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标题: Networking Properties of Cyclodextrin-Based Cross-Linked Polymers Probed by Inelastic Light-Scattering Experiments
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摘要: An integrated experimental approach, based on inelastic light-scattering techniques, has been here employed for a multilength scale characterization of networking properties of cyclodextrin nanosponges, a new class of cross-linked polymeric materials built up from natural oligosaccharides cyclodextrins. By using Raman and Brillouin scattering experiments, we performed a detailed inspection of the vibrational dynamics of these polymers over a wide frequency window ranging from gigahertz to terahertz, with the aim of providing physical descriptors correlated to the cross-linking degree and elastic properties of the material. The results seem to suggest that the stiffness of cross-linked polymers can be successfully tuned by acting on the type and the relative amount of the cross-linker during the synthesis of a polymer matrix, predicting and controlling their swelling and entrapment properties. The proposed experimental approach is a useful tool for investigating the structural and physicochemical properties of polymeric network systems.
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