

Title Antimicrobial silver-montmorillonite nanoparticles to prolong the shelf life of fresh fruit salad

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Abstract

In this work, silver-montmorillonite (Ag-MMT) antimicrobial nanoparticles have been obtained by allowing silver ions from nitrate solutions to replace the Na^+ of natural montmorillonite and then to be reduced by a thermal treatment. Ag-MMT were used as active antimicrobial compounds to improve the shelf life of fresh fruit salad. In order to assess their influence on product shelf life, sensorial and microbiological quality has been monitored during the storage. The microbiological quality was determined by monitoring the principal spoilage microorganisms (mesophilic and psychrotrophic bacteria, coliforms, lactic acid bacteria, yeasts and molds). Additionally, the evolution of sensorial quality was assessed by monitoring color, odor, firmness and product overall quality. The Ag-MMT nanoparticles seemed to be effective in inhibiting microbial growth, above all at the highest tested concentration. Consequently, the sensorial quality of samples stored in the active packaging appeared to be better preserved. Thus, experimental results showed that a significant shelf life prolongation of fresh fruit salad can be obtained by a straightforward new packaging system.