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Phosphorus-containing diacid and its application in jute/poly(lactic acid) composites: Mechanical, thermal and flammability properties

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Abstract: Phosphorous-based flame retardant was demonstrated excellent fire resistance for polymers and their composites, but the mechanical properties were always deteriorated. In this work, a phosphorous-containing diacid derivative (DOPO-MA) was synthesized by the reaction between 9,10-Dihydro-9-oxa-10-phosphaphenanthrene-10-oxide (DOPO) and and maleic acid (MA). The chemical structure of DOPO-MA was confirmed by Fourier transform infrared spectroscopy (FTIR) and differential scanning calorimetry (DSC). DOPO-MA had been incorporated into short jute/poly(lactic acid) (PLA) composites to study the influence of DOPO-MA on the mechanical, thermal and flammability properties of jute/PLA composites. Compared to DOPO, slight enhancements in tensile, flexural and impact strength were observed with DOPO-MA loading. The thermal degradation behaviour and flammability of the composites with different DOPO and DOPO-MA loading were investigated by thermogravimetric analysis

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