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Structure Development and Characteristics of Fibers Prepared in High Speed Melt Spinning and Drawing Processes of Polypropylenes with Controlled Stereo-regularity Distribution

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Polypropylenes (PPs) with controlled stereo-regularity distribution were prepared by blending the high molecular weight and low molecular weight polymers, which have different degree of stereo regularity. High-speed melt spinning and subsequent drawing processes were applied to these polymers. Both types of blend polymer exhibited high spinnability, even though these polymers have relatively high polydispersity. It is also noteworthy that the behaviors of neck-like deformation and crystalline structure formation of these polymers are significantly different. On the contrary, drawing of low-speed spun fibers prepared from these polymers suggested that the structure development in the drawing process is mainly controlled by the draw ratio, and the effect of polymer characteristics on the structure development is insignificant in comparison with that in the melt spinning process.