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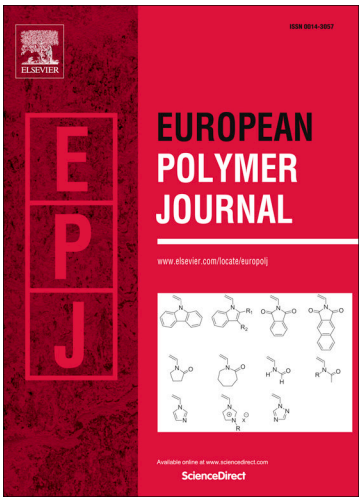

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SYNTHESIS OF SOL-GEL HYBRID POLYHYDROXYURETHANES

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Abstract

Syntheses of novel hybrid PolyHydroxyUrethane (PHU)/siloxane polymers have been performed by sol-gel process in order to mix properties of organic and inorganic compounds. In the objective to replace Polyurethanes (PU) for environmental and health concern, Polyhydroxyurethanes (PHU) are becoming interesting candidates in Non-Isocyanate Polyurethanes (NIPUs) routes. Therefore, mixing PHU and siloxane monomers to synthesize hybrid organic/inorganic materials is a promising approach. In this way, Polyhydroxyurethanes prepolymers with trimethoxysilane end groups were firstly obtained via two synthetic pathways and finally cross-linked by sol-gel process. Trimethoxysilane groups can be grafted onto diamines or dicyclic-carbonates varying chemical structure and thus properties of final materials. Three different PHU hybrid bulk materials have been obtained and these thermosets have been characterized with DSC, ATG, SEM and DMA measurements.

Keywords: cyclic carbonate; polyhydroxyurethane; sol-gel; siloxane; cross-linking

Graphical Abstract