

Processing and Physical Properties of Wood Flour/Polyethylene/Clay Nanocomposites: Clay type Performance

박병섭, 김대수*, 임현중, 홍진욱, 채현규
충북대학교 화학공학과
(dskim@chungbuk.ac.kr*)

Wood plastic composites (WPCs) are attracting a lot of interests because they are economic, eco-friendly, and show fairly good performance. In this study, the wood flour/polyethylene/clay nanocomposites were prepared by melt-blending all the ingredients, followed by compression molding. The composites were blended in a melt mixer equipped with a roller blades rotor at different mixing conditions (150°C, 60rpm, 30min). To improve the performance of the nanocomposites four different types of clays were incorporated as nanofillers respectively. In this study, the effect of four different types of nanoclay on the mechanical properties of HDPE was examined to identify the most effective nanoclay type for wood plastic composites (WPCs). The mechanical properties of the nanocomposites were measured using UTM, i-zod impact tester. The thermal properties of the nanocomposites were characterized using DMA, DSC, TMA and TGA. The morphology of the nanocomposites was investigated using SEM. The most hydrophobic clay (Cloisite 20A) was the best among the clays tested in this study because it could be most compatible to the PE matrix.