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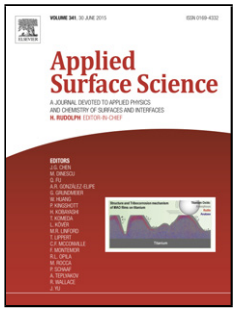

Title: The effect of graphene oxide on surface features, biological performance and bio-stability of calcium phosphate coating applied by pulse electrochemical deposition

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The effect of graphene oxide on surface features, biological performance and bio-stability of calcium phosphate coating applied by pulse electrochemical deposition

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Highlights

- The effect of incorporation of GO sheets into the CaP coating on the surface features, biocompatibility, bio-stability, and biomineralization ability of the coating were studied.
- The presence of GO sheets in the electrolyte led to co-electrodeposition of the uniform GO-CaP coating with a refined microstructure and rougher surface.
- The GO-CaP showed better bio-stability as compared to CaP coating mainly because of increasing the chance of formation of the most stable phase of carbonated hydroxyapatite in the composite coating.
- The GO-CaP coating having the less roughness, more stability, additional surface functional groups and appropriate wettability revealed better cell adhesion and proliferation.
- The apatite biomineralization ability of the GO-CaP coating was more than that for the CaP one, mainly owing to the presence of additional hydroxyl groups on the surface of the composite coating and its more bio-stability.

Abstract

In the current study, the effect of second phase of graphene oxide (GO) on the surface features and biological behavior of calcium phosphate (CaP) coating was evaluated. To do so, the GO-CaP composite coating was applied on TiO_2 nanotubular arrays using pulse electrochemical deposition.