

## عنوان مقاله:

Investigation the Effect of Process Time on Microstructure and Corrosion Behavior of Ceramic Coatings Fabricated by Plasma Electrolytic Oxidation (PEO) on Pure Titanium

## محل انتشار:

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## نویسنده:

## خلاصه مقاله:

In this study, the effect of processing time on microstructure and corrosion behavior of coatings fabricated by plasma electrolytic oxidation (PEO) on pure titanium substrate was investigated. All PEO processes were performed in aluminate based electrolyte and under constant applied voltage ( $420\text{ V}$ ) and at three times ( $180$ ,  $240$  and  $300\text{ s}$ ). By studying the surface morphology of coatings, it was found that the coating formed at  $180\text{ s}$  had the most compact and uniform structure with smallest micropores and the least porosity. The XRD pattern of this coating showed that the coating is composed of rutile, anatase and  $\text{TiAl}_2\text{O}_5$  phases. Also, studying the corrosion behavior of coatings with potentiodynamic polarization and electrochemical impedance spectroscopy (EIS) tests in  $3.5\text{ wt.}\%$  NaCl solution proved that the coating formed at  $180\text{ s}$  exhibited the most noble corrosion potential, the lowest corrosion current density and the most polarization resistance and so the best corrosion resistance among all samples.

## کلمات کلیدی:

Titanium, Plasma Electrolytic Oxidation (PEO), Aluminate electrolyte, Rutile, Anatase, Corrosion  
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