

Reactive Blending of Thermoplastic Starch, Ethylene-1-Butene Rubber, and Chitosan

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Abstract : Thermoplastic starch (TPS) was prepared by melt-blending of cassava starch with glycerol (70/30 wt%/wt%) at 130 °C for 10 min. Chitosan (CTS) was used as a compatibilizer. TPS/CTS blend was melt-blended with maleic anhydride grafted ethylene-1-butene rubber (EB-MAH) in the composition of 80/20 respectively. Addition of CTS in TPS/EB-MAH blend decreased particles size of EB-MAH rubber to 1µm in TPS matrix. Mechanical properties, solubility, swelling property, morphology, and water contact angle of TPS/EB-MAH blend were improved by CTS incorporation. FTIR confirmed a reaction had occurred between amino groups (-NH₂) of CTS and the MAH groups of EB-MAH. This reaction and the enhanced miscibility between TPS and CTS improved morphology and properties of the TPS/EB-MAH/CTS blend.

Keywords : thermoplastic starch, rubber, reactive blending, chitosan

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