Corrosion Study of Al-Fe (20 wt%) Alloy in Seawater Alkaline Solutions

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The assessment of corrosion susceptibility of the Al-Fe (20 wt%) alloy in seawater at different alkaline pH values was performed applying potentiodynamic polarization, linear polarization resistance (LPR) and electrochemical impedance spectroscopy (EIS) techniques. The electrochemical results carried out at room temperature showed lower values of the corrosion current density of about 0.008 - 0.0896 mA/cm². The polarization curves showed the formation of an unstable layer which decreases with the pH increasing. EIS results revealed a corrosion mechanism controlled by the ion transport through the permeable film. Microstructural characterization confirmed the formation of hydroxides phases as corrosion products by increasing the pH and exposure time.

Keywords: Al-Fe (20 wt%) alloy, electrochemical techniques, seawater.

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