

Curriculum Vitae



1.0 General Information

1.1 Personal Information

Name: Sang-Hyoun Kim

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Birth Date/Place: December 12, 1977/Daegu, South Korea

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Professional Registration: Waste Treatment Engineer, Korea (No. 002032130617B)

1.2 Education

Ph.D.	Korea Advanced Institute of Science and Technology (KAIST), Korea (GPA 3.88/4.3)	2005	Civil and Environmental Engineering
M.S.	KAIST (GPA 3.82/4.3)	2001	Civil and Environmental Engineering
B.S.	KAIST (GPA 3.56/4.3)	1999	Chemistry

1.3 Academic Experience

Associate Professor, Yonsei University	Mar. 2018 – present
Associate Professor, Daegu University	Mar. 2016 – Feb. 2018
Assistant Professor, Daegu University	Mar. 2010 – Feb. 2016
Visiting Scholar, University of Illinois at Urbana-Champaign	Aug. 2016 – Jul. 2017
Senior Researcher, Korea Institute of Industrial Technology	Feb. 2009 – Feb. 2010
Postdoctoral Research Fellow, Iowa State University	Feb. 2006 – Jan. 2009
Postdoctoral Research Fellow, KAIST	Sep. 2005 – Jun. 2007
Teaching/Research Assistant, KAIST	Mar. 1999 – Jun. 2005

2.0 Publication

2.1 Doctoral Thesis

- Title: Continuous Biohydrogen Production by Mesophilic Anaerobic Fermentation of Organic Solid Waste
- Advisor: Prof. Hang-Sik Shin
- Committee: Prof. Heekyung Park, Prof. Dong-soo Kim, Prof. Jeong Hoe Kim, Prof. Yong Hwan Kim

2.2 Refereed Journal Articles (SCIE)

107 published, 1 accepted, H-index: 34

("*" indicates the corresponding author.)

1. Ahn Y, Lee W, Kang S, **Kim, S.-H.** * 2019. Enhancement of sewage sludge digestion by co-digestion with food waste and swine waste. *Waste and Biomass Valorization* (accepted).
2. Park, J.-H., Park, J.-H., Sim, Y.-B., **Kim, S.-H.**, Park, H.-D.* 2019. Formation of a dynamic membrane altered the microbial community and metabolic flux in fermentative hydrogen production. *Bioresour Technol.* 282: 63-68.
3. **Kim S.-H.**, Mudhoo A, Pugazhendhi A, Saratale RG, Surroop D, Jeetah P, Park JH, Saratale GD, Kurmar G. *. 2019. A perspective on galactose-based fermentative hydrogen production from macroalgal biomass: Trends and opportunities. *Bioresour Technol.* 280: 447-458.
4. Cayetano RDA, Park JH, Kang S, **Kim, S.-H.** * 2019. Food waste treatment in an anaerobic dynamic membrane bioreactor (AnDMBR): Performance monitoring and microbial community analysis. *Bioresour Technol* 280: 158 – 164.

5. Anburajan P, Yoon JJ, Kumar G, Park JH, **Kim, S.-H.*** 2019. Evaluation of process performance on biohydrogen production in continuous fixed bed reactor (C-FBR) using acid algae hydrolysate (AAH) as feedstock, *Int. J. Hydrogen Energy* 44: 2164 - 2169
6. Gonzales RR, Kim JS, **Kim, S.-H.**, 2019. Optimization of dilute acid and enzymatic hydrolysis for dark fermentative hydrogen production from the empty fruit bunch of oil palm, *Int J Hydrogen Energy* 44: 2191 – 2202.
7. Bakonyi P, Kumar G, Bélafi-Bakó K, **Kim, S.-H.***, Koter S, Kujawski W, Nemestóthy N, Peter J, Pientka Z. 2018. A review of the innovative gas separation membrane bioreactor with mechanisms for integrated production and purification of biohydrogen. *Bioresource Technol.*, 270: 643-655.
8. Nemestóthy N, Bakonyi P, Rózsenszki T, Kumar G, Koók L, Kelemen G, **Kim, S.-H.**, Bélafi-Bakó K. 2018. Assessment via the modified gompertz-model reveals new insights concerning the effects of ionic liquids on biohydrogen production, *Int J Hydrogen Energy* 43: 18918 – 18924.
9. Park JH, Yoon JJ, Kumar G, Jin YS, **Kim, S.-H.*** 2018. Effects of acclimation and pH on ammonia inhibition for mesophilic methanogenic microflora, *Waste Management* 80: 218 – 223.
10. Saratale GD, Saratale RG, **Kim S.-H.**, Kumar G* 2018. Screening and optimization of pretreatments in the preparation of sugarcane bagasse feedstock for biohydrogen production and process optimization, *Int J Hydrogen Energy* 43: 11470 - 1148
11. Kumar, G., Sivagurunathan, P., Anburajan, P., Pugazhendi, A., Saratale, G.D., Choi, C.S., **Kim, S.-H.*** 2018. Continuous biogenic hydrogen production from dilute acid pretreated algal hydrolysate using hybrid immobilized mixed consortia. *Int. J. Hydrogen Energy* 43: 11452-11459.
12. Sivagurunathan, P., Kumar, G., Kobayashi, T., Xu, K.* , **Kim, S.-H.**, Nguyen, D., Chang, S.W. 2018. Co-digestion of untreated macro and microalgal biomass for biohydrogen production: Impact of inoculum augmentation and microbial insights , *Int. J. Hydrogen Energy* 43: 11484-11492.
13. Park, J.-H., Kim, D.-H., **Kim, S.-H.**, Yoon, J.-J. *, Park, H.-D.* 2018. Effect of substrate concentration on the competition between *Clostridium* and *Lactobacillus* during biohydrogen production. *Int. J. Hydrogen Energy* **43**: 11460-11469.
14. Sivagurunathan, P., Pugazhendi, A., Kumar, G., Park, J.-H., **Kim, S.-H.*** 2018. Biohydrogen fermentation of galactose at various substrate concentrations in an immobilized system and its microbial correspondence. *J. Biosci. Bioeng.* **125**: 559-564.
15. Park, J.-H., Sim, Y.-B., Kumar, G., Anburajan, P., Park, J.-H., Park, H.-D., **Kim, S.-H.*** 2018. Kinetic modeling and microbial community analysis for high-rate biohydrogen production using a dynamic membrane. *Bioresource Technol.* **262**: 59-64.

