

## Mechanical and Barrier Properties of Cellulose Fibers/HNT Reinforced Epoxy Nanocomposites

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**Abstract :** Natural fiber reinforced composites have attracted researchers for their desirable properties of toughness, high modulus, low density, recyclability, and renewability. In fact, the use of natural fibers in polymer composites has the potential to produce materials with higher specific strength and specific modulus due of their low density. Likewise, polymer-nano-filler composites have been widely investigated for their unique and significant improvement in strength, modulus, impact strength, barrier properties, heat resistance and thermal stability. In this paper, The addition of halloysite nanotubes (HNTs) with three different weight percentages (1%, 3% and 5%) on enhancing barrier and flexural strength and modulus of cellulose-fiber (CF) /epoxy composites after water treatment for six months was studied. Results indicated that water uptake decreased as HNT content increased. The presence of HNT improved flexural strength and flexural modulus of CF/epoxy composites. SEM results showed damages in fiber-matrix interfacial bonding due to water absorption. The addition of HNTs was found to enhance to adhesion between fibers and matrix.

**Keywords :** mechanical properties, epoxy, nanocomposites, halloysite nanotubes

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