

Nanochemistry and biotechnology

Investigation of bioactivity of polyurethane ureas containing folate-derivative of ferrocene *in vivo*

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An important stage of the development of polymer materials is investigation of their biological activity. Determination of enzyme acid phosphatase (AP) activity is an reliable test, that reflects the character and course of pathological process including inflammation i can serve as evidence of biological activity of developed polymeric materials. Polyurethane ureas (PUU) containing folate-derivative of ferrocene (FDF) were obtained by structural modification of diisocyanate prepolymer (DPP) (polyoxypropylene glycol (MW 1000) i 2,4-;2,6-toluene diisocyanate (mixture of isomers 80/20 wt. %) by molar ratio equal 1:2) extended by 1,6-hexamethylenediamine (GMDA). 0,5 wt. % FDF was introduced to PUU solution as a 20% solution in N,N-dimethylacetamide.

The biological activity of polymeric material containing FDF was investigated spectrophotometric method by the change in activity in blood serum of experimental animals while subcutaneous implantation of PUU samples. The method is based on the hydrolysis of the substrate of p-nitrophenyl phosphate by AP to form p-nitrophenol, which is yellow in alkaline medium with maximum absorption at 410 nm. Studies were conducted on intact white laboratory rats. Animals were divided into two groups. The first group of animals were implanted with DPP+GMDA films (control). The second group were implanted with DPP +GMDA+0,5%FDF films (prototype). The animals were taken out of the experiment at day 7 and 30 by decapitation to obtain blood samples. The research results are presented in the table.

Table. Activity of AP in rat serum at implantation of PUU samples

AP activity in blood serum of rats	Activity of acid phosphatase			
	7 days		30 days	
	DPP+GMDA	DPP+GMDA+ 0,5%FDF	DPP+GMDA	DPP+GMDA + 0,5%FDF
57,85±6,34	58,60±3,70	81,21±3,29*	85,80±6,56	63,14±5,62*

* – The difference compared with control are reliable ($p < 0,05$).

As follows, synthesized polymers exhibit biological activity *in vivo*.