

Dr. Xiuping Zhu

Assistant Professor

Department of Civil and Environmental Engineering, 3240G Patrick Taylor Hall,
Louisiana State University, Baton Rouge, LA 70803

Office Phone: 225-578-1523; Cell Phone: 814-880-9829

Email: xzhu@lsu.edu. Website: <http://sites01.lsu.edu/faculty/xzhu/>

Education

2011 Ph.D. in Environmental Engineering, Peking University, Beijing, China

2005 B.S. in Environmental Engineering, Beihang University, Beijing, China

Professional Positions

Assistant Professor Louisiana State University (August 15, 2016 – present)

Postdoctoral Researcher Pennsylvania State University (August 1, 2011 - July 22, 2016)

Professional Memberships

International Society of Microbial Electrochemical Technologies (ISMET) (Since 2012)

Electrochemical Society (ECS) (Since 2013)

American Chemical Society (ACS) (Since 2015)

Association of Environmental Engineering and Science Professors (AEESP) (Since 2015)

Society of Women Engineers (SWE) (Since 2015)

Awards and Honors

Louisiana Sea Grant LA DIA Fellowship (2017)

Louisiana Sea Grant

National Excellent Doctoral Dissertation Award (2013)

Ministry of Education, China

Top Ten Ph.D. Candidate Award (2011)

Peking University

Outstanding Ph.D. Candidate Award (2010)

Ministry of Education, China

Academic Innovation Award (2007)

Peking University

Research Projects

Development of novel-battery systems to harvest salinity gradient energy between seawater and river water. (PI: Xiuping Zhu). Louisiana Board of Regents, Research Competitiveness Subprogram. June 1, 2017-June 30, 2020. \$134,750.

Microbial electrodialysis cells for wastewater treatment and water recycling in space. (PI: Xiuping Zhu). NASA, LaSPACE Research Enhancement Award. July 1, 2017 – June 30, 2018. \$34,475.

Desalination of salt water for agriculture based on a novel battery system. (PI: Xiuping Zhu). Louisiana Water Resources Research Institute. March 1, 2017- February 28, 2018. \$15,400.

Development of a NaSG battery to harvest salinity gradient energy between seawater and river water. Louisiana State University, Faculty Research Grant. July 1, 2017 - June 30, 2018. \$10,000.

Enhancing salinity gradient energy recovery based on Na-ion salinity gradient batteries (PI: Xiuping Zhu, Co-PI: Y. Wang). National Science Foundation, Energy for sustainability. September, 2018-August, 2021. \$299,535. (Under review)

Journal Publications (1833 citations based on Google Scholar, H-index = 23)

