

Abstract Submitted
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Lyotropic nematic droplets of single-walled carbon nanotubes in super acids: equilibrium shape and dynamics NATNAEL BEHABTU, BUDHADIPTA DAN, Rice University, LEE TAEWOO, IVAN SMALYUKH, University of Colorado , MATTEO PASQUALI, Rice University — The balance between surface tension, elastic energy and surface anchoring creates nematic droplets with elongated shape, called tactoids. Here we report equilibrium shape and coalescence dynamics of single-walled carbon nanotube (SWNT) nematic droplets in superacids. Surprisingly, we observe bipolar tactoids with uniform aspect ratio. The uniform aspect ratio is not expected based on theoretical arguments that indicated that aspect ratio should drop with domain volume. Bipolar order contrasts recent findings of uniform order in liquid crystalline tactoid droplets of aqueous SWNTs stabilized with bile salts. The coalescence dynamics is highly influenced by the drop elasticity. Coalescence pathways that lead to defect creation are not observed, unlike spherical nematic droplets. Instead coalescence proceeds by tangentially matching the nematic director of two drops.

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