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Fibril Morphology in Immiscible Polymer Blends and its Extensional Behavior

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The fibril morphology was generated in immiscible polymer blends and the interrelationship between morphology and rheological behavior has been investigated. The dispersed phase has formed fibril morphology in matrix with the viscosity ratio during mixing. The blend has shown the particular rheological behavior including strain hardening behavior as long as fibril morphology was survived between the melting temperatures of two polymers. When second component was added as small as less than 1%, it was difficult to discriminate morphological difference under shear flow whether PP forms fibril or droplet structure. However, fibril morphology showed significant increase of extensional viscosity under uniaxial extensional flow since it became more energy dissipative as fiber is aligned with the extensional flow. In addition, strain hardening behavior was induced due to the restricted stretching of fibrils.