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Properties of bioplastic films made from chitosan and poly (lactic acid) blends with plasticizer PEG 400

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The increasing usage of non-degradable packaging plastic causes environmental matters. The development of degradable or bioplastic has become an alternative solution to those matters. Chitosan was one of the bioplastic materials that can be used as packaging. Bioplastic film which was made of chitosan has low barrier properties. By improving those properties, the study was performed with a film made of chitosan-PLA mixture with a ratio of 10:0; 9:1; 8:2; 7:3; and 0:10. The films were tested for tensile strength, percent elongation, melting point, moisture permeability, and antimicrobial activity. The interactions among constituent components were characterized by a Fourier transform infrared spectrophotometer (FTIR), whereas a film surface structure was observed using scanning electron microscope (SEM). The chitosan-PLA mixture film has a tensile strength and a smaller elongation percentage throughout the increasing of PLA ratio. Based on the FTIR spectrum, the interaction between chitosan and PLA are physically occurred. The chitosan-PLA film barrier has been reported decreasing. The chitosan-PLA bioplastic film has a lower melting point than its constituent components. The surface of the chitosan-PLA film was not homogeneous. The chitosan-PLA blend film can inhibit or kill Gram positive or Gram negative bacteria.

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