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MICROPLASMA SYNTHESIS of BIOCOMPATIBLE COATINGS with ADDITIONS OF
MAGNESIUM, SILICON AND SILVER on PURE TITANIUM from HOMOGENEOUS
ELECTROLYTES

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Abstract

The coating was produced by microplasma process (plasma electrolytic oxidation, microarc oxidation) of Ti substrate. The coatings formed in basic solution containing Ca^{2+} , EDTA^{4-} , PO_4^{3-} , Mg, Si, Ag were selected as additives in the anodizing bath to produce modified Ca/P coatings. The morphology, phase and elemental composition of the coating were characterised using scanning electron microscopy, X-ray diffraction and EDX analysis. The results showed that Mg, Si, Ag additions was successfully incorporated. The coatings mainly consists of anatase, rutile and calcium phosphates and besides Mg incorporated coatings contain additionally $\text{CaMg}(\text{CO}_3)_2$, CaCO_3 , MgCO_3 and $\text{Ca}_{9.5}\text{Mg}_{0.5}\text{P}_7\text{O}_{28}$; the Si-incorporated coatings contain additionally CaTiSiO_5 phases. The way was found to regulate the characteristics of the coatings by introducing desired elements, such as Mg, Si, Ag by microplasma technique.

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