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**Nanoparticle Solubility in Liquid Crystalline Defects** JONATHAN

K. WHITMER, Department of Chemical and Biological Engineering, University of Wisconsin–Madison, JULIO C. ARMAS-PEREZ, Institute for Molecular Engineering, University of Chicago, ABHIJEET A. JOSHI, TYLER F. ROBERTS, Department of Chemical and Biological Engineering, University of Wisconsin–Madison, JUAN J. DE PABLO, Institute for Molecular Engineering, University of Chicago — Liquid crystalline materials often incorporate regions (defects) where the orientational ordering present in the bulk phase is disrupted. These include point hedgehogs, line disclinations, and domain boundaries. Recently, it has been shown that defects will accumulate impurities such as small molecules, monomer subunits or nanoparticles. Such an effect is thought to be due to the alleviation of elastic stresses within the bulk phase, or to a solubility gap between a nematic phase and the isotropic defect core. This presents opportunities for encapsulation and sequestration of molecular species, in addition to the formation of novel structures within a nematic phase through polymerization and nanoparticle self-assembly. Here, we examine the solubility of nanoparticles within a coarse-grained liquid crystalline phase and demonstrate the effects of nanoparticle size and surface interactions in determining sequestration into defect regions.

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