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Dynamics of Hyperbranched Polymers in the Bulk and under Confinement: Effect of Dendritic Generation KIRIAKI CHRISSOPOULOU, KRYSTALENIA ANDROULAKI, SPIROS H. ANASTASIADIS, Foundation for Research and Technology - Hellas and Univ of Crete, Greece, DANIELE PREVOSTO, MASSIMILIANO LABARDI, CNR-IPCF, University of Pisa, Italy — The structure and dynamics of three generations of a hyperbranched polyester polyol (Boltorn) and their nanocomposites with natural montmorillonite (Na^+-MMT) are investigated to offer a detailed picture of the behavior in bulk and under confinement. The structure was studied with X-ray diffraction (XRD) and differential scanning calorimetry (DSC), while the dynamics using dielectric spectroscopy (DS). XRD reveals that the polymer chains reside within the galleries of the Na^+-MMT producing an intercalated nanocomposite. The glass transition temperature, Tg, of the bulk polymers shows a dependence on the generation whereas the transition is completely suppressed when all chains are intercalated. The dynamics of the polymers and nanocomposites with ∼50wt% polymer, where all chains are confined, were investigated for temperatures both below and above the polymer Tg. A sub-Tg process was found, showing similar features for the three polymers whereas the segmental relaxation was observed around Tg. For the nanocomposites, the dynamics that are observed show similarities and differences with the respective of the pure polymers depending on the specific process. Partially sponsored by EU (COST Action MP0902) and by the Greek GSRT (Research Funding Program: THALES (MIS 377278))

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