Strontium doped hydroxy-apatite coatings on Ti and NiTi by Electrodeposition: Surface and Electrochemical Characterization

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Abstract

In the present work, we synthesized strontium doped hydroxy-apatite coatings on titanium and nickel titanium (Nitinol) surface via cathodic deposition at different current densities. The coatings were produced from electrolytic bath containing calcium, phosphorus and strontium ions maintained in the molar ratio 1.67. Scanning electron microscope (SEM) micrographs reveal a mixed morphology of coating, i.e., needle shaped crystals along with spherical crystals. Coatings produced at different current densities showed preferential orientation of apatite crystals along *c*-axis and the texture coefficient was calculated. . The crystallite size calculation revealed that, the crystallites are in nano-range and the size decreases with increase in deposition current density. The diffraction pattern obtained from the TEM investigation confirmed the presence of texture in these coatings. Electrochemical studies using potentiodynamic polarization and electrochemical impedance spectroscopy (EIS) showed that the strontium doped hydroxy-apatite coatings formed at higher current density has superior corrosion resistance.