term plan for odor management.” Korean Ministry of Environment, Duration: 10 months (Mar. 2005 ~ Jan. 2006), Co-PI (completed).
14. “Design of water reuse system for LG-Philips.” LG-Philips, Duration: 10 months (Apr. 2005 ~ Dec. 2005), Co-PI (completed).
15. "Development of a control scheme to optimize an alternating aerobic/anoxic activated sludge system." Hyosung-Ebara Environment, Duration: 1 year (May. 2005 ~ Apr. 2006), PI (complete).
16. “Novel chemical and analytical approach for odor removal on waste treatment systems.” United States Department of Agriculture, Duration: 1 year (Jun. 2005 ~ May. 2006), PI (complete).
17. “Development of anticorrosive sonicator using noble metal tip.” Small and Medium Business Administration, Duration: 1 year (May 2005 ~ Apr. 2006), PI (completed).
18. “Optimization of pump scheduling for water distribution in Seoul.” Seoul Metropolitan Water Works Institute of Water Research and Technology, Duration: 1 year (May 2005 ~ Apr. 2006), PI (completed).
19. “Environmental fate of brominated flame retardants in biosolids land application programs.” DCWASA, Duration: 2 years (Aug. 2005 ~ May 2007), Co-PI (completed).
20. “Telemetering of water rate.” Seoul Metropolitan Water Works Institute of Water Research and Technology, Duration: 1 year (Sep. 2005 ~ Aug. 2006), Co-PI (completed).
21. “Evaluation of applicability of different wastewater treatment processes.” Seoul Metropolitan Research Institute for Seoul Policy, Duration: 6 months (Sep. 2005 ~ Mar. 2006), PI (completed).
22. “Design of guideline for water quality of effluent from livestock waste treatment facility.” Korean Ministry of Environment, Duration: 8 months (Jan. 2006 ~ Aug. 2006), PI (completed).
23. “Design of a U-city.” Seoul Metropolitan Government, Duration: 5 years (Jan. 2006 ~ Dec. 2010), Co-PI (completed).
24. “Application of Fe (VI) to oxidation of metal EDTA.” Korean Science Foundation, Duration: 2 years (Jan. 2006 ~ Dec. 2007), Co-PI (completed).
25. “Performance evaluation and new technology of Swirl Screen, a CSOs treatment facility.” RSTENC, Duration: 3 months (Apr. 2006 ~ Jun. 2006), PI (completed).
26. “Water quality analysis to evaluate performance of swirl screen, a CSO treatment facility.” RSTENC, Duration: 2 month (May. 2006 ~ Jun. 2006), PI (completed).
27. “Development and commercialization of pig manure odor abatement and liquid fertilization accelerator.” Ministry of Commerce, Industry and Energy, Duration: 2 years (May. 2006 ~ Apr. 2008), PI (completed).
28. “Development of flux chamber equipped with surrogate inlet device using permeation tube.” Harim Engineering, Inc., Duration: 5 months (Jul. 2006 ~ Dec. 2006), PI (completed).
29. “Development of innovative monitoring device to early detect nitrification inhibition using DO and pH sensor.” Small and Medium Business Administration, Duration: 1 year (Aug. 2006 ~ Jul. 2007), PI (completed).
30. “WWTP performance simulation using GPS-X.” Korea Engineering Consultant Corp., Duration: 2 months (Dec. 2006 ~ Feb. 2007), PI (completed).
31. “Transferring food waste into energy.” Rural Development Administration, Duration: 1 year (Jan. 2007 ~ Dec. 2007), PI (completed).
32. “Study on odor emission reduction occurred at wastewater treatment plant in Banwol Shihwa paper plant.” Shiheung Environmental Technology Development Center, Duration: 10 months (Apr. 2007 ~ Jan. 2008), Co- PI (completed).
33. “Study on improvement of standard methods for water quality analysis.” National Institute of Environmental Research, Duration: 8 months (Apr. 2007 ~ Dec. 2007), PI (completed).
