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Synthesis, Characterization, and Glass Fiber Reinforcement of Furan-Maleimide Polyimides

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Abstract : Novel polyimides were synthesized by Diels–Alder polymerization. Bisfuran was reacted with a couple of bismaleimides containing diglycidyl ether of bisphenol-A and F (epoxy) segment to obtain Diels–Alder polyadducts. Polyadducts were then aromatized and imidized (i.e. cyclized) through carboxylic and amide groups to afford polyimides. Synthesized polyadducts and polyimides were characterized by elemental analysis, spectral features, the number of average molecular weight (Mn) and thermal analysis. The 'in situ' glass fiber reinforced composites were prepared and characterized by mechanical, electrical, and chemical properties. These properties were compared with the other reported polyimides. All the composites showed good mechanical and electrical properties and good resistance to organic solvents and mineral acids.

Keywords : Diels-Alder reaction, bisfuran, bismaleimides, polyimide
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