SL 8.1

Crystallization and Melting Propylene-butene Random Copolymers

G. Pernel (a), B. Monasse (a) and O. Lhost (b) (a) CEMEF, Ecole des Mines de Paris, BP 207, 06904 Sophia-Antipolis France (b) BP Polyolefins Europe, B-1120 Brusels

The crystallization and melting of polypropylene-butene-1 random copolymers were studied in a wide range of composition, from 6% to 60% w/w. The results were compared to similar ethylene-propylene random copolymers with a narrower composition range, 5.7 to 15% ethylene content w/w, and also to ethylene/butene-1/propylene terpolymers. The crystallization is measured by DSC under various cooling rates and the further melting exhibit very unusual melting peaks with a very low temperature component. These butene-1/propylene copolymers differ from the ethylene-propylene random copolymers by their behaviour. The random copolymer always crystallizes even for a 50/50 propylene/butene-1 content while crystallinity almost vanishes for a 15% ethylene content. Optical microscopy crystallization and X-rays diffraction explain this unusual behaviour. Furthermore the crystallization kinetics is discussed.