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Synthesis and characterization of photo-crosslinkable linear segmented polyurethanes based on coumarin

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Abstract

Linear segmented polyurethanes with 10% weight of coumarin groups within the soft segment, the hard segment or equally distributed between both segments were successfully prepared. These polyurethanes, based on polycaprolactones, isophorone diisocyanate, butanediol and a dihydroxylated coumarin monomer, were completely amorphous and homogeneous with a single phase morphology. In non-irradiated polyurethanes T_g value varied linearly with hard segment content that in turn was the main factor influencing the mechanical properties. Photo-dimerization at 354 nm produced crosslinked materials with little change on the T_g and outstanding mechanical properties, as high as 54 MPa, better than that of any other coumarin-containing polymer described.

Keywords

Coumarin; ring-opening polymerization; polycaprolactone; segmented polyurethanes; photo-dimerization

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