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CAES SEMINAR SERIES

“Peroxymonosulfate-based Oxidation Processes for Pollutant Degradation in Water”

Dr. Yi Yang

Dept. of Environmental Sciences, CAES

Wednesday, May 1, 2019

12:00 noon to 1:00 p.m.

Food and coffee will be available at 11:45 a.m.

Jones Auditorium
The Connecticut Agricultural Experiment Station
123 Huntington Street, New Haven, CT

Peroxymonosulfate (HSO_5^-, PMS) is an optional bulk oxidant in advanced oxidation processes (AOPs) for treating wastewaters, where it is normally activated by the input of energy or reducing agents to generate sulfate and/or hydroxyl radicals. Our study shows that PMS without explicit activation undergoes direct reaction with a variety of organic compounds, including antibiotics, pharmaceuticals, phenolics, and commonly-used singlet oxygen ($^1O_2$) traps and quenchers, furfuryl alcohol (FFA), azide ion, and histidine. Reaction timeframes varied from a few minutes to a few hours at pH 9. Direct reactions with PMS are highly pH- and ionic strength-dependent and can be accelerated by common buffers, (bi)carbonate and borate (but not phosphate), as well as pyrophosphate ions, also via non-radical reactions. The findings indicate that direct reaction of PMS must be taken into account in AOPs and other applications of PMS.

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