

عنوان مقاله:

Internal Coating Selection of Desalter Vessel by Electrochemical Studies on the Corrosion rate of Sweet Crude Oil

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خلاصه مقاله:

In this research, the corrosive effect of sweet crude oil was studied by Electrochemical Impedance Spectroscopy (EIS), Tafel polarization and Electrochemical Noise (ECN), on Carbon steel samples immersed in the extracted water of desalter vessel. According to the EIS results, after ۴ hours, the impedance modulus at ۰.۰۱ Hz frequency were ۱۳۷۶ at ۲۵ °C and ۶۲۵ Ohm.cm^۲ at ۸۵ °C . The relatively low variations of impedance modules at ۲۵ and ۸۵ °C can be caused by the formation of Iron carbonate film on carbon steel at temperatures above ۶۰ °C, in the presence of CO_۲ of the sweet crude oil. Also, the results of Tafel polarization confirmed that the corrosion rate due to the significant increase of temperature, was equal to ۵.۹ MPY and ۱۰.۷ MPY, at ۲۵ and ۸۵ °C respectively. The ECN results at ۶۵ and ۸۵ °C demonstrated that the large contribution of low frequency events on these immersed carbon steel samples is an indicative of general corrosion due to the discontinuous formation of carbonate film on the carbon steel surface. The discontinuous formation of carbonate film was also confirmed by scanning electron microscopy (SEM) micrographs. Then, for inside corrosion control of the desalter vessel, the best protective commercial coating has been selected considering the corrosion rate of carbon steel samples immersed in the extracted water of desalter vessel. To do so, the EIS tests in the special immersion cell and pull off tests were done on the solvent free Epoxy coatings with different hardners. Although all three solvent free coating samples can exhibit a suitable corrosion resistance at ۸۰ °C, but on the comparison between them, the performance of epoxy coating with phenolic hardener is better than epoxy coating with poly amino- amide hardener.

کلمات کلیدی:

,Corrosion, Desalter equipment, Solvent free epoxy coating, Electrochemical evaluations
خوردگی، تجهیز نمکزدا، پوشش اپوکسی بدون حلال، ارزیابی های الکتروشیمیایی

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