

Research Title: Development of biodegradable packaging from thermoplastic cassavastarch reinforced by pectin and cotton fibers

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ABSTRACT

This research studied on properties of thermoplastic starch (TPS) prepared from cassava starch using glycerol as a plasticizer at the ratio of starch : glycerol; 65:35. Properties of the TPS were modified by different contents of pectin and cotton fibers, In addition, the combinations of pectin and cotton fibers were also studied. Cassava starch and glycerol were mixed using an internal mixer and, then, shaped by a compression molding machine. It was found from FT-IR spectra that the new addition wavenumbers of 1720 cm^{-1} was observed by the incorporation of pectin into the TPS matrix. The water absorption was lower when cotton fibers were incorporated into the TPS matrix. For morphology, obtained from Scanning Electron Microscope (SEM), the results illustrated that pectin or cotton fibers were well distributed and compatible with the TPS matrix. The highest maximum load, stress at maximum load and Young's modulus were obtained by the TPS modified by both pectin and cotton fibers. Moreover, thermal stability of the TPS was also improved in all of the modified TPS. Finally, the quickest degradation was found in the TPS modified by both pectin and cotton fibers.

Keywords : biodegradable packaging, thermoplastic starch, cassava starch.