CRYSTALLIZATION OF PET UNDER PHYSICAL CONFINEMENT IN PET/PC MULTILAYERS BY MEANS OF X-RAY SCATTERING

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Crystallization of polymers under physical confinement is, at present, a topic of increasing interest. The presence of interfaces, the chain conformation near the surface and also the reduced volume of a confined environment, modify significantly the crystallization behaviour found in the bulk [1]. The coextrusion of PET and PC in laminar architectures provides, in spite of the nanometer dimension of each layer, the opportunity to study the crystallization behaviour of PET layers under confinement by using conventional X-ray scattering techniques because the number of layers can be multiplied practically at will.

Results concerning the crystallization behaviour of PET, from the glassy state, taking place between amorphous layers of PC will be presented. Physical confinement of PET below the micrometer range has shown to delay the crystallization process (Figure 1) and to decrease crystallinity. Confinement also causes orientation of the crystalline lamellae indicating that crystallites grow parallel to the interfaces [2].

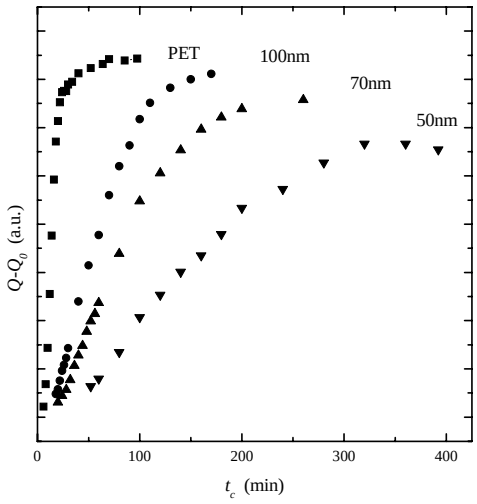

Figure 1: Variation of the invariant Q-Q_0 during isothermal crystallization at 117ºC. (■) PET-control; PET/PC films. $\ell_{\text{PET layer thickness}}$: (●) 100nm; (▲) 70 nm; (▼) 50 nm.

References

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[2] - - F.J. Balta Calleja, F. Ania, I. Puente Orench, E. Baer, A. Hiltner, T. Bernal, S. Funari. Progr. Colloid Polym. Sci. (2005) **130**,140.