

عنوان مقاله:

Mechanical Properties of Electrophoretically Deposited 45S5 Bioglass-Graphene Oxide Composite Coatings

محل انتشار:

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خلاصه مقاله:

Bioglass-graphene oxide composites can be served as an appropriate alternative for bone implant applications due to its specific mechanical properties. In this study, the 45S5 bioactive glass (BG) - graphene oxide (GO) composite containing 2wt% GO was deposited on the Ti-6Al-4V alloy substrate via the electrophoretic deposition process (EDP). The synthesized GO was incorporated into BG coating to improve the mechanical properties. The phase, structural agents, microstructure, and composition were investigated by X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), and scanning electron microscopy (SEM) equipped with energy dispersive spectroscopy (EDS), respectively. The micro scratch test with a progressive load was applied to study the adhesion and fracture toughness of coatings based on a linear elastic fracture mechanics model. micro scratch results showed the highest critical distances of crack initiation and delamination, critical contact pressures (P_{c1} and P_{c2} = 4.80 and 5.37GPa, respectively), and fracture toughness (K_{IC} = 0.885 MPa.m^{1/2}) for BG-GO composite coatings.

کلمات کلیدی:

bioglass, graphene oxide, bonding, Scratch, Fracture toughness

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