Electrochemical and Mechanical Properties of Cast Ti-V Alloys for Dental Applications

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A series of Ti-*x*V alloys with a vanadium (V) content ranging from 5 to 20 wt% were fabricated to investigate phase/microstructure, various mechanical, and electrochemical properties. The microstructural samples were characterized using X-ray diffractometry (XRD), scanning electron microscopy (SEM) and transmission electron microscopy (TEM). All the Ti-*x*V alloys showed colonies of hexagonal close packed (hcp) α -phase lamellae within large body centered cubic (bcc) β -phase grains of several lath boundaries. As a result of solid-solution strengthening of α -Ti and β -Ti phase matrix, the Ti-*x*V showed better mechanical properties than the commercially pure titanium (cp-Ti). Based on the electrochemical results, the Ti-5V alloy exhibited improved corrosion resistance as compared with cp-Ti.

Keywords: Ti-V alloy, mechanical properties, electrochemical properties, dental materials

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