16. Nemestóthy, N., Bakonyi, P.*, Szentgyörgyi, E., Kumar, G., Nguyen, D.D., Chang, S.W., **Kim, S.-H.**, Bélafi-Bakó, K. 2018. Evaluation of a membrane permeation system for biogas upgrading using model and real gaseous mixtures: The effect of operating conditions on separation behavior, methane recovery and process stability. *J. Cleaner Production* **185**: 44-51.
17. Kumar, M.D., Tamilarasan, K., Kaliappan, S. Rajesh Banu, J.,* Rajkumar, M., **Kim, S.-H.** 2018. Surfactant assisted disperser pretreatment on the liquefaction of *Ulva reticulata* and evaluation of biodegradability for energy efficient biofuel production through nonlinear regression modelling. *Bioresource Technol.* **255**: 116-122.
18. Bhatia, S.K., Kim, J.H., Kim, M.S., Kim, J., Hong, J.W., Hong, Y.G., Kim, H.J., Jeon, J.M., **Kim, S.-H.**, Ahn, J., Lee, H., Yang, Y.* 2018. Production of (3-hydroxybutyrate-co-3-hydroxyhexanoate) copolymer from coffee waste oil using engineered *Ralstonia eutropha*. *Bioprocess Biosyst. Eng.* **41**: 229-235.
19. Huy, M., Kumar G., Kim, H.W., **Kim S.-H.*** 2018. Photoautotrophic cultivation of mixed microalgae consortia using various organic waste streams towards remediation and resource recovery. *Bioresour Technol.* **247**: 576-581.
20. Park, J.-H., Kumar, G., Yun, Y.-M., Kwon, J.-C., **Kim, S.-H.*** 2018. Effect of feeding mode and dilution on the performance and microbial community population in anaerobic digestion of food waste. *Bioresource Technol.*, **248 Part A**: 134-140.
21. Anburajan, P., Pugazhendhi, A., Park, J.-H., Sivagurunathan, P., Kumar, G., **Kim, S.-H.*** 2018. Effect of 5-hydroxymethylfurfural (5-HMF) on high-rate continuous biohydrogen production from galactose. *Bioresource Technol.* **247**: 1197-1200.
22. Gonzales, R.R., **Kim, S.-H.*** 2017. Dark fermentative hydrogen production following the sequential dilute acid pretreatment and enzymatic saccharification of rice husk. *Int. J. Hydrogen Energy* **42**: 27577-27583.
23. Pugazhendhi, A., Anburajan, P., Park, J.-H., Kumar, G., Sivagurunathan, P., **Kim, S.-H.*** 2017. Process performance of biohydrogen production using glucose at various HRTs and assessment of microbial dynamics variation via q-PCR. *Int. J. Hydrogen Energy* **42**: 27550-27557.
24. Park, J.-H., Anburajan, P., Kumar, G., Park, H.-D., **Kim, S.-H.*** 2017. Biohydrogen production integrated with an external dynamic membrane: A novel approach. *Int. J. Hydrogen Energy* **42**: 27543-27549.
25. Anburajan, P., Pugazhendi, A., Park, J.-H., Kumar, G., Choi, C.-S., **Kim, S.-H.*** 2017. Inhibitory effect of 5-hydroxymethylfurfural on continuous hydrogen fermentation by mixed culture in a fixed bed reactor. *Int. J. Hydrogen Energy* **42**: 27570-27576.
26. Gonzales, R.R., Kumar, G., Sivagurunathan, P., **Kim, S.-H.*** 2017. Enhancement of hydrogen production by downstream processes, pH adjustment and fractionation, of dilute acid pretreatment of lignocellulosic biomass. *Int. J. Hydrogen Energy* **42**: 27502-27511.

