

Dynamic mechanical analysis of treated and untreated sugar palm fibre based phenolic composites

ABSTRACT

Phenolic-based sugar palm fibres (SPFs) were used as a filler for composites that were fabricated by hot pressing. The composites were prepared using various volume loadings of SPFs. Dynamic mechanical analysis (DMA) was carried out to evaluate the storage modulus (E'), loss modulus (E''), and tan delta as a function of temperature. The SPFs were treated by seawater for 30 days and a 0.5 alkaline solution for 4 days. The phenolic composites with 30% volume loading of SPFs were used to determine the effect of treatments on the DMA properties of the composites. The obtained results indicate that incorporating a SPF filler notably increased the E' and E'' properties and decreased the damping factor of the phenolic composites. Both treatments affected the DMA results. However, the alkaline-treated composites showed higher DMA properties compared with the seawater-treated and untreated fibre composites.

Keyword: Composites; Sugar palm fibre; Phenolic; Treatment; DMA