

Jong Kwon Choe

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Professional

- 2016.9–Present **Assistant Professor, Seoul National University**
Department of Civil and Environmental Engineering
- 2016.1–2016.6 **Assistant Professor, Clarkson University**
Department of Civil and Environmental Engineering
- 2013.11–2015.11 **Postdoctoral Research Fellow, Stanford University**
Department of Civil and Environmental Engineering
Advisor: William Mitch
- 2007.8–2013.10 **Graduate Research Assistant, U. Illinois at Urbana Champaign**
Department of Civil and Environmental Engineering
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Education

- 2013 **Ph.D. in Civil and Environmental Engineering**
University of Illinois at Urbana Champaign, Illinois
Advisors: Charles Werth and Timothy Strathmann (Co-advisors)
Dissertation: Development of a Sustainable Water Treatment Technology for Oxyanions Using Pd-based Catalysts: Catalyst Design, Reaction Mechanisms, and Life Cycle Assessment
- 2009 **M.S. in Civil and Environmental Engineering**
University of Illinois at Urbana Champaign, Illinois
Advisors: Charles Werth and Timothy Strathmann (Co-advisors)
Thesis: Influence of Rhenium Speciation on the Stability and Activity of Palladium/Rhenium Bimetal Catalysts Used for Perchlorate Reduction
- 2007 **B.Eng. in Civil Engineering, summa cum laude**
The Cooper Union for the Advancement of Science and Art, New York
Concentration: Environmental Engineering
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Research Interests

- Redox transformation and byproduct formation of water contaminants
- Catalytic water treatment process
- Nanomaterial synthesis and modification
- Spectroscopic (XPS, XAS) and microscopic characterization (STEM-EDS) of catalyst materials
- Applications of life cycle assessment (LCA) tools to water treatment technologies

Awards and Honors

- 2016 **Recipient of SNU Invitation Program for Distinguished Scholar**, Seoul National University
- 2013 **3rd Place ACS–AEESP Outstanding Student Poster Award**, American Environmental Engineering Society for Professors (AEESP) 50th Anniversary Conference
- 2012 **C. Ellen Gonter Environmental Chemistry Paper Award**, American Chemistry Society (ACS)
- 2011 **Thomas R. Camp Scholarship**, American Water Works Association (AWWA)
- 2007–2010 **Illinois Distinguished Fellowship**, U. Illinois at Urbana Champaign
- 2007 **Carver Fellowship**, U. Illinois at Urbana Champaign
- 2007 **Carollo Engineering Fellowship**, U. Illinois at Urbana Champaign
- 2004–2007 **Harry and Peggy Ploss Fellowships in Engineering**, The Cooper Union

Research Grants

US\$ conversion based on 1\$=1000 KRW

1. “Development of catalytic reduction technology for perfluorinated compounds in water” National Research Foundation of Korea (2017.03-2020.02) \$249,000
2. “Physicochemical interaction of nanomaterials and biomacromolecules” Seoul National University (2017.04-2018.03) \$15,000
3. “Development of Pd-based catalyst technology for nitrate treatment in water and ammonia recovery in ion exchange brine” Doosan Yonkang Foundation (2016.12-2017.11) \$15,000
4. SNU Invitation Program for Distinguished Scholar (2016.09 – 2017.08) \$150,000

Peer Reviewed Publications

1. J. Liu, M. Han, D. Wu, X. Chen, **J. Choe**, C. J. Werth, T. J. Strathmann. (2016) A New Bioinspired Perchlorate Reduction Catalyst with Significantly Enhanced Stability via Rational Tuning of Rhenium Coordination Chemistry and Heterogeneous Reaction Pathway. *Environ. Sci. Technol.* **50**, 5874-5881. <http://dx.doi.org/10.1021/acs.est.6b00886> (2015 impact factor: 5.394)
2. A. M. Bergquist, **J. Choe**, T. J. Strathmann, and C. J. Werth. (2016) Evaluation of a Hybrid Ion Exchange-Catalyst Treatment Technology for Nitrate Removal from Drinking Water. *Water Res.* **96**, 177-187. <http://dx.doi.org/10.1016/j.watres.2016.03.054> (2015 impact factor: 5.991)
3. **J. Choe**, D. H. Richards, C. J. Wilson, and W. A. Mitch. (2015) Degradation of Amino Acids and Secondary Structure in Model Proteins and Bacteriophage MS2 by Chlorine, Bromine and Ozone. *Environ. Sci. Technol.* **49**, 13331-13339. <http://dx.doi.org/10.1021/acs.est.5b03813> (2015 impact factor: 5.394)
4. **J. Choe**, A. M. Bergquist, S. Jeong, J. S. Guest, C. J. Werth, and T. J. Strathmann. (2015) Performance and Environmental Benefits of Recycling of Spent Ion Exchange Brines via Catalytic Reduction. *Water Res.* **80**, 267-280. <http://dx.doi.org/10.1016/j.watres.2015.05.007> (2015 impact factor: 5.991)
5. J. Liu, **J. Choe**, Y. Wang, J. R. Shapley, C. J. Werth, and T. J. Strathmann. (2015) A Bio-inspired Complex-Nanoparticle Hybrid Catalyst System for Aqueous Perchlorate Reduction: Rhenium Speciation and Its

