Corrosion Inhibition and Adsorption Behavior of Nerium Oleander Extract on Carbon Steel in Hydrochloric Acid Solution

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Nerium Oleander (N. Oleander) was investigated as a corrosion inhibitor for carbon steel (CS) in 1 M HCl solution using electrochemical techniques (potentiodynamic polarization (PP), electrochemical impedance spectroscopy (EIS) and electrochemical frequency modulation (EFM)) and non-electrochemical method (weight loss (WL)). The data showed that the inhibition protection (%IP) raised and corrosion rate (CR) lowered with raising both NOE concentration and temperature to reach 91% at 300 ppm. The adsorption of the NOE on CS surface was found to obey the Langmuir's adsorption isotherm. The PP curves showed that this extract behaved as a mixed type inhibitor. Fourier transform infrared (FT-IR) was utilized to detect the functional groups adsorbed on CS surface. Surface morphology was examined using scanning electron microscope (SEM) and atomic force microscopy (AFM) techniques.

Keywords: Inhibition protection, Carbon steel, N. Oleander extract, HCl, SEM, AFM

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