

Nanostructured surfaces

Anodic nanostructuring of titanium oxide

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Morphology of anodic titanium oxide considerably depends on electrolyte composition. In the absence of fluoride ions in aside electrolyte on the titanium film surface solid protection layer of titanium oxide is formed. Introduction of fluoride ions and some other supplements in electrolyte leads to the formation of quasiordered system of nanochannels grating. In our experiments diameter of nanochannels was 30-150 nm with a height of 500 nm approximately.

Further etching of film forms nanopillars.

The goal of this work is find out technological factors in systematic research of morphology of nanostructural anodic titanium. Morphology investigated with SEM and ASM techniques.

Anodic oxidation of titanium film accompanied with molar volume expansion which brings significant mechanical stress. That is why we pay attention to crystallinity, adhesion and inner stress of source titanium film which was deposited by magnetron sputtering.

Unlike anodic aluminum oxide anodic titanium oxide is resistant in alkaline solution, more durable mechanically and has higher heat-resistance.

Perspective usage of nanostructural anodic titanium oxide would be quasiordered cheap templates, membranes, nanostructure medium for chemisorption of specific molecules, nanofilters manufacture, optic and semiconductor devices, nanosensors..