

Galvanic Corrosion Behaviour of Ti and Ti6Al4V Coupled to Noble Dental Alloys

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This study aims to evaluate the electrochemical corrosion behaviour of titanium and Ti6Al4V alloy coupled to the following noble dental alloys: Pontor® 2, Cerapall® 2, V-Gnathos® Plus and Pagalin® 2. The study was conducted in artificial saliva, pH 7.1, at 37°C, by linear sweep voltammetry, electrochemical impedance spectroscopy and chronoamperometry. The R_p values of the noble dental alloys varied from 10^4 to $10^5 \Omega \text{ cm}^2$. Data from E_{ocp} curves, linear polarization resistance, Tafel plots and electrochemical impedance spectroscopy lead to the same order for the resistance against corrosion of the four noble alloys in artificial saliva. The order from the less to the more reactive alloy is: Cerapall® 2 → Pontor® 2 → V-Gnathos® Plus → Pagalin® 2. Values of the i_{couple} , varying between 0.2 and $0.7 \mu\text{A cm}^{-2}$, were obtained for the four noble alloys when coupled to pure titanium or to the titanium alloy, respectively. Among the couples studied the Pontor® 2 | Ti was found to be the more resistant galvanic couple, while the Cerapall® 2 | Ti6Al4V presents the lowest corrosion resistance.

Keywords: Titanium, Ti6Al4V alloy, noble dental alloys, corrosion resistance, electrochemical techniques, galvanic couples.