

Melt Extensional Properties and Orientation Behaviors of Polypropylene/Layered Silicate Nanocomposites

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Polypropylene/layered silicate nanocomposites consisting of three components; pure polypropylene(PP), maleated polypropylene(MAPP) and organically modified silicate(20A), are prepared by melt intercalation method to investigate melt extensional properties such as melt strength, neck-in test and orientation behaviors. The nanocomposites have the almost exfoliated morphology and show the good dispersibility, the enhanced tensile modulus, enhanced storage modulus, much enhanced melt tension and the reduced neck-in during the melt processing, compared with neat polymer. The uniaxial drawing induces the silicate surface to align parallel to the sheet surface. The c- and a*-axes of polypropylene crystals are bimodally oriented to the flow direction, and b-axes are oriented to the thickness direction. The bimodal orientation of polypropylene crystal is enhanced with the concentration of silicates.

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