

NANOSTRUCTURED SURFACES OF SOLID SUBSTRATES FOR BIOAPPLICATIONS

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Abstract

A number of materials studied in materials research and in bio-applications (polymers, glass, silicates) have a wide range of interesting properties, but their use is often limited to certain applications due to inappropriate surface properties. Particularly for bio-applications are very important surface properties like chemistry, surface charge, morphology and porosity of the materials studied. Therefore, we focus on the possibility of modification of the surface properties so that they are suitable for pre-planned applications. We use a wide range of analytical methods for characterization of the samples before and after modifications. The aim of work is to modify the surface and surface properties of different substrates. Make it suitable for bio-applications, namely to: be useful for adhesion and proliferation of cells, or to exhibit antibacterial effects.

We have modified surfaces of polymers and glass by chemical methods, and we studied the resultant changes of surface properties of the modified substrates. The surfaces of solid substrates were firstly pre-treated by piranha solutions. The activated surfaces were grafted with selected vicinal compounds and then with some boron cluster compounds - highly fluorescent boron hydride cluster anti-B18H22 or its thiolated derivative 4,4'-(HS)2-anti-B18H20.

Keywords: Polymers, surface, piranha, boron cluster, antibacterial effect, cell

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