

Thesis Title	EFFECTS OF GAMMA RAY AND ADDITIVES ON HETEROGENEOUS BLENDS OF POLYOLEFINS AND POLYSTYRENE
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ABSTRACT

The immiscible blends of low density polyethylene, polypropylene and polystyrene were investigated. In this study, the immiscibility of polymer blends was improved by the addition of compatibilizers, i.e., styrene-butadiene-styrene (SBS) and ethylene vinyl acetate (EVA). The effects of gamma-ray irradiation and CaCO_3 on morphology, thermal and mechanical properties were investigated. The results showed that the compatibilizers improved both elongation at break and impact strength of the blends, particularly in the system containing SBS. While, radiation in the dose range of 40-180 kGy improved both tensile strength and modulus of the polymer blends. Gel content indicated that degree of crosslinking in LDPE was higher than those in compatibilizers and PP.

The results of thermal properties from DSC showed that T_m , T_c , ΔH_m and ΔH_c of the system without compatibilizers decreased with increasing of PS content. The system with compatibilizers displayed the small change of T_m and T_c while ΔH_m and ΔH_c decreased with increasing of compatibilizers. SEM analysis illustrated that the addition of compatibilizers lead to a finer and more dispersed phase morphology, whereas the radiation technique did not effects morphology.

In the case of the system without compatibilizers, CaCO_3 content more than 12% by weight reduced mechanical properties of the blends. While, the mechanical properties of the system with SBS plus CaCO_3 decreased with the increasing of SBS content.