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Influence of heat treatment condition on passivity of titaniumaluminum-vanadium alloy in sodium chloride solution

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Abstract: Corrosion of Ti6Al4V was study with different heat treatments in3,5% NaCl solution by electrochemical measurements, includedpotenthiodynamic polarization curves, linear polarization resistance(LPR) measurements and electrochemical impedance spectroscopy(EIS), in order to focus on exploring the effect of annealing on theelectrochemical response in a quantitative manner. The samples wereprepared in the state of the art; heat treatments were applied at fourdifferent temperatures of 550, 750, 950 and 1100°C. Themicrostructure of samples has been studied using the opticalmicroscopy and the mechanical properties have been evaluated suchas microhardness HV. The electrochemical test show that the corrosionrates of treated samples at temperature equal or more then 750 ° C;are much better for the untreated sample. Although, the corrosionproduct on the surface is identified as titanium dioxide by XRD in allsamples.

Keywords : Ti6Al4V, corrosion, heat treatment, Corrosion product, XRD