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Investigating the Diffusive Behavior of HPC with DLS and FPR

RYAN MCDONOUGH, Cleveland State University, PAUL RUSSO, Louisiana State University, KIRIL STRELETZKY, Cleveland State University — The study of the dynamic properties of HPC (Hydroxy-propyl-cellulose) in aqueous solution through the experimental techniques of FPR (Fluorescence Photo-bleaching Recovery) and DLS (Dynamic Light Scattering) has shown empirical inconsistencies in observed polymer dynamics. The approach to analyzing the inconsistencies consisted of preparing fluorescently labeled and unlabeled HPC solutions at a range of concentrations from the same stock solution. Results from DLS have indicated the reliable presence of a slow mode of diffusion. The slow mode appeared in FPR experiments, but not reproducibly. In addition, results from DLS on labeled and unlabeled HPC have found startling differences in line shape of correlation function indicating signal detection from an unknown mechanism. Future directions for this study include an investigation into the reasons behind the before mentioned inconsistencies and an analysis of HPC solutions with different fluorescent labels to further explore the nature of the slow diffusion mode if it is determined to not be an artifact.

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