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Colloidal particles embedded in liquid crystal droplets DREW MELCHERT, MONIROSADAT SADATI, YE ZHOU, JUAN J. DE PABLO[1], Institute for Molecular Engineering, University of Chicago — In this work, we encapsulate polystyrene and silica particles in nematic liquid crystal (LC) droplets dispersed in water using microfluidic glass capillary devices. While polystyrene particles induce planar anchoring on the surface, silica particles, treated with DMOAP, create homeotropic anchoring of the LC molecules at their surface. Sodium dodecyl sulfate (SDS) is added to the aqueous phase to stabilize LC droplets and promote a radial configuration with point defect in the center of LC droplet. Our experimental and computational studies show that, when trapped inside the LC droplets, particles with both anchoring types become mostly localized at the defect point (at the center) and interact with the radial configuration. Interestingly, a twisting structure is observed for polystyrene particle with strong planar anchoring. Although localization of the particles at the droplet center is the most stable state and with the lowest free energy, off-center positions also emerge, displacing the defect point from the center to near the surface of a radial droplet.

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