

EEE Research Seminar

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LOCATION: via Zoom

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Peracetic Acid as an Alternative Oxidant for Water Disinfection and Decontamination: Underlying Chemistry

Peracetic acid (PAA) is an organic peroxy oxidant known as a broad-spectrum antimicrobial agent. Owing to the advantages of high disinfection capability, limited toxic byproduct formation, and easy retrofit, PAA is an emerging oxidant to replace chlorine, and has been increasingly applied in various industries and in wastewater disinfection in North America and Europe. PAA may also be activated to produce advanced oxidation processes (AOPs) by generating highly reactive radicals for intensified reactions. With growing interests and utilization of PAA, it is critical to improve the fundamental knowledge of the reactivity of PAA and activated PAA. This presentation will highlight our recent research efforts in this area. Specifically, the reactivity of PAA toward various microorganisms and organic compounds were evaluated. Novel AOPs by activating PAA with UV irradiation or transition metals, and the performance of these AOPs for microbial disinfection and micropollutant abatement were studied in depth. The reaction kinetics and mechanisms in PAA-based (advanced) oxidative systems were elucidated by complementary experimental, computational, and kinetic modeling approaches. The new findings and modeling tools obtained by our studies significantly facilitate further development and optimization of PAA-based processes for improved water treatment.

Bio

Dr. Ching-Hua Huang is the Turnipseed Family Chair and Professor in the School of Civil and Environmental Engineering at Georgia Institute of Technology. Dr. Huang received her Ph.D. and M.S. degrees in environmental engineering from Johns Hopkins University, and B.S. degree in chemistry from National Taiwan University. With more than 25 years of research and teaching experience, Dr. Huang's expertise includes environmental chemistry, advanced water/wastewater treatment technology, emerging contaminants, sustainable water reuse, waste remediation and resource recovery. Dr. Huang has supervised many research projects from multiple agencies and has published more than 160 peer-reviewed journal papers, book chapters and conference proceeding papers. She is the Associate Editor of ACS Environmental Science & Technology Water and the Editorial Advisory Board member of Environmental Science & Technology. The research by Dr. Huang and her students has received multiple honors from the American Chemical Society and the Society of Environmental Toxicology and Chemistry.