

The effects of ionic liquid (ILs) as additive on recycled high-density polyethylene reinforced bamboo filler composites

Abstract

The study aim to improve the mechanical properties of recycled high density polyethylene (rHDPE) reinforced with bamboo filler (BF) by incorporating support of ionic liquids (ILs). The rHDPE/BF composites were produced by using injection molding process with different types of ILs in imidazolium based at three concentrations which is 0.2, 0.4 and 0.6 wt.%. The rHDPE/BF with ILs was compound with twin-screw extruder and undergoes injection molding process. The effects of ILs were characterized for mechanical, chemical and morphological properties of composites using tensile test, fourier transform infrared spectroscopy (FTIR) and field emission scanning electron microscope (FESEM). The results indicated that mechanical properties of the composites were improved by addition of ILs as additive. From the FTIR spectroscopy test, the presences of ILs were detected in the composites as it will improve the properties of composites. Finally, FESEM of fractured surface revealed better adhesion between the filler and matrix with the presence of additives.