1. **Zhu, X. P.**; Xu, W.W.; Tan, G.C.; Wang, Y. Na-ion salinity gradient batteries for efficient salinity gradient energy recovery with nanostructured open framework hexacyanoferrate electrodes. *ChemSusChem* (under review)
2. **Zhu, X. P.**; Kim, T.; Rahimi, M.; Gorski, C.A.; Logan, B. E. Integrating Reverse-electrodialysis stacks with flow batteries for improved energy recovery from salinity gradient and energy storage. *ChemSusChem*. 2017, 10: 1-8
3. Jiang, Y.; **Zhu, X. P.**; Xing, X. Electrochemical oxidation of phenolic compounds at boron-doped diamond anodes structure -reactivity relationships. *The Journal of Physical Chemistry A*. 2017, 121: 4326–4333.
4. Yilmazel, Y. D.; **Zhu, X. P.**; Kim, K. Y.; Holmes, D. E.; Logan, B. E. Electrical current generation in microbial electrolysis cells by hyperthermophilic archaea *Ferroglobus placidus* and *Geoglobus ahangari*. *Bioelectrochemistry*. 2018, 119: 142–149
5. Martinez, C.M.; **Zhu, X. P.**; Logan, B. E. AQDS Immobilized solid-phase redox mediators and their role during bioelectricity generation and RR2 decolorization in air-cathode single-chamber microbial fuel cells. *Bioelectrochemistry*, 2017, 118: 123-130
6. Rahimi, M.; Schoener Z.; **Zhu, X. P.**; Zhang, F.; Gorski, C.A.; Logan, B. E. Removal of copper from water using a thermally regenerative electrodeposition battery. *Journal of Hazardous Materials*. 2017, 322: 551-556
7. Tian, Y. S.; He, W. H.; **Zhu, X. P.**; Yang, W. L.; Ren, N. Q.; Logan, B. E. Improved electrocoagulation reactor for rapid removal of phosphate from wastewater. *ACS Sustainable Chemistry & Engineering*, 2017, 5(1): 67-71.
8. Rahimi, M.; Zhu, L.; Kolawski, K.L.; **Zhu, X. P.**; Gorski, C.A.; Hickner, M.A.; Logan, B. E. Improved electrical power production of thermally regenerative batteries using a poly(phenylene oxide) based anion exchange membrane. *Journal of Power Sources*. 2017, 342: 956-963
9. **Zhu, X. P.**; Rahimi, M.; Gorski, C.; Logan, B. E. A thermally-regenerative ammonia-based flow battery for electrical energy recovery from waste heat. *ChemSusChem*, 2016, 9: 873–879
10. He, W. H.; Wallack, M. J.; Kim, K.Y.; Zhang, X.; Yang, W. L.; **Zhu, X. P.**; Feng, Y. J.; Logan, B. E. The effect of flow modes and electrode combinations on the performance of a multiple module microbial fuel cell installed at wastewater treatment plant. *Water Research*. 2016, 105: 351-360
11. He, W. H.; Yang, W. L.; Tian, Y. S.; **Zhu, X. P.**; Liu, J.; Feng, Y. J.; Logan, B. E. Pressurized air cathodes for enhanced stability and power generation by microbial fuel cells. *Journal of Power Sources*. 2016, 332:447-453
12. Ye, Y. L.; **Zhu, X. P.**; Logan, B. E. Effect of buffer charge on performance of air-cathodes used in microbial fuel cells. *Electrochimica Acta*, 2016, 194: 441–447
13. Tian, Y. S.; He, W. H.; **Zhu, X. P.**; Yang, W. L.; Ren, N. Q.; Logan, B. E. Energy efficient electrocoagulation using an air-breathing cathode to remove nutrients from wastewater. *Chemical Engineering Journal*, 2016, 292: 308–314
14. **Zhu, X. P.**; He, W. H.; Logan, B. E. Influence of solution concentration and composition on the performance of reverse electrodialysis cells. *Journal of Membrane Science* 2015, 486:215-221.
15. **Zhu, X. P.**; He, W. H.; Logan, B. E. Reducing pumping energy by using different flow rates of high and low concentration solutions in reverse electrodialysis cells. *Journal of Membrane Science* 2015, 486:215-221.
16. **Zhu, X. P.**; Siegert, M.; Yates, M. D.; Logan, B. E. Alamethicin suppresses methanogenesis and promotes acetogenesis in bioelectrochemical systems. *Applied and Environmental Microbiology* 2015, 81: 3863-3868.

