



Environmental Engineering & Sciences

Department of Civil and Environmental Engineering
CEE 595AG Seminar

Friday, March 31, 2023 | 10:00 – 10:50 a.m. CST | 3310 Yeh Center

Peroxyacids as Emerging Oxidants for Water Disinfection and Decontamination

Peroxyacids ($R-C(O)OOH$), such as peracetic acid (PAA) and performic acid (PFA), are a group of emerging oxidants alternative to conventional chlorine, owing to their advantages of high disinfection capacity, limited toxic byproduct formation, and easy retrofit. Recent research has intensified the evaluation of peroxyacids as alternative disinfectants for pathogen inactivation in water and wastewater treatment. Moreover, activation of peroxyacids to generate reactive radicals is actively being explored to create novel advanced oxidation processes (AOPs) for organic micropollutant (OMP) abatement. The growing interests and utilization of peroxyacids in water treatment applications necessitate a better understanding of their chemical reaction kinetics and mechanisms. This presentation will highlight recent research efforts in this area from our lab at Georgia Tech. Examples include surveying the reactivity of peroxyacids toward various microorganisms and organic compounds, development of novel AOPs by activating peroxyacids with light irradiation or transition metals, and assessing the performance of these AOPs in real water samples. The underlying chemistry of peroxyacid-based oxidative systems are elucidated by complementary experimental, computational, and kinetic modeling approaches. Our research shows strong promise of peroxyacids and provides new knowledge and modeling tools useful for further development and optimization of peroxyacid-based processes for water treatment applications.

Guest Speaker



Prof. Ching-Hua Huang
Georgia Institute of Technology

Turnipseed Family Chair and Professor
School of Civil and Environmental Engineering

Dr. Ching-Hua Huang is the Turnipseed Family Chair and Professor in the School of Civil and Environmental Engineering at Georgia Institute of Technology in Atlanta, Georgia, U.S.A. Prof. 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. Prof. Huang's research expertise includes environmental chemistry, advanced water treatment technology and reuse, emerging contaminants, waste remediation and resource recovery, with >145 publications in the leading journals. Prof. Huang serves as the Associate Editor of ACS Environmental Science & Technology Water and 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.