

Compositional and morphological changes of chemical modified oil palm mesocarp fiber by alkaline bleaching and silane coupling agents

ABSTRACT

In this study, the effects of chemical modifications of oil palm mesocarp fiber (OPMF) via bleaching, silane coupling agents, and combinations of the two on the composition and morphology of OPMF were investigated. The chemically modified OPMF was characterized by Fourier transform infrared spectroscopy (FTIR), thermogravimetric analysis (TGA), and scanning electron microscopy (SEM). The FTIR spectra showed that bleached OPMF became more hydrophilic, while silanized unbleached and silanized bleached OPMF became less hydrophilic. The TGA thermograms indicated that bleaching successfully removed hemicellulose from the OPMF, while TGA analysis showed that silanized unbleached and silanized bleached OPMF had higher thermal stabilities than unbleached or bleached OPMF. The SEM micrographs revealed that the modified OPMF surface was rougher and more porous than that of the unbleached OPMF, further indicating that OPMF was successfully modified.

Keyword: Oil palm mesocarp fiber; Chemical modification; Bleaching; Silane coupling agent