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Experimental and theoretical study of D-Biotin as green Inhibitors on the corrosion inhibition of carbon steel in Chloride ion environment

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Abstract: Electrochemical impedance, Potentiodynamic polarization and weight loss studies were performed on carbon steel in 240ppm Chloride ion solution with various concentrations of D-Biotin as inhibitors, The results of potentiodynamic polarization showed that i_{corr} (corrosion current density) decreases with increasing the concentration of biotin showing a decrease in the corrosion rate as well as an increase in the inhibition efficiency of carbon steel. The observed results show that biotin is good corrosion inhibitors. Surface analysis using UV-Vis, FTIR, SEM, EDX spectra, Adsorption isotherm and Thermodynamic parameter of these inhibitors in 240 ppm Chloride ion medium shows that biotin act as good corrosion inhibitors. Quantum chemical data obtained from DFT (density functional theory) calculations agree with this experimental results.

Keywords: Potentiodynamic, polarization, Electrochemical impedance spectroscopy, Biotin, Carbon steel, Chloride ion medium.

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