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Multiscale Dynamics of Pre-Transitional Fluctuations in the Isotropic Phase of a Lyotropic Liquid Crystal[1] MIKHAIL ANISIMOV, University of Maryland, College Park, CHRISTOPHER BERTRAND, The Petroleum Institute, Abu Dhabi, UAE, KIRT LINEGAR, University of Maryland, College Park, ANDREI KOSTKO, St. Petersburg State University of Refrigeration and Food Engineering, Russia — Using an improved static and dynamic light scattering technique, we have observed multiscale relaxation of the pre-transitional fluctuations in the isotropic phase of a cromolyn aqueous solution, a lyotropic liquid crystal where rods are formed by aggregates of disc-like molecules. We have detected the onset of cromolyn aggregation about 12 C above the transition temperature. The onset is manifested by the emergence of strong scattering due to the fluctuations of local anisotropy and by the split of the diffusion dynamics into two modes, one associated with the diffusion of the cromolyn monomers and the other one with the diffusion of the cromolyn aggregates. A third observed dynamic mode is associated with the pretransitional slowing down of the fluctuations of local anisotropy. This mode behaves differently in polarized and depolarized light scattering, due to a coupling between the fluctuations of anisotropy and velocity fluctuations.

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