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Can Nanorods Emulsify Immiscible Polymer Blends? MICHAEL J.A. HORE, MOHAMED LARADJI, Department of Physics, The University of Memphis — The addition of nanoscale rods to immiscible binary polymer blends has a pronounced effect on the dynamics of phase separation. The results of computer simulations of the Dissipative Particle Dynamics (DPD) model in three dimensions (3D) indicate that when nanorods prefer one of two components in an immiscible binary polymer blend, the rate of phase separation decreases when the volume fraction of nanorods is increased, or as the aspect ratio (L/D) of the rods is increased. Interestingly, anisotropic nanoparticles have a much more pronounced effect on phase separation dynamics in the system when compared to the effects of spherical nanoparticles, which, generically, do not alter the characteristics of the kinetics in the system. In particular, it may be the case that at high volume fractions – or alternatively, low volume fractions and large aspect ratio of nanorods – the system may undergo micro-phase separation only, indicating that the nanorods may be excellent emulsifying agents.

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