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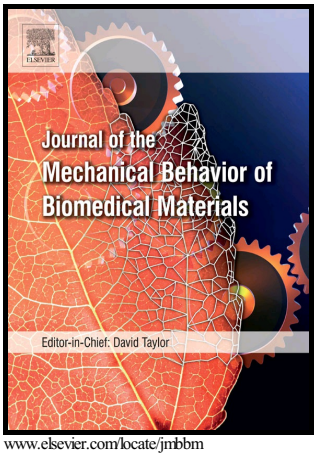

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Electrochemical corrosion and bioactivity of Ti-Nb-Sn-hydroxyapatite composites fabricated by pulse current activated sintering

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Abstract

Ti-Nb-Sn-hydroxyapatite (HA) composites were prepared by mechanical alloying for different times (unmilled, 4 8 and 12 h), followed by pulse current activated sintering. The effects of the milling time on the electrochemical corrosion resistance and bioactivity of the sintered Ti-35Nb-2.5Sn-15HA composites were investigated. Potentiodynamic polarization test results indicated that the sintered Ti-35Nb-2.5Sn-15HA composites exhibited higher corrosion resistance with increasing milling time. The corrosion potential and current of the Ti-35Nb-2.5Sn-15HA composite sintered by 12 h milled powders were −0.261 V and 0.18 μA/cm^2, respectively, and this sintered composite showed a stable and wide passivation region. The hemolysis rate of the sintered Ti-35Nb-2.5Sn-15HA composites reduced with increasing milling time and the lowest hemolytic rate of the composites was 0.87%. In addition, the *in vitro* cell culture results indicated that the composite sintered by 12 h milled powders had good biocompatibility. These results indicate the significant potential of Ti-35Nb-2.5Sn/*x*HA composites for biomedical implant applications.