

## Accepted Manuscript

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PII: S1359-835X(18)30316-6  
DOI: <https://doi.org/10.1016/j.compositesa.2018.08.007>  
Reference: JCOMA 5141

To appear in: *Composites: Part A*

Received Date: 11 March 2018  
Revised Date: 4 June 2018  
Accepted Date: 8 August 2018

Please cite this article as: Fei, M-e., Liu, W., Jia, A., Ban, Y., Qiu, R., Bamboo fibers composites based on styrene-free soybean-oil thermosets using methacrylates as reactive diluents, *Composites: Part A* (2018), doi: <https://doi.org/10.1016/j.compositesa.2018.08.007>

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## **Bamboo fibers composites based on styrene-free soybean-oil thermosets using methacrylates as reactive diluents**

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### **Abstract**

The present work aims at preparation of green composites by using bamboo fibers (BFs) as reinforcements and styrene-free soybean-oil based thermosets as matrices. To facilitate the formulation of acrylated epoxidized soybean oil (AESO) resins with a low viscosity and high crosslinking density, two methacrylate monomers, i.e., 1,4-butanediol dimethacrylate (BDDMA) and trimethylolpropane trimethacrylate (TMPTMA) were respectively used as reactive diluents (RDs) for replacing anticipatory carcinogenic styrene. Results indicated that the crosslinking density of AESO resins was improved and their viscosities were reduced simultaneously. The rheological and curing behaviors of AESO resins incorporated with RDs were investigated. The static and dynamic mechanical performance and thermal properties of bamboo fibers composites with the novel AESO resins were tested.

**Keywords:** A. Biocomposite; A. Thermosetting resin; A. Natural fibers; E. Compression moulding

### **1. Introduction**

The growing usage of fibers reinforced polymer composites profited from the progress in new processing techniques and researches on advanced resin matrices. Some novel green resins, such as polyester [1, 2], epoxy [3, 4] and other kinds of resins from natural feedstocks [5], have been applied in industrial fields including architecture,

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