

Graded-Oxide Tantalum Nanoporous Films

The Problem

A porous oxygen rich environment on the surface of implants is known to stimulate tissue growth and provide increased surface area for the attachment of osteoblast processes. However such surfaces are a potential host to microbes which can lead to infection.

The Solution

A graded-oxide tantalum porous film of controlled porosity and particle size is deposited. This film has smart hydrophobicity as shown. Initially the film is super-hydrophilic, enhancing integration, after repeated exposure to water it becomes hydrophobic, reducing microbes and other contaminants.

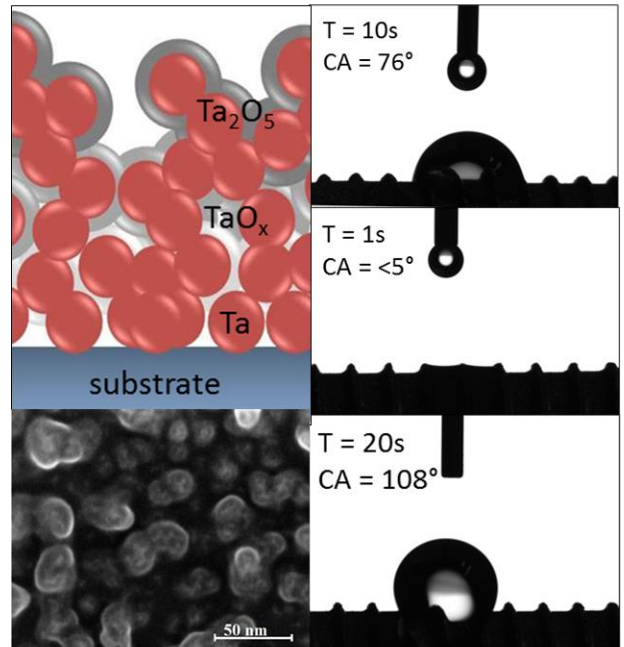


Figure showing from top left clockwise, schematic of cross section of film with Ta_2O_5 surface and Ta at implant surface, hydrophobicity of uncoated implant (top), as deposited graded-oxide Ta coated implant (middle), and graded-oxide Ta coated implant after repeated exposure to water, and SEM of graded-oxide coating showing porosity and typical feature size.

Applications

- Medical implant coating

Benefits

- Approved bio-compatible material
- Smart hydrophobicity

Keywords

Nano-porous coating, medical implant, hydrophobicity, smart hydrophobicity, super-hydrophilic

Opportunity

- Licensing
- Collaborative research

Patent Granted

For more information

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