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ABSTRACT:

Polymeric packaging films modified with carbon, silver, and copper, dedicated for the food industry

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Packaging is a very important stage in food production technology. Appropriately designed packaging not only provides protection for the product from external factors but can also enable control over changes related to transformations occurring in the product during storage. Additionally, properly chosen packaging allows for the reduction of preservatives, which is important in terms of public health. Of course, reducing storage changes and loss of quality is associated with a decrease in food waste, which is also one of the current issues in more developed societies.

Nanoparticles and nanotechnologies have entered and established themselves in our lives. Currently, numerous studies are being conducted on the application of nanoparticles in the packaging industry. The activity of silver, carbon, or copper nanoparticles is widely known and is utilized in many industrial sectors, from paint production to various composites and automotive windshield washer fluids.

The next stage of nanoparticle research will be their potential application in the packaging industry, especially for food. Analyses of the interaction between living organisms and nanoparticles are known. We are aware of the toxicity of graphene. We know the properties of nanodiamonds and the possibilities of modifying their properties. We are well aware of the antibacterial properties of silver nanoparticles. Research is being conducted on nutritional issues related to nanoparticles as well as technological problems associated with the modification of packaging films, such as the impact of modification on the effectiveness of sealing packaging films.