27. Anburajan, P., Park, J.-H., Sivagurunathan, P., Pugazhendhi, A., Kumar, G., Choi, C.-S., **Kim, S.-H.*** 2017. Mixed-culture H₂ fermentation performance and the relation between microbial community composition and hydraulic retention times for a fixed bed reactor fed with galactose/glucose mixtures. *J. Biosci. Bioeng.* **124**: 339-345.
28. Kumar, G.* , Sivagurunathan, P., Sen, B., **Kim, S.-H.**, Lin, C.-Y. 2017. Mesophilic continuous fermentative hydrogen production from acid pretreated de-oiled jatropha waste hydrolysate using immobilized microorganisms. *Bioresource Technol.* **240**: 137-143.
29. Sivagurunathan, P., Anburajan, P., Kumar, G., Park, J.-H., **Kim, S.-H.*** 2017. Recovering hydrogen production performance of upflow anaerobic sludge blanket reactor (UASBR) fed with galactose via repeated heat treatment strategy. *Bioresource Technol.* **240**: 207-213.
30. Kumar, G., Shobana, S., Chen, W.-H.*, Bach, Q.V., **Kim, S.-H.**, Atabani, A.E., Chang, J.-S. 2017. A review of thermochemical conversion of microalgal biomass for biofuels: chemistry and process. *Green Chemistry* **19**: 44-67.
31. Sivagurunathan, P., Kumar, G.* , Mudhoo, A., Rene E.R., Saratale G.D., Kobayashi T., Xu K., **Kim, S.-H.**, Kim, D.-H. 2017. Fermentative hydrogen production using Lignocellulose biomass: An overview of pre-treatment methods, inhibitor effects and detoxification experiences. *Renewable and Sustainable Energy Reviews* **77**: 28-42.
32. Kumar, G.* , Bakonyi, P.* , Zhen, G., Sivagurunathan, P., Kook, L., **Kim, S.-H.**, Toth, G., Nemestothy, N., Belafi-bako K. 2017. Microbial electrochemical systems for sustainable biohydrogen production: surveying the experiences from a start-up viewpoint. *Renewable and Sustainable Energy Reviews* **70**: 589-597.
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36. Sivagurunathan, P., Anburajan, P., Kumar, G., Pugazhendhi, A., Bakonyi, P., **Kim, S.-H.*** 2017. Improvement of hydrogen fermentation of galactose by combined inoculation strategy. *J Biosci. Bioeng.* **123**: 353-357.
37. Sivagurunathan, P., Anburajan, P., Park, J.-H., Kumar, G., **Kim, S.-H.*** 2017. Mesophilic biogenic H₂-production using galactose in a fixed bed reactor. *Int. J. Hydrogen Energy* **42**: 3658-3666.

38. Kumar G., Park, J.-H., Sivagurunathan, P., Lee, S.-H., Park, H.-D., **Kim, S.-H.*** 2017. Microbial responses to various process disturbances in a continuous hydrogen reactor fed with galactose. *J. Biosci. Bioeng.* **123**: 216-222.
39. Kumar, G., Sivagurunathan, P., Sen, B., Mudhoo, A., Davila-Vazquez, G., Wang, G., **Kim, S.-H.*** 2017. Research and development perspectives of lignocellulose-based biohydrogen production. *Int. Biodeter. Biodeg.* **119**: 225-238.
40. Bhatia, S.K., **Kim, S.-H.**, Yoon, J.-J., Yang, Y.-H.* 2017. Current status and strategies for second generation biofuel production using microbial systems. *Energy Conversion and Management* **148**: 1142-1156.
41. Sivagurunathan, P., Anburajan, P., Kumar, G., **Kim, S.-H.*** 2016. Effect of hydraulic retention time (HRT) on biohydrogen production from galactose in an up-flow anaerobic sludge blanket reactor. *Int. J. Hydrogen Energy* **41**: 21670-21677.
42. Kumar, G., Sivagurunathan, P., Dung, T.N.B., Zhen, G., Kobayashi, T.*, **Kim, S.-H.**, Xu, K. 2016. Evaluation of different pretreatments on organic matter solubilization and hydrogen fermentation of mixed microalgae consortia. *Int. J. Hydrogen Energy* **41**: 21628-21640.
43. Gonzales, R.R., Sivagurunathan, P., **Kim, S.-H.*** 2016. Effect of severity on dilute acid pretreatment of lignocellulosic biomass and the following hydrogen fermentation. *Int. J. Hydrogen Energy* **41**: 21678-21684.
44. Nam, J.-Y., Kim, D.-H., **Kim, S.-H.**, Lee, W., Shin, H.-S., Kim, H.-W.* 2016. Harnessing dark fermentative hydrogen from pretreated mixture of food waste and sewage sludge under sequencing batch mode. *Environ. Sci. Pollut. Res.* **23**: 7155-7161.
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46. Sivagurunathan, P., Kumar, G.*, Bakonyi, P., **Kim, S.-H.**, Kobayashi, T., Xu, K.Q., Lakner, G., Toth, G., Nemestothy, N., Belafi-Bako, K. 2016. A critical review on issues and overcoming strategies for the enhancement of dark fermentative hydrogen production in continuous systems. *Int. J. Hydrogen Energy* **41**: 3820-3836.
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50. Kumar, G., Bakonyi, P.*, Kobayashi, T., Xu, K.Q., Sivagurunathan, P., **Kim, S.-H.**, Buitron, G., Nemestothy, N., Belafi-Bako, K., 2016. Enhancement of biofuel production via microbial augmentation: The case of dark fermentative hydrogen. *Renew. Sust. Energ. Rev.* **57**: 879-891.
51. Gonzales, R.R., Park, J.-H., Kumar, G., Hong, Y., **Kim, S.-H.*** 2016. Kinetics and equilibria of 5-hydroxymethyl (5-HMF) sequestration from algal hydrolyzate using granular activated carbon. *J. Chem. Technol. Biotechnol.* **91**: 1157-1163.
52. Gonzales R.R., Sivagurunathan, P., Anburajan, P., **Kim, S.-H.*** 2016. Optimization of substrate concentration of dilute acid hydrolyzate of lignocellulosic biomass in batch hydrogen production. *Int. Biodeter. Biodegr.* **113**: 22-27.
53. Sivagurunathan, P., Anburajan, P., Kumar, G., Kobayashi, T., Xu, K.Q., Lee, C.-Y., **Kim, S.-H.*** 2016. High-rate hydrogen production from galactose in an upflow anaerobic sludge blanket reactor (UASBr). *RSC Advances* **6**: 59823-59833.
54. Lee, W., Son, Y., Ahn, Y.-T., Kim, H.-W., **Kim, S.-H.**, Kang S.*, Lee, C.-Y. 2016. Microbial behavior and characteristics of biomass during starvation and their influence on ultrafiltration of activated sludge. *Desalin. Water Treat.* **57**: 7487-7494.
55. Park, J.-H., Lee, S.-H., Ju, H.J., **Kim, S.-H.**, Yoon, J.-J., Park, H.D.* 2016. Failure of biohydrogen production by low levels of substrate and lactic acid accumulation. *Renew. Energ.* **86**: 889-894.
56. Kumar, G., Sivagurunathan, P., Park, J.-H., **Kim, S.-H.*** 2016. Anaerobic digestion of food waste to methane at various organic loading rates (OLRs) and hydraulic retention times (HRTs): Thermophilic vs. mesophilic regimes. *Environ. Eng. Res.* **21**: 69-73.
57. Kumar, G.*, Bakonyi, P., Periyasamy, S., **Kim, S.-H.**, Nemestothy, N., Belafi-Bako, K., Lin, C.-Y. 2015. Enhanced biohydrogen production from beverage industrial wastewater using external nitrogen sources and bioaugmentation with facultative anaerobic strains. *J. Biosci. Bioeng.* **120**: 155-160.
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59. Park, J.-H., Kumar, G., Park, J.-H., Park, H.-D., **Kim, S.-H.*** 2015. Changes in performance and bacterial communities in response to various process disturbances in a high-rate biohydrogen reactor fed with galactose. *Bioresource Technol.* **188**: 109-116.
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98. **Kim, S.-H.***, Han, S.-K, Shin, H.-S. 2008. Optimization of continuous hydrogen fermentation of food waste as a function of solids retention time independent of hydraulic retention time. *Process Biochemistry*, **43**: 213-218.
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105. Shin, H.-S.*, Youn, J.-H., **Kim, S.-H.** 2004. Hydrogen production from food waste in anaerobic mesophilic and thermophilic acidogenesis. *International Journal Hydrogen Energy*, **29**: 1355-1363.
106. **Kim, S.-H.**, Han, S.-K., Shin H.-S.* 2004. Kinetics of LCFA inhibition on acetoclastic methanogenesis, propionate degradation and β -oxidation. *Journal of Environmental Science and Health A*, **39**: 1025-1037.
107. **Kim, S.-H.** Han, S.-K., Shin H.-S.* 2004. Two-phase anaerobic treatment system for fat-containing wastewater. *Journal of Chemical Technology and Biotechnology*, **79**: 63-71.
108. Han, S.-K., Shin, H.-S.*, Song, Y.-C., Lee, C.-Y., **Kim, S.-H.** 2002. Novel anaerobic process for the recovery of methane and compost from food waste. *Water Science and Technology*, **45**(10): 313-319.