34. “Evaluation of food waste drying facility.” Emerging Infrastructure Fund Company, Duration: 1 month (Apr. 2007 ~ May. 2007), PI (completed).
35. “Research service on the application service on sewer service standard assessment system (ISO-TC224).” Dohwa Engineering Co., Ltd., Duration: 7 months (May. 2007 ~ Dec. 2007), PI (completed).
36. “Development of real-time monitoring and modeling based optimization technique for advanced wastewater treatment system.” Korean Ministry of Environment, Duration: 4 years (Jun. 2007 ~ May. 2011), PI (completed).
37. “Eco-STAR project: development of control strategy for the HUBN II process.” Korean Ministry of Environment, Duration: 1 year (Jun. 2007 ~ May 2008), Co-PI (completed).
38. “Mungyeong City WWTP performance prediction using GPS-X model.” Korea Engineering Consultants Corp., Duration: 3 months (Aug. 2007 ~ Oct. 2007), PI (completed).
39. “Investigation of odors from Ttukdo retention pond.” Mecca Construction Co., Ltd., Duration: 1 year (Jan. 2008 ~ Dec. 2008), PI (completed).
40. “Study on applicability of on line analyzers for industrial wastewater treatment plants.” Environmental Management Corporation, Duration: 5 months (Jan. 2008 ~ May 2008), PI (completed).
41. “Eco-STAR project: development of control strategy for anaerobic digester.” Korean Ministry of Environment, Duration: 6.5 years (Jan 2008 ~ Jun. 2010), Co-PI (completed).
42. “Development of odor controlling technology for odor from organic waste digestion system.” Korea Environmental Industry and Technology Institute, Duration: 2 years (Feb. 2008 ~ May. 2010), Co-PI (completed).
43. “Performance evaluation on waste water treatment method using a floating media.” Korea Engineering Consultants Corp., Duration: 7 months (Apr. 2008 ~ Oct. 2008), PI (completed).
44. “Reduction of odors from Shiheung City waste water treatment plant.” Shiheung Environmental Technology Development Center, Duration: 10 months (Apr. 2008 ~ Jan. 2009), PI (completed).
45. “Evaluating performance and economic impact of home food waste processor.” Seoul Development Institute, Duration: 6 months (Apr. 2008 ~ Oct. 2008), PI (completed).
46. “Research of surface water contamination.” Centennial Technology, Duration: 7 months (Jun. 2008 ~ Dec. 2008), PI (completed).
47. “Development of odorants control technology using TRS sensor.” Small and Medium Business Administration, Duration: 1 year (Jul. 2008 ~ Jun. 2009), Co-PI (completed).
48. “National automatic control technology for odorants using water quality monitoring network and development of performance indicators.” Environmental Management Corporation, Duration: 5 months (Jul. 2008 ~ Nov. 2008), PI (completed).
49. “Measurement of greenhouse gas emission from landfill site.” Environmental Management Corporation, Duration: 6 months (Jul. 2008 ~ Dec. 2008), PI (completed).
50. “Research project on floatation technology for high-efficient sludge concentration and side stream treatment.” Soosan E&C Co., Ltd, Duration: 6 months (Aug. 2008 ~ Jan. 2009), PI (completed).
51. “Proposition of strategy for performance improvement of automatic COD analyzers.” Dong Yang Electro-system Co., Ltd, Duration: 1 year (Sep. 2008 ~ Sep. 2009), PI (completed).
52. “Various test results and evaluation to verify effectiveness of sewer odor reducing agent.” Seoul Metropolitan Government, Duration: 6 months (Dec. 2008 ~ Jun. 2009), PI (completed).
53. “Development of biogas wastewater purification treatment technology.” Rural Development Administration, Duration: 3 years (Jan. 2009 ~ Dec. 2011), PI (completed).
54. “Basic design and detailed design to resolve odor problem of roadside rain gutters (odor generation research area).” Kyunghwa Engineering Co., Ltd, Duration: 7 months (Jan. 2009 ~ Jul. 2009), PI (completed).
