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Fluorescent Polystyrene Sulfonate for Polyelectrolyte Studies WAYNE HUBERTY, XIAOWEI TONG, SREELATHA BALAMURUGAN, DONGHUI ZHANG, PAUL RUSSO, Louisiana State University — The slow-mode decay found by dynamic light scattering for polyelectrolytes in low-salt conditions has perplexed investigators since its first observation. Many characterization methods have suggested temporary or transient aggregation, although there is still no consensus on the cause. Many different polyelectrolytes demonstrate the slow-mode decay, but the sodium salt of polystyrene sulfonate (NaPSS) is the most popular choice for study. Commercially available NaPSS may have hydrophobic patches due to incomplete sulfonation leading to associations apart from any putative ionic mechanisms. Therefore, essentially full sulfonation, or "patchless", NaPSS should be synthesized. To facilitate fluorescence measurements, which can provide new insights to the slow-mode phenomenon, the material must be rendered fluorescent (F-NaPSS). Several approaches to F-NaPSS have appeared; some labeled a previously synthesized NaPSS without concern for its hydrophobic patches. Other strategies include a free radical copolymerization of styrene sulfonate and a vinyl amine to provide side chains viable for labeling. This method is successful, but yields only small amounts of nearly monodisperse polymer after fractionation. In this presentation, a high-yield synthesis of fully sulfonated, low-polydispersity, fluorescently tagged polymer will be discussed.

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