2.3 Refereed Journal Articles (non-SCIE)

34 published

1. Kumar G., Huy, M., Bakonyi, P., Belafi-Bako, K., **Kim, S.-H.*** 2018. Evaluation of gradual adaptation of mixed microalgae consortia cultivation using textile wastewater via fed batch operation. *Biotechnology Reports* 20: e00289.
2. Park, J.-H., Sim, Y.-B., Kang, S.-Y., **Kim, S.-H.*** 2018. Inactivation of indicating microorganisms in ballast water using chlorine dioxide. *Ecology and Resilient Infrastructure* **5**(3): 111-117. (in Korean)

3. Park, J.-H., Kang, S.-Y., **Kim, S.-H.*** 2017. Feasibility of Odor Removal using Ultrasonic Droplet of Dilute Hydrochloric Acid Electrolyzed Water. *Journal of Korea Society of Waste Management* **34**(8): 813-818. (in Korean)
4. Park, J.-H., Kang, S.-Y., **Kim, S.-H.*** 2016. Feasibility study on the treatment of food waste leachate in municipal wastewater treatment facility - Case of P city-. *Journal of Korean Organic Resource Recycling Association* **24**: 41-49. (in Korean)
5. Kang, S.-Y., Park, J.-H., **Kim, S.-H.*** 2016. Composite oxidizing agents generation using electrolysis of dilute hydrochloric acid. *Journal of Korean Society of Environmental Engineers* **38**: 329-333. (in Korean)
6. Park, J.-H., Jung, I.-G., Seo, J.-G., **Kim, S.-H.*** 2015. Current status of by-products generation and industrial symbiosis network in Pohang, South Korea. *Journal of Korean Organic Resource Recycling Association* **23**: 63-39. (in Korean)
7. **Kim S.-H.*** 2014. Effects of disinfectant concentration, pH, temperature, ammonia, and suspended solids on the chlorine disinfection of combined sewer overflow. *Journal of Korean Society of Environmental Engineers* **36**: 685-690. (in Korean)
8. Choi, D.-H., Bae, H.-K., Jung, J.-Y., **Kim, S.-H.*** 2014. Comparison of nitrogen removal efficiency on process stability for granular and immobilized anammox bacteria. *Journal of Korean Society of Water and Wastewater* **28**: 195-206. (in Korean)
9. **Kim, S.-H.*** 2014. Economic assessment of biogas utilization produced from co-digestion of sewage sludge. *Journal of Environmental & Thermal Engineering* **11**: 1-5. (in Korean)
10. Park, J.-H., Choi, G.-J., **Kim, S.-H.*** 2014. Effects of pH and slow mixing conditions on heavy metal hydroxide precipitation. *Journal of Korean Organic Resource Recycling Association* **22**(2): 50-56. (in Korean)
11. **Kim, S.-H.***, Park, J., Ju, H.J. 2013. Phosphorus removal from dewatering centrate in wastewater treatment by struvite formation. *Journal of Korean Organic Resource Recycling Association* **21**(2): 73-80. (in Korean)
12. Nam, S.-Y.* , Kim, J.-H., **Kim, S.-H.** 2012. Enhanced dewaterability of sewage sludge by a natural inorganic conditioner. *Journal of Korean Society of Environmental Engineers* **34**(10): 651-655. (in Korean)
13. **Kim, S.-H.***, Ju, H.J. 2012. Effect of feed concentration and F/M ratio on anaerobic digestion of thickened sewage sludge. *Journal of Korean Society of Water and Wastewater* **26**(6): 825-831. (in Korean)
14. Cheon, H.-C., Nam, S.-Y., **Kim, S.-H.*** 2012. Effects of pH, temperature, and dissolved oxygen on phosphorus release from marine sediment to seawater. *Journal of Navigation and Port Research* **36**(6): 513-519. (in Korean)

