ELABORATION OF BIODEGRADABLE WHEY ISOLATE FILM INCORPORATED WITH GREEN SYNTHESIZED SILVER NANOPARTICLES

Andra-Sabina NECULAI-VALEANU[1], Adina-Mirela ARITON [1]

e-mail: amariton@yahoo.ro

Abstract

Finding a feasible alternative to reduce the use of conventional polymers in the plastic sector has become a top priority, since industrially generated plastic waste, mostly traditional food packaging, has turned into a global environmental disaster. The aim of the study was the preparation and characterization of biodegradable films based on whey protein isolate, functionalized with green synthesized nanoparticles. Green silver nanoparticles (AgNPs) were synthesized using cinnamon extract as both capping and reducing agent. Biodegradable nanocomposite blend films based on silver nanoparticles and whey protein isolate (WPI) were made by casting denatured WPI film solutions incorporated with green synthesized silver nanoparticles. The film thickness and water vapor permeability (WVP) of both control and AgNPs were determined. The biodegradable films based on whey and (1%) green synthesized nanoparticles have potential application as active food packaging in the cheese industry.

Key words: whey, green synthesis, silver nanoparticles, biodegradable film, active packing