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Flame retardancy of glucofuranoside based bioepoxy and carbon fibre reinforced composites made thereof

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Abstract

Flame retarded bioepoxy resins and carbon fibre reinforced composites were prepared from a novel glucofuranoside based trifunctional epoxy monomer (GFTE) cured with aromatic amine hardener. 4% phosphorus (P)-containing samples were prepared using liquid resorcinol bis(diphenyl phosphate) (RDP), solid ammonium polyphosphate (APP), and their combination. The common application of the inorganic APP and the organophosphorus RDP had two main advantages: APP compensated the plasticizing effect of low P-containing RDP, resulting in increased glass transition and storage modulus values compared to RDP-containing sample, while RDP added gas phase flame retardant action to the APP acting only in the solid phase, resulting in self-extinguishing, V-0 UL-94 rated bioepoxy matrix and composite specimens.