15. Cheon, H.-C., **Kim, S.-H.*** 2012. Hydrogen fermentation of galactose-glucose mixture. *Trans. of the Korean Hydrogen and New Energy Society* **23**(4): 397-403. (in Korean)
16. Lee, M.-E., Lee, C.-Y., Kang, S., **Kim, S.-H.**, Cho, Y., Kim, S.-H., Chung, J.-W.* 2012. Adsorption property of heavy metals onto MCM-41 and expanded graphite. *Journal of Korean Society of Water and Wastewater* **26**(2): 275-283. (in Korean)
17. **Kim, S.-H.**, Park, J., Kang, S., Chung, J.-W., Kim, S.-H., Cho, Y., Lee, C.-Y.* 2012. Characteristics of p-xylene adsorption using functionalized mesoporous silica. *Journal of Korean Geo-Environmental Society* **13**(6): 27-31. (in Korean)
18. Lee, C.-Y., Jee, H.-S., Chung, J.-W., **Kim, S.-H.**, Cho, Y., Kang, S.-T.* 2012. Adsorption of p-xylene by expanded graphite. *Journal of Korean Geo-Environmental Society* **13**(5): 35-40. (in Korean)
19. **Kim, S.-H.***, Ju, H.-J. 2012. Feasibility of co-digestion of sewage sludge, swine waste, and food waste leachate. *Journal of Korean Organic Resource Recycling Association* **20**(1): 61-70. (in Korean)
20. Kim, J.-B., Chung, J.-W., Suh, S.-W., **Kim, S.-H.**, Park, H.-S.* 2011. Comparison of direct and indirect CO₂ emission in provincial and metropolitan city governments in Korea: Focused on energy consumption. *Journal of Korean Society of Environmental Engineers* **33**: 874-885. (in Korean)
21. Cheon, H.-C., Hwang, E.-J., **Kim, S.-H.*** 2011. Effects of air supply rate and eggshell addition on liquid fertilizer efficiency of aerobic stabilized organic wastewater sludge. *Journal of Korean Society of Environmental Engineers* **33**(8): 578-582. (in Korean)
22. **Kim, S.-H.***, Lee, C.-Y. 2011. Effects of pretreatment time and pH low set value on continuous mesophilic hydrogen fermentation of food waste. *Journal of Korean Society of Water and Wastewater* **25**(3): 343-348. (in Korean)
23. Lee, C.-Y.* , Lee, S.-W., **Kim, S.-H.** 2011. Anaerobic batch hydrogen fermentation of the food waste generated from apartment houses using the food waste disposal system. *Journal of Korea Society of Waste Management* **28**(5): 486-492. (in Korea)
24. **Kim, S.-H.***, Sung, S. 2010. Co-digestion of Waste Glycerol with Swine Waste. *Journal of Korean Organic Resource Recycling Association* **18**(2): 71-75.
25. **Kim, S.-H.***, Shin, H.-S. 2009. Acidogenesis of Lipids-Containing Acidogenesis of Lipids-Containing Wastewater in Anaerobic Sequencing Batch Reactor. *Journal of Korean Society of Environmental Engineers* **31**(12): 1075-1080. (in Korean)
26. **Kim, S.-H.**, Nam, S.-Y.* 2009. Anaerobic Digestion of Waste Activated Sludge from Livestock Wastewater Treatment. *Journal of Korean Solid Waste Management* **26**(6): 526-563.

