

Accepted Manuscript

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PII: S1359-835X(17)30098-2
DOI: <http://dx.doi.org/10.1016/j.compositesa.2017.03.004>
Reference: JCOMA 4594

To appear in: *Composites: Part A*

Received Date: 25 July 2016
Revised Date: 22 February 2017
Accepted Date: 2 March 2017

Please cite this article as: Yu, T., Tuerhongjiang, T., Sheng, C., Li, Y., Phosphorus-containing diacid and its application in jute/poly(lactic acid) composites: Mechanical, thermal and flammability properties, *Composites: Part A* (2017), doi: <http://dx.doi.org/10.1016/j.compositesa.2017.03.004>

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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 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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