17. He, W. H.; Zhang, X. Y.; Liu, J.; **Zhu, X. P.**; Feng, Y. J.; Logan, B. E. Microbial fuel cells with an integrated spacer and separate anode and cathode modules. *Environmental Science: Water Research & Technology* 2015, DOI: 10.1039/C5EW00223K
18. **Zhu, X. P.**; Yang, W. L., Hatzell, M. C.; Logan, B. E. Energy recovery from solutions with different salinities based on swelling and contraction of hydrogels. *Environmental Science & Technology* 2014, 48:7157-7163.
19. **Zhu, X. P.**; Yates, M. D.; Hatzell, M. C.; Rao, H. A.; Saikaly, P. E.; Logan, B. E. Microbial community composition is unaffected by anode potential. *Environmental Science & Technology* 2014, 48: 1352-1358.
20. **Zhu, X. P.**; Yates, M. D.; Hatzell, M. C.; Rao, H. A.; Saikaly, P. E.; Logan, B. E. Reply to "Strain level variation in biofilms selected at different anode potentials: a response to Zhu et al.". *Environmental Science & Technology* 2014, 48: 14853-14854.
21. **Zhu, X. P.**; Hatzell, M. C.; Logan, B. E. Microbial reverse-electrodialysis electrolysis and chemical-production cell for H₂ production and CO₂ sequestration. *Environmental Science & Technology Letters* 2014, 1:231-235.
22. **Zhu, X. P.**; Logan, B. E. Microbial electrolysis desalination and chemical-production cell for CO₂ sequestration. *Bioresource Technology* 2014, 159:24-29.
23. **Zhu, X. P.**; Logan, B. E. Copper anode corrosion affects power generation in microbial fuel cells. *Journal of Chemical Technology and Biotechnology* 2014, 89: 471-474.
24. Hatzell, M. C.; **Zhu, X. P.**; Logan, B. E. Simultaneous hydrogen generation and waste acid neutralization in a reverse electro-dialysis system. *ACS Sustainable Chemistry & Engineering* 2014, 2: 2211-2216.
25. Hou, H. J.; Chen, X. F.; Liu, J.; **Zhu, X. P.**; Bazan, G.C.; Logan, B. E. Repression of hydrogen uptake by using conjugated oligoelectrolytes in microbial electrolysis cells. *International Journal of Hydrogen Energy* 2014, 39: 19407-19415.
26. Siegert, M.; Yates, M. D.; Call, D. F.; **Zhu, X. P.**; Spormann, A.; Logan, B. E. Comparison of non-precious metal cathode materials for methane production by electromethanogenesis. *ACS Sustainable Chemistry & Engineering* 2014, 2: 910-917.
27. Hatzell, M. C.; Ivanov, I.; Cusick, R. D.; **Zhu, X. P.**; Logan, B. E. Comparison of hydrogen production and electrical power generation for energy capture in closed-loop ammonium bicarbonate reverse electro-dialysis systems. *Physical Chemistry Chemical Physics* 2014, 16: 1632-1638.
28. **Zhu, X. P.**; Hatzell, M. C.; Cusick, R. D.; Logan, B. E. Microbial reverse-electrodialysis chemical-production cell for acid and alkali production. *Electrochemistry Communications* 2013, 31, 52-55.
29. **Zhu, X. P.**; Logan, B. E. Using single-chamber microbial fuel cells as renewable power sources for electro-Fenton treatment of organic pollutants. *Journal of Hazardous Materials* 2013, 252-253, 198-203.
30. **Zhu, X. P.**; Tokash, J. C.; Hong, Y. Y; Logan, B.E. Controlling the occurrence of power overshoot by adapting microbial fuel cells to high anode potentials. *Bioelectrochemistry* 2013, 90, 30-35.
31. **Zhu, X. P.**; Yates, M. D.; Logan, B. E. Set potential regulation reveals additional oxidation enzyme peaks of *Geobacter sulfurreducens* anodic biofilms. *Electrochemistry Communications* 2012, 22, 116-119.
32. Xing, X.; **Zhu, X. P.**; Li, H. N.; Jiang, Y; Ni, J. R. Electrochemical oxidation of nitrogen- heterocyclic compounds at boron-doped diamond electrode. *Chemosphere* 2012, 86, 368-375.
33. **Zhu, X. P.**; Ni, J. R.; Wei, J. J.; Xing, X.; Li, H. N.; Jiang, Y. Scale-up of B-doped diamond anode system for electrochemical oxidation of phenol simulated wastewater in batch mode. *Electrochimica Acta* 2011, 56, 9437-9447.

