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Recycled PET/Organo-clay Nanocomposites

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Preparation of polymer/clay nanocomposites in intercalated and particularly in exfoliated state is scientifically challenging and practically important. The utilization of recycled polymers for nanocomposite preparation is industrially attractive for both economical and ecological reasons. It is presumed that very small addition of clay to PET waste materials could improve their barrier and mechanical properties qualitatively or even quantitatively.
In our work, a significant enhancement of the properties of recycled PET by addition of commercially available organo-clays was achieved, despite a moderate degradation of the matrix. In effort to obtain higher level of delamination of silicate layers and reduce degradation reactions, modification of the three best suitable commercial organo-clays by (3-glycidoxypropyl) trimetoxysilan and hexadecyltrimetoxysilan was performed. The effect of modifiers on processability and final material properties was investigated by means of rheology, morphology and mechanical testing.