Abstract Submitted
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Assessment of structure, dynamics, and stability of HPC microgel nanoparticles in good and poor solvents KIRIL STRELETZKY, Cleveland State University, JOHN MCKENNA, Cleveland State University, JERRY HILLIER, Cleveland State University, RAMI MOHIEDDINE, Case Western Reserve University — Microgel nanoparticles formed in aqueous solutions of neutral polymer hydroxypropylcellulose (HPC) is a promising drug carrier system due to their ability to solubilize hydrophobic drugs and to serve as vesicles for controlled drug delivery and release. Microgel was synthesized through self-association of amphiphilic HPC molecules at room temperature by lowering polymer phase-transition with salt addition and consequent cross-linking and dialysis. Dynamic Light Scattering and Optical Probe Diffusion techniques were used to study structure and dynamics of microgel of different polymer composition in good and poor solvents. We found the size distribution of microgel to be broad and multimodal in good solvents and narrow and unimodal in poor solvents, indicating shrinking of the nanoparticles. We present comparative analysis of microgel and HPC chain dynamics in good solvents and near good-poor solvent transition. The comparison with polymer transport properties gives important insights into the structure, dynamics, and, potentially, drug delivery capabilities of HPC microgel.

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