عنوان مقاله:

comparison of the surface pretreatment of mild steel by acid and alkaline solutions for corrosion enhancement of silane coatings

محل انتشار:

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خلاصه مقاله:

In this work, the effect of acidic and basic treatments on mild steel samples before applying silane coatings was investigated. H2SO4 and H3PO4 as acid solutions with pH and 25 g/L (pH 13.25) NaOH as the basic solution were used. Coated samples were prepared using (3-Glycidyloxypropyl) trimethoxysilane and tetraethylorthosilicate, as silane precursors through dip coating method. Scanning electron microscopy (SEM) and potentiodynamic polarization tests were applied for investigating the corrosion behavior of mild steels in treatment media. Electrochemical impedance spectroscopy (EIS) was carried out for evaluating the corrosion performance of silane coated steels at different immersion times in 0.1 NaCl. SEM images showed good distribution and different morphology of corrosion products on H3PO4 treated mild steel. Polarization curves also showed the higher tendency to corrosion of mild steels in acidic solutions than the basic one. EIS results for silane coated steel showed the best corrosion behavior for samples treated with H3PO4 solution. This could be related to better adhesion of the active silanols in the sol to surface hydroxides of the H3PO4 treated steel which is converted to strong covalent bonds during curing. Visual .appearance of the samples also confirmed these findings

کلمات کلیدی:

Mild Steel, Corrosion performance, Silane coating, Acidic treatment, Basic treatment, Electrochemical impedance spectroscopy

لینک ثابت مقاله در پایگاه سیویلیکا: