Ciprofloxacin as Eco-Friendly Corrosion Inhibitor for Carbon Steel in Hydrochloric Acid Solution

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Ciprofloxacin antibiotic was studied as a new corrosion inhibition for carbon steel (CS) in 1M hydrochloric acid solution using (mass loss (ML), hydrogen evolution (HE) and thermometric) as chemical methods at different temperatures, AC impedance (EIS), potentiodynamic polarization (PP) and electrochemical frequency modulation (EFM) as electrochemical techniques at 25°C. Polarization technique showed that the ciprofloxacin performs as a mixed-type inhibitor and give protection percentage reached to 91% in the presence of 300 ppm of the drug. Adsorption of the ciprofloxacin on surface of CS has obeyed Langmuir isotherm. Thermodynamic adsorption and activation parameters were calculated and discussed. Surface analyses have evaluated using different techniques.

Keywords: CS, Corrosion inhibition, HCl, ML, HE, PP, EFM, EIS, SEM, EDX.

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