Effect of Crude Palm Oil as Plasticizer on the Mechanical and Morphology Properties of Low Density Polyethylene Blown Film.

ABSTRACT

This paper presents a study on the mechanical and morphology properties of low density polyethylene (LDPE) blown film modified with crude palm oil (CPO). The effect of the crude palm oil as plasticiser on LDPE matrix has been studied. The LDPE were compounded with 1%, 3% and 5% of crude palm oil in a co–rotating twin screw extruder and pelletised. The blends were processed using blow thin film machine. The results on tensile properties were showed the gradual enhanced the elongation at break about 79% to 90% in machine direction (MD) and transverse direction (TD) and gradually decreased the tensile strength about 9%. The rupture properties of LDPE modified with CPO showed the decrement pattern due to the plastisticisation effect. The fracture mechanism of modified LDPE was also investigated from scanning electron microscope micrographs which clearly indicated the orientation strengthening consistently with the result in mechanical properties. From Fourier transmission infra–red (FTIR) spectras, the presence of CPO showed the addition peak in 1,745 to 1,747 cm−1 region indicated the physical interaction between molecular of polyolefins and CPO. These observations have important implication as an alternative environmental friendly plasticiser based from renewable resources for polymeric materials.

Keyword: Mechanical Properties; Crude Palm Oil (CPO); Low Density Polyethylene; Plasticizer