**Characterization of hybrid oil palm empty fruit bunch/woven kenaf fabric-reinforced epoxy composites**


ABSTRACT

In this research, the physical, mechanical and morphological properties of oil palm empty fruit bunch (EFB) mat/woven kenaf fabric-reinforced epoxy composites have been investigated. The oil palm EFB/woven kenaf fabrics were varied, with weight ratios of 50/0 (T1), 35/15 (T2), 25/25 (T3), 15/35 (T4) and 0/50 (T5). The composites were fabricated using a simple hand lay-up technique followed by hot pressing. The result obtained shows that an increase in kenaf fiber content exhibited higher tensile and flexural properties. On the other hand, the opposite trend was observed in the impact strength of hybrid composites, where an increase in kenaf fiber content reduced the impact strength. This can be corroborated with the physical properties analysis, where a higher void content, water absorption and thickness swelling were observed for pure oil palm EFB (T1) composites compared to other samples. The scanning electron microscopy analysis results clearly show the different failure modes of the tensile fractured samples. Statistical analysis was performed using one-way ANOVA and shows significant differences between the obtained results.



**Keyword:** Hybrid composites; Oil palm fiber; Kenaf fiber epoxy; Mechanical properties; Physical properties; Morphological properties