

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Line shape analysis of dynamic light scattering results on polymeric microgel nanoparticles KIRIL A STRELETZKY, IMAAN BENMERZOUGA, JOHN MCKENNA, Cleveland State University — Hydroxypropylcellulose (HPC) is nontoxic polysaccharide with temperature dependent water solubility. HPC polymer chains can be chemically cross linked into stable nanoparticles- microgels. HPC microgel properties depend on polymer and salt concentration and cross linking density. One of the most important properties of HPC is its critical temperature of 41°C, at which the polymer undergoes a reversible phase transition. HPC microgels also undergo a reversible volume phase transition in which particles shrink considerably. This property might lead to application of microgels as effective targeted drug delivery and release system. We used Dynamic Light Scattering to study microgels at different temperatures and applied line shape analysis algorithm to analyze resulting spectra. We found that the microgel initial size depends heavily on polymer concentration. We also found that varying salt concentration affects the dynamics of microgels. In addition, we were able to determine the effective cross linking density that yields relatively monodisperse microgels. We explored the structure of several microgel solutions by angular dependence analysis and found that most of them were spherical particles. In addition, we explored dynamics of the same microgels at different temperatures that enabled us to monitor their shrinking behavior.

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Date submitted: 27 Nov 2007

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