

Synthesis and Characterization of Schiff Base Used for the Improvement of Corrosion Performance of XC38 Carbon Steel, in Acidic Medium

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Abstract

To study the inhibitory effect of the Schiff base on the corrosion protection of carbon steel, several characterization techniques were used. Weight loss, potentiodynamic polarization and electrochemical impedance spectroscopy were used to evaluate the corrosion behavior of the inhibitor.

Weight loss allowed to reach an inhibition efficiency of 92.8% at a concentration of 150 ppm. Potentiodynamic polarization revealed that I_{corr} decrease and E_{corr} increase, it means that the corrosion performance is improved with presence of inhibitor and reach a value about 87.50% at 100 ppm which is in good agreement with weight loss. Tafel plots showed that the used Schiff base is a mixed inhibitor, it acts on both the anodic and cathodic branches. Electrochemical impedance spectroscopy confirms the obtained results. FTIR was used to determine the functional groups. Scanning electron microscopy method was used to investigate the surface of the C-steel surface before and after immersion in 1M HCl solution, without and with inhibitor.

Keywords –Mild Steel, Corrosion, Schiff base, Inhibitor, Electrochemical tests