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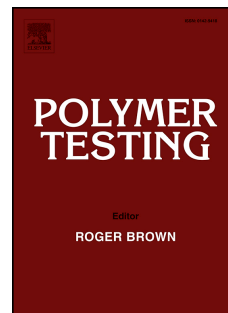
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ORIGIN OF EPOXIES EMBRITTLEMENT DURING OXIDATIVE AGEING

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ABSTRACT

Thermal oxidation of three epoxy resins prepared from flexible or rigid prepolymers and hardeners was studied by monitoring epoxy mechanical and physical changes. The physical changes were followed by mass measurements, glass transition temperature using DSC and sub-glass β transition using DMA. It was put in evidence that embrittlement is not directly associated to T_g or mass loss changes since epoxy network based on isophorone diamine (IPDA) hardeners were shown to undergo mainly a chain scission at the beginning of exposure process whereas epoxy network based on trioxatridecane diamine (TTDA) hardeners exhibits a crosslinking process with a significant mass loss. The only common feature for both epoxy systems to understand embrittlement is the drop of amplitude of β transition with oxidation.

KEYWORDS

Epoxy diamine, oxidation, failure properties.

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