Impact of Hydrogen Peroxide and Albumin on the Corrosion Behavior of Titanium Alloy (Ti6Al4V) in Saline Solution

Benea Lidia*, Simionescu Nicoleta

Competence Center: Interfaces-Tribocorrosion-Electrochemical Systems, Dunarea de Jos University of Galati, 47 Domnească Street, RO-800008, Galati, Romania

*E-mail: Lidia.Benea@ugal.ro

doi: 10.20964/2021.02.39

Received: 5 October 2020 / Accepted: 23 November 2020 / Published: 31 December 2020

In this study our goal was to monitoring the corrosion behavior of titanium alloy (Ti6Al4V) in four solution: saline solution, saline solution with addition of 1% H₂O₂, saline solution with 1% albumin and saline solution with mixed 1% albumin + 1% H₂O₂ in order to see the synergistic effects of this two compound in combination. It is known that H₂O₂ is a ROS (reactive oxygen species) which appear in human body when inflammatory reactions occur and albumin it is used because is a protein (the most abundant) from the human body. In vitro studies for corrosion behavior of titanium alloy (Ti6Al4V) in a presence of saline solution, H₂O₂ and albumin in this study were investigated by different electrochemical measurements: OCP (open circuit potential), PD (potentiodynamic polarization curves) and EIS (electrochemical impedance spectroscopy). From the electrochemical results we can say that the presence of H₂O₂ in the saline solution decreases the corrosion resistance of the Ti6Al4V alloy, while the presence of albumin in the saline solution acts as an inhibitor and the corrosion resistance of Ti6Al4V alloy increases as compared to the solution in which it was added H₂O₂.

Keywords: Corrosion resistance; Titanium alloy; Reactive oxygen species; Albumin.

[FULL TEXT](#)

© 2021 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).