32−33 Optical switching behavior of liquid crystalline polymer networks containing azobenzne molcules

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Photoresponsive liquid crystalline polymer networks with macroscopically uniaxial molecular orientation were prepared by polymerizing mixtures of liquid crystalline mono and di-acrylates, and an azobenzene compound in a homogenous glass cell at a nematic phase. The polymer networks showed an enantiotropic phase transition from an anisotropic phase to an isotropic phase as well as high transparency. The photoisomerization of the azobenzene compound resulted in a change in a birefringence. The photochemical change in the birefriengence was investigated by using a Xe lamp and a single pulse light from a Nd:YAG laser as light sources. We observed a response time in a range of a few microseconds and a decay time in a range of a few microhundreds of seconds. The optical switching behavior depended on the cross-linking density of the liquid crystalline polymer networks.

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