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Structure and Dynamics of Polymer-Coated Nanoparticles in Ionic Liquids Studied by In-Situ Electron Microscopy PAUL KIM, THOMAS RUSSELL, DAVID HOAGLAND, Polymer Science and Engineering Department, University of Massachusetts, Amherst, MA 01002 — Ionic liquids (ILs) have unique solvent properties, including extremely low vapor pressure and high conductivity, which makes IL-solvated soft matter systems suitable to investigation by electron microscopy. ILs, as two-component solvents, may themselves organize into nanostructures, and these organizations can affect the behavior of dispersed polymers/particles. To understand these effects, the structure and dynamics of nanoparticles IL systems have been studied via multiple-particle tracking with electron microscopy. Several systems consisting of different polymer-coated nanoparticles, different ILs, and different substrates were prepared and analyzed with fluorescent microscopy, scanning electron microscopy (SEM), and transmission electron microscopy (TEM). Spatial and temporal imaging information affords insight into particle-IL and polymer-IL interactions.

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