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Dynamics of Hydrogen-Bonded Supramolecular Polymers ERIC BUHLER, MATIERE ET SYSTEMES COMPLEXES, University Paris Diderot, Paris, France, JEAN CANDAU, ELENA KOLOMIETS, JEAN-MARIE LEHN, ISIS, University of Strasbourg, MSC PARIS TEAM, ISIS TEAM — Supramolecular polymers formed from molecular recognition directed association between monomers bearing complementary hydrogen bonding groups were studied by rheology, small-angle neutron and light scattering experiments. The semiflexible fibers consist of few aggregated monomolecular wires. At T= 25 $^\circ$ C the formation of branched aggregates occurs around the crossover concentration, C*, between the dilute and semi-dilute regimes, whereas the classical behaviour of equilibrium polymers is observed at T=65 $^\circ$ C. For semi-dilute solutions the steady-state flow curves showed a shear banding type instability, namely the occurrence of a stress plateau $\sigma_p$above a critical shear rate $\dot{\gamma}_c$. The values of σ_p and $\dot{\gamma}_c$ were found to be of the same order of magnitude as those of the elastic plateau modulus and the inverse stress relaxation time, respectively. The above features are in agreement with the theoretical predictions based on the reptation model. Dynamic light scattering experiments showed the presence in the autocorrelation function of the concentration fluctuations of a slow viscoelastic relaxation process that is likely to be of Rouse type.

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