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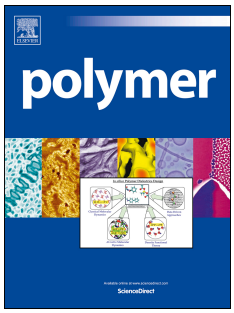

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Yield Behavior of Random Copolymers of Isotactic Polypropylene

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Keywords: Isotactic copolymers of propylene; Crystallographic Micromechanical Model; Yielding behavior; Semicrystalline polymers; Deformation models.

Abstract The crystallographic micromechanical model (CMM) for prediction of yield stress of semicrystalline polymers, based on the thermally activated nucleation of screw dislocations at the boundary of lamellar crystals, is employed to interpret the yield behavior by effect of uniaxial drawing of some isotactic copolymers of propylene with different comonomeric units such as ethylene, 1-butene, 1-pentene, 1-hexene, and 1-octadecene (iPPEt, iPPBu, iPPPe, iPPHe and iPPOc, respectively). The samples are characterized by a random distribution of the comonomeric units. The CMM predicts that the values of stress at yield depend on the thickness of the lamellar crystals and relies on two parameters, i.e. the critical value of the free energy needed for nucleation an activation of a screw dislocation in crystallographic planes parallel to the chain axes, and the shear modulus relative to the planes of slip for the dislocations, whereas the role of the interlamellar amorphous phase is neglected. The aim of this study is to analyze to which extend the thickness of

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