

Abstract Submitted
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HPC-Microgels: New Look at Structure and Dynamics JOHN MCKENNA, KIRIL STRELETZKY, Cleveland State University, RAMI MOHIED-DINE, Cornell University — Issues remain unresolved in targeted chemotherapy including: an inability to effectively target cancerous tissue, the loss of low molecular weight medicines to the RES system, the high cytotoxicity of currently used drug carriers, and the inability to control the release of medicines upon arrival to the target. Hydroxy-propyl cellulose(HPC) microgels may be able to surmount these obstacles. HPC is a high molecular weight polymer with low cytotoxicity and a critical temperature around 41C. We cross-linked HPC polymer chains to produce microgel nanoparticles and studied their structure and dynamics using Dynamic Light Scattering spectroscopy. The complex nature of the fluid and large size distribution of the particles renders typical characterization algorithm CONTIN ineffective and inconsistent. Instead, the particles spectra have been fit to a sum of stretched exponentials. Each term offers three parameters for analysis and represents a single mode. The results of this analysis show that the microgels undergo a multi to uni-modal transition around 41C. The CONTIN size distribution analysis shows similar results, but these come with much less consistency and resolution. During the phase transition it is found that the microgel particles actually shrink. This property might be particularly useful for controlled drug delivery and release.

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