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Disentanglement in polymer-star mixtures HENDRIK MEYER, Institut Charles Sadron, CNRS UPR22, Strasbourg, France — Recent molecular dynamics simulations provide new insights to entangled polymer melts and mixtures with compact stars as a model system of nanocomposites without polymer-particle adsorption. The particle size is in the order of the tube diameter, the particles remain well dispersed over the whole concentration range and the stars are sufficiently compact that the pure system is jammed. For this system, we observe a weak compression of the matrix chains with increasing volume fraction of stars. Short (unentangled) matrix chains get slowed down by adding particles to the system. When the matrix chains become significantly longer than the entanglement length, this trend is inversed and the matrix chains become faster because the particles dilute the entanglement network. The center-of mass (CM) dynamics exhibits regimes of anomalous diffusion in accordance with viscoelastic hydrodynamic interactions (VHI) [1]. At low and intermediate star-particles concentration, the particles themselves vary little in mobility, only at high concentration (above percolation), they become slowed down because of colloidal packing. [1] J. Farago et al. PRL 107, 178301 (2011); PRE 85, 051807 (2012).

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