

Yunfeng Zhai, PhD, Chem. Eng.

Assistant Researcher

Hawaii Natural Energy Institute

School of Ocean & Earth Science & Technology

University of Hawaii at Manoa

Ph: 808-593-1714 Email: yunfeng@hawaii.edu

RESEARCH INTERESTS

- Develop new materials for fuel cells, secondary batteries, and other electrochemical renewable energy convert or store systems
- Develop novel technologies for water purification and waste water treatment
- Test and diagnosis PEMFC stability and durability, and the components degradation
- Develop strategies to mitigate contaminants effect on PEMFC and restore the cell performance

EXPERIENCE

03/15-present: Assistant researcher, HNEI, University of Hawaii at Manoa

- Development of recovery strategies for contaminated proton exchange membrane fuel cells (PEMFCs)
- Airborne and system contaminants effect on proton exchange membrane fuel cells
- Research and Development of electrolytes and electrodes for flow batteries
- Development of novel technologies for water purification and waste water treatment

02/11-02/15: Junior researcher, HNEI, University of Hawaii at Manoa

- Airborne and system contaminants effect on proton exchange membrane fuel cells

11/07-01/11: Post-Doctoral Fellow, HNEI, University of Hawaii at Manoa

- Sulfur dioxide effect on proton exchange membrane fuel cells

12/04-10/07: Research Associate, Dalian Institute of Chemical Physics (DICP)-SAMSUNG Fuel Cell Lab, Dalian, China

- Studies on performance degradation of H₃PO₄/PBI high temperature PEMFC
- R&D of composite membrane for high temperature PEMFC

07/03-11/04: Research Associate, Dalian Institute of Chemical Physics (DICP), Chinese Academy of Sciences (CAS), Dalian, China

- R&D of new materials for proton conductive membrane at middle temperature (120 °C-180°C)

02/02-06/02: Research Assistant, Kay Lab for Special Functional Materials, Kaifeng, China

- Studies on Photo-catalytic Degradation of Toluene by La Doped TiO₂

EDUCATION

10/07 Ph.D in Chemical Engineering, Chinese Academy of Sciences (CAS), China

- Studies on performance degradation of H₃PO₄/PBI high temperature PEMFC and R&D of high temperature proton conductive membrane

06/02 B.S in Chemical Engineering & Technology, He'nan University, China

- Studies on Photo-catalytic Degradation of Toluene by La Doped TiO₂

PROFESSIONAL AFFILIATIONS

Member: The Electrochemical Society, American Chemical Society.

SELECTED PUBLICATIONS

Y. Zhai and J. St-Pierre, Acetonitrile Contamination in Cathode of Proton Exchange Membrane Fuel Cells and the Cell Performance Recovery, *Applied Energy*, 242: 239-247, 2019.

Y. Zhai and J. St-Pierre, Tolerance and mitigation strategies of proton exchange membrane fuel cells subject to acetylene contamination, *Int. J. Hydrog. Energy*, 43: 17475-17479, 2018.

Y. Zhai, J. Ge and J. St-Pierre, Effect of Acetonitrile Contamination on Long-Term Degradation of Proton Exchange Membrane Fuel Cells, *J. Electrochem. Soc.*, 165: F3191-F3199, 2018.

Y. Zhai and J. St-Pierre, Impact of Operating Conditions on the Acetylene Contamination in the Cathode of Proton Exchange Membrane Fuel cells, *J. Power Sources*, 372:134–144, 2017.

Y. Zhai and J. St-Pierre, Acetylene Contamination Reactions in cathode of Proton Exchange Membrane Fuel Cells, *ChemElectroChem*, 4:655–670, 2017.

Y. Zhai, O. Baturina, D. Ramaker, E. Farquhar, J. St-Pierre, and K. Swider-Lyons, Bromomethane contamination in the Cathode of Proton Exchange Membrane Fuel Cells, *Electrochim. Acta.*, 213:482-489, 2016.

Y. Zhai, J. Ge and J. St-Pierre, The ionic conductivity and catalyst activity effects of acetonitrile on proton exchange membrane fuel cells, *Electrochem. Comm.*, 66:49-52, 2016.

Y. Zhai, O. Baturina, D. Ramaker, E. Farquhar, J. St-Pierre, and K. Swider-Lyonsb, Chlorobenzene Poisoning and Recovery of Platinum-Based Cathodes in Proton Exchange Membrane Fuel Cells, *J. Phys. Chem. C*, 119 (35): 20328–20338, 2015.

Y. Zhai and J. St-Pierre, Proton exchange membrane fuel cell cathode contamination - Acetylene, *J. Power Sources*, 279:165-171, 2015.

Y. Zhai, G. Bender, S. Dorn, K. Bethune and R. Rocheleau, Influence of Cell Temperature on Sulfur Dioxide Contamination in Proton Exchange Membrane Fuel Cells, *J. Power Sources*, 247: 40-48, 2014.

Y. Zhai, K. Bethune, S. Dorn, G. Bender and R. Rocheleau, Analysis of the SO₂ Contamination Effect on the Oxygen Reduction Reaction in PEMFCs by Electrochemical Impedance Spectroscopy, *J. Electrochem. Soc.*, 159(5):B524-B530, 2012.

Y. Zhai, G. Bender, S. Dorn and R. Rocheleau, The Multi-process Degradation of PEMFC Performance Due to Sulfur Dioxide Contamination and Its Recovery, *J. Electrochem. Soc.*, 157(1):B20-B26, 2010.