- Influence on Catalyst Activity. *ACS Catal.* **5**, 511-522. <http://dx.doi.org/10.1021/cs501286w> (2015 impact factor: 9.307)
6. **J. Choe**, M. Boyanov, J. Liu, K. M. Kemner, C. J. Werth, and T. J. Strathmann. (2014) X-ray Spectroscopic Characterization of Immobilized Rhenium Species in Hydrated Rhenium-Palladium Bimetallic Catalysts Used for Perchlorate Water Treatment. *J. Phys. Chem. C.* **118**, 11666-11676. <http://dx.doi.org/10.1021/jp5006814> (2015 impact factor: 4.509)
 7. D. R. Vardon, B. K. Sharma, H. Jaramillo, D. Kim, **J. Choe**, P. N. Ciesielski, and T. J. Strathmann. (2014) Hydrothermal Catalytic Processing of Saturated and Unsaturated Fatty Acids to Hydrocarbons with Glycerol for In situ Hydrogen Production. *Green Chem.* **16**, 1507-1520. <http://dx.doi.org/10.1039/c3gc41798k> (2015 impact factor: 8.506)
 8. **J. Choe**, M. H. Mehnert, J. S. Guest, T. J. Strathmann, and C. J. Werth. (2013) Comparative Assessment of the Environmental Sustainability of Existing and Emerging Perchlorate Treatment Technologies for Drinking Water. *Env. Sci. Technol.* **47**, 4644-4652. <http://dx.doi.org/10.1021/es3042862> (2015 impact factor: 5.394)
 9. D. Shuai, D. McCalman, **J. Choe**, J. Shapley, W. Schneider, and C. Werth. (2013) Structure Sensitivity Study of Waterborne Contaminant Hydrogenation Using Shape- and Size- Controlled Pd Nanoparticles. *ACS Catal.* **3**, 453-463. <http://dx.doi.org/10.1021/cs300616d> (2015 impact factor: 9.307)
 10. J. Liu, **J. Choe**, Z. Sasnow, C. J. Werth, and T. J. Strathmann. (2013) Application of a Re-Pd Bimetallic Catalyst for Treatment of Perchlorate in Waste Ion-Exchange Regenerant Brine. *Water Res.* **47**, 91-101. <http://dx.doi.org/10.1016/j.watres.2012.09.031> (2015 impact factor: 5.991)
 11. D. Shuai, **J. Choe**, J.R. Shapley, W.F. Schneider, and C.J. Werth. (2012) Enhanced Activity and Selectivity of CNF Supported Pd-based Catalysts for Nitrate and Nitrite Reduction. *Env. Sci. Technol.* **46**, 2847-2855. <http://dx.doi.org/10.1021/es203200d> (2015 impact factor: 5.394)
 12. **J. Choe**, T. J. Strathmann, J.R. Shapley, and C. J. Werth. (2010) Influence of Rhenium Speciation on the Stability and Activity of Pd/Re Bimetal Catalysts for Perchlorate Reduction. *Env. Sci. Technol.* **44**, 4716-4721. <http://dx.doi.org/10.1021/es100227z> (2015 impact factor: 5.394)

Works in Progress

13. **J. Choe** and W. A. Mitch. Motif Study of Histidine Chloramine Transfer Reaction. *In Preparation for Environ. Sci. Technol. Letters.*
14. **J. Choe***, Y. Kokamki*, W. A. Mitch. The importance of halide radical on protein oxidation and damage. *In Preparation.* (*co-first author)

Selected Invited and Conference Presentations

Invited Presentation

Korea Institute of Science and Technology (KIST) Gangneung, Institute of Natural Products. Seoul, The Republic of Korea. June 16, 2015.

