

## Thermal degradation of four bamboo species

### ABSTRACT

Bamboo, among other natural plants, has a special structure, with different characterization along the culms and between species. In this study, the thermal stabilities of four bamboo species, named *Dendrocalamus pendulus* (DP), *Dendrocalamus asper* (DA), *Gigantochloa levis* (GL), and *Gigantochloa scortechinii* (GS), were investigated by thermogravimetric analysis (TGA) and differential scanning calorimetry (DSC) under a nitrogen atmosphere. Each species was divided into three different portions: bottom, middle, and top, and fibres were manually extracted from the specified sections of each species. The thermal analysis of extracted bamboo fibres indicated that the thermal degradation behaviour of each bamboo species varied from bottom to top and between species. However, these variations were lower in DA species compared to GS, GL, and DP, because of minor differences between lignocellulosic components of its three portions. The top and middle portions of the four species degraded at a higher temperature range (314 to 379 °C) than the bottom portions. The results of this study suggest that DA and GS species, according to their thermal stabilities, are most suitable for use as reinforcement in composite materials.

**Keyword:** Bamboo fibres; Natural fibres; Thermal degradation; Thermal properties