

CRYSTALLIZATION KINETICS OF POLYETHYLENE IN COMPATIBILIZED POLYETHYLENE/POLYAMIDE 6 BLENDS

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Blends of semicrystalline polymers can exhibit much better properties than each of the pure polymers regarding e.g. impact/modulus compromise. Controlling the crystallization mechanisms (nucleation, kinetics) during processing is a key factor for obtaining the desired morphologies which lead to these unique properties. We have studied the crystallization of High Density Polyethylene (PE) in blends of PE and polyamide 6 (PA) compatibilized by PE functionalized with maleic anhydride (PE-g-MA, 1 wt% MA) obtained by reactive blending at high shear rate. Varying PA concentration (0-60 %vol), samples with different blend morphologies have been prepared showing PA dispersion or co-continuous structures. The PE crystallization kinetics has been investigated by polarized optical microscopy and Differential Scanning Calorimetry. The samples were heated at a temperature above the melting temperature of PE and below the melting temperature of PA, and then cooled at the selected crystallization temperature. Both the spherulite growth rate and the overall crystallization kinetics are affected by the presence of PA. Particularly, increasing PA concentration slows down the PE crystallization kinetics.