

Investigation on Polyvinyl Chloride (PVC) and Polycaprolactone (PCL) Blend Ratio: Effect on Their Mechanical and Physical Properties

Abstract

The effect of blend ratio for polyvinyl chloride (PVC) and polycaprolactone (PCL) blends on their mechanical and physical properties has been studied in this report. Polymer blends which consists of polyvinyl chloride (PVC) and polycaprolactone (PCL) were prepared by solution casting method with different ratio of PVC/PCL (100/0, 70/30, 50/50, 30/70, 0/100). The tensile and flexural properties of PVC/PCL blends were observed in this work by using universal machine testing. The sample of PVC/PCL blends showed that the tensile and flexural strength of the blend systems increased as the PCL content increased. Hardness test showed that as PCL is absorbed into PVC, the hardness decreased, and this tendency decreased as the amount of PCL is increased. The surface morphology of the PVC/PCL blends was been examined using scanning electron microscopy. The surface morphology resulted that smooth surface can be seen with large pores in the pure PVC while rough surface appeared in the blends due to high content of PCL. The water absorption and density of the PVC/PCL blend is obtained by immersing the sample into the distilled water. The density result showed that the density of blends increased when the content of PCL increased. The water absorption result showed that by increasing the amount of PCL in the blends has decreased the percentage of water absorption.

Keywords

Blends; Mechanical properties; Physical properties; Polycaprolactone (PCL); Polyvinyl chloride (PVC)