عنوان مقاله:

Investigation on the Corrosion Behavior and Microstructure of SCM۴۲۰H Steel Coated With Manganese Phosphate at Different Temperatures

محل انتشار:

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خلاصه مقاله:

In order to improve the surface quality and prevention of corrosion and reduction of wear in the components like gears and bearings, they can be coated with phosphate coatings. SCH۴۲۰H alloy steel was coated with manganese phosphate deposition. The microstructure and corrosion resistance of the coating was studied by change of bath temprature. In order to investigate the phase analysis and coating microstructure, X-ray diffraction (XRD) and scanning electron microscopy (SEM) were used, respectively. XRD analysis from the coated surface revealed the phases of MnFe۲(PO۴)۲(OH)۲H۲O, Mn(PO)۳, Fe(PO)۳ and (Mn,Fe)۵H۲(PO۴)۴.۴H۲O. Results showed the obtained coating at ۹۰°C was uniform and continuous and no crack or porosity was observed. The phosphate surface at ۸۵°C and ۹۵°C was non-uniform and included cracks. In order to investigate the corrosion resistance, potentiodynamic polarization and electrochemical impedance spectroscopy (EIS) tests were applied on coated and uncoated specimens in ۳.۵% NaCl solution. The results of potentiodynamic polarization and electrochemical impedance spectroscopy tests were in agree with microscopic images and results showed that the coated specimen at ۹۰°C has higher corrosion resistance.

کلمات کلیدی:

Manganese phosphate coating, Temperature, Potentiodynamic polarization, Electrochemical impedance spectroscopy,
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