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Synthesis and Polymerization Kinetics of Novel Dicyanate Ester Based on Dimer of 4-tert-butylphenol

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Abstract

A novel dicyanate ester, which constitutes the first member of the family of linear oligomers of 4-tert-butyl-phenol, is synthesized as a part of the systematic study on the relation between the reactivity of cyanate esters and their structure. The synthesized monomer undergoes thermally stimulated polymerization in the melt. The kinetics of polymerization is studied by conventional and temperature-modulated DSC. Detailed isoconversional analysis of the obtained kinetic data has revealed that the process rate is limited by a single reaction step of the auto-catalytic nature. Thermal stability and glass transition temperature of polymerization product are characterized by means of thermogravimetry and fast scanning calorimetry.

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Keywords

cyanate esters, isoconversional approach, kinetics, polymerization, thermal analysis

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