27. **Kim, S.-H.***, Sung, S. 2008. Thermophilic Anaerobic Digestion of Animal Carcasses. *Journal of Korean Organic Resource Recycling Association* **16**(1): 31-38.
28. Han, S.-K., **Kim, S.-H.**, Sung, S., Shin H.-S.* 2003. Effects of pH and repeated heat-shock treatment on hydrogen fermentation on sucrose by a mixed culture. *Environmental Engineering Research* **8**: 202-211.
29. **Kim, S.-H.**, Lim, J.-L., Nam, S.-Y., Shin, H.-S.* 2003. Air stripping-UV irradiation-thermal hydrolysis for trichloroethylene removal. *Journal of Korean Society of Environmental Engineers* **25**: 1010 - 1015. (in Korean)
30. Lim, J.-L., Nam, S.-Y., **Kim, S.-H.**, Shin, H.-S.* 2003. Thermal hydrolysis of dichloroacetic acid produced during photooxidation of trichloroethylene. *Journal of Korean Society of Environmental Engineers* **25**: 920-924. (in Korean)
31. **Kim, S.-H.**, Han, S.-K., Youn, J.-H., Shin, H.-S.* 2003. Continuous anaerobic H₂ production with a mixed culture. *Journal of Korean Organic Resource Recycling Association* **11**(1): 70-76. (in Korean)
32. Han, S.-K.* , Shin, H.-S., **Kim, S.-H.**, Kim, H.-W. 2002. Effect of waste components on performance of acidogenic fermenter. *Journal of Korean Organic Resource Recycling Association* **10**(2): 65-70. (in Korean)
33. Han, S.-K., Shin, H.-S.* , **Kim, S.-H.**, Kim, H.-W., Park, J.-Y. 2002. Evaluation of environmental impact from the reuse of a completed refuse landfill. *Journal of Korean Society of Environmental Engineers* **24**: 1881-1890 (2002). (in Korean)
34. Shin, H.-S.* , **Kim, S.-H.** 2001. Review: Anaerobic treatment of organic waste in Korea. *Journal of Korea Society of Waste Management* **18**(8), 14-21 (2001). (in Korean)

2.5 Patents

18 issued (1 US, 17 KR)

1. Deodorizing apparatus for spraying oxidant complex mist and deodorizing method thereof, KR Patent # 10-1916455, Dec. 2018.
2. Apparatus for biohydrogen production using dynamic biofilm and manufacturing method thereof, KR Patent # 10-1888166, Aug. 2018.
3. Apparatus for manufacturing sterilized water, KR Patent # 10- 1847924, Apr. 2018.
4. Method for hydrogen production using fixed-bed bioreactor and apparatus thereof, KR Patent # 10-1809155, Dec. 2017.
5. Apparatus for sterilization of ballast water and method thereof, KR Patent # 10-1796976, Nov. 2017.

6. Apparatus and method for treating wastewater containing heavy-metal, KR Patent # 10-1788625, Oct. 2017.
7. Hydrogen sulfide removal apparatus, KR Patent # 10-1108237, Feb. 2016.
8. Method for producing granular meso-porous silica, KR Patent # 10-1574416, Nov. 2015.
9. Organic birnessite and adsorber using the same, KR Patent # 10-1482840, Jan. 2015.
10. Method of preparing 5-hydroxymethylfurfural from Seaweeds, KR Patent # 10-1385236, Apr. 2014.
11. A novel isolated *Phoma* sp. from rotten tangerine peel and cellulolytic enzymes and β -glucosidase produced by thereof, KR Patent # 10-1236558, Feb. 2013.
12. Sequencing batch bioreactor for hydrogen production, KR Patent # 10-1202932, Nov. 2012.
13. Method for preparation and quantification of 3,6-anhydrogalactose from hydrolyzate derived from red algae, KR Patent # 10-1122176, Feb. 2012.
14. Mutant strain of *Brettanomyces custersii* and method of ethanol production using the same, KR Patent # 10-1075602, Oct. 2011.
15. Method for producing hydrogen from organic waste, US Patent # 7,901,916 B2, May 2011.
16. Acid fermentation of slaughterhouse wastewater using alkaline hydrolysis and sequencing batch bio-reactor, KR Patent # 10-0845195, Jul. 2008.
17. Hydrogen production by anaerobic co-digestion of organic waste, KR Patent #10-0622994, Sep. 2006.
18. Fermentative hydrogen production from organic wastewater using gas sparging and the fermenting device, KR Patent #10-0578107, May 2006.

2.6 Awards and Honors

- Korea Association of University, Research Institute and Industry, University-Research-Industry Cooperation Prize, 2015
- Dongil Foundation of Scholarship, Faculty grant Recipient for 2014 Program
- Daegu University, Faculty Award for Excellence in Research for 2017, 2015 and 2013
- Korea Research Foundation (KRF), Overseas Post-Doctoral Fellowship Recipient for 2006/2007 Program
- KRF, Ph.D. Student Scholarship Recipient for 2004/2005 Program

- Korean Government, Graduate Scholarship Recipient (1999-2004)
- KAIST, Academic Excellence Scholarship Recipient (1995-1998)

3.0 Teaching Activities

3.1 Teaching at Yonsei University

CEE3330	Introduction to Environmental Engineering (Undergraduate)
CEE3406	Biological Wastewater Treatment (Undergraduate)
CEE3415	Sustainable Resource Engineering (Undergraduate)
CEE8602	Wastewater Treatment and Process Design (Graduate)

3.2 Teaching at Daegu University

22618	Introduction to Engineering Design (Undergraduate)
18771	Environmental Stoichiometry (Undergraduate)
20196	Environmental Microbiology Laboratory (Undergraduate)
23363	Introduction to Energy Engineering (Undergraduate)
23368	Energy System Design (Undergraduate)
23568	Solid Waste Treatment Design (Undergraduate)
23364	Capstone Design for Environmental Engineering (Undergraduate)
24521	Physical Chemistry for Engineers (Undergraduate)
23366	New Renewable Energy Technology (Graduate)
18501	Anaerobic Digestion (Graduate)

