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Selective dispersion of nanofillers in PET/PC blends E. MANIAS, M.J. HEIDECKER, Materials Science & Eng, Penn State University — The nanocomposite formation of immiscible PET/PC blends with organically-modified montmorillonite layered-silicates was studied as a model system to tailor thermodynamics, so as to achieve (a) selective dispersion in the PET only phase, and (b) promote physical mixing ("compatibilization") of the PET and PC matrices. Dispersion was controlled by design of appropriate surfactant chemistries used for nanofiller modification. The desired composite structure is obtained even when the organically-modified fillers are premixed (masterbatched) in the "unfavorable" polymer. This behavior, i.e. the composite structure being markedly independent of processing conditions, indicates that, for these systems, the thermodynamics of dispersion overwhelmingly determine the resulting structure rather than the processing conditions. The resulting changes in PET crystal morphology afford novel new mechanical properties, that combine substantial increases in modulus with accompanying increases in ductility and toughness.

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