Study of Biocompatible Titanium Alloys Using X-Ray Photoemission Spectroscopy

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Abstract. Modern medicine offers many applications that would be unthinkable without the possibility of implants. Individual implants have to satisfy various requirements to ensure their efficient and safe use. In this respect, one needs to control a very important property: the biocompatibility. One of the widely used biocompatible materials is titanium (Ti). A thin TiO2 coating layer genuinely forms on its surface along with some other chemical bonds which will be studied in this experiment.
In this study, we measured the chemical composition and bonds of four variously treated surfaces by X-Ray Photoemission Spectroscopy (XPS): with bacteria, MG-63 human osteosarcoma cells [1], bacterial medium and cells medium. All samples were studied in titanium and also nano-titanium forms [2]. The emission was measured at 0° and 60°, in order to better investigate the surface composition. For examination of chemical changes with depth we also used Ar sputtering on the samples.

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