3.3 Teaching Assistance at KAIST

CE 372	Water and Wastewater Engineering (Undergraduate)
CE 571	Environmental Engineering Laboratory (Graduate)
CE 573	Biological Wastewater Treatment Processes (Graduate)

3.4 Major Advisor for Graduate Students' Theses

No.	Name	Degree	Thesis Title	Graduation Date
1.	Anburajan Parthiban	Ph.D.	High-rate Biohydrogen Production from Red Algal Biomass	Feb. 18

2	Hyo-Chang Cheon	M.S.	Biohydrogen production from red algal biomass by optimizing pretreatment and preventing the inhibitory effects of byproducts	Feb. 13
3	Hyun-Jun Ju	M.S.	Enhancement of sludge anaerobic digestion by pretreatment and co-digestion	Aug. 14
4	Jong-Hun Park	M.S.	High-rate biohydrogen production from galactose	Feb. 15
5	Ralph Rolly Gonzales	M.S.	Fermentative Biohydrogen Production from Dilute Acid Pretreated Lignocellulosic Biomass	Aug. 16
6	Shin-Young Kang	M.S.	Solid-liquid separation of acid-fermented food waste	Feb. 18
7	Menghour Huy	M.S.	Microalgae cultivation with wastewater treatment	Aug. 18
8	Abura Tobby Oliwit	M.S.	Feasibility study for biogas recovery of Uganda's agricultural byproduct with aqueous ammonia pretreatment	Feb. 19

3.5 Major Advisor for Current Graduate Students

No.	Name	Degree	Tentative Thesis Title	Year
1	Jong-Hun Park	Ph.D.	Microbial behavior and characteristics of anaerobic digestion (Co-advising with H.-D. Park in Korea University)	5 th
2	Roent Dune Cayetano	Ph.D.	Anaerobic dynamic membrane reactor for methane production	2 nd
3	Ju-Hyeong Jung	Ph.D.	Bio-H ₂ production from agricultural byproducts	1 st
4	Young-Bo Sim	M.S.	Bio-H ₂ production with dynamic membrane	2 nd
5	Jung Su Park	M.S.	Biogas upgrading using microalgae	2 nd
6	Gi-Beom Kim	M.S.	PHB production from organic waste	1 st

3.6 Direction of Research Professor/Postdoctoral Research Fellow

No.	Name	Period	Current position
1	Anburajan Parthiban	Mar. 18– present	Postdoctoral Research Fellow, Yonsei University
2	Gopalakrishnan Kumar	Sep. 16– June 18 Mar. 14 – Feb. 15	Associate Professor, Stavanger University, Norway
3	Pugazhendhi Arivalagan	Dec. 15 – Feb. 17	Assistant Professor, Ton Duc Thang University, Vietnam

4	Periyasamy Sivagurunathan	Nov. 14 – Nov. 15	Research Officer, Indian Oil Corporation, India
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4.0 Research /Creative Activities

4.1 Funded Research Contracts and Grants

No.	Sponsor	Title	RoI	Amount	Duration
1	MTIE (Korea Institute of Energy Technology Evaluation and Planning)	Bio-HCNG (Hydrogen enriched compressed natural gas) from agricultural byproducts for transport fuel market in developing countries	PI	KRW 310,000,000	Nov. 18– Oct. 21
2	MSI (National Research Foundation, Korea)	Towards the sustainable production of valuable chemicals from microalgae based on the sequestration of refused-CO ₂ in a novel, circular-loop gas separation membrane bioreactor system	PI	KRW 150,000,000	Oct. 17– Sep. 20
3	MSI (National Research Foundation, Korea)	Development of a Novel Process with Selective Pressure Control and Engineered Strain for Value-added Hydrogen Production from Organic Waste	PI	KRW 570,180,000	Mar. 17– Feb. 20
4	MSI (National Research Foundation, Korea)	Biogas upgrading with micro-aeration and algal cultivation	PI	KRW 30,000,000	Dec. 16– Nov. 17
5	MSI (National Research Foundation, Korea)	Sustainable biofuel production technologies from algae biomass via CO ₂ sequestration with concomitant bio-based production of chemicals in a circular loop	PI	KRW 150,000,000	Sep. 16– Jun. 18
6	Dai Ho Industry Co., Ltd.	Optimization of Solid-Liquid Separation for Organic Acid Recovery	PI	KRW 165,000,000	Jun. 16 – Mar. 19
7	SMBA (Korea Technology and Information Promotion Agency)	Mobile Deodorization and Disinfection Unit Spraying Composite Oxidizing Agents	PI	KRW 116,212,000	May 16 – Apr. 17
8	MSI (National Research Foundation, Korea)	Combined Sewer Overflow Disinfection by Chlorine Dioxide	PI	KRW 22,000,000	Jul. 15 – Dec. 15

