

The use of starch with the addition of glauconite to create nanocomposite packaging materials

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In recent decades, the demand for plastics in Ukraine and the world has increased significantly, and most are used to produce packaging. Active use of such materials in everyday life leads to the accumulation of a large number of plastic waste, hazardous to the environment. These materials decompose for quite some time and release toxic substances. Therefore, the development of qualitatively new environmental packaging is a key issue.

This paper was received film materials from annually renewable components - starch with the addition of clay mineral glauconite in the form of nanoparticles.

To produce such films using native potato starch, which added glycerol plasticizer dispersion and magnetic-separated glauconite in specific proportions. This suspension is heated to a temperature of 90⁰C. Thus as shown in [1, 2] by heating starch to a temperature of 70-80⁰C is the destruction of his quasi-crystalline structure with the release crystalline hydrate water and increase adsorption properties of the particles to disperse natural clay minerals.

Disperse particles of the mineral glauconite have spherical shape and virtually no swell in aqueous solutions. It is assumed that the polysaccharide chains of starch are adsorbed on the outer surface of the particles and partly in inter-packet space aluminosilicate mineral layers near the surface due to their intercalation into inter-packet space.

Unlike layered aluminosilicates such as montmorillonite, saponite, etc..., suggest that the polysaccharide chains are adsorbed and located around spherical glauconite particles more compact form and durable film.

After drying a stable aqueous dispersion of starch and clay formed film, which has an increased ability to stretch. As shown by the mechanical strength of such films research is growing by 15% when you enter it glauconite, compared with the addition of montmorillonite and 35%, compared with starch film.

The developed film can be used in packaging technology, particularly for food packaging. This film also exhibit increased bactericidal property due to the presence of clay mineral glauconite [3].

Thus, using natural ingredients you can not just get an environmental packaging, but also formed by direct decomposed organic matter the needs of agriculture. It should be noted that mineral glauconite used as potash or complex fertilizer.

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3. S.I. Hong, J.W. Rhim. Journ. of Nanoscience and Nanotechnology. 2008, V.8. P. 5818–5824.