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Dynamics and rheology of living polymers[1] SUBAS DHAKAL, Department of Biomedical and Chemical Engineering, Syracuse University, RADHAKRISHNA SURESHKUMAR, Department of Biomedical and Chemical Engineering, and Department of Physics, Syracuse University — Molecular dynamics simulations are used to study the dynamics and stress relaxation in "living" polymers such as wormlike micelles (WLMs) of surfactants. These systems exhibit complex dynamical properties due to incessant chain scission and inter-chain recombination events over time scales that range from few ns to milliseconds. We study the structure and energetics of WLMs obtained from large-scale coarse-grained Molecular Dynamics simulations that consist of millions of atoms. Various dynamical properties such as the non-monotonic variation of the zero shear viscosity with salt concentration, as well as the recombination time and a possible reptation-based stress relaxation mechanism will be discussed.

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