55. “Research on sources and behavior of pharmaceutical materials in the environment (2nd year).” National Institute of Environmental Research, Duration: 11 months (Feb. 2009 ~ Dec. 2009), PI (completed).
56. “Research on minimization of odor matter by optimizing operation of Shihwa/Banwol area food waste treatment facilities.” Siheung Green Environment Center, Duration: 10 months (Mar. 2009 ~ Dec. 2009), PI (completed).
57. “Automatic water quality monitoring network long term development plan.” Korea Environment Corporation, Duration: 6 months (Apr. 2009 ~ Oct. 2009), PI (completed).
58. “National Institute of Environmental Research automatic water quality monitoring data public system (II).” NDS Co., Ltd, Duration: 7 months (Apr. 2009 ~ Dec. 2009), PI (completed).
59. “Study on water quality and ecological impact of Seoul vested water rights, such as "upstream of water source" of the river environment.” Office of Waterworks, Seoul Metropolitan Government, Duration: 6 months (Apr. 2009 ~ Oct. 2009), PI (completed).
60. “EXP-MBR technology development to maximize efficiency of sewage and wastewater treatment.” Bukang Tech Co., Ltd, Duration: 6 months (May. 2009 ~ Nov. 2009), PI (completed).
61. “Real-time monitoring and modeling based advanced wastewater treatment system.” Ministry of Environment, Duration: 1 year (Jun. 2009 ~ May. 2010), PI (completed).
62. “Research on plan to improve the efficiency of 2nd settling basin at Nanji water reclamation center.” Gentro Co., Ltd, Duration: 3 months (Aug. 2009 ~ Nov. 2009), PI (completed).
63. “Research on plan to improve auto water quality monitoring device (TOC, TN, TP) installation standards and operation management method.” Environmental Management Corporation, Duration: 1 year (Dec. 2009 ~ Aug. 2010), PI (completed).
64. “Study on greenhouse gas-air pollutant reduction technologies (CO-Benefit) cases and development plan.” Siheung Green Environment Center, Duration: 10 months (Mar. 2010 ~ Dec. 2010), PI (completed).
65. “Research on sources and behavior of pharmaceutical materials in the environment (3rd year).” National Institute of Environmental Research, Duration: 9 months (Apr. 2010 ~ Dec. 2010), PI (completed).
66. “Construction of auto water quality monitoring network data public system (3rd year).” National Institute of Environmental Research, Duration: 8 months (May 2010 ~ Dec. 2010), Co-PI (completed).
67. “Development of analytical method and study of exposure of pharmaceuticals and personal care products in environment.” Korean Ministry of Environment, Duration: 3 years (Feb. 2009 ~ Dec. 2011), PI (completed).
68. “Development of strategy for controlling odors from sewer system of Gangnam, Seoul.” City of Gangnam, Seoul, Duration: 1 year (Mar. 2009 ~ Oct. 2010), PI (completed).
69. “Extended application of water quality standards and management standards supplement.” Centennial Technology, Duration: 1year (May. 2010 ~ Apr. 2011), PI (completed).
70. “Establishment of good drinking water guideline.” Office of Waterworks, Seoul Metropolitan Government, Duration: 6 months (Jun. 2010 ~ Nov. 2010), PI (completed).
71. “Development of core water treatment technologies based on intelligent BT-NT-IT fusion platform.” Korean Ministry of Knowledge & Economy, Duration: 4 years (Jun. 2010 ~ Mar. 2014), PI (completed).
72. USN sensor based software development logic and intake pump/water treatment plant control.” Electronics and Telecommunications Research Institute (ETRI), Duration: 6 months (Aug. 2010 ~ Jan. 2011), PI (completed).
73. “Samsung Total consulting service.” Samsung Total Co., Ltd, Duration: 1 year (Dec. 2010 ~ Dec. 2011), PI (completed).
74. “Anaerobic Digestion Modeling (ADM) and produced wastewater link modeling service.” Samwoo ANC, Duration: 1 month (Feb. 2011 ~ Mar. 2011), PI (completed).
