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Effect of physical crossliking on the thermal and mechanical properties of polymers

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Interpenetrating polymer networks (IPNs) are a new class of polymer blends, in a network with at least one of the systems synthesized in the presence of the other.

The main objective of this work was the elaboration and characterization of a novel sequential Homo-interpenetrating polymer network (Homo-IPN) based on poly (isobornyl acrylate) Poly(IBOA), in the presence of a difunctional cross-linker 1,6-hexanedioldiacrylate (HDDA) and the photoinitiator 2-Hydroxy-2-methyl-1-phenylpropane-1 (Darocur 1173) to initiate the radical polymerization under UV radiations. The swelling kinetics of the polymer network was measured as function of the time at room temperature. The differential scanning calorimetry techniques allowed us to determine the thermo physical properties of the networks. The study of the networks by DMA was undertaken according to the temperature, in order to evaluate the modulus of elasticity (E') and of loss (E'') and the tan δ curve. It is evident that the storage modulus of the networks decreases drastically as the temperature increases and then the modulus value reaches a plateau after such a descent, in our work, homo-IPN has the highest storage modulus comparing with Poly IBOA network which shows improvement of the thermal-mechanical properties of the networks.

Biography

Ahlam Benkhelifa is a PhD student in materials physic and composites, Researcher-students at the Macromolecules Laboratory at the University of Tlemcen in Algeria. Holder of a master's degree in polymer physics, my research focuses on the development and characterization of thermal and mechanical properties of polymers networks.

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