

The Inhibiting Effect of Non Toxic 4-Amino antipyrine and 4,6-Dimethyl-1H-pyrazolo[3,4-b]pyridin-3-amine on Mild steel Corrosion in Sulphuric acid

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Potentiodynamic polarization, electrochemical impedance, weight loss, and scanning electron microscopy (SEM) techniques are used to study the inhibiting effect of 4-amino antipyrine (AAP) and the prepared 4,6-dimethyl-1H-pyrazolo[3,4-b]pyridin-3-amine (PP) in order to decrease the dissolution of mild steel in 0.5 M H₂SO₄. The results indicate that increasing inhibitors concentration increases the efficiency of inhibition and increasing the temperature decreases the efficiency of inhibition. The AAP compound was seen to retard the rate of corrosion of mild steel more effective than PP compound. The adsorption of the AAP inhibitor on the mild steel surfaces obeys both of Langmuir and Temkin isotherms while PP inhibitor obeys only Langmuir isotherm. Studies of the scanning electron microscopy established the corrosion protection property of AAP and PP to be through adsorption on sites on the mild steel surface which are active. Also, mixed action of the inhibitors effect is showed from the results. The theoretical assumptions show proper agreement with most of experimental data. Temperature studies are occurred to find the thermodynamic parameters of inhibition and to suggest the isotherm of the adsorption processes.

Keywords: Mild steel, Corrosion Inhibitor, Potentiodynamic polarization, Adsorption isotherms and EIS

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