34. **Zhu, X. P.**; Ni, J. R. The improvement of boron-doped diamond anode system in electrochemical degradation of *p*-nitrophenol by zero-valent iron. *Electrochimica Acta* 2011, 56, 10371-10377.
35. **Zhu, X. P.**; Ni, J. R.; Xing, X.; Li, H. N.; Jiang, Y. Synergies between electrochemical oxidation and activated carbon adsorption in three-dimensional boron-doped diamond anode system. *Electrochimica Acta* 2011, 56, 1270-1274.
36. **Zhu, X. P.**; Ni, J. R.; Wei, J. J.; Xing, X.; Li, H. N.; Jiang, Y. Destination of organic pollutants during electrochemical oxidation of biologically-pretreated dye wastewater using boron-doped diamond anode. *Journal of Hazardous Materials* 2011, 189, 127-133.
37. Wei, J. J.; **Zhu, X. P.**; Ni, J. R. Electrochemical oxidation of phenol at boron-doped diamond electrode in pulse current mode. *Electrochimica Acta* 2011, 56, 5310-5315.
38. Wei, J. J.; **Zhu, X. P.**; Lu, F. X.; Ni, J. R. Comparative study of oxidation ability between boron-doped diamond (BDD) and lead oxide (PbO₂) electrodes. *International Journal of Minerals Metallurgy and Materials* 2011, 18, 589-593.
39. Li, H. N.; **Zhu, X. P.**; Ni, J. R. Comparison of electrochemical method with ozonation, chlorination and monochloramination in drinking water disinfection. *Electrochimica Acta* 2011, 56, 9789-9796.
40. **Zhu, X. P.**; Ni, J. R.; Li, H. N.; Jiang, Y.; Xing, X.; Borthwick, A. Effects of ultrasound on electrochemical oxidation mechanisms of *p*-substituted phenols at BDD and PbO₂ anodes. *Electrochimica Acta* 2010, 55, 5569-5575.
41. **Zhu, X. P.**; Ni, J. R.; Wei, J. J.; Xing, X.; Li, H. N.; Jiang, Y. Scale-up of BDD anode system for electrochemical oxidation of phenol simulated wastewater in continuous mode. *Journal of Hazardous Materials* 2010, 184, 493-498.
42. Li, H. N.; **Zhu, X. P.**; Ni, J. R. Inactivation of Escherichia coli in Na₂SO₄ electrolyte using boron-doped diamond anode. *Electrochimica Acta* 2010, 56, 448-453.
43. Li, H. N.; **Zhu, X. P.**; Jiang, Y.; Ni, J. R. Comparative electrochemical degradation of phthalic acid esters using boron-doped diamond and Pt anodes. *Chemosphere* 2010, 80, 845-851.
44. Jiang, Y.; **Zhu, X. P.**; Li, H. N.; Ni, J. R. Effect of nitro substituent on electrochemical oxidation of phenols at boron-doped diamond anodes. *Chemosphere* 2010, 78, 1093-1099.
45. Cheng, J.; **Zhu, X. P.**; Ni, J. R.; Borthwick, A. Palm oil mill effluent treatment using a two-stage microbial fuel cells system integrated with immobilized biological aerated filters. *Bioresource Technology* 2010, 101, 2729-2734.
46. **Zhu, X. P.**; Ni, J. R. Simultaneous processes of electricity generation and *p*-nitrophenol degradation in a microbial fuel cell. *Electrochemistry Communications* 2009, 11, 274-277.
47. **Zhu, X. P.**; Ni, J. R.; Lai P. Advanced treatment of biologically pretreated coking wastewater by electrochemical oxidation using boron-doped diamond electrodes. *Water Research* 2009, 43, 4347-4355.
48. **Zhu, X. P.**; Tong, M. P.; Shi, S. Y.; Zhao, H. Z.; Ni, J. R. Essential explanation of the strong mineralization performance of boron-doped diamond electrodes. *Environmental Science & Technology* 2008, 42, 4914- 4920.
49. **Zhu, X. P.**; Shi, S. Y.; Wei, J. J.; Lv, F. X.; Zhao, H. Z.; Kong, J. T.; He, Q.; Ni, J. R. Electrochemical oxidation characteristics of *p*-substituted phenols using a boron-doped diamond electrode. *Environmental Science & Technology* 2007, 41, 6541-6546.
50. Kong, J. T.; Shi, S. Y.; Kong, L. C.; **Zhu, X. P.**; Ni, J. R. Preparation and characterization of PbO₂ electrodes doped with different rare earth oxides. *Electrochimica Acta* 2007, 54, 2048-2054.

Patents

1. Logan, B. E.; Rahimi, M.; Schoener Z.; **Zhu, X. P.**; Gorski, C. A. Copper removal from wastewater using thermally regenerative battery. Application No. 62280940. (2016)

2. Ni, J. R.; **Zhu, X. P.**; Wei, J. J. A novel reactor for phenol simulated wastewater treatment. Granted No. 201010222308. (2011)
3. **Zhu, X. P.**; Ni, J. R.; Cheng P. Advanced treatment of *Dioscorea zingiberensis* C. H. Wright wastewater. Granted No. 201010222284. (2010)
4. **Zhu, X. P.**; Ni, J. R. A technology for bio-refractory pharmaceutical wastewater treatment. Granted No. 201010222306. (2010)
5. Ni, J. R.; **Zhu, X. P.** A technology for advanced treatment of landfill leachate. Granted No. 201010222275. (2010)

