Short Communication

Improved Surface Properties for Nanotube Growth on Selective Laser Melted Porous Ti6Al4V Alloy via Chemical Etching

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In this work, porous Ti6Al4V components with a 400 μm interval were prepared by selective laser melting (SLM), one of most popular powder-bed additive manufacturing technologies for metallic alloys, there were many un-melted powders adhered to the as-received substrate framework. To improve the bio-functional property, surface treatment for this complex structure must be taken into consideration and chemical etching for proper time can remove the trapped powders. Anodic oxidation experiments showed that non-uniform nanotubes grew on the trapped powders, while nanotubes grew uniformly on the chemical etched substrate and the diameter of nanotubes was about 100 nm all over the place. The electrochemical experiments and cell proliferation results all showed that the chemical etching method can improve the corrosion resistance and biocompatibility of the SLM porous Ti6Al4V.

Keywords: Ti-6Al-4V; Selective laser melting; Nanotube; Porous materials; Chemical etching

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