

ANTIMICROBIAL MODIFICATION OF PACKAGING MATERIALS

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Abstract

Nanotechnology represents the future of materials with unique properties enabling construction of new devices with properties which are not obtainable with macroscopic materials. Nowadays many nanomaterials are studied in scientific laboratories but only several of them have spread to the common life of people. Silver nanoparticles are one of these nanomaterials mainly thanks to their excellent antimicrobial activity. They are used for antimicrobial treatment of fabrics, in cosmetic products and also in materials for human or veterinary medicine.

The modern packaging materials have a multifunctional properties which are adjusted on demand of particular utilization of package in commercial practice. The serious problem in commercial practice represents microbial contamination of outer part of package during manipulation with goods during their distribution. Therefore, development of packaging materials with antimicrobial properties represents a current problem of packaging technology. Silver nanoparticles can be used to solve this problem in packaging technology. However, typical packaging materials are non-polar polymers as polyethylene or polypropylene and combination of these polymers with silver nanoparticles represents complex technological problem. We have developed the highly concentrated and well stabilized dispersion of silver nanoparticles which can be used for modification of low-density polyethylene polymer (LDPE) to obtain antimicrobial activity of the resulting composite material. This way modified LDPE polymer can be used for production of packaging materials with excellent antimicrobial properties.

Keywords: Silver nanoparticles, packaging materials, antimicrobial activity

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