

Abstract Submitted
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Polymer and protein interfacial competition in a shell production process¹ EMMA WILLARD, University of California Davis, GREG RANDALL, General Atomics — We are exploring oil-in-aqueous polymer compound droplet formulations to UV polymerize into shells while in a strong AC electric field (kV/cm, 20 MHz). The electric field drives the drops to adopt a concentric configuration so that a “perfect” spherical shell can be polymerized with a uniform wall thickness. In our previous study of oil-in-water droplet centering, we determined that droplet stretching in the electric field was a problem, which we overcame by using protein additives to strengthen the oil/water interface. However, adding polymer to the shell fluid has been shown to weaken the droplet interface and further complicates T junction droplet generation. In this work, we study the adsorption competition between bovine serum albumin and polyethylene glycol diacrylate with the pendant drop method to generate a polymer/protein shell formulation that will resist stretching in the centering electric field. Furthermore, we explore droplet generation of polymer/protein shell formulations in a double T junction and stretching in an electric field.

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