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The evaluation of mechanical, physical and antifungal properties of LLDPE/LDPE/PLA antimicrobial film with potassium sorbate as an antifungal agent

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In this work, a series of blends of linear low-density polyethylene (LLDPE)/ low-density polyethylene (LDPE)/PLA at various ratios (10%, 20%, 30% PLA) were prepared in twin screw extrusion with post extrusion blown film. The blends, then, were optimized by their mechanical properties. On the basis of mechanical results, blend with the ratio 80/20/20/5phr of LLDPE/LDPE/PLA/PE-g-MA was selected as the optimum composition. In order to achieve an antifungal film, 4phr potassium sorbate was added into the blend. The results show that with an addition of 4phr potassium sorbate tensile strength and elongation @ break of LLDPE/LDPE/PLA/PE-g-MA film (80/20/20/5phr) highly increased from 7.93Mpa to 11.71Mpa and from 282.57 % to 551.57 % respectively. Moreover, the result from water absorption test of the optimized composition with and without potassium sorbate on the basis of ISIRI 911 shows that the presence of potassium sorbate has no significant effect on water absorption of the film. The antifungal results of the film containing 4phr potassium sorbate against *Aspergillus niger* and *Aspergillus fumigatus* demonstrate fungistatic effect during 10-day test.

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