



## 6. Effect of UV Wavelength on Apatite Formation of Anodised Titanium

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### **Abstract**

A novel method to accelerate the apatite formation on the anodised titanium is proposed in this article. The processing was composed of two steps which were UV light treatment after anodic oxidation, and UV light illumination during soaking in simulated body fluid (SBF). This study aims to investigate the effect of different UV wavelengths during SBF on the apatite formation of anodised titanium. The titanium foils were anodised in mixture of  $\beta$ -glycerophosphate disodium salt pentahydrate ( $\beta$ -GP) and calcium acetate monohydrate (CA). Subsequently, the anodised titanium foils were pre-treated with UV light. *In vitro* was conducted by illuminating with different wavelengths of UV light (254nm and 365nm) in SBF. Field emission scanning electron microscopy (FESEM) and X-ray diffractometer (XRD) were used to characterise the surface morphology and crystallinity of anodised titanium. The results showed that donut-shaped pores with anatase/rutile phases were formed on the surface of anodised titanium. Apart from that, the UV light treatment did change the chemical properties of anodised titanium by producing more •OH groups. After UV light illumination in SBF for 1 week, the anodised titanium foils were fully covered by bone-like apatite.

**Keywords:** Anodic Oxidation; Titanium; UV light; Simulated body fluid; Apatite.

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