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High Throughput Plasma Water Treatment[1] SELMAN MUJOVIC, JOHN FOSTER, Univ of Michigan - Ann Arbor — The troublesome emergence of new classes of micro-pollutants, such as pharmaceuticals and endocrine disruptors, poses challenges for conventional water treatment systems. In an effort to address these contaminants and to support water reuse in drought stricken regions, new technologies must be introduced. The interaction of water with plasma rapidly mineralizes organics by inducing advanced oxidation in addition to other chemical, physical and radiative processes. The primary barrier to the implementation of plasma-based water treatment is process volume scale up. In this work, we investigate a potentially scalable, high throughput plasma water reactor that utilizes a packed bed dielectric barrier-like geometry to maximize the plasma-water interface. Here, the water serves as the dielectric medium. High-speed imaging and emission spectroscopy are used to characterize the reactor discharges. Changes in methylene blue concentration and basic water parameters are mapped as a function of plasma treatment time. Experimental results are compared to electrostatic and plasma chemistry computations, which will provide insight into the reactor's operation so that efficiency can be assessed.

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