

INFLUENCE OF TiO₂ SCALING ON CORROSION RESISTANCE OF TITANIUM IMPLANTS

IOANOVICI Teodora*, MARGINEAN Gabriela**, BERETEU Liviu*,
TOTH-TASCAU Mirela*

*University "Politehnica" Timisoara, **Fachhochschule Gelsenkirchen
teodora.ioanovici@mec.upt.ro, gabriela.marginean@fh-gelsenkirchen.de,
liviu.bereteu@mec.upt.ro, mirela@cmpicsu.upt.ro

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Considering the increasing use of Titanium and its alloys for medical purposes, numerous studies to increase biocompatibility by scaling different implants with Titanium oxide have been performed. There are many methods of achieving TiO₂ scaling, but the most accessible one and the one studied in this paper is thermal oxidation. In order to obtain the TiO₂ thin coat, several samples obtained from Titanium plate implants (**Fig. 1**) were oxidized at different temperatures and maintained for different periods of time in an oven.^[2]



Fig. 1: Titanium plate implant for long bones

The influence of TiO₂ scaling on corrosion resistance was studied by testing the oxidized samples in simulated body fluid (SBF) and comparing the obtained results. As we can see from **Fig. 2** the thin TiO₂ layer (scale) of 4.36 μm shows a good behavior with no obvious cracks. The corrosion tests were realized using VoltaMaster 4 and then the results were analyzed with the XL 30 ESEM-scanning electron microscope.^{[1][3]}

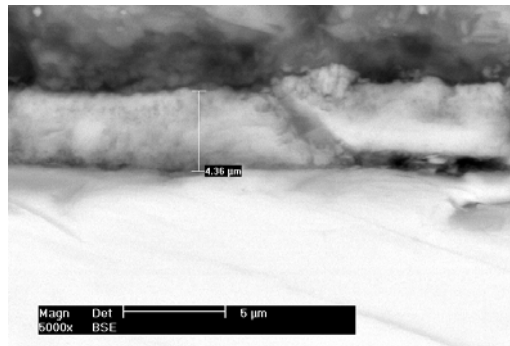


Fig. 2: Thickness of the oxide layer after corrosion, 5000x magnified

Selective Bibliography:

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