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Dr. Yuefeng Xie received his BS, MS and PhD degrees from Tsinghua University, Beijing, China. A registered Professional Engineer and Board Certified Environmental Engineer, he co-founded Small Public Water Systems Technology Assistance Center and Environmental Training Center at Penn State Harrisburg. His research interests include emerging contaminant analysis and control, water disinfection and disinfection byproducts, rapid sand/membrane filtration, and other physical chemical biological water treatment processes. Honors and awards he received include the 2014 Penn State University Faculty Outreach award, the 2010 Fulbright scholar award, and the 2012 Fellow recognition from the International Water Association. He serves on the US EPA Science Advisory Board Drinking Water Committee. Dr. Xie also serves as an adjunct chair professor at Tsinghua University, Beijing, China.

Impact of the Marcellus Shale gas production wastewater on disinfection byproduct formation

The rapid rise of shale gas development has triggered environmental and human health concerns due to its impacts on water resources, especially on disinfection byproduct (DBP) formation upon chlorination. In this study, we investigated the effects of production wastewater, with bromide and non-bromide species, on the formation of DBPs when production wastewater was spiked into surface waters at various percentages. Results showed the presence of produced water as low as 0.005% changed the DBP profile measurably. Results also showed that the introduction of debrominated production wastewater led to increased formation of some chlorinated DBP species in selected surface water and wastewater. The significance of this study lies in the fact that in addition to bromide concerns from production wastewater, non-bromide species also contributed to DBP formation. An aerated electrolysis (AE) process was employed for treatment of both synthetic and field production wastewaters. Results showed the aerated electrolysis could lead to 64% reduction on formation of total disinfection by-products (DBPs), suggesting that it could be used as a potential in-situ pretreatment technology.