World Academy of Science, Engineering and Technology
International Journal of Chemical and Materials Engineering
Vol:8, No:11, 2014

The Corrosion Resistance of the 32CrMoV13 Steel Nitriding

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Abstract : This paper presents corrosion behavior of the plasma-nitrided 32CrMoV13 steel. Different kinds of samples were tested: non-treated, plasma nitrided samples. The structure of layers was determined by X-ray diffraction, while the morphology was observed by scanning electron microscopy (SEM). The corrosion behavior was evaluated by electrochemical techniques (potentiodynamic curves and electrochemical impedance spectroscopy). The corrosion tests were carried out in acid chloride solution (HCl 1M). Experimental results showed that the nitrides ε-Fe2−3N and γ′-Fe4N present in the white layer are nobler than the substrate but may promote, by galvanic effect, a localized corrosion through open porosity. The better corrosion protection was observed for nitrided sample.

Keywords : plasma-nitrided, 32CrMoV13 steel, corrosion, EIS
Conference Title : ICCEE 2014 : International Conference on Chemical and Environmental Engineering
Conference Location : Paris, France
Conference Dates : November 21-22, 2014