

Yong-Uk Shin

Department of Chemical and Environmental Engineering, Yale University

Tel: +1-(203)-390-0740, Email: yonguk.shin@yale.edu

EDUCATION

Ph.D. (Feb. 2020) Environmental Engineering, Korea University, 145 Anam-ro, Seongbuk-gu, Seoul, 02841, South Korea.
[GPA: 3.96/4.50]

Thesis title: Electrochemical Oxidative Treatment of Aquatic Pollutants: Exploring Hybrid Processes and New Metal-Free Electrocatalysts. (Advisor: Prof. Jaesang lee)

M.S. (Feb. 2012) Civil & Environmental Engineering, Yonsei University, 50 Yonsei-ro Seodaemun-gu, Seoul, 03722, South Korea. [GPA: 4.18/4.50]

Thesis title: A study on removal efficiency of nitrate in groundwater using hollow-fiber membrane biofilm reactor. (Advisor: Prof. Younkyoo Choung)

B.S. (Feb. 2008) Civil & Environmental Engineering, Chung-Ang University, 84 Heukseok-ro, Dongjak-gu, Seoul, South Korea. [GPA: 3.58/4.50]

EMPLOYMENT

Yale University in New Haven, CT, USA 2021 -Pre.
Postdoctoral Researcher (Advisor : Prof. Menachem Elimelech)

Korea University in Seoul, South Korea 2020 -2021
Postdoctoral Researcher (Advisor : Prof. SeungKwan Hong)

HALLA Corporation in Seoul, South Korea 2012 - 2015
Assistant manager

Korea Institute of Science and Technology (KIST) in Seoul, South Korea 2012
Researcher staff

LG Electronics in Seoul, South Korea 2011
Researcher staff

RESEARCH BACKGROUND & INTERESTS

- **ENVIRONMENTAL REMEDIATION**
 - ✓ Electrochemical advanced oxidation (EAOPs) and electro-Fenton reaction.
 - ✓ Investigation on the decomposition mechanism of aquatic pollutants.
 - ✓ Capacitive deionization and Flow-electrode capacitive deionization (FCDI) Process.
- **ADVANCED ELECTROCATALYST AND ELECTROCATALYTIC INTERFACE MECHANISTIC ANALYSIS**
 - ✓ Electrosorption, Oxygen evolution, hydrogen evolution and other electrocatalysis.
 - ✓ Electro analysis and electrochemical sensors.
- **ENERGY/ENVIRONMENTAL NANO-MATERIALS**
 - ✓ Environmental-friendly and cost-effective fabrication of composite materials.
 - ✓ 2D nanomaterials and electrocatalysts (graphene, Black phosphorus, et al)

AWARD

1. **Best paper award** by Korea University (2019)
2. **Best paper award** by Korea University (2018)
3. **Excellent paper presentation award** by Korean Society of Environmental Engineers (KSEE) (2011)
4. **Best poster presentation award** by Korean Society of Environmental Engineers (KSEE) (2010)
5. **Outstanding graduation student award** by Chung-Ang University (2008)

RESEARCH PERFORMANCE

A. **PUBLISHED and IN PROGRESS**

1. **Yong-Uk Shin**, Ha-Young Yoo, Seonghun Kim, Kyung-Mi Chung, Yong-Gyun Park, Kwang-Hyun Hwang, Seok Won Hong, Hyunwoong Park, Kangwoo Cho, and Jaesang Lee, "Sequential Combination of Electro-Fenton and Electrochemical Chlorination Processes for Treatment of Anaerobically-Digested Food Wastewater" *Environmental Science & Technology*, 2017,51, 10700-10710
2. **Yong-Uk Shin**, Ha-Young Yoo, Yong-Yoon Ahn, Min Sik Kim, Kang Lee, Seungho Yu, Changha Lee, Kangwoo Cho, Hyoung-il Kim, and Jaesang Lee "Electrochemical Oxidation of Organics in Sulfate Solutions on Boron-Doped Diamond Electrode: Multiple Pathways for Sulfate Radical Generation" *Applied Catalysis B: Environmental*, 2019, (254), 156-165
3. **Yong-Uk Shin**, Eun-Tae Yun, Junghyun kim, Seungkwan Hong and Jaesang Lee "An Electrolysis-Membrane Distillation Hybrid Process: Utilizing Electric Resistance Heating for Distillation and Anodically Formed Persulfate for Membrane Fouling and Wetting Mitigation" *Environmental Science & Technology*, 2020
4. **Yong-Uk Shin**, Jihun Lim, Chanhee Boo, SeungKwan Hong "Improving the Applicability and Feasibility of Flow-Electrode Capacitive Deionization (FCDI): A Review on Process Optimization and Energy Efficiency" *Desalination*, 2021
5. **Yong-Uk Shin**, Jihun Lim, Seungkwan Hong "Integrating electrochemical oxidation and flow-electrode capacitive deionization for enhanced organic degradation and perchlorate removal in high salinity waters" *water Research* (**submitted**)
6. **Yong-Uk Shin**, Jihun Lim, Seungkwan Hong "Electrochemical Degradation of Organic Pollutants Coupled with Oxidants Activation using a Black Phosphorus Anode" (**In preparation**)
7. **Yong-Uk Shin**, Jihun Lim, Seungkwan Hong "Novel TiO₂ nanotube arrays for trace organic pollutant degradation coupled with flow-electrode capacitive deionization for low-energy desalination of brackish water" *npj clean water* (**submitted**)
8. **Yong-Uk Shin**, Jihun Lim, Seungkwan Hong "Aqueous electrolyte effect of capacitive deionization of flow electrode using desulfurized wastewater and improvement of desalination treatment capacity" (**In preparation**)
9. Jihun Lim, **Yong-Uk Shin**, Seungkwan Hong "Perovskite solar cell-Flow electrode capacitive deionization (FCDI): High performance, Energy minimization strategies, biochar assessment and applications via contaminated groundwater" (**In preparation**)
10. Yelim Kim, Hong-shin Lee, **Yong-Uk Shin** and Jaesang Lee "Reaction pathway of organic pollutant decomposition under periodate anolyte using BDD electrode" (**In preparation**)

