Influence of polymorphism and the new trigonal modification on the mechanical response of isotactic poly(propylene-\textit{co}-1-pentene-\textit{co}-1-hexene) terpolymers

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Figure S1. Dependence on comonomer content (comonomer being either pentene or hexene) of melting temperatures, $T_m$, (left) and degree of crystallinity, $f_c$, (right) corresponding to melt crystallized samples of iPHe copolymers (data from references S1 and S2) and of iPPe copolymers (data from references S3 and S4).

**Determination of overall degree of crystallinity**

The total X-ray degree of crystallinity, $f_c$, can be estimated from the diffractograms depicted in Figure 1, as follows. First of all, to accurately determine overall crystallinity, it is necessary to obtain (or estimate) the totally amorphous profile of each terpolymer. Unfortunately, the crystallization of these terpolymers is rather fast, and, irrespectively of the quenching procedure, all of subsequent diffractograms at room temperature exhibit a certain degree of crystallinity.

A second possibility for estimating the amorphous profile of iPP copolymers/terpolymers is to use a linear combination of the diffractogram of a totally amorphous polypropylene with that of a copolymer/terpolymer that could be obtained completely amorphous at room temperature. In the absence of such amorphous copolymer/terpolymer, the alternative is to use the profile of the molten terpolymer for each terpolymer.

Thus, amorphous profiles are obtained from variable-temperature X-ray diffraction measurements for each terpolymer on cooling experiments from the melt, using the profiles...
where no sign of crystallinity is observed [S5,S6]. A careful inspection of these numerous amorphous diffractograms (at a given terpolymer) allows observing a small but appreciable shifting of the location of maximum to higher angles (lower d spacing values) as temperature is lowered. Then, a temperature coefficient is deduced.

The full width at half maximum, FWHM, of those amorphous profiles is also estimated, being observed that it does not change appreciably on temperature (the possible variation is well inside the experimental error). Consequently, these molten profiles can be reasonably used at room temperature just by shifting them to higher angles by the amount deduced from the temperature coefficient extrapolation at each terpolymer under study.

The dependence of total crystallinity and the individual contributions of each polymorph on overall comonomers content in the 75Pe-25He terpolymers for the two thermal treatments analyzed are presented in Figure S2.

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**Figure S2.** Dependence of total crystallinity and the individual contributions of each polymorph on overall comonomers content in the 75Pe-25He terpolymers for the two thermal treatments analyzed.
References


