

Abstract Submitted
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Mesoscopic drop dynamics and rheological modeling for polymer blends¹ YUANZE XU, Fudan University, WEI YU, Shanghai Jiaotong University, JIANMAO YANG, Fudan University — Fundamental challenge to rheology for poly-blends originates from the dynamic coupling between interfacial morphology and viscoelastic flow. This work will outline our approaches. The framework of irreversible thermodynamics was employed to model immiscible viscoelastic blends considering the chain conformation, the drop deformation, drop break-up and collapse and the hydrodynamic interaction of drops in concentrated blends. The theoretical predictions were proved by measuring the drop dynamics in a four-roll mill rheometer with success. Great challenge to the model exists in systems where the drop dynamics severely deviating from emulsions of Newtonian droplets. A new type of drop merging by a string pulling two beads together (BSB) was observed and analyzed. The relevant material and process conditions causing BSB or beads-on-string are discussed elucidating its origin of non-linear viscoelasticity of polymers.

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