

Effects of mixing and bi-orientation processes on physical and thermal properties of microvoided PLA film by blending LDPE

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In the study, a microvoided PLA film was prepared by mixing of poly(lactic acid) (PLA) and low-density polyethylene (LDPE) and bi-orientation processes. Since the microvoided PLA film is lower density and higher insulation property, it is able to apply for construction materials. A formation of microvoided PLA film is explained by the fact that PLA is immiscible with LDPE. Therefore, it is important to study on mixing and bi-orientation technology for a higher micro-voided film. A mixed resin blending 5~20 wt% LDPE was extruded at 220°C and casted at lower temperature than 20°C to be 20~30 um thickness. Finally, the microvoided film was obtained by stretching both 200% mechanical direction (MD) and 200% transverse direction (TD).

Density of microvoided PLA film is 0.8~1.1 g/cm³ due to the formation of many microvoids in film inside by LDPE dispersion, orientation, and annealing processes.