9	SMBA (Korea Association of Industry, Academy and Research Institute)	Chlorine Dioxide Disinfection for Ballast Water Treatment	PI	KRW 125,151,000	May 15 – Apr. 16
10	ME (Gyeongbuk Green Environment Center)	Combined Treatment of Food Waste Leachate with Domestic Wastewater in Pohang	PI	KRW 35,000,000	Apr. 15 – Dec. 15
11	SMBA (Korea Association of Industry, Academy and Research Institute)	Semiconductor Wastewater Treatment using Membrane and Ion Exchange	PI	KRW 108,492,000	Dec. 14 – Nov. 15
12	MTIE (Korea Industrial Complex corporation)	Resource and Energy Network in Southwest Region of Gyeongbuk Province - Gumi, Chilgok, and Goryeong	PI	KRW 35,000,000	Nov. 14 – May 15
13	MSI (National Research Foundation, Korea)	Preservable Ozone Water Generator using Sonication	PI	KRW 22,000,000	Oct. 14 – Jan. 15
14	SMBA (Korea Association of Industry, Academy and Research Institute)	Disinfection Process with Electrolysis	PI	KRW 75,232,000	Aug. 14 – Jul. 15
15	MSI (National Research Foundation, Korea)	Monitoring, Enrichment, and Genetic Modification of Hydrogen producing Bacteria for Organic Waste to Hydrogen Process	PI	KRW 612,000,000	May 14 – Apr. 17
16	MTIE (Korea Institute of Energy Technology Evaluation and Planning)	Development of High Efficiency Upflow Anaerobic Digestion process in High Capacity Organics	PI	KRW 63,000,000	Nov. 13 –Oct. 14
17	SMBA (Korea Association of Industry, Academy and Research Institute)	Disinfection Process for Combined Sewer Overflow	PI	KRW 95,000,000	Jul. 13 – May 14
18	SMBA (Korea Association of Industry, Academy and Research Institute)	Heavy Metal Removal using a Large-Pore Membrane Filtration	PI	KRW 81,600,000	Jun. 13 – May 14
19	MSI (National Research Foundation, Korea)	Apparatus for Phosphorus Removal in Digester Supernatant	PI	KRW 22,000,000	Sep. 12 – Jan. 13

20	SMBA (Korea Association of Industry, Academy and Research Institute)	WACTS (Waste heat, Alkaline, and crushing Pretreatment for Thickened Sludge) Process for energy self-sufficiency in wastewater treatment	PI	KRW 78,666,000	Jul. 12 – Jun. 13
21	SMBA (Korea Association of Industry, Academy and Research Institute)	Sludge Treatment using SAMAP (Solubilization-Anaerobic digestion-Magnesium Ammonium Phosphate) System	PI	KRW 59,827,000	Jun. 11 – May 12
22	SMBA (Korea Association of Industry, Academy and Research Institute)	Development of Biogas Technology	PI	KRW 23,000,000	Jul. 11 – Jun. 12
23	MSI (National Research Foundation, Korea)	High-rate Bio-Hydrogen Process Fed with Rhodophyta	PI	KRW 139,065,000	May 11 – Apr. 14
24	ME (Gyeongbuk Green Environment Center)	Optimization of Biogas Production by Co-digestion of Sewage Sludge with Animal Waste and Food Waste for the Energy-Independence Program	PI	KRW 30,000,000	Apr. 11 – Dec. 11
25	MTIE (Korea Industrial Complex corporation)	Upgrading of Inorganic By-Product for Eco-Industrial Park	PI	KRW 35,000,000	May 10 – May 11

* MSI = Ministry of Science and ICT, Republic of Korea

* SMBA = Small and Medium Business Administration, Republic of Korea

* ME = Ministry of Trade, Industry & Energy, Republic of Korea

* MOE = Ministry of Environment, Republic of Korea

4.2 Technology Transfer

No.	Technology	Industry	Date	Amount
1	Phosphorus removal in digestate	Wiltech Co., Ltd.	Nov. 12, 2012	KRW 5,000,000
2	Ozone microbubble generation using sonication	Goseong Co., Ltd.	Nov. 28, 2014	KRW 6,000,000
3	Disinfection using chlorine dioxide	Kwang Young Hightech Co., Ltd.	Sep. 16, 2015	KRW 6,000,000

4.3 Professional Societies and Committees

2018 - present Member of Yong Korean Academy of Science and Technology

2018 - present	Editor of Korean Society of Environmental Engineers
2011 - present	Conference Organizing Committee of Korean Society of Water and Wastewater
2017 - 2018	Guest Editor of Bioresource Technology
2014 - 2017	Editorial Board of Korean Society of Environmental Engineers
2014 - 2015	Vice chair of General Affair Committee of Korean Society of Waste Management
2011 - present	Director of Conference Organizing Committee of Korea Organic Resource Recycling Association
2010 - present	Editorial Board of Korean Society of Water and Wastewater

4.4 Editorial Services for SCI Journals

- Guest Editor of Bioresource Technology (SI: Special Issue from ICAFEE-2018)
- Guest Editor of Fuel (SI: Special Issue from ICAFEE-2018)
- Guest Editor of Bioresource Technology (SI: Special Issue from ICAFEE-2017)

4.5 Referee Services for SCI Journals

- Bioresource Technology, Fuel, Renewable & Sustainable Energy Reviews, Chemical Engineering Journal, International Journal of Hydrogen Energy, Process Biochemistry, Water Environment Research, Water Research, Journal of Environmental Engineering and Science, Applied Engineering in Agriculture, Waste Management, Environmental Engineering Review, Waste and Biomass Valorization, BMC Energy, Renewable Energy

5.0 Institutional Services

5.1 Daegu University

Director, Project Management Office of LINC Project	Aug. 2014 – Aug. 2016
Head, Dept. of Environmental Engineering	Mar. 2012 – Feb. 2014
Program Director, Environmental Engineering, ABEEK	Mar. 2010 – Feb. 2011