

Physicochemical characterization of ph indicator film based anthocyanin for active food packaging applications

ABSTRACT

Smart packaging has received tremendous attention recently due to its ability to track and trace safety within a reasonable timeframe by capturing and presenting information on packaged food or shelflife quality. In this study, biodegradable anthocyanin-based biopolymer films were prepared and characterized as physicochemical properties. Anthocyanin was extracted from roselle and incorporated into the anthocyanin/starch film with starch. The morphological and chemical characteristics were characterized by scanning electron microscopy (SEM) and transmission electron microscopy (TEM). The micrography indicated that the anthocyanin/starch film surface was smooth and homogeneous and showed irregular benzene ring shapes. Besides, anthocyanin/starch films exhibit higher mechanical strength, superior UV-versus light barrier properties, and improved water vapor than starch film due to the strong interfacial interaction between anthocyanin and starch hydrogen bonds. Based on the findings, it might be useful to establish promising noticeable pH-sensing as a smart food packaging to monitor meat products' freshness. Anthocyanin/starch films, therefore, offer good potential for developing active food packaging to extend the foodstuff's shelf-life.