Conference presentations

1. **Zhu, X.P.**; Sidan Lu. Microbial electrodialysis cells for wastewater treatment and water recycling in space. *Oral presentation* at LaSPACE Fall 2017 Council Meeting. Louisiana State University, USA, Nov. 17-18, 2017.
2. **Zhu, X. P.**; Kim T.; Rahimi, M.; Gorski, C.A.; Logan, B. E. Reverse-electrodialysis cells for salinity gradient energy recovery between seawater and river water. *Oral presentation* at Eleventh Annual Louisiana Groundwater, Surface Water & Water Resources Symposium. Louisiana State University, USA, April 11-12, 2017.
3. **Zhu, X. P.**; Siegert, M.; Yates, M. D.; Logan, B. E. Alamethicin Suppresses Methanogenesis and Promotes Acetogenesis in Bioelectrochemical Systems. *Oral presentation* at 3th Meeting of the North American branch of the International Society for Microbial Electrochemistry and Technology, Stanford University, Stanford, CA, USA, Oct. 6, 2016.
4. **Zhu, X. P.**; Logan, B. E. A thermally-regenerative ammonia-based flow battery for electrical energy recovery from waste heat. *Oral presentation* at Kappe Environmental Engineering Seminar, the Pennsylvania State University, USA, Nov. 11, 2015.
5. **Zhu, X. P.**; He, W. H., M. D.; Logan, B. E. Saving pumping energy by using different flow rates of high and low concentration solutions in reverse electrodialysis cells. *Poster presentation* at 2015 AEESP Research and Education Conference, Yale University, USA, Jun. 13-15, 2015.
6. **Zhu, X. P.**; Hatzell, M. C.; Logan, B. E. Microbial reverse-electrodialysis chemical-production cell for H₂ generation and CO₂ sequestration. *Oral presentation* at the 224th Annual Meeting of the International Society of Electrochemistry (ECS), San Francisco, USA, Oct. 27-Nov. 1, 2013.
7. **Zhu, X. P.**; Logan, B. E. Microbial electrolysis desalination and chemical-production cell for CO₂ sequestration. *Oral presentation* at Kappe Environmental Engineering Seminar, the Pennsylvania State University, USA, Feb. 27, 2013.
8. **Zhu, X. P.**; Tokash, J. C.; Hong, Y. Y; Logan, B.E. Influence of anode potentials on power overshoot in microbial fuel cells. *Oral presentation* at the 244th American Chemical Society (ACS) National Meeting & Exposition, Philadelphia, USA, Aug. 19-23, 2012.
9. **Zhu, X. P.**; Yates, M. D.; Logan, B. E. Potential regulation on extracellular electron transfer processes of *Geobacter sulfurreducens*. *Poster presentation* at the North American meeting of the International Society for Microbial Electrochemistry (NA-ISMET), Cornell University, USA, Oct. 8-10, 2012.
10. **Zhu, X. P.**; Yates, M. D.; Logan, B. E. Potential regulation on extracellular electron transfer processes of *Geobacter sulfurreducens*. *Poster presentation* at 5th Annual Postdoc Research Exhibition, the Pennsylvania State University, USA, May. 7, 2012.
11. **Zhu, X. P.**; Ni, J. R. The improvement of boron-doped diamond anode system in electrochemical degradation of *p*-nitrophenol by zero-valent iron. *Oral presentation* at the 61st Annual Meeting of the International Society of Electrochemistry, Nice, France, Sep. 26-Oct. 1, 2010.

12. **Zhu, X. P.**; Ni, J. R. Application of PbO₂ electrodes as cathode materials in microbial fuel cells. *Poster presentation* at the 1st International Forum on Microbial Fuel Cells in China, Harbin, China, Nov. 3-4, 2008.

Invited presentations

1. Renewable energy and power generation. E.J. Ourso College of Business, Louisiana State University Feb. 14, 2017.
2. Water-Energy nexus based on electrochemical systems. College of Life and Environmental Sciences *Minzu University of China*, Dec. 27, 2016.
3. Water-Energy nexus based on electrochemical systems. College of Environmental Science and Engineering. *Huazhong University of Science and Technology*, Dec. 22, 2016.

Teaching

CE 7105 Advanced Topics in Water Quality and Treatment (Fall 2017)

EVEG 4780 Renewable Energy and Power Generation (Spring 2017, Course evaluation: 3.498)

EVEG 3110 Water and Wastewater Treatment (Fall 2016, Course evaluation: 3.278)

Student Advising

Ph.D. students: Guangcai Tan (Aug. 2017 – present), Sidan Lu (Aug. 2017 – present)

Master students: Haihui Zhu (Aug. 2017 – present), Elizabeth Whiddon (Aug. 2017 – present)

Undergraduate students: Tristan Pluta (Aug. 2016 – present), Matthew Gordon (Aug. 2016 – Jul. 2017)

Journal Review

Water Environmental Research (since 2016)

Bioelectrochemistry (since 2016)

International Journal of Environmental Science and Technology (since 2015)

Bioresource Technology (since 2015)

Ecological Engineering (since 2015)

Chemical Engineering Journal (since 2014)

Journal of Chemical Technology and Biotechnology (since 2013)

Electrochemistry Communications (since 2013)

Journal of Hazardous Materials (since 2013)

Environmental Science & Technology Letters (since 2013)

Electrochimica Acta (since 2012)

Environmental Science & Technology (since 2008)

Synergistic Activities

Member of College Policy Committee in College of Engineering at Louisiana State University, August 2017-present.

Science Research Mentor for middle school students at the Caddo Middle Magnet School and Kenilworth Science and Technology Charter School, Louisiana, 2016-present.

Advisor for Environmental Engineering undergraduates at Louisiana State University, 2016-present.