

Nanocomposites and nanomaterials

Based on polyesters bioresistant nanostructured polyurethanes

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Nanostructured polyurethanes have been prepared by modification of cross-linked polyurethanes based on polyesters and aromatic polyisocyanate. The nanostructured organic-inorganic siloxane oligomer obtained by the sol-gel method, which is a classical hydrolysis-copolycondensation reaction of tetraethoxysilane with phenyltriethoxysilane, was used as a modifier [1].

The biological stability of the samples of modified polyurethane coatings with respect to the association with heterotrophic bacteria was evaluated. The main indicator of the biological stability of coatings is the lack of biofilm of bacteria on the surface of the coating, the absence of haze after testing in microbiological solutions. The study showed that the medium with the test samples of the modified polyurethane was clear. In the biofilm removed from the surface of the samples of the polyurethane coating the bacteria have not been found, i.e. these samples had the biological stability on microbiological indices. IR spectroscopic studies showed that the main composition of the materials after an exposure to the bacteria cultures was unchanged, what is an additional feature of the biological stability of the materials. In addition, the physical and mechanical characteristics of the polyurethane coating samples also allow to attribute them to the biological stable materials: elasticity and strength of the films after exposure to the corrosive bacteria cultures practically remained at the initial level [2].

1. Кузнецова В.П., Ласковенко Н.Н., Омельченко С.И. Органо-неорганические полимеры, синтез и свойства.// Композиционные, полимерные материалы. - 2000.- №2.- С. 87 - 91.
2. Ласковенко Н.Н., Коптева Ж.П., Козлова И.А., Кузьменко Н.Я. и др. Биостойкость защитных модифицированных полиуретановых покрытий//Журнал «Полимер».- Киев.- 2015. - №3, в печати