Washington State University at Pullman, Department of Civil and Environmental Engineering. February 27, 2015.

Clarkson University, Department of Civil and Environmental Engineering. February 11, 2015.

Conference Presentations

J. Choe and W. A. Mitch. Comparison of Damage to Proteins and MS2 Virus by Chlorine, Bromine and Ozone. Presented at the 2015 Gordon Research Conference on Drinking Water Disinfection By-Products, Holyoke, MA, August 9-13, 2015 (Poster)

J. Choe, J. S. Guest, T. J. Strathmann and C. J. Werth. The Environmental Sustainability Assessment of Catalytic Reduction and Other Perchlorate Treatment Technologies for Drinking Water. Presented at the 2013 Association of Environmental Engineering and Science Professors Conference on Environmental Engineers and Scientists of 2050: Education, Research, and Practice, Golden, CO, July 14-16, 2013. (Poster)

J. Choe, A. Bergquist, C. J. Werth and T. J. Strathmann. Environmental Sustainability Assessment of a Hybrid Ion Exchange/Catalytic Treatment System for Nitrate Removal from Drinking Water. Presented at the Fall 2013 American Society National Meeting, Indianapolis, IN, September 8-12, 2013. (Oral)

J. Choe, M. H. Mehnert, C. J. Werth and T. J. Strathmann. *Evaluation of Current and Emerging Perchlorate Treatment Technologies Using Environmental Impact Assessment*. Presented at the Fall 2012 American Chemical Society National Meeting, Philadelphia, PA, August 19-23, 2012. (Oral)

J. Choe, M. I. Boyanov, K. M. Kemner, C.J. Werth and T. J. Strathmann. *Mechanistic Study of Carbon-Supported Pd/Re Catalysts for Perchlorate Reduction: Spectroscopic Characterization of Re Speciation and Support Properties*. Presented at the 2012 Gordon Research Conference on Environmental Science: Water, Plymouth, NH, June 25-29, 2012 (Poster)

J. Choe, M. Mehnert, J.R. Shapley, C.J. Werth, and T.J. Strathmann. *Life Cycle Assessment of Ion Exchange Treatment Systems for Perchlorate in Drinking Water*. Presented at the American Water Works Association's Water Quality Technology Conference, Phoenix, AZ, November 13-17, 2011. (Oral)

J. Choe, T.J. Strathmann, J.R. Shapley, and C.J. Werth. *Characterization of Re Speciation and its Influence on Stability and Activity of the Pd-Re Catalysts for Perchlorate Treatment*. Presented at the Spring 2010 American Chemical Society National Meeting, San Francisco, CA, March 21-25, 2010. (Oral)

J. Choe, T.J. Strathmann, J.R. Shapley, and C.J. Werth. *The Influence of Rhenium Surface Speciation on Stability and Activity of Pd-Re Catalysts used for Perchlorate Reduction*. Presented at the 2009 Association of Environmental Engineering and Science Professors Conference on Grand Challenges in Environmental Engineering and Science, Iowa City, IA, July 27-29, 2009. (Poster)

J. Choe, L. Koscielski, C.J. Werth, T.J. Strathmann, and J.R. Shapley. *Effects of Natural Water Constituents on Perchlorate Reduction by a Heterogeneous Pd/Re Catalyst*. Presented at the 235th American Chemical Society National Meeting, New Orleans, LA, April 6-10, 2008 (Symposium on Advances in Abiotic Transformation Processes for Micropollutants in Drinking Water and for Sourcewater Protection). (Poster)

Teaching

2017	Physicochemical Treatment Process (graduate), Seoul National University Environmental Engineering (undergraduate), Seoul National University Advanced Water Quality (graduate), Seoul National University Leadership for Civil Engineers (undergraduate), Seoul National University
2016	Physicochemical Treatment Process (graduate), Seoul National University Environmental Engineering (undergraduate), Seoul National University Environmental Physicochemical Process (graduate), Clarkson University

Professional Service

Journals Reviewer

Applied Catalysis B, Chemical Engineering Journal, Environmental Engineering Science, Environmental Science & Technology, Industrial and Engineering Chemistry, Journal of Chemical Technology and Biotechnology, Water Research

Conference Organizer

2016 ACS San Diego, Environmental Chemistry Division, “Innovative Materials and Technology for Water Purification”

Professional Affiliations

2010 – Present **Member**, American Water Works Association
2009 – Present **Member**, American Environmental Engineering Society of Professors
2008 – Present **Member**, American Chemical Society