

Moisture diffusion into palm/polypropylene composites in sodium chloride solutions.

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Abstract

A previous study showed that it was feasible to use wood fibers obtained from palm-tree branches to reinforce polypropylene. It was the objective of this study to study the moisture-sorption characteristics of palm fiber/polypropylene composites and the effect of using a compatibilizer on that important material property. The results of the study showed that the amt. of moisture absorbed at satn. by polypropylene during immersion in distd. water and various salt solns. increased significantly with the introduction of palm fiber into the polymer. The use of maleated (maleic anhydride modified) polypropylene (Epolene E-43) as the compatibilizer did not have a significant effect on the amt. of moisture intake of palm/polypropylene composites at satn. However, there was a significant change in the moisture-diffusion rate with the incorporation of the Epolene E-43 compatibilizer into the composites: the compatibilizer resulted in a significant increase in the diffusion rate. The moisture diffusivity was not affected by the soln. type for the palm/polypropylene composite specimens without any compatibilizer, but some increase in the mass diffusivity was obsd. as the purity of the soln. increased (as the salt concn. decreased) when the Epolene E-43 compatibilizer was used in the palm/polypropylene composites.