75. “Development of QA strategy for air TMS system in Korea.” City of Gangnam, Seoul, Duration: 1 year (Mar. 2011 ~ Dec. 2011), Co-PI (completed).
76. “Automatic chimney measurement device communication method digitization and QA program development service.” Korea Environment Cooperation, Duration: 1 year (Mar. 2011 ~ Feb. 2012), PI (completed).
77. “Analysis of residual pharmaceutical materials in water sources.” Daelim Industral Co., Ltd., Duration: 1 year (Mar. 2011 ~ Feb 2012), PI (completed).
78. “Research on sources and behavior of pharmaceutical materials in the environment.” National Institute of Environmental Research, Duration: 7 months (May. 2011 ~ Dec. 2011), PI (completed).
79. “Development of eco-smart water supply system for water supply system of Sri Lanka.” Hyundai Engineering Co., Ltd., Duration: 3 years (May. 2011 ~ Apr. 2014), PI (completed).
80. “Demonstration of performance of sewage odor abatement device.” Seoul Metropolitan Government, Duration: 9 months (Dec. 2011 ~ Oct. 2012), Co-PI (completed).
81. “Research on application of development of efficient wastewater oxidation technology applied water treatment technology.” Meurer Asia Inc., Duration: 4 months (Feb. 2012 ~ May. 2012), PI (completed)
82. “ADM services of anaerobic digestion process.” Daelim Industral Co., Ltd., Duration: 1 year (Mar. 2012 ~ Feb. 2013), PI (completed).
83. “Treatability evaluation of activated sludge processes for pharmaceuticals and personal care products in wastewater.” Korean Ministry of Environment, Duration: 1 year (Mar. 2012 ~ Nov. 2012), PI (completed).
84. “Development of strategy for controlling odors from sewer system of mega city.” Hong Ik Construction Co., Ltd, Duration: 1 year (Mar. 2012 ~ Feb. 2013), PI (completed).
85. “Sewage odor reduction using odor reduction dredge method.” Hong Ik Industrial Development Co., Ltd, Duration: 8 months (Apr. 2012 ~ Nov. 2012), PI (completed).
86. Research on sources and behavior of pharmaceutical materials in the environment (V-1).” National Institute of Environmental Research, Duration: 6 months (May. 2012 ~ Nov. 2012), PI (completed).
87. “Development of smart water block system based on water supply optimization scheme.” Korean Ministry of Knowledge & Economy, Duration: 2 years (Jul. 2012 ~ Jun. 2014), Co-PI (completed).
88. “Development of CSO treatment system automatic measuring devices and micro-bubble floatation.” Korea Evaluation Institute of Industrial Technology, Duration: 1 year (Jun. 2012 ~ May. 2013), Co-PI (completed).
89. “Development of TRS (Total reduced sulfides) continuous measurement core technology.” C-mac Co., Ltd., Duration: 1 year (Dec. 2012 ~ Dec. 2013), PI (completed).
90. “Study on management plan for accuracy improvement of real-time water quality analysis data.” National Institute of Environmental Research, Duration: 8 months (Apr. 2013 ~ Nov. 2013), PI (completed).
91. “Development of water treatment plant management system optimization technology for developing countries.” Korea Environmental Industry Technology Institute, Duration: 1 year (May. 2013 ~ Apr. 2014), PI (completed).
92. “Evaluation on removal efficiency of pharmaceutical materials using micro-bubble.” University of Seoul Industry Cooperation Foundation, Duration: 1 year (May. 2013 ~ Apr. 2014), PI (completed).
93. “Development of performance indicator to measure accuracy of measurement results of auto water quality monitoring network.” Korea Environment Corporation, Duration: 6 months (May. 2013 ~ Nov. 2013), PI (completed).
94. “Development of smart water block system for hydro energy optimization technology.” Small and Medium Business Administration, Duration: 2 year (Jun. 2012 ~ May. 2014), PI (completed).
95. “Development of disinfection and chlorine input device for distributing reservoir.” C-mac Co., Ltd., Duration: 8 months (Jul. 2013 ~ Mar. 2014), PI (completed).
