Abstract

High density polyethylene (HDPE) and cellulose (CELL) were used to prepare the samples used in this study. A fungal strain was isolated from the dumpsite capable of adhering to HDPE surface.The fungal strain was identified as Aspergillus niger. Blend composition was varied and the effect of Aspergillus niger on the creep properties investigated.Creep measurements were performed at 30 oC, 40 oC, 50 oC and 60 oC. Viscoelastic behavior of HDPE/CELL blends was found to be governed by temperature, CELL loading and inoculation. As expected with CELL loading, creep performance of the HDPE/CELL blends improved on addition of CELL but decreased with temperature increase and on inoculation. Creep compliance and creep strain increased with inoculation indicating that A.niger ruptured the blends hence increased chain motion. Wiliam-Landel Ferry (WLF) model offered a better long-term prediction based on the short-term creep data by shifting curves along the logarithmic time-axis to obtain a master curve. Time-temperature superposition technique produced smooth master creep curves through horizontal shifts.