ADHESION OF BACTERIAL FILMS ON POLYMER FOOD FILMS COVERED BY GRAPHENE OXIDE EMULSION AND GRAPHENE NANOPARTICLES

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Introduction

Bioactive food packaging should protect food against bacteria and fungi. An important aspect is the initiation of a protective barrier process against pathogens. Such a barrier may be a graphene oxide emulsion layer [1-3].

Materials and Methods

The study used a commercially available water emulsion of graphene oxide and three types of food films for fat products. The bacteriostatic properties of the emulsion of graphene oxide (GO) graphene nanoparticles and silver nanoparticles were investigated. The tests used standard strains that are representative pathogens: *Escherichia coli ATCC 25922, Pseudomonas aeruginosa NCTC 12903 / ATCC 27853, Staphylococcus aureus ATCC® 25923, Streptococcus mutans ATCC 35668, Streptococcus sanguis ATCC10556*.

The assessment of antibacterial activity was made using the direct method based on the criteria contained in the description of SN 195920: by modified circular diffusion according to Czerwińska.

The adhesion of bacteriological biofilms to food foils with graphene on a fluorescence microscope was then carried out (MOTIC B1410E, 400 x magnification).

Results and Discussion

The research results indicate the lack of antibacterial properties of graphene oxide emulsions (as a layer) and the strong bacteriostatic properties of graphene nanoparticles and silver nanoparticles. Fluorescence of graphene on food films was not observed in the fluorescence microscope.

Conclusions

The bioactivity of packages with graphene oxide emulsion is a protective barrier against food-borne pathogens.

References

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