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Advanced Oxidation Dose and Correlation with Contaminant Removal Kinetics in a Dielectric Barrier Discharge Plasma-water Reactor¹ JOSEPH GROELE, JOHN FOSTER, University of Michigan - Ann Arbor -Plasma-water interaction generates a variety of reactive species that are transported into the liquid. Hydrogen peroxide and ozone are two reactive oxygen species with lifetimes that allow them to penetrate into the bulk liquid and react to form hydroxyl radicals in-situ for the non-selective oxidation of organic contaminants in the volume of treated water. De-ionized water is processed by the plasma-water reactor and the resulting aqueous hydrogen peroxide and ozone concentrations are measured as part of the advanced oxidation dose. De-ionized water is then spiked with a model contaminant and processed at the same power supply conditions, and the contaminant concentration is measured along with the residual peroxide and ozone. The experimental contaminant removal kinetics are compared with those predicted by conventional advanced oxidation process modelling using peroxide and ozone concentrations determined by the pristine de-ionized water dosing experiments. The correlation between the oxidation dose delivered by the plasma and the contaminant removal kinetics are investigated.

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