Potential of silver-kaolin in gelatin composite films as active food packaging materials

ABSTRACT

This study discovered the potential application of kaolin (Kln) and silver-kaolin (Ag-Kln) in gelatin-composite films as active packaging material for food products. Three different types of kaolins; raw Kln, Ag-Kln (1:2) mix and Ag-Kln (1:1) mix with various concentrations (15%, 30% and 45%) were prepared by solution casting. For the water barrier properties, the wettability test indicated that the addition of kaolin in gelatin films produced hydrophobic films and lower ($p < 0.05$) water vapour permeability, regardless of the kaolin type and concentration. Scanning electron microscopy images portrayed that higher inclusions of Ag-Kln compounds are able to develop smoother surface and homogenous cross-section. In addition, by incorporating these two materials, films with great antimicrobial effect towards both Gram-positive and Gram-negative bacteria were produced. Elevation of Ag-Kln concentration also proved to lower the transmission of ultraviolet-vis light through the films. These findings suggested that gelatin film with Ag-Kln has a potential and beneficial in food packaging industry due to its enhanced properties. tilizer formulations for crop growth on acid soils.

Keyword: Biodegradable films; Active packaging; Fish gelatin; Kaolin; Silver