EH O 2

Elektroforetsko taloženje antibakterijske kompozitne prevlake hidroksiapatita sa hitozanom, grafenom i gentamicinom

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U ovom radu su ispitivane kompozitne prevlake koje se sastoje od hidroksiapatita (HAP), hitozana (CS) i grafena (Gr), sa i bez gentamicina (Gent) dobijene postupkom elektroforetskog taloženja (EPD). Taloženje je izvedeno u jednom koraku iz četvorokomponentne vodene suspenzije (HAP/CS/Gr/Gent) pri konstantnom naponu na titanskim (Ti) pločicama. Uticaj Gr i Gent je detaljno istražen primenom različitih fizičko-hemijskih i bioloških analiza. Karakteristike dobijenih HAP/CS/Gr i HAP/CS/Gr/Gent prevlaka ispitivane su infracrvenom spektroskopijom sa Furijeovom transformacijom (FT-IR), skenirajućom elektronskom mikroskopijom (FE-SEM), rendgenskom fotoelektronskom spektroskopijom (XPS) i rendgenskom difrakcionom analizom (XRD). Ispitivanja antibakterijske aktivnosti prema *Escherichia coli* i *Staphylococcus aureus* izvršena su metodom agar difuzije i testa u suspenziji, a citotoksičnost MTT testom na ćelijskim linijama MRC-5 i L929. Dobijeni rezultati ukazali su na veliki potencijal elektroforetski istaloženih kompozita za medicinske primene.

Electrophoretic deposition of antibacterial composite hydroxyapatite coating with chitosan, graphene and gentamicin

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In this work composite coatings consisting of hydroxyapatite (HAP), chitosan (CS) and graphene (Gr), with and without gentamicin (Gent) produced by electrophoretic deposition process (EPD) were investigated. Deposition was performed in a single step from the four-component aqueous suspension (HAP/CS/Gr/Gent) at a constant voltage on titanium (Ti) plates. The influence of Gr and Gent has been thoroughly explored using various physico-chemical and biological analyses. The characteristics of the obtained HAP/CS/Gr and HAP/CS/Gr/Gent coatings were investigated using Fourier transform infrared spectroscopy (FT-IR), field emission scanning electron microscopy (FE-SEM), X-ray photoelectron analysis (XPS) and X-ray diffraction (XRD) techniques. Antibacterial efficacy assays against *Escherichia coli* and *Staphylococcus aureus* were performed by agar diffusion method and in suspension testing, while cytotoxicity was elucidated using MTT test toward MRC-5 and L929 cell lines. Obtained results pointed out high potential of electrodeposited composites for medical applications.