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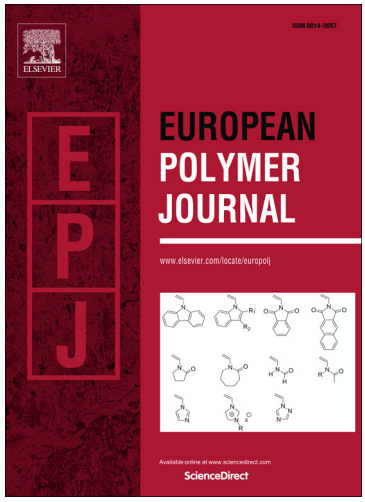

Catalysis of deblocking and cure reactions of easily cleavable phenol blocked polyisocyanates with poly(polytetrahydrofuran carbonate) diol.

S. Kalaimani, A. Sultan Nasar

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Catalysis of deblocking and cure reactions of easily cleavable phenol blocked polyisocyanates with poly(polytetrahydrofuran carbonate) diol.

S. Kalaimani and A. Sultan Nasar*

Department of Polymer Science, University of Madras, Guindy Campus, Chennai-600025, India. E-mail: drasultannasar@yahoo.com; drasultannasar@unom.ac.in;

Abstract

The deblocking and cure reactions of 2-chloro-4-esterphenol and 2-chloro-4-nitrophenol-blocked polyisocyanates with poly(polytetrahydrofuran carbonate) diol in the presence of a tertiary amine (DABCO), an organotin compound (DBTDL) and mixed amine and tin compounds were investigated using a hot-stage FT-IR spectrophotometer and gel-time method respectively. Though the deblocking temperatures of 2-chloro-4-nitrophenol-blocked polyisocyanate were not very different compared to 2-chloro-4-esterphenol-blocked polyisocyanate, it showed remarkably high cure-time. It was found that the tin catalyst showed higher catalytic activity than the amine catalyst in the case of 2-chloro-4-esterphenol-blocked polyisocyanate whereas this activity was not well pronounced in the case of 2-chloro-4-nitrophenol-blocked polyisocyanate due to the tin-nitro interaction confirmed by FT-IR spectroscopic method. The synergistic effect of amine and organotin mixed catalysts was also investigated and observed the synergism only in the case of 2-chloro-4-esterphenol-blocked polyisocyanate. The interaction between amine and tin catalysts leading to formation of an active complex was confirmed by FT-IR and UV-visible spectroscopic methods. The highest catalysts concentration used deblocks the 2-chloro-4-esterphenol-blocked polyisocyanate at 40 ^{o}C and cures this blocked polyisocyanate with a polol within 60 minutes at 80 ^{o}C.

Keywords