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Characterization of Microgels in Ionic Liquid

College of Sciences and Health Professions

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Abstract

Microgels are thermoresponsive polymeric nanoparticles whose size in aqueous solution is dependent on temperature. The microgels were studied using both dynamic light scattering (DLS) and scanning electron microscopy (SEM) to better understand the nanoparticles dynamics. The first part of the study focused on developing a controlled preparation procedure which would generate reproducible SEM images on a wet sample. The ionic liquid was mixed with a dilute solution of microgels and water was dried using nitrogen gas. This technique allowed a large volume of microgels to easily transition from their natural water solvent to a low vapor pressure ionic solvent. The second part of the study attempts to correlate the diffusion found from microgels in ionic liquid using scanning electron microscopy to the statistical average diffusion measured with dynamic light scattering. The microgels in ionic liquid observed with SEM exhibited the same radius that was measured with DLS for microgels in a water based solvent.