B. **PATENTS (KOREAN PATENT)**

1. Hong-shin Lee, Jaesang Lee, Jaesung Kim, **Yong-Uk Shin**, "A novel synthesis method of platinumized core-shell tungsten oxide (Pt-WO₂-WO₃) nanoparticles as an efficient visible light catalyst"
2. Hong-shin Lee, Jaesang Lee, Jaemin Choi, **Yong-Uk Shin**, Moongyu Kim, Geondu Kim "Portable hydrogen peroxide detection tape and method for preparing the same"
3. Seungkwan Hong, Dongwan Kim, Jaesang Lee, Junhong Noh, **Yong-Uk Shin** "A desalination system"
4. **Yong-Uk Shin**, Jaesang lee, Dongwan Kim, Eun-tae Yun "Wastewater treatment system using an

electrochemical oxidation and a membrane distillation process and wastewater treatment method using the same”

5. **Yong-Uk Shin**, Sengwoo Bae “Method and apparatus for activated sludge process with submerged membrane operating alternatively”
6. **Yong-Uk Shin**, Hong-shin Lee, Jaesang Lee, Jaemin Choi “Two-dimensional black phosphorus anode materials based electrochemical wastewater treatment system and method for preparing the same”

c. PRESENTATION IN INTERNATIONAL & DOMESTIC CONFERENCES

1. **Yong-Uk Shin**, Jaesang Lee, “Multiple pathways for sulfate radical production during Electrolysis at Boron-doped diamond electrode”, American chemical society national meeting & exposition, August 25-29, 2019, sandiego, **USA**
2. Jaesang Lee, **Yong-Uk Shin**, “Sequential Combination of Electro-Fenton and Electrochemical Chlorination Processes for Treatment of Anaerobically-Digested Food Wastewater”, 7th IWA-ASPIRE Conference 2017 & Water Malaysia Exhibition, Sep 11 -14, 2017, kuala Lumpur, **Malaysia**
3. **Yong-Uk Shin**, **Younkyoo Choung**, “A study on 1,4-dioxane decomposition using oxygen based membrane biofilm reactor”, Membranes in Drinking and Industrial Water Treatment, June 27-30, 2010, Trondheim, **Norway**
4. **Yong-Uk Shin**, Jaesang Lee, “Application for removal of the High COD and Ammonia by Electro-Fenton and electrolytic oxidation process, Korean Society of Environmental Engineers(KSEE), Aug 17-24, 2017, Cheju Island, **South Korea**
5. **Yong-Uk Shin**, hyunjin Shon, kwanyong Lee, Seokwon Hong, “Evaluation of Advanced Wastewater Treatment MBR Process using Ceramic Membrane”, Water korea, March 21-27, 2012, Il-san, South Korea
6. Hyunjin Shon, **Yong-Uk Shin**, Seokwon Hong, “A Study of Optimal Operation Factors for Sewage Treatment Process Using Ceramic Membrane, Korean Society of Environmental Engineers(KSEE), March 21-27, 2012, Gwangju, **South Korea**
7. **Yong-Uk Shin**, Insang song, Younkyoo Choung “Study on the Change of Nitrogen Removal Efficiency and Biofilm Growth with Hydrogen Pressure in the Denitrification Process Using MBfR”, Korean Society of Environmental Engineers (KSEE), Dec 2-9, 2010, Songdo Incheon, **South Korea**
8. Sooyoung Lee, **Yong-Uk Shin**, Insang song, Younkyoo Choung, “Comparison of Nitrogen Removal Efficiency with Hydrogen Pressure in H₂-based MBfR”, Korean Society of Environmental Engineers(KSEE), May 6-12, 2010, Cheju Island, **South Korea**
9. **Yong-Uk Shin**, Insang song, Younkyoo Choung “A study of Aerobic Composting Application of Sewage Sludge Pretreated Using Microwave and Hot Air”, Korean Society of Environmental Engineers(KSEE), Nov 5-12, 2009, Gwangju, **South Korea**