

Characterisation and in vitro Corrosion Resistance of Plasma Sprayed Hydroxyapatite and Hydroxyapatite: Silicon Oxide Coatings on 316L SS

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Abstract : In the current investigation plasma spray technique was used for depositing hydroxyapatite (HA) and HA - silicon oxide (SiO₂) coatings on 316L SS substrate. In HA-SiO₂ coating, 20 wt% SiO₂ was mixed with HA. The feedstock and coatings were characterized by X-ray diffraction (XRD) and scanning electron microscopy (SEM)/energy-dispersive X-ray spectroscopy (EDX) analyses. The corrosion resistance of the uncoated, HA coated and HA + 20 wt% SiO₂ coated 316L SS was investigated by electrochemical corrosion testing in simulated human body fluid (Ringer's solution). The influence of SiO₂ (20 wt%) on corrosion resistance was determined. After the corrosion testing, the samples were analyzed by XRD and SEM/EDX analyses. The addition of SiO₂ reduces the crystallinity of the coating. The corrosion resistance of the 316L SS was found to increase after the deposition of the HA + 20 wt% SiO₂ and HA coatings.

Keywords : HA, SiO₂, corrosion, Ringer's solution, 316L SS

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