

Abstract Submitted
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Microfluidic enhanced conductive polymer microspheres for sensor applications JESSICA SNYDER, University of Washington, DONGLAI LU, Pacific Northwest Laboratory, AMY SHEN, University of Washington — Methods and devices were developed to produce monodispersed, conducting, responsive polyaniline (PANI) particles for drug delivery and sensor applications. Liquid droplets are produced containing a dispersed phase carried through the device by the continuous phase. The two phases are immiscible. Each phase can be either oil or water based. The aniline monomer is contained within the dispersed phase while the oxidizing agent, ammonium persulfate (APS) is contained within the aqueous phase. The production of either solid (aniline, APS in dispersed phase) or shell particles (aniline in dispersed phase, APS in continuous phase) is possible. Droplets are formed by controlling the viscous and capillary forces at the interface. Droplet size is controlled by phase flow rates, the interfacial tension and viscosity ratio between the phases and the inlet geometry. PANI particles are produced via oxidative polymerization. The polymerization is pH dependent and the time of polymerization is monitored by the distance the droplets travel in the channel. The morphology and electrochemical characteristics of the particles resulting from these methods are studied.

Jessica Snyder
University of Washington

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