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Self-Extinguishing Crystallization: Copolymer Behavior under Flow DIANA SMIRNOVA, MEISAM HAJIMORAD, JULIA KORNFIELD, California Institute of Technology — It is known that short chain branches in copolymers act as crystal defects, resulting in materials with low crystallinity and poorly-defined morphology. We are interested in the behavior of copolymers under flow in the presence of species that readily form well-defined shish-kebab morphologies. Bimodal blends containing small concentrations of high molecular weight, high density polyethylene (HDPE, Mw = 526 kg/mol, Mw/Mn = 3) in an ethylene-co-hexene matrix (Mw = 50 kg/mol, Mw/Mn = 2, 5 mol % hexene) were studied via rheo-optical and rheo-xray techniques. HDPE concentrations were selected above and below the overlap concentration of 0.6%, but maintained below 1% such that the rheology of the blends was not significantly altered from that of the copolymer matrix. DSC traces were collected to ensure that co-crystallization between the two blend components occurs. Crystallization after shear quickly leveled off revealing a self-extinguishing behavior. The time frame for this extinction is coupled with a loss of anisotropy in scattering patterns indicating random crystallization uncorrelated with existing oriented structures.

Diana Smirnova
California Institute of Technology

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