

Nanostructured surfaces

Influence of self-assembled monolayers on formation of biomimetic hydroxyapatite on titanium surface

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In modern medicine, is widely used and investigated biotechnical products and systems in which the various elements and parts interact with biological fluids, soft and hard tissues of the body. Transplantation of foreign material inevitably accompanied by suppressive therapy, which severely limits the recovery of damaged tissue.

The bioceramics are widely used for the repair and re-construction of diseased or damaged parts of the skeleton. Widely used bioceramics in bone surgery is hydroxyapatite (HA) - mineral component of human bone.

This work is aimed on the comparative studies on the process of biomimetic synthesis of hydroxyapatite (HA) on the titanium surface via using self-assembled monolayers.

Self-assembled monolayers (SAM) - compact and highly organized monolayers, which are formed by chemical adsorption (Fig. 1.). The structure of one molecule SAM includes three main elements: a functional group and an anchor end between alkyl chains.

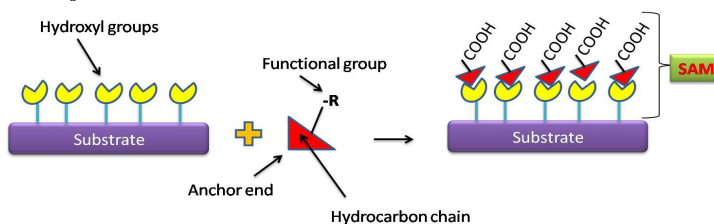


Fig. 1. Formation of self-assembled monolayers (SAM)

Fourier transform infrared spectroscopy and XPS confirmed the formation of the biomimetic Hydroxyapatite coating, on the surface of titanium plates, with different quantity and “quality” of HA, according to chemical nature of samples surface [1].

1. Petranovska, A.L., Turelik, M.P., Pylypchuk, E.V., Gorbyk, P.P., Korduban, O.M., Ivasishin, O.M. Formation of biomimetic hydroxyapatite on a surface of titanium (2013) *Metallofizika i Noveishie Tekhnologii*, 35 (11), pp. 1567-1584.