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Shear and extensional rheology of model branched polymer melts (H shaped and grafted)[1] GENGXIN LIU, Department of Polymer Science, The University of Akron, Akron, OH 44325, KONSTANTINOS NTETSIKAS, Department of Materials Science and Engineering, University of Ioannina, University Campus, 45110 Ioannina, Greece, KOSTAS MISICHRONIS, NAMGOO KANG, JIMMY MAYS, Department of Chemistry, University of Tennessee, Knoxville, TN 37996, APOSTOLOS AVGEROPOULOS, Department of Materials Science and Engineering, University of Ioannina, University Campus, 45110 Ioannina, Greece, SHI-QING WANG, Department of Polymer Science, The University of Akron, Akron, OH 44325
— While nonlinear rheology of entangled linear polymers has been fully explored in recent years, the effect of chain architecture remains the last frontier in polymer rheology. Here we study two H-shape and one grafted-polyisoprene (3 branches) using startup and step extension and shear. Long chain branches (LCB) impede yielding and prevent entangled network from full disentanglement. Thus, nonlinear rheological behavior of LCB polymers forms a sharp contrast to that of linear chains. We will demonstrate these striking differences.

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