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Edge electrospinning from a fluid-filled bowl for high throughput production of quality nanofibers J.R. BOCHINSKI, Department of Physics, NC State University, N.M. THOPPEY, R.E. GORGA, Fiber and Polymer Science Program, NC State University, L.I. CLARKE, Department of Physics, NC State University — We present a stationary, edge-cylinder geometry for high throughput electrospinning that utilizes a reservoir filled with polymer solution and a concentric cylindrical collector [*Nanotechnology* **22**, 345303 (2011)]. In this "bowl" electrospinning configuration, under high voltage initiation, multiple jets spontaneously form on the fluid surface, rearrange until they are approximately equidistant along the reservoir-edge and spin towards the collector, producing high quality fibers after the voltage is reduced to a working value. The technique produced poly(ethylene oxide) nanofibers with average diameter of 225 nm and a demonstrated throughput ∼40 times higher than traditional single-needle electrospinning. The electric field patterns generated by traditional, bowl, and our previously reported edge-plate [*Polymer* **51**, 4928 (2010)] geometries show significant similarity in field magnitude and gradient along a path towards the collector, which may underlie the ability to form similar quality fibers. We discuss how the interaction between fluid properties and the applied electric field determines the effective flow rate, jet stability versus time, throughput, and fiber quality.

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