96. “Study on performance evaluation for certification of new technology for SBR-MC system including Asahi Kasei phosphate removal process.” Asahi Kasei Japan, Duration: 2 years 5 months (Dec. 2013 ~May 2016), PI (completed).
97. “Seoul Initiatives, Fiji improving water quality in rural commissioned research project (joint supply).” Korea Environment Corporation, Duration: 5 months (Dec. 2013 ~ May. 2014), PI (completed).
98. “Design and development of operation technology for the connection of contactor activated carbon (PAC) and membrane processes (Membrane).” Korea Environmental Industry Technology Institute, Duration: 1 year (May. 2014 ~ Apr. 2015), Co- PI (completed).
99. “Propulsion of water supply O&M market development and evaluation of test-bed operation.” Hyundai Engineering Co., Ltd., Duration: 9 months (Aug. 2014 ~ Jun. 2015), PI (completed).
100. “R&D for demonstration of producing biogas and energy from POME (Palm Oil Mill Effluent) by using two-phase anaerobic digester.” Korean Ministry of Trade, Industry & Energy, Duration: 4 months (Nov. 2014 ~ Feb. 2015), Co- PI (completed).
101. “Based Research for Introduction of Water Quality Monitoring Network in Cambodia.” Korea Environment Corporation, Duration: 6 months (Dec. 2014 ~ July 2015), PI (completed).
102. “Water Treatment *Technology f*or Malaysia Water System Applicable Type.” A&M Co., Ltd., Duration: 1 year (Feb. 2015 ~ Jan. 2016), PI (completed).
103. “Design and development of operation technology for the connection of contactor activated carbon (PAC) and membrane processes (Membrane).” Korea Environmental Industry Technology Institute, Duration: 1 year (May. 2015 ~ Apr. 2016), Co- PI (completed).
104. “Development of engineering technology for enhancing feed-flexibility of anaerobic digester” Korea Institute of Energy Technology Evaluation and Planning, Duration: 3 years (Jun. 2015 – May 2018), Co-PI (completed).
105. “Conservation of Environment through Ecological Modeling Approaches and Eco-friendly Environmental Management Practices.” National Research Foundation of Korea, Duration: 1 year (Jul. 2015~Jun. 2016), PI (completed).
106. “Development of engineered aqua depuration system (EADS) for removal of TP, SS in run off effluent.” Korean Institute of Environmental Industrial Technology, Duration: 3 years (Aug. 2015~Jul. 2018), Co- PI (completed).
107. “Development of MBR process with high efficiency for high concentrations of nitrogen removed from sewage and waste water treatment.” Samjin Precision Co., Ltd., Duration: 25 months (Aug. 2015 ~ Aug. 2017), PI (completed).
108. “A study on the improvement of the national water quality automatic measurement network. Quality assurance project. (Joint Research Institute).” Korea Environment Corporation., Duration: 5 months (Aug. 2015 ~ Dec. 2015), PI (completed).
109. “High salt-containing food waste anaerobic digestion residues and purification technologies to improve environmental performance.” National Research Council of Science & Technology, Duration: 2 years (Sept. 2015~ Sept. 2017), Co-PI (completed).
110. “Tan-Cheon Water Reclamation Center processes by water quality research.” Korea Engineering Consultants Corp., Sunjin Engineering & Architecture Co., Ltd., Tae Sung Engineering Consultant Co., Ltd., Duration: 8 months (Oct. 2015~May 2016), PI (completed).
111. “Study on river protection measures provided by the feasibility study of conversion technology to biodiesel of Fiji’s greases and oils.” Korea Environment Corporation, Duration: 6 months (Dec. 2015 ~ Jul. 2016), PI (completed).
112. “Construction of products concerned risk’s quality control and risk management system.” Korean Ministry of Environment, Duration: 8 months (Mar. 2016 ~ Nov. 2016), PI (completed).
113. “Advised on the development of a program and on-site verification technology for the application of HUB-N III Process to the Yeongam Daebul site.” Daesun Construction Co., Ltd., Duration: 10 months (Aug. 2016 ~July 2017), PI (completed).
