

Maleic anhydride modified unsaturated polyester composites reinforced with chicken feather fiber: dielectric and morphological study

ABSTRACT

In this study, chicken feather fiber has been used as reinforcement and unsaturated polyester as matrix. In addition, unsaturated polyester had been modified using maleic anhydride and reinforced with chicken feather fiber. The dielectric properties of the unsaturated polyester reinforced chicken feather fiber have been studied with reference to maleic anhydride modification and various fiber loading. The structures of unsaturated polyester and maleic anhydride modified unsaturated polyester have been investigated. SEM indicated an improved interfacial bonding between polymer and fiber through maleic anhydride modification. XRD analysis indicated the development of intercalated maleic anhydride structure, which in turn forms intercalated unsaturated polyester composite. It is observed that maleic anhydride modified composites increases dielectric constant, dissipation factor and resistivity. The dielectric constant, dissipation factor and resistivity increases with fiber content for the entire range of frequencies. The values are high for the composites with 40wt% fiber content. The results also indicated that both composite systems are stable at low frequency, i.e. at 60Hz and high frequency, i.e. at 1000 KHz. The increments of dielectric values are high at low frequency region and gradually becoming low at higher frequencies.

Keyword: Dielectric properties; Chicken feather fiber; Maleic anhydride; Unsaturated polyester; Morphology