عنوان مقاله:

The Impact of Current Density of Electroplating on Microstructure and Mechanical Properties of Ni-ZrO2-TiO2 Composite Coating

محل انتشار:

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خلاصه مقاله:

Metallic composite coatings with ceramic particles can be used to improve the mechanical and corrosion properties of steel. In the present research, Ni-ZrO2-TiO2 composite coating was fabricated on AISI 430 stainless steel through the electrodeposition method. The effect of the current density of electroplating (15, 17, 20, and 23 mA.cm-2)was investigated on the microstructure and mechanical behavior of coated steel. Scanning electron microscopy (SEM) and X-ray diffraction (XRD) were used to study the morphology and phases. Micro-hardness was measured by the Wickers method, and wear behavior was evaluated by the pin-on-disk test. The results showed that the deposition of TiO2 and ZrO2 ceramic particles in the composite coating increased and then decreased by increasing the applied current density up to 20 mA.cm-2. Similar trends were observed for the variations in hardness and wear resistance of the composite coating. According to the results, the use of Ni-ZrO2-TiO2 composite coating on AISI 430 stainless .steel improved the mechanical properties

کلمات کلیدی:

composite coating, TiO2, ZrO2, Current Density, Abrasive Resistance