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Titre :

Phase Behavior of Poly(n-butyl acrylate) and Poly(2-ethylhexyl acrylate) in Hematic Liquid Crystal E7

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Résumé :

This paper reports on the phase behavior of photochemically crosslinked poly(n-butyl acrylate) (PABu) and poly(2-ethylhexyl acrylate) (PEHA) networks in a nematic liquid crystal (Le) solvent. The swelling properties of these networks were studied as a function of temperature using a low molecular weight LC (LMWLC). Which is an eutectic mixture of cyanoparaphenylenes named E7. To obtain different polymer network densities, the ratio of the reactive monomers ABu (or EHA) to the crosslinking agent hexanedioldiacrylate (HDDA) was varied prior to polymerization/ crosslinking reactions. Immersion of these networks in an excess of LC solvent allowed for the measurement of size increase by polarizing optical microscopy in terms of temperature. Diameter ratios were calculated considering swollen to dry network states of the samples. The uptake of LMWLC inside the network preferentially takes place around the nematic to isotropic transition temperature of the solvent. Phase diagrams in the concentration-temperature framework were given and discussed as a function of crosslinking degree of the polymer network and temperature and phase behavior of the solvent.

Mots Clés :

crosslinking; density; homopolymerization; phase behavior; phase diagram; swelling

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