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Synthesis, Structure, and Dynamics of a promising drug delivery system: HPC microgel nanoparticles RAMI MOHIEDDINE, Case Western Reserve University, KIRIL STRELETZKY, Cleveland State University — Recent advances of macromolecular and medical sciences created a lot of interest in processes of self-association of amphiphilic molecules into stable nanoparticles with ability to solubilize hydrophobic drugs and serve as reservoirs for controlled drug delivery/release. Microgel nanoparticles formed in water solutions of neutral polymer Hydroxypropylcellulose (HPC) is a promising drug carrier system with an important advantage of being non-toxic (HPC is FDA-approved food additive). We synthesized HPC microgel at room temperature by crosslinking and dialysis after lowering HPC phase transition with salt addition. Using Dynamic Light Scattering (DLS) we studied structure and dynamics of microgel nanoparticles at different polymer concentrations and at a range of temperatures and scattering angles. Contrary to the literature, the size distribution of microgels is found to be multimodal leading to failure of conventional cumulant analysis. We present the initial steps of alternative analysis of microgel structure and dynamics and outline a few possible future directions of our study.

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