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Structure and dynamics of hyperbranched polymers in bulk and under nanoscopic confinement S. H. ANASTASIADIS, K. CHRISSOPOULOU, Foundation for Research and Technology-Hellas and Univ. of Crete, Greece, K. KARATASOS, S. FOTIADOU, C. KARAGEORGAKI, I. TANIS, D. TRAGOUDARAS, Aristotle University of Thessaloniki, Greece, B. FRICK, Institut Laue Langevin, France — The structure and dynamics of a hyperbranched polyesteramide (Hybrane S 1200) and its nanocomposites with natural montmorillonite (Na+-MMT) are investigated. In bulk, the behavior is probed by QENS with MD simulations employed for a deeper insight into the relevant relaxation processes. The energy-resolved elastically scattered intensity from the polymer relaxes with two steps, one below and one above the polymer Tg. The QENS spectra are consistent with the elastic measurements and can be correlated to the results emerging from the detailed description afforded by the atomistic simulations, which cover a broad time range and predict the existence of three relaxation processes. The nanocomposites are investigated by XRD, DSC and QENS. XRD reveals an intercalated nanocomposite structure. The polymer chains confined within the galleries show similarities in the dynamic behavior with that of the bulk polymer for temperatures below the bulk polymer Tg, whereas they exhibit frozen dynamics under confinement at temperatures higher than that. Sponsored by the Greek GSRT (ΣΥΝΕΡΓΑΣΙΑ 09ΣΥΝ-42-580).

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