114. “High-quality methane energy conversion method development and feasibility analysis.” LG Hitachi Water Solutions Co., Ltd. (LHWS), Duration: 3 years (March 2017 ~ Sept. 2019), PI (completed).
115. “Criteria for Revision of Process Test Standards for Persistent Organic Pollutants (I).” National Institute of Environmental Sciences, Duration: 7 months (April 2017 ~ Nov 2017), PI (completed).
116. “A study on establishing the basis for the introduction of a monitoring and management system for trace organic substances caused by watershed sewage (I).” National Institute of Environmental Sciences, Duration: 1 year (May 2017 ~ May 2018), PI (completed).
117. “Development of electrochemical antifouling technology to prevent biofilm formation inside power plant piping.” Korea Institute of Energy Technology Evaluation and Planning (Ministry of Trade, Industry and Energy), Duration: 4 years (May 2017 ~ April 2020), PI (completed).
118. “Pollution source tracking study through stable isotope analysis of fine dust.” Korea Research Foundation (Future Creation Science Division), Duration: 3 years (Sept 2017 ~ May 2020), PI (completed).
119. “A study to prepare measures to improve the standards for calculating the amount of sewage generated by building use (IV).” Ministry of Environment, duration: 10 months (Oct 2017 ~ July 2018), PI (completed).
120. “IoT-based wastewater treatment facility demand management business model development and demonstration (participation).” Korea Institute of Energy Technology Evaluation and Planning (Ministry of Trade, Industry and Energy), Duration: 4 years (Dec 2017 ~ Feb 2021), PI (completed).
121. “Development of transportation fuel production technology using exhaust gas in the industrial sector based on waste biomass biogasification process.” Korea Institute of Energy Technology Evaluation (Ministry of Trade, Industry and Energy), Duration: 4 years (Dec 2017 ~ April 2021), PI (completed).
122. “Estimation and Analysis of Pollution Sources of Seoul Superfine Dust (PM2.5) Using Stable Isotope Consumption.” Seoul Institute (Seoul City), Duration: 14 months (Feb 2018 ~ June 2019), PI (completed).
123. “A study on establishing the basis for the introduction of a monitoring and management system for trace organic substances caused by watershed sewage.” National Institute of Environmental Sciences, Duration: 1 year (May 2018 ~ May 2019), PI (completed).
124. “A Study on the Preparation of Effective Control Plan for Microplastics in Water Treatment Process.” National Institute of Environmental Sciences, Duration: 6 months (June 2018 ~Dec 2018), PI (completed).
125. “Developing a business model to improve the acceptance of biogas production facilities.” Korea Institute of Energy Technology Evaluation (Ministry of Trade, Industry and Energy), Duration 2 years (July 2018 ~ June 2020), PI (completed).
126. “A feasibility study for empirical commercialization of integrated process technology based on anaerobic digestion technology for energy conversion and resource conversion of livestock manure in China.” Korea Institute of Energy Technology Evaluation (Ministry of Trade, Industry and Energy), Duration 1 year (Aug 2018 ~ July 2018), PI (completed).
127. “Development of BBF high-speed filtration technology to remove dissolved BOD and virus in initial excellence.” Bugang Tech Co., Ltd., Duration: 1 year (Sept 2018 ~ Dec 2021), PI (on-going).
128. “Development of ferrate technology to remove non-degradable organic matter.” Hyundai NGB, Duration: 1 year (Dec 2018 ~ Dec 2019), PI (completed).
129. “Research on the origin of fine dust from pollutants deposited on the surface of plants.” Rural Development Administration, Duration: 3 years (Jan 2019 ~ Dec 2021), PI (on-going).
130. “Data survey of 2nd and 3rd priority substances and evaluation of efficiency of removal of endocrine disorders and persistent organic substances in water purification plants.” Korea Environmental Industry & Technology Institute, Duration: 5 years (Apr 2019 ~ Dec 2023), PI (on-going).
131. “Research on the preparation of the Korean Industrial Standard (KS) analysis method for microplastics in water.” National Institute of Environmental Sciences, Duration: 6 months (July 2019 ~ Jan 2020), PI (completed).
132. “Biogas plant digested sludge characteristics analysis study.” Jeongeup Jeongae Farming Association Corporation, Duration: 1 year (July 2019 ~ June 2020), PI (completed).
133. “Study on removal of trace pollutants using chitosan-based hybrid hydrogel containing graphene chemically bound to macrocycle.” Korea Research Foundation, Duration: 5 years (Sept 2019 ~ Dec 2023), PI (on-going).
134. “Water Regeneration Center Sludge Treatment System Operation Efficiency Basic Plan Establishment Service.” Seoul City, Duration: 1 year (Sept 2019 ~ Sept 2020), PI (completed).
135. “2020 Seoul Initiative (SI) network project in two countries.” Ministry of Environmen, Duration: 10 months (Feb 2020 ~ Nov 2020), PI (completed).
136. “A study on the rational readjustment of drinking water quality standards (consignment).” Yonsei University, Duration: 15 months (May 2019 ~ April 2021), PI (completed).
137. “Faculty of Environmental Engineering, Future Talent Training Project.” University of Seoul, Duration: 6 months (Feb 2020 ~ July 2020), PI (completed).
138. “Jamsil Water Supply Water Quality Management Plan Research Service.” Seoul city, Duration: 5 months (July 2020 ~ Nov 2020), PI (completed).
139. “Planning a project to build a biogas upcycling platform to solve the problem of plastic waste in the metropolitan area.” Korea Science and Technology Planning Evaluation, Duration: 5 months (July 2020 ~ Nov 2020), PI (completed).
140. “Jungnang water recycling center facility modernization (2nd stage) basic design service.” Donghae General Technology Corporation (Isan), Duration: 8 months (July 2020 ~ March 2021), PI (completed).
141. “Dehydration test of the sludge treatment system of the water recovery center among the basic plan establishment service for the operation efficiency of the sludge treatment system of the water recovery center.” New Entech, Donghae General Technology Corporation, Duration: 5 months (June 2020 ~ Oct 2020), PI (completed).
142. “Test and analysis of persubstituted compounds in wastewater.” Eco-Able Co., Ltd., Duration: 1 year (Aug 2020 ~ July 2021), PI (on-going).
143. “Development of continuous monitoring technology for sub-μm microplastics in water using electrochemical separation technology and optical technology.” Korea Research Foundation (Ministry of Science and Technology), Duration: 3 years (Sept 2020 – Aug 2023), PI (on-going).
144. “Green Convergence Technology Talent Development Specialized Graduate School Project (Post Plastic).” Korea Environmental Industry & Technology Institute (Ministry of Environment), Duration: 5 years (Oct 2020 ~ Feb 2024), PI (on-going).

**Publication:**

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5. Kim, H., Hao, O.J., McAvoy, T.J., 2001. SBR system for phosphorus removal: ASM2 and simplified linear model. *Journal of Environmental Engineering ASCE*, 127(2), 98-104.
6. Kim, H., Hao, O.J., McAvoy, T.J., 2001. SBR system for phosphorus removal: Linear model based optimization. *Journal of Environmental Engineering ASCE*, 127(2), 105-111.
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9. Hao, O.J., Kim, M.H., Seagren, E.A., Kim, H., 2001. Kinetics of phenol and chlorophenol utilization by *Acinetobacter* species. *Chemosphere,* 46(6), 797-807.
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11. Kim, H., Murthy, S., McConnell, L.L., Peot, C., Ramirez, M., Strawn, M., 2002. Characterization of wastewater and solids odor using solid phase microextraction at a large wastewater treatment plant. *Water Science & Technology,* 46(10), 9-16.
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15. Noh, S., Kwon, I., Yang, H., Kim, H., 2004. Current status of water reuse systems in Korea. *Water Science and Technology*, 50(2), 309-314, 2004.
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